Non-collateralised Structured Products

Issuer

J.P. Morgan Structured Products B.V.

(Incorporated with limited liability in The Netherlands)

Guarantor

JPMorgan Chase Bank, National Association

(a national banking association organised under the laws of United States of America)

Managers

J.P. Morgan Securities plc

J.P. Morgan Securities (Asia Pacific) Limited

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This document, for which the issuer and the guarantor accept full responsibility, includes particulars given in compliance with the Rules Governing the Listing of Securities on the Stock Exchange of Hong Kong Limited (the ''Rules'') for the purpose of giving information with regard to the issuer, the guarantor and the structured products referred to in this document. The issuer and the guarantor, having made all reasonable enquiries, confirm that to the best of their knowledge and belief the information contained in this document is accurate and complete in all material respects and not misleading or deceptive, and there are no other matters the omission of which would make any statement herein or this document misleading.

We, the issuer of our structured products, are publishing this base listing document in order to obtain a listing on the Stock Exchange of our standard warrants (the ''warrants''), inline warrants, callable bull/bear contracts (the ''CBBCs'') and other structured products. We will refer to the warrants, inline warrants, CBBCs and other structured products as ''structured products'' in this document.

We will publish a launch announcement and supplemental listing document for each issue of structured products to set out the terms specific to that issue. If at that point the information in this base listing document (and any applicable addendum) needs to be updated, we will either include the updated information in the relevant launch announcement and supplemental listing document or produce a supplemental disclosure document or an addendum to this base listing document. You should read the relevant launch announcement and supplemental listing document and the supplemental disclosure document (if any) together with this base listing document (including any addendum) before deciding whether to buy our structured products. Neither the delivery of this base listing document nor any sale of any structured products shall under any circumstances create any implication that there has been no change in our affairs or the affairs of the guarantor or its affiliates since the date of this base listing document. You should ask the managers if any supplemental disclosure document or any addendum to this base listing document or any later base listing document has been issued. You must not assume that our supplemental disclosure document or any addendum contains the most recent information at any time after the date of such supplemental disclosure document or addendum.

The structured products involve derivatives. Investors should not invest in the structured products unless they fully understand and are willing to assume the risks associated with them.

The structured products are complex products. Investors should exercise caution in relation to them.

Investors are warned that the price of the structured products may fall in value as rapidly as it may rise and holders may sustain a total loss of their investment. Prospective purchasers should therefore ensure that they understand the nature of the structured products and carefully study the risk factors set out in this document and, where necessary, seek professional advice, before they invest in the structured products.

The structured products constitute general unsecured contractual obligations of the issuer and of no other person and the guarantee constitutes the general unsecured contractual obligation of the guarantor and of no other person. The structured products will rank equally among themselves and with all our other unsecured obligations and the guarantee will rank equally with all of the guarantor's other unsecured obligations (in each case, save for obligations preferred by law) upon liquidation. If you purchase the structured products you are relying upon the creditworthiness of the issuer and the guarantor and have no rights under the structured products against (a) the company which has issued the underlying shares; (b) the fund which has issued the underlying securities, or its trustee (if applicable) or manager; or (c) the index compiler of the underlying index. If the issuer becomes insolvent or defaults on its obligations under the structured products or the guarantor becomes insolvent or defaults on its obligations under the guarantee, you may not be able to recover all or even part of the amount due under the structured products (if any).

The guarantee of the guarantor (i) is an unsecured and unsubordinated general obligation of the guarantor and not of any of its affiliates; (ii) is not a savings account or deposit of the guarantor or any bank or non-bank subsidiary of the guarantor; and (iii) will rank *pari passu* with all other unsecured and unsubordinated obligations of the guarantor, except obligations, including U.S. domestic deposits of the guarantor, that are subject to any priorities or preferences by law. The guarantee is not a deposit insured by the U.S. Federal Deposit Insurance Corporation, the U.S. Deposit Insurance Fund or any other governmental agency or instrumentality.

The issuer and the guarantor are part of a large global financial institution and have many financial products and contracts outstanding at any given time. When purchasing the structured products, you will be relying on the creditworthiness of the issuer and the guarantor and of no one else.

The distribution of this base listing document, any launch announcement and supplemental listing document, any supplemental disclosure document, any addendum and the offering, sale and delivery of structured products in certain jurisdictions may be restricted by law. You are required to inform yourselves about and to observe such restrictions. Please read Annex 3 ''Purchase and Sale'' in this base listing document. **The structured products have not been and will not be registered under the U.S. Securities Act of 1933, as amended (the ''Securities Act''), and trading in the structured products has not been and will not be approved by the U.S. Commodity Futures Trading Commission under the U.S. Commodity Exchange Act. The structured products may not be offered or sold within the United States or to or for the account or benefit of U.S. Persons (as defined in Regulation S under the Securities Act). The guarantee has not been and will not be registered under the rules of the U.S. Office of the Comptroller of the Currency.**

Base Listing Document dated 11 March 2024

J.P.Morgan

IMPORTANT

If you are in doubt as to the contents of this base listing document, you should obtain independent professional advice.

Copies of this base listing document, the relevant launch announcement and supplemental listing document, the supplemental disclosure document (if any) (together with a Chinese translation of each of these documents) and other documents listed under the section "Where can I read copies of the Issuer's documentation?" under the section headed "More information about our structured products and our listing documents" in this base listing document are available on the website of the HKEX at *www.hkexnews.hk* and the Issuer's website at *https://www.jpmhkwarrants.com*.

本基本上市文件、有關推出公佈及補充上市文件及補充披露文件（如有）(及以上各份文件的英文版）連同本基本上市文件「有關本公司結構性產品及上市文件的更多資料」一節內「本人從何處可查閱發行人的文件？」一節所列之其餘文件，可於香港交易所披露易網站(*www.hkexnews.hk*)以及發行人網站(*https://www.jpmhkwarrants.com*)瀏覽。

We do not give you investment advice; you must decide for yourself, after reading the listing documents for the relevant structured products and, if necessary, seeking professional advice, whether our structured products meet your investment needs.

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SUMMARY OF OUR STRUCTURED PRODUCTS

The types of structured products that we may issue include, but are not limited to: cash-settled stock warrants, cash-settled foreign stock warrants, cash-settled warrants over exchange traded fund, cash-settled index warrants, cash-settled currency warrants, cash-settled stock inline warrants, cash-settled index inline warrants, cash-settled CBBCs over single stock, cash-settled CBBCs over index, and cash-settled CBBCs over exchange traded fund. Each type of our structured products will be subject to a separate set of master terms and conditions (Conditions) either as set out in Annex 1 to this base listing document (for the structured products listed above) or as set out in the relevant launch announcement and supplemental listing document (for other types of structured products). For each issue of our structured products, we will publish a launch announcement and supplemental listing document setting out the specific terms. The specific terms set out in the relevant launch announcement and supplemental listing document supplement and amend the applicable set of Conditions to form the legally binding terms and conditions of that issue of structured products.

We describe below the main features of the different types of our structured products.

General features of our structured products:

Issuer:	J.P. Morgan Structured Products B.V.
Guarantor:	JPMorgan Chase Bank, National Association
Current credit ratings of the Guarantor's long-term debt	A+ (stable outlook) by S&P Global Ratings ("**S&P**") Aa2 (negative outlook) by Moody's Investors Service, Inc. ("**Moody's**") The ratings above are the credit ratings of the guarantor as of the day immediately preceding the date of this base listing document and are subject to change. Please refer to our Investor Relations website: *https://www.jpmorganchase.com/ir* for the latest credit ratings of the guarantor. The ratings of the guarantor are only an assessment by the rating agencies of the guarantor's overall financial capacity to pay its long-term debts. A+ is among the top three major credit rating categories and is the fifth highest investment-grade ranking of the ten investment-grade ratings (including + or – sub-grades) assigned by S&P. Aa2 is the third highest investment-grade ranking of the ten investment-grade ratings (including 1, 2 and 3 sub-grades) assigned by Moody's. Please refer to the brief guide in Annex 4 to this base listing document for more information about credit ratings.
Rating of the structured products:	The structured products are not rated by any credit rating agencies.

Ranking of our structured products:	Upon exercise, our structured products will become our direct, unconditional, unsecured and unsubordinated obligations ranking equally with all our other direct, unconditional, unsecured and unsubordinated obligations.
Guarantee:	The obligations of the guarantor under the guarantee are direct, unconditional, unsecured and unsubordinated, subject to the terms of the guarantee and except as specifically set forth therein. You can find the form of the guarantee in Annex 2.
Liquidity provider:	J.P. Morgan Broking (Hong Kong) Limited or such other entity appointed by us as may be specified in the relevant launch announcement and supplemental listing document. We will describe in each launch announcement and supplemental listing document whether and to what extent we are obligated to provide liquidity in our structured products.
Form:	In registered form subject to and with the benefit of a deed poll made by us and the guarantor. Each issue will be represented by a global certificate registered in the name of HKSCC Nominees Limited (or its successors) as holder and deposited within the Central Clearing and Settlement System (CCASS). We will not issue any definitive certificates for our structured products.
Use of proceeds:	We will use the proceeds from the issue of our structured products for our general working capital or any other purposes permitted under our memorandum and articles of association, including entering into hedging transactions with our affiliates.
Further issues:	We can issue further structured products to form a single series with an existing issue of our structured products.
Delisting of the shares/units underlying our structured products:	If the shares of the company or the units or shares of the fund underlying a particular issue of our structured products are delisted from the relevant stock exchange, we may adjust the terms of that structured products as further detailed in the relevant terms and conditions.
Adjustments upon certain events affecting the company/fund, the index underlying, the currency pair underlying, or such other asset underlying our structured products:	If certain events occur in connection with the company/fund underlying our structured products, or if certain events have occurred which materially modify the underlying index, underlying currency pair or such other underlying asset, we may make adjustments to the terms of that structured products to account for the effect of such events. Please see the applicable set of Conditions of our structured products for further details.
Governing law:	Our structured products and the guarantee are governed by Hong Kong law.

SPECIFIC FEATURES OF OUR STRUCTURED PRODUCTS

Warrants:

Warrants are structured financial products, the value of which is derived from the price or value of another asset. The underlying asset may be a stock, units or shares in funds, an index, a currency pair, or other asset or combination of such assets.

A list of the eligible underlying assets for warrants is available on the HKEX website at *https://www.hkex.com.hk/Products/Securities/Structured-Products/Eligible-Underlying-Assets?sc_lang=en.*

- Cash-settled stock warrants, cash-settled foreign stock warrants and cash-settled warrants over exchange traded fund:

The underlying asset of stock warrants and foreign stock warrants is the shares of a company and the underlying asset of warrants over exchange traded fund is units or shares in a fund. The shares in the company and units or shares in the fund may be listed in Hong Kong or overseas.

Our cash-settled stock warrants, cash-settled foreign stock warrants and cash-settled warrants over exchange traded fund provide for cash settlement only, which means that physical delivery of the underlying shares or units will not be available as a method of settlement; instead, upon the exercise of each board lot of warrants, we will pay the warrantholder a cash amount equal to:

in the case of call warrants:

$$\frac{\text{entitlement} \times (\text{average price} - \text{exercise price}) \times \text{one board lot}}{\text{number of warrant(s) per entitlement}}$$

in the case of put warrants:

$$\frac{\text{entitlement} \times (\text{exercise price} - \text{average price}) \times \text{one board lot}}{\text{number of warrant(s) per entitlement}}$$

and in each case (i) if applicable, converted into the settlement currency at the exchange rate(s) as specified in the relevant launch announcement and supplemental listing document; and (ii) less any exercise expenses, so long as such amount is greater than zero.

The average price of an underlying share or unit is determined by reference to the market closing price on each valuation date; please see the terms and conditions of our warrants for further details.

- **Cash-settled index warrants:** The underlying asset of index warrants is an index published by an index compiler.

  Our index warrant gives its holders a right upon exercise of each board lot of warrants, to receive from us a cash amount equal to:

  in the case of call warrants:

  $$\frac{(\text{closing level} - \text{strike level}) \times \text{one board lot} \times \text{index currency amount}}{\text{divisor}}$$

  in the case of put warrants:

  $$\frac{(\text{strike level} - \text{closing level}) \times \text{one board lot} \times \text{index currency amount}}{\text{divisor}}$$

  and in each case converting such amount into the settlement currency of our warrants if necessary, and less any exercise expenses, so long as such amount is greater than zero.

  The closing level of the index on the date of exercise may be determined by reference to the official settlement price of an exchange traded contract relating to the index or some other means; please see the terms and conditions of our warrants for further details.

- **Cash-settled currency warrants:** The underlying asset of currency warrants is a currency pair.

  Our currency warrant gives its holders a right upon exercise of each board lot of warrants, to receive from us a cash amount equal to:

  in the case of call warrants:

  $$\frac{(\text{spot rate} - \text{strike rate}) \times \text{currency amount} \times \text{one board lot}}{\text{divisor}}$$

  in the case of put warrants:

  $$\frac{(\text{strike rate} - \text{spot rate}) \times \text{currency amount} \times \text{one board lot}}{\text{divisor}}$$

  and in each case (i) if applicable, converted into the settlement currency at the exchange rate(s) as specified in the relevant launch announcement and supplemental listing document; and (ii) less any exercise expenses, so long as such amount is greater than zero.

The launch announcement and supplemental listing document will set out, among others, the following terms specific to our warrants to supplement the applicable set of master terms and conditions in this base listing document:

Board lot	Minimum number at which our warrants trade
Shares of the company	Name of the underlying company (for our cash-settled stock warrants and cash-settled foreign stock warrants only)
Fund	Name of the underlying exchange traded fund (for our warrants over exchange traded fund only)
Index	Name of the underlying index (for our index warrants only)
Index compiler	Name of company that maintains the index and calculates and publishes the index levels (for our index warrants only)
Currency pair	The underlying currency pair (for our currency warrants only)
Exercise price	Predetermined exercise price of the underlying share/unit (for our cash-settled stock warrants, cash-settled foreign stock warrants and warrants over exchange traded fund only)
Strike level	Predetermined level of the underlying index (for our index warrants only)
Strike rate	Predetermined rate of the underlying currency pair (for our currency warrants only)
Expiry date	Date on which our warrants expire
Entitlement	Number of shares/units to which a specified number of warrants relates (for our cash-settled stock warrants, cash-settled foreign stock warrants and warrants over exchange traded fund only)
Number of warrant(s) per entitlement	Number of warrants to which one entitlement relates (for our cash- settled stock warrants, cash-settled foreign stock warrants and warrants over exchange traded fund only)
Index currency amount	An amount denominated in the currency in which the constituent stocks of the index are traded, which is used in the calculation of the cash settlement amount payable upon the exercise of a board lot of our warrants (for our index warrants only)
European style	European style warrants can only be exercised on the expiry date
Listing date	The date on which our warrants are scheduled to commence trading on the Stock Exchange

Inline warrants

What is an inline warrant?

An inline warrant is a type of derivative warrants.

A derivative warrant linked to an underlying asset is an instrument which derives its value from the underlying asset. Investing in a derivative warrant does not give you any right in the underlying asset. It usually costs a fraction of the value of the underlying asset.

A derivative warrant may provide leveraged return to you (but conversely, it could also magnify your losses).

How and when can you get back your investment?

Our inline warrants are European style warrants. This means they can only be exercised on the expiry date.

An inline warrant will, upon exercise on the expiry date, entitle you to a cash amount called the "cash settlement amount" (net of any exercise expenses) (if positive) according to the applicable terms and conditions.

You will receive the cash settlement amount less any exercise expenses upon settlement at expiry. As of the date of this document, no exercise expenses are payable for cash settled warrants (including our inline warrants).

How do our inline warrants work?

Our inline warrants carry exotic features and their terms and pricing may be more complicated than the warrants. Our inline warrants provide a pre-fixed potential payoff at either a capped amount or a floor amount at expiry.

You will either:

(i) receive a fixed and capped amount equal to the maximum payoff amount per inline warrant at expiry if the average price (for an inline warrant linked to a share) or closing level (for an inline warrant linked to an index) is at or below the upper strike price or upper strike level (as the case may be) and at or above the lower strike price or lower strike level (as the case may be); or

(ii) receive a fixed and floor amount equal to the minimum payoff amount per inline warrant (which may be substantially less than your initial investment) at expiry and may suffer loss in your investment if the average price (for an inline warrant linked to a share) or closing level (for an inline warrant linked to an index) is above the upper strike price or upper strike level (as the case may be) or below the lower strike price or lower strike level (as the case may be). You will still receive the minimum payoff amount per inline warrant in this scenario because such amount is included in the price you pay for buying our inline warrants.

Where can you find the terms and conditions applicable to our inline warrants?

You should review the terms and conditions applicable to each type of the inline warrants before your investment.

The terms and conditions applicable to each type of our inline warrants are set out in Annex 1 (as may be supplemented by any addendum and/or the relevant launch announcement and supplemental listing document).

What are the factors determining the price of an inline warrant?

The price of an inline warrant generally depends on the prevailing price or level of the underlying asset. However, throughout the term of an inline warrant, its price will be influenced by one or more of the following factors, including:

(a) the range between the upper strike price or upper strike level and the lower strike price or lower strike level (both inclusive) applicable to that inline warrants: generally, the wider the range between the upper strike price or upper strike level and the lower strike price or lower strike level (both inclusive) of the inline warrants, the greater its value;

(b) the value or level of the underlying asset: generally, the closer the price or level of the underlying asset towards the mid-way of the upper strike price or upper strike level and the lower strike price or lower strike level, without taking into account interim interest rates and expected dividend payments on the underlying asset or on any components comprising the underlying index and assuming all other factors remain constant, the greater the value of the inline warrants; conversely, the further away the price or level of the underlying asset from the mid-way of the upper strike price or upper strike level and the lower strike price or lower strike level, without taking into account interim interest rates and expected dividend payments on the underlying asset or on any components comprising the underlying index and assuming all other factors remain constant, the lower the value of the inline warrants;

(c) the volatility of the price or level of the underlying asset (being a measure of the fluctuation in the price or level of the underlying asset over time): generally, if an inline warrant is "out-of-the-range" (i.e. the price or level of the underlying asset falls outside the range between the upper strike price or upper strike level and the lower strike price or lower strike level (both inclusive)), the higher the volatility, the greater the value of the inline warrants; conversely, if an inline warrant is "in-the-range" (i.e. the price or level of the underlying asset falls within the range between the upper strike price or upper strike level and the lower strike price or lower strike level (both inclusive)), the higher the volatility, the lower the value of the inline warrants;

(d) the expected probability of the average price or closing level falling within the range between the upper strike price or upper strike level and the lower strike price or lower strike level (both inclusive) at expiry;

(e) the time remaining to expiry: generally, if an inline warrant is out-of-the-range, the longer the remaining life of the inline warrant, the greater its value; conversely, if an inline warrant is in-the-range, the shorter the remaining life of the inline warrant, the greater its value;

(f) the interim interest rates;

(g) the expected dividend payments or other distributions (if any) on the underlying asset or on any components comprising the underlying index;

(h) the liquidity of the underlying asset or of the futures contracts relating to the underlying index;

(i) the supply and demand for the inline warrant;

(j) our related transaction costs; and

(k) our creditworthiness and the creditworthiness of the guarantor.

What is your maximum loss?

If we become insolvent or default on our obligations under our inline warrants or the guarantor becomes insolvent or defaults on its obligations under the guarantee, the maximum loss in the inline warrants will be your entire investment amount plus any transaction costs.

Otherwise, if the average price or closing level (as the case may be) is above the upper strike price or upper strike level (as the case may be) or below the lower strike price or lower strike level (as the case may be) at expiry, the maximum loss in the inline warrants will be your entire investment amount less the minimum payoff amount per inline warrant multiplied by the number of inline warrants purchased plus any transaction costs.

What is your maximum profit?

The potential maximum profit in our inline warrants will be capped at the maximum payoff amount per inline warrant multiplied by the number of inline warrants purchased less your entire investment amount and transaction costs.

You should note that your profit or loss in the inline warrants will be affected by the amount invested by you and transaction costs.

Callable bull/bear contracts (CBBCs):

CBBCs are structured products that track the performance of an underlying asset. CBBCs can be issued on different types of underlying assets, including:

(a) shares or units listed on the Stock Exchange;

(b) Hang Seng Index, Hang Seng China Enterprises Index, Hang Seng TECH Index, Hang Seng China H-Financials Index or other indices; or

(c) other assets as prescribed by the Stock Exchange from time to time.

A list of the eligible underlying assets for CBBCs is available on the HKEX website at *https://www.hkex.com.hk/Products/Securities/Structured-Products/Eligible-Underlying-Assets?sc_lang=en.*

CBBCs are issued either as callable bull contracts (bull CBBCs) or callable bear contracts (bear CBBCs). Bull CBBCs are designed for investors who have an optimistic view on the underlying asset. Bear CBBCs are designed for investors who have a pessimistic view on the underlying asset.

CBBCs have a mandatory call feature and, subject to the limited circumstances set out in the relevant conditions in which a mandatory call event (MCE) may be reversed, we must terminate the CBBCs upon the occurrence of a mandatory call event. See "What is the mandatory call feature?" below for further details.

There are two categories of CBBCs, namely (a) category N CBBCs and (b) category R CBBCs. Your entitlement following the occurrence of a mandatory call event will depend on the category of the CBBCs. See "Category R CBBCs or Category N CBBCs?" below for further details.

Our CBBCs are "European style" and, subject to no occurrence of a mandatory call event, only exercisable on the relevant expiry date. The cash settlement amount (if any) payable at expiry represents the difference between the closing price/closing level of the underlying asset on the valuation date and the strike price/strike level. If on the relevant expiry date, the cash settlement amount is zero or a negative amount, you will lose all of your investment in the CBBCs.

What is the mandatory call feature?

Mandatory call event

Subject to the limited circumstances set out in the relevant conditions in which a mandatory call event may be reversed, we must terminate the CBBCs if a mandatory call event occurs. A mandatory call event occurs when the spot price/spot level of the underlying asset is:

(a) for bull CBBCs, at or below the call price/call level; or

(b) for bear CBBCs, at or above the call price/call level,

at any time during the observation period.

The observation period commences from the observation commencement date specified in the relevant launch announcement and supplemental listing document to the trading day immediately preceding the expiry date (both dates inclusive).

Cancellation of trades

Subject to the limited circumstances set out in the relevant conditions in which a mandatory call event may be reversed and such modification and amendment as may be prescribed by the Stock Exchange from time to time:

(a) all trades in the CBBCs concluded via auto-matching or manually after the time at which a mandatory call event occurs; and

(b) if a mandatory call event occurs during a pre-opening session or closing auction session (if applicable), all auction trades in the CBBCs concluded in such session and all manual trades of the CBBCs concluded after the end of the pre-order matching period in such session,

(each, a post MCE trade) will be invalid and will be cancelled, and will not be recognised by us or the Stock Exchange.

The time at which a mandatory call event occurs will be determined by reference to:

(a) in respect of the CBBCs over single stock or CBBCs over exchange traded fund, the Stock Exchange's trading system time at which the spot price is at or below the call price (for a series of bull CBBCs) or is at or above the call price (for a series of bear CBBCs); or

(b) in respect of the CBBCs over index, the time at which the spot level published by the relevant index compiler is at or below the call level (for a series of bull CBBCs) or is at or above the call level (for a series of bear CBBCs),

subject to the rules and requirements as prescribed by the Stock Exchange from time to time.

Category R CBBCs or Category N CBBCs?

The launch announcement and supplemental listing document for the relevant series will specify whether the CBBCs are category N CBBCs or category R CBBCs.

"Category N CBBCs" refer to CBBCs for which the call price/call level is equal to their strike price/ strike level. In respect of a series of category N CBBCs, you will not receive any cash payment following the occurrence of a mandatory call event.

"Category R CBBCs" refer to CBBCs for which the call price/call level is different from their strike price/ strike level. In respect of a series of category R CBBCs, you may receive a cash payment called the residual value upon the occurrence of a mandatory call event. The residual value payable (if any) is calculated by reference to, among others:

(a) for bull CBBCs, the difference between the minimum trade price/minimum index level of the underlying asset during a specified period called the "MCE valuation period" and the strike price/ strike level; or

(b) for bear CBBCs, the difference between the strike price/strike level and the maximum trade price/maximum index level of the underlying asset during the MCE valuation period.

You must read the applicable conditions and the relevant launch announcement and supplemental listing document to obtain further information on the calculation formula of the residual value applicable to category R CBBCs. If the residual value is zero or a negative number, you will lose all of your investment.

- CBBCs over single stock or CBBCs over exchange traded fund: The underlying asset of CBBCs over single stock is the shares of a company and the underlying asset of CBBCs over exchange traded fund is units or shares in a fund.

  Generally for a series of CBBCs over single stock or a series of CBBCs over exchange traded fund, if no mandatory call event occurs during the observation period, upon expiry, for each board lot of CBBCs, we will pay the holder a cash amount equal to:

  in the case of bull CBBCs:

$$\frac{\text{entitlement} \times (\text{closing price} - \text{strike price}) \times \text{one board lot}}{\text{number of CBBC(s) per entitlement}}$$

  in the case of bear CBBCs:

$$\frac{\text{entitlement} \times (\text{strike price} - \text{closing price}) \times \text{one board lot}}{\text{number of CBBC(s) per entitlement}}$$

  and in each case less any exercise expenses, so long as such amount is greater than zero.

- CBBCs over index: The underlying asset of CBBCs over index is an index published by an index compiler.

Generally for a series of CBBCs over index, if no mandatory call event occurs during the observation period, upon expiry, for each board lot of CBBCs, we will pay the holder a cash amount equal to:

in the case of bull CBBCs:

$$\frac{(\text{closing level} - \text{strike level}) \times \text{one board lot} \times \text{index currency amount}}{\text{divisor}}$$

in the case of bear CBBCs:

$$\frac{(\text{strike level} - \text{closing level}) \times \text{one board lot} \times \text{index currency amount}}{\text{divisor}}$$

and in each case converting such amount into the settlement currency of our CBBCs if necessary, less any exercise expenses, so long as such amount is greater than zero.

The closing level of the index on the valuation date may be determined by reference to the official settlement price of an exchange traded contract relating to the index or some other means; please see the terms and conditions of our CBBCs for further details.

The launch announcement and supplemental listing document will set out, among others, the following terms specific to our CBBCs to supplement the applicable set of master terms and conditions in this base listing document:

Category	The category of our CBBCs: category N or category R
Type	The type of our CBBCs: bull or bear
Board lot	Minimum number at which our CBBCs trade
Shares of the company	Name of the underlying company (for our CBBCs over single stock only)
Fund	Name of the underlying exchange traded fund (for our CBBCs over exchange traded fund only)
Index	Name of the underlying index (for our CBBCs over index only)
Index compiler	Name of company that maintains the index and calculates and publishes the index levels (for our CBBCs over index only)
Call price	Predetermined call price of the underlying share(s)/unit (for our CBBCs over single stock or CBBCs over exchange traded fund only)
Call level	Predetermined call level of the underlying index (for our CBBCs over index only)

Strike price	Predetermined strike price of the underlying share(s)/unit (for our CBBCs over single stock or CBBCs over exchange traded fund only)
Strike level	Predetermined strike level of the underlying index (for our CBBCs over index only)
Expiry date	Date on which our CBBCs expire
Valuation date	Date on which the closing price or the closing level of the underlying asset is determined for calculation of the cash settlement amount upon automatic exercise on expiry
Entitlement	Number of shares/units to which a specified number of CBBCs relates (for our CBBCs over single stock or CBBCs over exchange traded fund only)
Number of CBBC(s) per entitlement	Number of CBBCs to which one entitlement relates (for our CBBCs over single stock or CBBCs over exchange traded fund only)
Index currency amount	An amount denominated in the currency in which the constituent stocks of the index are traded, which is used in the calculation of the cash settlement amount payable upon the occurrence of a mandatory call event or automatic exercise on expiry (for our CBBCs over index only)
Listing date	The date on which our CBBCs are scheduled to commence trading on the Stock Exchange

How can you get information about the structured products after issue?

You may visit our website at *https://www.jpmhkwarrants.com* to obtain further information on our structured products or any notice given by us in relation to our structured products.

MORE INFORMATION ABOUT OUR STRUCTURED PRODUCTS AND OUR LISTING DOCUMENTS

WHO IS RESPONSIBLE FOR THIS BASE LISTING DOCUMENT?

We and the guarantor accept full responsibility for the accuracy of the information contained in this base listing document.

We have included references to websites to guide you to sources of freely available information. The information on these websites does not form part of our base listing document. Neither we nor the guarantor accept any responsibility for the information on these websites. Such information has not been prepared for the purposes of our structured products.

Our base listing document is accurate at the date stated on the cover. You must not assume, however, that the information in this base listing document is accurate at any time after the date of this base listing document.

The managers and the liquidity provider are not responsible in any way for ensuring the accuracy of our listing documents.

This document has not been reviewed by the Securities and Futures Commission (the "**SFC**"). You are advised to exercise caution in relation to the offer of the structured products.

IS THE ISSUER OR THE GUARANTOR REGULATED BY THE HONG KONG MONETARY AUTHORITY REFERRED TO IN RULE 15A.13(2) OR THE SECURITIES AND FUTURES COMMISSION REFERRED TO IN RULE 15A.13(3)?

We are not regulated by any of the bodies referred to in Rule 15A.13(2) or Rule 15A.13(3) of the Rules. The guarantor is a licensed bank regulated by the Hong Kong Monetary Authority. It is also a national banking association organised and subject to regulation under the laws of the United States of America, including the National Bank Act.

WHERE CAN I FIND MORE INFORMATION ABOUT THE ISSUER, THE GUARANTOR AND THE STRUCTURED PRODUCTS?

Information on our structured products is described in this base listing document and the relevant launch announcement and supplemental listing document.

If the information in this base listing document needs to be updated at the time we issue a launch announcement and supplemental listing document, we will put the updated information in the launch announcement and supplemental listing document or a supplemental disclosure document or an addendum. Please read this base listing document together with the relevant launch announcement and supplemental listing document and, if applicable, the relevant supplemental disclosure document or the relevant addendum carefully before you decide whether to buy our structured products.

Additional information regarding the guarantor can be viewed at *https://www.jpmhkwarrants.com*. You are cautioned that this information will not have been prepared exclusively for the purposes of our structured products.

We have not authorised anyone to give you any information about our structured products other than the information in this base listing document, the relevant launch announcement and supplemental listing document and, if applicable, the relevant supplemental disclosure document and the relevant addendum.

WHEN WERE THE STRUCTURED PRODUCTS AUTHORISED?

The issue of our structured products was authorised by resolutions of our board of directors on 5 March 2024. The giving of the guarantee was authorised pursuant to resolutions of the board of directors of the guarantor adopted on 8 December 2015.

WHERE CAN I READ COPIES OF THE ISSUER'S DOCUMENTATION?

You can read copies of the documents set out below on the website of the HKEX at *www.hkexnews.hk* and our website at *https://www.jpmhkwarrants.com* while any of our structured products are in issue:

- each of the following documents (together with a Chinese translation of each of these documents), including:
    - this base listing document, which includes the guarantor's consolidated financial statements for the year ended 31 December 2023 and the Report of Independent Auditors on such consolidated financial statements;
    - any supplemental disclosure document or addenda to this base listing document, which may include the latest audited financial statements and interim or quarterly financial statements (if any) of us and/or the guarantor, and any other supplemental information or subsequent amendments to this base listing document;
    - the relevant launch announcement and supplemental listing document;
    - the base listing document dated 23 March 2023 which contains the guarantor's consolidated financial statements for the year ended 31 December 2022 and the Report of Independent Auditors on such consolidated financial statements; and

- the supplemental disclosure document dated 28 April 2023 which contains our annual financial statements for the year ended 31 December 2022 and the Independent Auditor's Report on such financial statements; and

- the letter from the guarantor's auditor, PricewaterhouseCoopers LLP, agreeing to the inclusion of its audit report on the consolidated financial statements of the guarantor for the year ended 31 December 2023 in this base listing document.

TRANSFER OF STRUCTURED PRODUCTS

Settlement of transactions between members of the Stock Exchange on any business day must take place on or before the second business day thereafter. Securities executed on the Stock Exchange would normally be settled under the continuous net settlement system in CCASS. Dealings in the structured products will take place in relevant board lots in the relevant settlement currency. For further details on transfers of structured products and their exercise or settlement, see the terms and conditions of the relevant issue of structured products.

DO I HAVE TO PAY STAMP DUTY OR OTHER LEVIES ON THE STRUCTURED PRODUCTS?

There is no Hong Kong stamp duty on issue of our structured products. There is also no Hong Kong stamp duty on the transfer of our cash-settled structured products. The levy for the investor compensation fund is currently suspended.

However, for each transaction effected on the Stock Exchange, the following trading fees and levies calculated on the value of the consideration for the structured products will be payable by each of the seller and the buyer:

(a) a trading fee of 0.00565 per cent. charged by the Stock Exchange;

(b) a transaction levy of 0.0027 per cent. charged by the SFC; and

(c) a transaction levy of 0.00015 per cent. charged by the Accounting and Financial Reporting Council of Hong Kong.

You should be aware that you may be required to pay stamp taxes or other documentary charges in accordance with the laws and practices of the country where the structured products are transferred. If you are in any doubt as to your tax position, you should consult your own independent tax advisers. You should also be aware that tax regulations and their application by the relevant taxation authorities change from time to time.

HOW DO I HOLD MY STRUCTURED PRODUCTS?

Our structured products will be issued in global registered form, represented by a global certificate registered in the name of HKSCC Nominees Limited (or its successors).

We have made all necessary arrangements to enable our structured products to be admitted for deposit, clearing and settlement in CCASS. We will not issue any definitive certificates for our structured products. Our structured products will be deposited within CCASS.

If you are a CCASS investor participant, you may hold your structured products in your account with CCASS. If you do not have a CCASS account, your broker or agent (as a CCASS participant) will arrange to hold your structured products for you in an account at CCASS. We or the guarantor will make all payments on our structured products to CCASS: you will have to check your CCASS account or rely on your broker or agent to ensure that payments on your structured products are credited to your account with your broker or agent. Once we have made the relevant payment in this way to CCASS, we will have no further obligations for that payment, even if CCASS or your broker/agent fails to transmit to you your share of such payment or if it was transmitted late. Any notices we and/or the guarantor give in relation to our structured products will be given in the same way: you will have to rely on CCASS and/or your broker or agent to ensure that those notices reach you.

RISK FACTORS

You should carefully consider the following information together with the other information contained in this base listing document and in the applicable launch announcement and supplemental listing document before purchasing our structured products.

This section highlights only some of the risks of investing in the structured products but their inclusion in this base listing document does not mean these are the only significant or relevant risks of investing in our structured products.

Unless otherwise specified or the context otherwise requires, references in this base listing document to:

(a) "JPMorgan Chase" are to JPMorgan Chase & Co. and its consolidated subsidiaries; and

(b) "JPMorgan Chase Bank" and "JPMorgan Chase Bank, N.A." are to JPMorgan Chase Bank, National Association and its consolidated subsidiaries.

Non-collateralised structured products

Our structured products are not secured by any of our or the guarantor's assets or any collateral.

You must rely on our and the guarantor's creditworthiness; our obligations are not deposit liabilities or other types of debt obligations.

Our structured products are not secured on any assets. Our structured products represent our general contractual obligations and will rank equally with our other general unsecured obligations. The number of structured products outstanding at any given time may be substantial. When purchasing our structured products, you will be relying upon our and the guarantor's creditworthiness and of the creditworthiness of no other entity. We do not intend to create upon ourselves a deposit liability or a debt obligation by issuing any structured products.

You should note that we are a non-banking subsidiary of J.P. Morgan International Finance Limited, which is a subsidiary of the guarantor, which is in turn a subsidiary of JPMorgan Chase & Co., a corporation incorporated under the laws of the State of Delaware in the United States of America. Our primary activity is the issuance of securitised derivatives, comprising notes, warrants and certificates including equity-linked, reverse convertible and market participation notes, with the proceeds of securities being used to enter into hedging arrangements with other JPMorgan Chase subsidiaries. Our ability to perform our obligations may therefore be affected by any inability or failure to perform obligations owed to us by other JPMorgan Chase subsidiaries.

Our structured products are subject to our and the guarantor's credit risk, and our and the guarantor's credit ratings and credit spreads may adversely affect the market value of our structured products. Investors in our structured products are dependent on our and the guarantor's ability to pay all amounts due on our structured products, and therefore investors are subject to our and the guarantor's credit risk and to changes in the market's view of our and the guarantor's creditworthiness. Any decline in our or the guarantor's credit ratings or increase in the credit spreads charged by the market for taking our or the guarantor's credit risk is likely to affect adversely the value of our structured products. If we or the guarantor were to default on our payment obligations, an investor may not receive any amounts owed to it under our structured products and the investor could lose its entire investment.

There are risks associated with investing in our structured products; our structured products are volatile instruments and you may sustain a total loss in your investment.

Our structured products are structured financial instruments, their value may fall as rapidly as they may rise and you may sustain a total loss of your investment. Your investment in our structured products involves risks. Before investing in any of our structured products, you should consider whether our structured products are suitable for you in light of your own financial circumstances and investment objectives. Not all of these risks are described in this base listing document or a launch announcement and supplemental listing document. You should consider taking independent professional advice prior to making an investment in our structured products.

Your investment in our structured products will be worthless if you are holding our structured products when:

(a) in the case of category N CBBCs only, they are terminated early following the occurrence of a mandatory call event;

(b) in the case of category R CBBCs only, they are terminated early following the occurrence of a mandatory call event and (for our bull CBBCs) the minimum trade price/minimum index level of the underlying asset is equal to or less than the strike price/level of our CBBCs or (for our bear CBBCs) the strike price/level of our CBBCs is equal to or less than the maximum trade price/maximum index level of the underlying asset; or

(c) they expire out-of-the-money – meaning that the average/closing price or closing level of the underlying asset in respect of the relevant valuation date(s), determined in accordance with the terms and conditions of our structured products, is greater (for our put warrants or bear CBBCs) or less (for our call warrants or bull CBBCs) than the exercise/strike price or strike level of our structured products.

Structured products are complex and volatile instruments.

Our structured products are complex instruments and their values at any time prior to expiry are governed by a number of factors, including but not limited to the time left till expiry, the price or level of the underlying asset compared with the exercise/strike price or strike level of our structured products, the volatility of price or level of the underlying asset, market interest rate movements, the volatility of the exchange rate of the currency pair (if applicable), our and the guarantor's financial condition and the market's view of our and the guarantor's credit quality. The values of our structured products may rise or fall rapidly over a short time due to changes in one or more factors. The interplay of these different factors also means that the effect on the value of our structured products from the change in one factor may offset or accentuate the effect from the change in another factor. The value or level of the underlying assets (and some of the other relevant factors) can also be unpredictable: it may change suddenly and in large magnitude or not change at all. You may risk losing your entire investment (or, in the case of inline warrants, a substantial part of your investment) if the price or level of the underlying assets does not move in your anticipated direction.

The cash settlement amount of our structured products if calculated at any time prior to expiry may typically be less than the market price of such structured products at that time. The difference will reflect, among other things, a "time value" for the structured products which depends on a number of interrelated factors including those specified above. The value of our warrants or CBBCs will decrease over time. The value of inline warrants is likely to decrease over time when the price or level of the underlying asset falls outside the range between the upper strike price or upper strike level and the lower strike price or lower strike level (both inclusive), without taking into account interim interest rates and expected dividend payments on the underlying asset or on any components comprising the underlying index and assuming all other factors remain constant. Therefore, our structured products should not be viewed as products for long term investments.

Your ability to realise your investment in our structured products is dependent on the trading market for our structured products.

As our structured products are not exercisable prior to the expiry date, the only way you may be able to realise the value of your investment in our structured products is to dispose of them either in the on-exchange market or over-the-counter market. If you dispose of your investment in our structured products before expiry in this way, the amount you will receive will depend on the price you are able to obtain from the market for our structured products. That price may depend on the quantity of our structured products you are trying to sell. The market price of our structured products may not be equal to the value of our structured products, and changes in the price of our structured products may not correspond (in direction and/or magnitude) with changes in the value of our structured products.

The liquidity provider appointed for our structured products will upon request provide bid and/or ask prices for our structured products on the Stock Exchange and may (but is not obliged to) provide such prices at other times too, but under certain circumstances it may not provide bid and/or ask prices even if requested. You should refer to the section regarding liquidity provider in the relevant launch announcement and supplemental listing document for further details. The prices provided by our liquidity provider are influenced by, among other things, the supply and demand of our structured products for a particular series in the market, and may not correspond with the values of such structured products or changes in such values.

You should note that the prices available in the market for our structured products may also come from other participants in the market, although we cannot predict if and to what extent a secondary market may develop for our structured products or whether that market will be liquid or illiquid. The fact that a particular series of structured products is listed does not necessarily lead to greater liquidity. In addition, no assurance can be given that the listing of any particular series of our structured products will be maintained. If our structured products of a particular series cease to be listed, they may not be transacted through the Stock Exchange or at all, and they may even be terminated early. Off-exchange transactions may involve greater risks than on-exchange transactions. You may be unable to find any buyer for your holdings of our structured products on the Stock Exchange if the value of the structured products falls below HK$0.01.

Only the liquidity provider appointed for our structured products is obliged to provide bid and/or ask prices for our structured products (subject to the terms set out in the relevant launch announcement and supplemental listing document), and at times it may be the only source of bid and/or ask prices for our structured products.

The liquidity of any series of our structured products may also be affected by restrictions on offers and sales of our structured products in some jurisdictions including the restrictions described in Annex 3 "Purchase and Sale" to this base listing document.

If trading in the underlying asset is suspended for whatever reason in the market on which it is listed (including the Stock Exchange), trading in the relevant series of structured products may be suspended for a similar period. In addition, if an underlying asset is an index and the calculation and/or publication of the index level by the index compiler is suspended for whatever reasons, trading in the relevant series of structured products may be suspended for a similar period. The value of our warrants or CBBCs will decrease over time, while the value of inline warrants is likely to decrease over time when the price or level of the underlying asset falls outside the range between the upper strike price or upper strike level and the lower strike price or lower strike level (both inclusive), without taking into account interim interest rates and expected dividend payments on the underlying asset or on any components comprising the underlying index and assuming all other factors remain constant. You should note that in the case of a prolonged suspension period, the market price of the relevant structured products may be subject to a significant impact of time decay of such prolonged suspension period and may fluctuate significantly upon resumption of trading after the suspension period of the relevant structured products. This may adversely affect your investment in the relevant structured products.

In respect of our structured products linked to foreign underlying assets, you should note that the trading hours of the foreign underlying assets (based on Hong Kong time) on the relevant stock exchange may be different from the trading hours of the Stock Exchange. In the case where trading in the foreign underlying assets on the relevant stock exchange is suspended during non-trading hours of the Stock Exchange, trading in the relevant structured products on the Stock Exchange will be suspended as soon as practicable afterwards. Such suspension may be lifted and trading of foreign underlying assets on the relevant stock exchange may resume during nontrading hours of the Stock Exchange, in which case, trading in the relevant structured products on the Stock Exchange will also resume as soon as practicable afterwards.

Our structured products are not rated and you should not solely rely on the guarantor's credit ratings when investing in the structured products.

Rating agencies usually receive a fee from the companies that they rate. When evaluating the guarantor's creditworthiness, you should not solely rely on the guarantor's credit ratings because:

- a credit rating is not a recommendation to buy, sell or hold the structured products;
- credit ratings of companies may involve difficult-to-quantify factors such as market competition, the success or failure of new products and markets and managerial competence;
- a high credit rating is not necessarily indicative of low risk. The guarantor's credit ratings as set out in this base listing document are for reference only. Any downgrading of the guarantor's credit ratings could result in a reduction in the value of the structured products;
- a credit rating is not an indication of the liquidity or volatility of the structured products; and
- a credit rating may be downgraded if the credit quality of the guarantor declines.

The guarantor's credit ratings are subject to change or withdrawal at any time within each rating agency's sole discretion. You should conduct your own research using publicly available sources to obtain the latest information with respect to the guarantor's ratings from time to time.

You have no rights in the underlying assets and the market price for our structured products may fluctuate differently from that of the underlying assets.

Our structured products are financial instruments issued by us and are separate from the underlying assets. You have no rights under our structured products against (i) any company or fund which issues or comprises the underlying assets of the relevant issue of structured products or (ii) the trustee (if applicable) or the manager of any underlying asset that is a fund or (iii) the sponsor of any underlying asset that is an index. In addition, buying our structured products is not the same as buying the underlying assets or having a direct investment in the underlying assets. You will not be entitled to have voting rights, rights to receive dividends or distributions or any other rights under the underlying shares in the company, or the underlying shares or units in the underlying fund. As mentioned, there are many factors influencing the value and/or market price of structured products, which are leveraged instruments. For example, increases in the price or level of the underlying assets may not lead to an increase in the value and/or market price of a call warrant by a proportionate amount or even any increase at all; however, a decrease in the price or level of the underlying assets may lead to a greater than proportionate decrease in the value and/or market price of a call warrant. There is no assurance that a change in value and/or market price of our structured products will correspond in direction and/or magnitude with the change in price or level of the underlying assets. In the case of inline warrants, generally, without taking into account interim interest rates and expected dividend payments on the underlying asset or on any components comprising the underlying index and assuming all other factors remain constant, the closer the price/level of the underlying asset towards the mid-way of the upper strike price/upper strike level and the lower strike price/lower strike level, the greater the value of the inline warrants; conversely, the further the price/level of the underlying asset from the mid-way of the upper strike price/upper strike level and the lower strike price/lower strike level, the lower the value of the inline warrants. You should recognise the complexities of utilising our structured products to hedge against the market risk associated with investing in an underlying asset.

The issuer, the trustee (if applicable), the manager or the sponsor of the underlying assets will have no involvement in the offer and sale of our structured products and no obligation to you as investors in our structured products. The decisions made by them on corporate actions, such as a merger or sale of assets, or adjustment of the method for calculation of an index may also have an adverse impact on the value and/or market price of our structured products.

There could be conflicts of interest arising out of our other activities which may affect our structured products.

We, the guarantor and its subsidiaries and affiliates may engage in transactions (whether for their accounts, including hedging, or trading for accounts under management or otherwise) involving, as well as provide investment banking and other services to, any company or to any trustee (if applicable) or manager of a fund underlying our structured products or their securities and may enter into transactions with the substantial shareholders of the underlying company. Those transactions may have a positive or negative impact on the price or level of the underlying asset and in turn the value and/or market price of our structured products. We, the guarantor and its subsidiaries and affiliates may have officers who serve as directors of any of the companies underlying our structured products. Our market-making activities (which include hedging of our structured products) in the underlying securities or related structured products may affect the value and/or market price of the structured products. We or the guarantor may issue other competing financial products which may affect the value and/or market price of our structured products. You should also note that potential conflicts of interest may arise from the different roles played by us, the guarantor and its subsidiaries and affiliates in connection with our structured products and the economic interests in each role may be adverse to your interests in our structured products. We or the guarantor owe no duty to you to avoid such conflicts.

There are risks relating to the early termination of our structured products due to any change in law applicable to our group.

We may early terminate our structured products upon the occurrence of a Change in Law Event (as defined below). Please refer to the paragraph headed "We may early terminate our structured products due to illegality or impracticality." below for further details.

The President of the United States issued Executive Order 13959 on 12 November 2020 and amended it by Executive Order 13974 of 13 January 2021 and Executive Order 14032 of 3 June 2021 (collectively, the "**Executive Orders**"). The Executive Orders are primarily administered by the U.S. Department of the Treasury's Office of Foreign Assets Control ("**OFAC**"). OFAC has published certain General Licenses and responses to Frequently Asked Questions related to the Executive Orders on its website at *https://home.treasury.gov/policy-issues/financial-sanctions/sanctions-programs-and-country-information/chinese-military-companies-sanctions*. The Executive Orders apply to our group. We believe that the Executive Orders and relevant guidance from OFAC do not presently restrict our ability to issue the structured products or comply with our obligations in relation to the structured products. In the event of any amendments to the Executive Orders, revised guidance from OFAC, or the issuance of additional economic sanctions by the U.S. government, this view may be revised and may constitute a Change in Law Event. We will monitor the developments with respect to the Executive Orders and will publish further announcements to inform investors if our obligations under the structured products become restricted pursuant to the Executive Orders.

We may early terminate our structured products due to illegality or impracticability.

We may terminate our structured products if we determine in good faith and in a commercially reasonable manner that, for reasons beyond our control, it has become or it will become illegal or impracticable: (a) for us to perform our obligations under any structured products or for the guarantor to perform its obligations under the guarantee, in whole or in part as a result of (i) the adoption of, or any change in, any relevant law or regulation (including any tax law) or (ii) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law) (each of (i) and (ii), a "**Change in Law Event**"); or (b) for us or any of our affiliates to maintain our hedging arrangements with respect to the structured products due to a Change in Law Event. Upon the occurrence of a Change in Law Event, we will, if and to the extent permitted by the applicable law or regulation, pay to each holder of those structured products a cash amount determined by us and/or the agent in good faith and in a commercially reasonable manner to be the fair market value of the structured products immediately prior to such termination (ignoring such illegality or impracticability) less our cost of unwinding any related hedging arrangement as determined by us and/or the agent in our sole and absolute discretion. Such fair market value of the structured products could be substantially less than the amount you invested and can be as low as zero.

Risks associated with structured products linked to the value of foreign underlying assets.

You should be aware that investments in structured products linked to the value of foreign underlying assets involve particular risks. For our structured products linked to a foreign stock or an index comprising of stocks traded in equity securities market(s) of foreign countries ("**Foreign Stock Exchange(s)**"), the liquidity and volatility of the relevant Foreign Stock Exchange(s) may be different from that of the Stock Exchange. Also, there may be less publicly available information about the underlying foreign companies than those available about Hong Kong listed companies and some of that information may or may not be available in English and/or Chinese. Foreign companies may also be subject to different accounting, auditing and financial reporting standards and requirements compared to those applicable to Hong Kong listed companies.

Prices and market value of foreign underlying assets may be subject to political, economic, financial and social factors which may differ favourably or unfavourably from those factors that apply to Hong Kong. Moreover, foreign economies may also differ favorably or unfavorably from the Hong Kong economy in important respects such as growth of gross national product, rate of inflation, capital reinvestment, resources and self-sufficiency.

Further, for our structured products linked to foreign underlying assets, the trading hours and closing times of the Foreign Stock Exchange(s) may be different from those of the Stock Exchange and the Foreign Stock Exchange(s) may be located in a different time zone compared with the Stock Exchange. The days on which the Foreign Stock Exchange(s) are open for trading may also be different to those of the Stock Exchange. As a result, there may be certain periods of time during the trading hours of the Stock Exchange when the price/level of the foreign underlying asset are not available. In such circumstances, the liquidity provider may not be able to provide liquidity in the market of the structured products. However, to the extent possible, the liquidity provider may be able to provide liquidity for the structured products in such circumstances using the last available closing price/level of the foreign underlying asset from the Foreign Stock Exchange(s), adjusted where necessary to reflect the fair market value of the foreign underlying asset. In addition, any delay or disruption in the display of the price/level of the foreign underlying asset may also result in a corresponding delay or unavailability of the prices of the structured products. The launch announcement and supplemental listing document for our structured products linked to a foreign underlying asset will set out further details on the Foreign Stock Exchange(s).

Risk specific to underlying asset adopting the multiple counters model.

Where the underlying asset of our structured products adopts the multiple counters model for trading its units or shares on the Stock Exchange in Hong Kong dollars ("**HKD**") and one or more foreign currencies (such as Renminbi and/or United States Dollars) ("**Foreign Currency**") separately, the novelty and relatively untested nature of the Stock Exchange's multiple counters model may bring the following additional risks:

(a) the structured products may be linked to the HKD-traded or the Foreign Currency traded units or shares. If the underlying asset is the units or shares traded in one currency counter, movements in the trading prices of the units or shares traded in another currency counter should not directly affect the price of the structured products;

(b) if there is a suspension of inter-counter transfer of such units or shares between different currency counters for any reason, such units or shares will only be able to be traded in the relevant currency counter on the Stock Exchange, which may affect the demand and supply of such units or shares and have an adverse effect on the price of the structured products; and

(c) the trading price on the Stock Exchange of the units or shares traded in one currency counter may deviate significantly from the trading price on the Stock Exchange of units or shares traded in another currency counter due to different factors, such as market liquidity, foreign exchange conversion risk, supply and demand in each counter and exchange rate fluctuation. Changes in the trading price of the underlying asset in the relevant currency counter may adversely affect the price of the structured products.

Risks associated with our structured products over exchange traded fund.

General risks

For our structured products over exchange traded fund, neither we nor any of our affiliates have the ability to control or predict the actions of the trustee (if applicable) or the manager of the underlying fund. Neither the trustee (if applicable) nor the manager of the underlying fund (i) is involved in the offer of any structured product in any way, or (ii) has any obligation to consider the interest of the holders of any structured product in taking any corporate actions relating to the underlying fund that might affect the value of any structured product. The trustee (if applicable) or the manager of the underlying fund is responsible for making investment and other trading decisions with respect to the management of the underlying fund consistent with its investment objectives and in compliance with the investment restrictions as set out in the constitutive documents of the underlying fund. The manner in which the underlying fund is managed and the timing of actions may have a significant impact on the performance of the units or shares in the underlying fund. Hence, the price which is used to calculate the performance of the units or shares in the underlying fund may also be subject to these risks.

You should note that our structured products over exchange traded fund reference the units or shares of the underlying fund and the cash settlement amount (if any) payable upon exercise of our structured products will be calculated using the official closing prices of the units or shares in the underlying fund on the Stock Exchange on the valuation date(s). Further, our structured products do not reference any index tracked by the underlying fund and changes in the level of such index may not lead to a corresponding change in the value and/or market price of our structured products over exchange traded fund.

Exchange traded funds

In the case of our structured products linked to units or shares of an exchange traded fund ("**ETF**"), you should note that:

(a) an ETF is exposed to the economic, political, currency, legal and other risks of a specific sector or market related to the underlying asset pool or index or market that the ETF is designed to track;

(b) there may be disparity between the performance of the ETF and the performance of the underlying asset pool or index or market that the ETF is designed to track as a result of, for example, failure of the tracking strategy, currency differences, fees and expenses; and

(c) where the underlying asset pool or index or market that the ETF tracks is subject to restricted access, the efficiency in the creation or redemption of unit or shares to keep the price of the ETF in line with its net asset value may be disrupted, causing the ETF to trade at a higher premium or discount to its net asset value. Hence, the market price of our structured products will also be indirectly subject to these risks.

Synthetic exchange traded funds

Additionally, where the underlying asset of our structured products comprises the units or shares of an ETF adopting a synthetic replication investment strategy to achieve its investment objectives by investing in financial derivative instruments linked to the performance of an underlying asset pool or index that the ETF is designed to track ("**Synthetic ETF**"), you should note that:

(a) investments in financial derivative instruments will expose the Synthetic ETF to the credit, potential contagion and concentration risks of the counterparties who issued such financial derivative instruments. As such counterparties are predominantly international financial institutions, the failure of one such counterparty may have a negative effect on other counterparties of the Synthetic ETF. Even if the Synthetic ETF has collateral to reduce the counterparty risk, there may still be a risk that the market value of the collateral has fallen substantially when the Synthetic ETF seeks to realise the collateral; and

(b) the Synthetic ETF may be exposed to higher liquidity risk if the Synthetic ETF invests in financial derivative instruments which do not have an active secondary market.

The above risks may have a significant impact on the performance of the relevant ETF or Synthetic ETF and hence the market price of our structured products linked to such ETF or Synthetic ETF.

QFI regimes ETF and/or China Connect

An ETF ("**China ETF**") may be issued and traded outside Chinese Mainland with direct investment in the Chinese Mainland's securities markets through the Qualified Foreign Institutional Investor regime and Renminbi Qualified Foreign Institutional Investor regime (collectively, "**QFI regimes**") and/or the Shanghai-Hong Kong Stock Connect and Shenzhen-Hong Kong Stock Connect (collectively, "**China Connect**"). Where the underlying asset of our structured products comprises the units or shares of such China ETF, you should note that, amongst others:

(a) the policy and rules for the QFI regimes and China Connect prescribed by the Chinese Mainland government are subject to change, and there may be uncertainty to their interpretation and/or implementation. The uncertainty and change of the laws and regulations in Chinese Mainland may adversely impact on the performance of the relevant China ETFs and the trading price of the relevant units or shares;

(b) a China ETF primarily invests in securities traded in the Chinese Mainland's securities markets and is subject to concentration risk. Investment in the Chinese Mainland's securities markets (which are inherently stock markets with restricted access) involves certain risks and special considerations as compared with investment in more developed economies or markets, such as greater political, tax, economic, foreign exchange, liquidity, volatility and regulatory risks. The operation of a China ETF may also be affected by interventions by the applicable government(s) and regulators in the financial markets;

(c) trading of securities invested by a China ETF under China Connect will be subject to a daily quota which is utilized on a first-come-first-serve basis under the China Connect. In the event that the daily quota under China Connect is reached, the manager may need to suspend creation of further units or shares of such China ETF, and therefore may affect the liquidity in unit or share trading of such China ETF. In such event, the trading price of a unit or share of such China ETF is likely to be at a significant premium to its net asset value, and may be highly volatile. The People's Bank of China and the State Administration of Foreign Exchange have jointly published the detailed implementation rules removing the investment quota under the QFI regimes with effect from 6 June 2020; and

(d) there are risks and uncertainties associated with the current Chinese Mainland's tax laws applicable to a China ETF investing in the Chinese Mainland through the QFI regimes and/or China Connect. Although such China ETF may have made a tax provision in respect of potential tax liability, the provision may be excessive or inadequate. Any shortfall between the provisions and actual tax liabilities may be covered by the assets of such China ETF and may therefore adversely affect the net asset value of such China ETF and the market value and/or potential payout of the structured products.

The above risks may have a significant impact on the performance of the relevant units or shares and the price of the structured products.

Please read the offering documents of the relevant China ETF to understand its key features and risks.

*Real estate investment trust ("**REIT**")*

Where the underlying asset of our structured products comprises the units of a REIT, you should note that the investment objective of a REIT is to invest in a real estate portfolio. Each REIT is exposed to risks relating to investments in real estate, including but not limited to (a) adverse changes in political or economic conditions; (b) changes in interest rates and the availability of debt or equity financing, which may result in an inability by the REIT to maintain or improve the real estate portfolio and finance future acquisitions; (c) changes in environmental, zoning and other governmental rules; (d) changes in market rents; (e) any required repair and maintenance of the portfolio properties; (f) breach of any property laws or regulations; (g) the relative illiquidity of real estate investment; (h) real estate taxes; (i) any hidden interests in the portfolio properties; (j) any increase in insurance premiums and (k) any uninsurable losses.

There may also be disparity between the market price of the units of a REIT and the net asset value per unit. This is because the market price of the units of a REIT also depends on many factors, including but not limited to (a) the market value and perceived prospects of the real estate portfolio; (b) changes in economic or market conditions; (c) changes in market valuations of similar companies; (d) changes in interest rates; (e) the perceived attractiveness of the units of the REIT against those of other equity securities; (f) the future size and liquidity of the market for the units and the REIT market generally; (g) any future changes to the regulatory system, including the tax system and (h) the ability of the REIT to implement its investment and growth strategies and to retain its key personnel.

Commodity market risk

Where the underlying asset of our structured products comprises the units or shares of an ETF whose value relates directly to the value of a commodity, you should note that fluctuations in the price of the commodity could materially adversely affect the value of the underlying units or shares. Commodity market is generally subject to greater risks than other markets. The price of a commodity is highly volatile. Price movement of a commodity is influenced by, among other things, interest rates, changing market supply and demand relationships, trade, fiscal, monetary and exchange control programmes and policies of governments, and international political and economic events and policies.

The above risks may have a significant impact on the performance of the relevant units or shares and the price of the structured products.

Risks associated with our structured products linked to the exchange rate of a currency pair.

Exchange rate risk

You will be exposed to the exchange rate risk of the currency pair to which the structured products are linked. In addition, if the currency amount is expressed in a currency other than the settlement currency, you will also be exposed to exchange rate risk as we are required to convert a foreign currency into the settlement currency in the calculation of the cash settlement amount.

Foreign exchange market risk

The foreign exchange market can be very volatile and unpredictable. Exchange rate of the currencies may fluctuate as a result of market, economic and/or political conditions in the principal financial centres of the countries of the currencies and also in other countries. For example, it can be affected by change of governments' monetary or foreign exchange policies, rates of inflation, interest rate levels and the extent of governmental surpluses or deficits in the relevant countries.

Risks specifically related to Renminbi

For our structured products linked to the exchange rate involving offshore Renminbi, investors in the structured products should note that the relevant CNH exchange rates will be applied for calculations of the exchange rate of the currency pair in relation to the structured products. Changes in the relevant CNH exchange rates may adversely affect the market value of our structured products.

Renminbi is the official currency of Chinese Mainland and is subject to foreign exchange control and restrictions by the Chinese government. Renminbi traded in Chinese Mainland is generally referred to as onshore Renminbi and Renminbi traded outside Chinese Mainland is generally referred to as CNH. Although both onshore Renminbi and CNH are the same currency, they are traded in different and separate markets which operate independently and subject to different foreign exchange control and restrictions.

There is currently a limited pool of Renminbi outside Chinese Mainland and any tightening of foreign exchange control may adversely affect the liquidity of CNH, and the market value and potential return of the structured products.

You should note that onshore Renminbi and CNH are currently quoted in different markets at different exchange rates. The movements in such exchange rates may not be in the same direction or of the same magnitude. As such, the CNH exchange rate adopted in the calculation of the exchange rate of the currency pair may deviate significantly from the onshore Renminbi exchange rate. There is no guarantee that Renminbi will not depreciate.

Liquidation of underlying company or termination of underlying fund.

In the event of liquidation, dissolution, winding up or termination of the company that issues the underlying shares, or termination of a fund that issues the underlying units or shares or the appointment of a receiver or administrator or analogous person to the company or fund, the relevant structured products shall lapse.

Time lag between the time of early termination/exercise and the time of determination of the settlement amount may affect the settlement amount.

Upon early termination or exercise of your structured products, there may be a time lag between the time of early termination or exercise and the time of determination of the settlement amount. Such delay could be significantly longer in the case of a market disruption event, delisting of the company that issues the underlying shares, termination of the fund that issues the underlying unit or share or other adjustment events. This may result in the settlement amount being zero.

We may adjust the terms and conditions of our structured products upon the occurrence of certain corporate events or extraordinary events affecting the underlying assets.

We and/or the agent may determine that certain corporate events or extraordinary events affecting the underlying assets have occurred and may in our sole discretion make corresponding adjustments to the terms and conditions of our structured products, including adjustments to (i) the exercise/strike price, the upper strike price/lower strike price or the call price (as and if applicable) of the structured products; (ii) the entitlement of the structured products; (iii) the composition of the underlying assets or (iv) any other terms of the structured products. Such events and/or adjustments (if any) may have adverse impact on the value and/or market price of our structured products.

In the case of structured products which relate to an index, the level of the index may vary over time and may increase or decrease by reference to various factors which may include changes in the formula for or the method of calculating the index. A level for the index may also be published by the index compiler at a time when one or more shares comprising the index are not trading. Certain (but not all) events relating to the index underlying the structured products require or permit us to make certain adjustments or amendments to the conditions (e.g. determining the closing level).

In the case of structured products which relate to a currency pair, the exchange rate of the currency pair may vary over time and may increase or decrease by reference to various factors which may include the implementation of exchange control. Certain (but not all) events relating to the currency pair underlying the structured products require or permit us to make certain adjustments or amendments to the conditions (e.g. determining the exchange rate).

However, we have no obligation to make an adjustment for every event that can affect the underlying asset. The value and/or market price of our structured products may be adversely affected by such events in the absence of an adjustment by us. If adjustments were made, we do not assure that such adjustments can negate any adverse impact of such events on the value and/or market price of our structured products.

We may modify the terms and conditions of the structured products.

We may, without your consent, effect any modification of the terms and conditions of the structured products which, in our opinion, is:

(i) not materially prejudicial to your interests generally (without considering the circumstances of any individual holder of the structured products or the tax or other consequences of such modification in any particular jurisdiction);

(ii) of a formal, minor or technical nature;

(iii) made to correct a manifest error; or

(iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Our determination of the occurrence of a market or settlement disruption event may affect the value and/or market price of our structured products.

We and/or the agent may determine that a market or settlement disruption event has occurred. Such determination may affect the value and/or market price of our structured products, and may delay settlement in respect of our structured products.

If we and/or the agent determine that a market disruption event exists, the valuation of the underlying assets for the purpose of calculating the cash settlement amount of our structured products may be postponed. Under certain circumstances, we and/or the agent may determine the good faith estimate of the value or level of the underlying assets that would have prevailed on the relevant valuation date but for such market disruption event.

The implied volatility of our structured products may not reflect the actual volatility of the underlying asset.

The market price of our structured products is determined among other factors by the supply and demand of the structured products. This price "implies" a level of volatility in the underlying asset in the sense that such level of volatility would give a theoretical value for the structured product which is equal to that price; but such level of volatility may not be equal to the actual level of volatility of the underlying asset in the past or future.

Investment in our structured products may involve exchange rate risks and interest rate risks.

An investment in our structured products may involve exchange rate risks. For example, the underlying asset may be denominated in a currency other than that of our structured products, our structured products may be denominated in a currency other than the currency of your home jurisdiction and our structured products may settle in a currency other than the currency in which you wish to receive funds. Changes in the exchange rate(s) between the currency of the underlying asset, the currency in which our structured products settle and/ or the currency of your home jurisdiction may adversely affect the return of your investment in our structured products. We cannot assure that current exchange rates at the issue date of our structured products will be representative of the future exchange rates used in computing the value of our structured products. Fluctuations in exchange rates may therefore affect the value of our structured products.

An investment in our structured products may also involve interest rate risk as the intrinsic value of a structured product may be sensitive to fluctuations in interest rates. Fluctuations in the short term or long term interest rates of the currency in which our structured products are settled or the currency in which the underlying asset is denominated may affect the value and/or market price of our structured products.

United States federal tax may be withheld from payments with respect to structured products that are treated as "dividend equivalents". This may have an adverse effect on the value and liquidity of the structured products.

A "dividend equivalent" payment generally is treated as a dividend from sources within the United States and such dividend equivalent payments (including deemed payments) generally would be subject to a 30 per cent (30%) United States withholding tax if paid to a Non-U.S. Holder (as defined in "Taxation – United States of America"). Under the U.S. Treasury regulations and related official guidance issued pursuant to Section 871(m) of the U.S. Internal Revenue Code of 1986, as amended (the "**Internal Revenue Code**"), payments (including deemed payments) with respect to certain financial instruments linked to U.S. equities or indices that include U.S. equities may be treated as dividend equivalents. Section 871(m) provides certain exceptions to this withholding regime, including for instruments linked to certain broad-based indices that meet requirements set forth in the applicable U.S. Treasury regulations. Additionally, the applicable regulations and guidance exclude from the scope of Section 871(m) instruments issued before 1 January 2025 that do not have a "delta" of one with respect to underlying securities that could pay U.S.-source dividends for U.S. federal income tax purposes. If any payments are treated as dividend equivalents subject to withholding, we (or any applicable withholding agent) would be entitled to withhold taxes without being required to pay any additional amounts with respect to amounts so withheld. As a result, actual payments on the structured products may be substantially less than the amounts specified in their terms.

Payments made by us to certain holders with respect to the structured products may be subject to United States withholding tax under the United States Foreign Account Tax Compliance Act.

The Foreign Account Tax Compliance Act ("**FATCA**") generally imposes a 30 per cent (30%) United States withholding tax on certain United States source payments, including interest (and original issue discount), dividends (and "dividend equivalent" payments), or other fixed or determinable annual or periodical gain, profits, and income, and on the gross proceeds from a disposition (subject to the discussions below relating to the Proposed Regulations) of property of a type which can produce United States source interest or dividends ("**Withholdable Payments**"), if paid to a foreign financial institution (including amounts paid to a foreign financial institution on behalf of a holder), unless such institution enters into an agreement with the U.S. Treasury to collect and provide to the U.S. Treasury substantial information regarding United States account holders (including certain account holders that are foreign entities with United States owners) with such institution, or such institution otherwise complies with its obligations under FATCA. A structured product may constitute an account for these purposes. FATCA also generally imposes a withholding tax of 30 per cent (30%) on Withholdable Payments made to a nonfinancial foreign entity unless such entity provides the withholding agent with a certification that it does not have any substantial United States owners or a certification identifying the direct and indirect substantial United States owners of the entity, or otherwise establishes an exemption.

The U.S. Treasury Department and the U.S. Internal Revenue Service have announced that FATCA withholding on payments of gross proceeds from the sale or disposition of a structured product will only apply to payments made after 31 December 2018. However, recently proposed regulations (which have not yet been finalized) (the "**Proposed Regulations**") have eliminated this withholding requirement.

Taxpayers are permitted to rely on the Proposed Regulations until final regulations are issued; however, final regulations could reinstate this withholding obligation (or otherwise modify the Proposed Regulations) at any time, possibly with retroactive effect.

In addition, under FATCA, "passthru payments" made by a foreign financial institution to "recalcitrant holders" or noncompliant foreign financial institutions are subject to a 30 per cent (30%) United States withholding tax. A "recalcitrant holder" generally is a holder of an account with a foreign financial institution that fails to comply with certain requests for information that will help enable the relevant foreign financial institution to comply with its obligations under FATCA (a structured product may constitute an account for these purposes). Pursuant to U.S. Treasury regulations, a passthru payment is any Withholdable Payment and any "foreign passthru payment", which has yet to be defined. Under the Proposed Regulations, withholding on foreign passthru payments would not be required with respect to payments made before the date that is two years after the date of publication in the U.S. Federal Register of final regulations defining the term "foreign passthru payment". Taxpayers are permitted to rely on the Proposed Regulations until final regulations are issued; however, final regulations could reinstate these withholding obligations (or otherwise modify the Proposed Regulations) at any time, possibly with retroactive effect.

If we determine that withholding is appropriate with respect to the structured products, we (or an applicable withholding agent) will withhold tax at the applicable statutory rate without being required to pay any additional amounts with respect to amounts so withheld.

The proposed financial transaction tax ("FTT").

The European Commission has published a proposal for a Directive for a common FTT in certain participating Member States.

The proposed FTT has very broad scope and could apply to certain dealings in financial instruments (including secondary market transactions).

The Commission's Proposal has not yet been implemented. However, the Commission has stated that if no agreement was reached by the participating Member States by the end of 2022, the Commission would make new proposals. The Commission stated that it would endeavour to make any such proposals by June 2024, with a view to introduction on 1 January 2026. However, at the current time the status of the participating Member States' negotiations, and the scope and timing of any new proposals by the Commission, remain unclear.

Prospective holders of the structured products are advised to seek their own professional advice in relation to the FTT.

Please consult your tax advisers if you are in any doubt of your tax position.

You may be required to pay stamp taxes or other documentary charges in accordance with the laws and practices of the country where our structured products are transferred and such laws and practices may change from time to time. If you are in any doubt of your tax position, you should consult your own independent tax advisers.

Our structured products are issued in global registered form; you have to rely on your brokers to evidence title to your investment and to receive notices and the cash settlement amount.

Our structured products are issued in global registered form and held on your behalf within a clearing system. This means that evidence of title to your interests, as well as the efficiency of ultimate delivery of the cash settlement amount, will be governed by the CCASS Rules.

Our structured products in global registered form will be registered in the name of HKSCC Nominees Limited (or its successors), which shall be treated by us as the holder of our structured products for all purposes. This means that you will not receive definitive certificates and the register will record at all times that our structured products are being held by HKSCC Nominees Limited (or its successors). If you are a CCASS investor participant, you may hold your structured products in your account with CCASS. If you do not have a CCASS account, you will have to rely solely upon your brokers and the statements received from your brokers to evidence title to your investments. You will also have to rely on your brokers to effectively inform you of any notices, announcements and/or meetings issued or called by us (upon receipt by those brokers as CCASS participants of the same from CCASS and ultimately from us). The Rules also provide that our obligations to deliver notices, announcements and/or meetings will be complied with by a posting on the HKEX website. Our obligations to deliver any cash settlement amount to you will be duly performed by the delivery of any such amount to HKSCC Nominees Limited (or its successors) as the holder. You will therefore have to rely on CCASS and/or your brokers for the ultimate delivery of any cash settlement amount to you as the investor.

We and our guarantor do not give you any advice or credit analysis.

Neither we nor the guarantor is responsible for the lawfulness of your acquisition of our structured products. We and the guarantor are not giving you any advice or credit analysis of the underlying assets. You shall be deemed to have made a representation to such effect for each purchase of our structured products of any series.

The guarantor is subject to the Financial Institutions (Resolution) Ordinance

The Financial Institutions (Resolution) Ordinance (Cap. 628, the Laws of Hong Kong) (the "**FIRO**") was enacted by the Legislative Council of Hong Kong in June 2016. The FIRO (except Part 8, section 192 and Division 10 of Part 15 thereof) came into operation on 7 July 2017.

The FIRO establishes a regime for the orderly resolution of financial institutions with a view to avoiding or mitigating the risks otherwise posed by their non-viability to the stability and effective working of the financial system of Hong Kong, including the continued performance of critical financial functions. The FIRO seeks to empower the resolution authorities with authority to decide whether to initiate the resolution of a financial institution and which stabilization options to apply and other powers to exercise in effecting a resolution. In particular, it is envisaged that subject to certain safeguards, the relevant resolution authority would be provided with powers to affect contractual and property rights as well as payments (including in respect of any priority of payment) that creditors would receive in resolution, including but not limited to powers to write off, or convert into equity, all or a part of the liabilities of the failing financial institution.

We are not subject to or bound by the FIRO. However, the guarantor, as an authorised institution regulated by the Hong Kong Monetary Authority, is subject to and bound by the FIRO. The exercise of any resolution power by the relevant resolution authority under the FIRO in respect of the guarantor may have a material adverse effect on the value of the structured products, and as a result, you may not be able to recover all or any amount due under the structured products (if any).

Risks associated with inline warrants.

Inline warrants are exotic warrants and are not comparable to warrants

Inline warrants are exotic warrants with different terms and risk and return profile compared to standard call or put warrants listed on the Stock Exchange and are not comparable to warrants. Inline warrants carry exotic features and their terms and pricing may be more complicated than warrants. Inline warrants may behave quite differently from warrants and other exotic warrants in its response to the price levels/levels or movements in the price/level of the underlying asset. The pricing structure of inline warrants requires investors to assess accurately the value of inline warrants in relation to the expected probability of the average price/closing level falling within the range between the upper strike price/ upper strike level and the lower strike price/lower strike level (both inclusive). Inline warrants are highly complicated and risky financial instruments and may be difficult for investors to properly value and/or to use as a hedging tool. You should carefully review and understand the terms and conditions, including the exotic features, before deciding to invest in inline warrants. In particular, you should note that inline warrants provide a pre-fixed potential payoff at either **a capped amount or a floor amount** at expiry. If the average price/closing level falls outside the range between the lower strike price/lower strike level and the upper strike price/upper strike level (both inclusive), you will receive a lower fixed and floor amount equal to the minimum payoff amount per inline warrant (which may be substantially less than your initial investment) at expiry and may suffer loss in your investment. You will still receive the minimum payoff amount per inline warrant in this scenario because such amount is included in the price you pay for buying the inline warrants. Do not invest in inline warrants unless you fully understand them and are willing to assume the risks associated with them.

Maximum potential payoff is fixed and capped

If the average price/closing level stays within the range between the lower strike price/lower strike level and the upper strike price/upper strike level (both inclusive), we will only pay you a fixed and capped amount equal to the maximum payoff amount per inline warrant at expiry. This is the maximum potential payoff under inline warrants.

Rejection of orders and trades at the price above HK$1

You should note that any orders and reported trades of inline warrants at the price above HK$1 will be automatically rejected upon their entry to the Stock Exchange's trading system. The Stock Exchange and its recognised exchange controller, HKEX, will not incur any liability (whether based on contract, tort (including, without limitation, negligence), or any other legal or equitable grounds and without regard to the circumstances giving rise to any purported claim except in the case of wilful misconduct on the part of the Stock Exchange and/or HKEX) for any direct, consequential, special, indirect, economic, punitive, exemplary or any other loss or damage suffered or incurred by us or any other party arising from or in connection with such rejection of orders and trades, including without limitation, any delay, failure, mistake or error in such rejection of orders and trades.

We and our affiliates shall not have any responsibility for any losses suffered as a result of such rejection of orders and trades in any circumstances.

Prohibition on the sale of certain binary options in European retail markets

There have been regulatory concerns over the sale of certain binary options to retail investors across the European Union in recent years. Such binary options are typically traded over-the-counter with bespoke structures and are very short-term, making them extremely speculative in nature. Until recently, the European Securities and Markets Authority ("**ESMA**") implemented a temporary ban on the marketing, distribution or sale of binary options to retail customers in the European Union except for securitised binary options. The temporary ban expired and was lifted by ESMA on 1 July 2019 based on the fact that most national competent authorities within the European Union had taken permanent national product intervention measures relating to binary options that are at least as stringent as ESMA's measure. For example, the Financial Conduct Authority ("**FCA**") in the United Kingdom (a then European Union member) imposed a permanent ban effective from 2 April 2019 on the marketing, distribution or sale of all binary options (including securitised binary options) to retail customers in the

United Kingdom while the Federal Financial Supervisory Authority ("**BaFin**") in Germany and the Autorité des Marchés Financiers ("**AMF**") of France had also permanently banned the marketing, distribution or sale of binary options (other than securitised binary options) to retail customers.

Inline warrants are a form of securitised binary options. Unlike the binary options in the European retail markets as described above, the inline warrants listed on the Stock Exchange have a more standardised structure and relatively longer period to expiry (with a minimum duration of 6 months before expiry).

Irrespective of the differences between the inline warrants listed on the Stock Exchange and the binary options in Europe, you should nevertheless note the approach taken by the European regulators over binary options. Inline warrants are complex products. You should fully understand the structure and terms and conditions of inline warrants and are willing to assume the risks associated with them before investing in inline warrants.

Risks associated with CBBCs.

CBBCs will become volatile if trading close to the call price/call level

Although the price changes of a CBBC tend to reflect the changes in value of the underlying asset, when the underlying asset is trading at a price/level close to the applicable call price/ call level, the CBBC tends to be more volatile and any price changes of the CBBC at such time may not be comparable and may be disproportionate with the movement in the value of the underlying asset.

Mandatory call event is irrevocable

A mandatory call event is irrevocable unless it is triggered by:

(a) system malfunction or other technical errors of the HKEX (such as the setting up of wrong call price or call level and other parameters) and such event is reported by the Stock Exchange to us and the Stock Exchange and we mutually agree that such mandatory call event is to be revoked; or

(b) manifest errors caused by the relevant third party price sources (such as any miscalculation of the index level by the index compiler) and such event is reported by us to the Stock Exchange and the Stock Exchange and we mutually agree that such mandatory call event is to be revoked.

In each of the above cases, such mutual agreement must be reached no later than 30 minutes before the commencement of trading (including pre-opening session) (Hong Kong time) on the trading day of the Stock Exchange immediately following the day on which the mandatory call event occurs, or such other timeframe as prescribed by the Stock Exchange from time to time.

In such case, the mandatory call event so triggered will be reversed and all trades cancelled (if any) will be reinstated and the trading of the CBBCs will resume as soon as practicable.

Subject to the limited circumstances described above in which a mandatory call event may be reversed, the CBBCs will be terminated following a mandatory call event and you will not be able to benefit from any movement in the underlying asset after the occurrence of the mandatory call event.

Delay in announcement of mandatory call event

The Stock Exchange will notify the market as soon as practicable after the CBBCs have been called upon the occurrence of a mandatory call event. You should be aware that there may be a delay in the announcement of a mandatory call event due to technical errors, system failures and other factors that are beyond our control and the control of the Stock Exchange.

Non-recognition of post MCE trades

You should note that after the occurrence of a mandatory call event, all post MCE trades will be invalid and will be cancelled and will not be recognised by us or the Stock Exchange.

Disclaimers relating to mandatory call event

The Stock Exchange and its recognised exchange controller, HKEX, will not incur any liability (whether based on contract, tort, (including, without limitation, negligence), or any other legal or equitable grounds and without regard to the circumstances giving rise to any purported claim except in the case of wilful misconduct on the part of the Stock Exchange and/or HKEX) for, any direct, consequential, special, indirect, economic, punitive, exemplary or any other loss or damage suffered or incurred by us or any other party arising from or in connection with the mandatory call event or the suspension of trading (trading suspension) or the non- recognition of trades after a mandatory call event (non-recognition of post MCE trades), including without limitation, any delay, failure, mistake or error in the trading suspension or non-recognition of post MCE trades.

We and our guarantor shall not have any responsibility for any losses suffered as a result of the trading suspension and/or non-recognition of post MCE trades in connection with the occurrence of a mandatory call event, notwithstanding that such trading suspension or non-recognition of post MCE trades may have occurred as a result of an error in the observation of the event.

Fluctuation in the funding cost

The issue price of the CBBCs is set by reference to the difference between the initial reference spot price/level of the underlying asset and the strike price/level, plus the applicable funding cost.

The initial funding cost applicable to the CBBCs will be specified in the relevant launch announcement and supplemental listing document. It will fluctuate throughout the life of the CBBCs as the funding rate changes from time to time. The funding rate is a rate determined by us and/or the agent based on one or more of the following factors, including, but not limited to, the strike price/level, the call price/level, the prevailing interest rate, the expected life of the CBBCs, any expected notional dividends in respect of the underlying asset (if applicable) and the margin financing provided by us.

Residual value will not include residual funding cost

For category R CBBCs, the residual value (if any) payable by us following the occurrence of a mandatory call event will not include the residual funding cost for the CBBCs. You will not receive any residual funding cost back from us upon early termination of a category R CBBC following a mandatory call event.

Our hedging activities

Our or our affiliates' market-making and/or hedging activities and/or other financial instruments issued by us or our affiliates from time to time may have an impact on the price/level of the underlying asset and may trigger a mandatory call event.

In particular, when the price/level of the underlying asset is close to the call price/level, our unwinding activities in relation to the underlying asset may cause a fall or rise (as the case may be) in the price/level of the underlying asset leading to a mandatory call event as a result of such unwinding activities.

In respect of category N CBBCs, we or our affiliates may unwind our hedging transactions relating to the CBBCs at any time even if such unwinding activities may trigger a mandatory call event.

In respect of category R CBBCs, before the occurrence of a mandatory call event, we or our affiliates may unwind our hedging transactions relating to the CBBCs in proportion to the amount of the CBBCs we repurchase from the market from time to time. Upon the occurrence of a mandatory call event, we or our affiliates can unwind any hedging transactions relating to the CBBCs. Such unwinding activities after the occurrence of a mandatory call event may affect the price/level of the underlying asset and consequently the residual value for the CBBCs.

The market price of the CBBCs may become more sensitive to changes in the value of the underlying asset where the value is approaching the call price/call level, resulting in greater volatility of market price of the CBBCs.

Status of the Guarantee

JPMorgan Chase Bank, N.A.'s guarantee of our structured products (i) is an unsecured and unsubordinated general obligation of the guarantor and not of any of its affiliates, (ii) is not a savings account or deposit of the guarantor or any bank or non-bank subsidiary or affiliate of the guarantor and (iii) will rank pari passu with all other unsecured and unsubordinated indebtedness of the guarantor, except obligations, including U.S. domestic deposits of the guarantor, that are subject to any priorities or preferences by law. JPMorgan Chase Bank, N.A.'s guarantee is not a deposit insured by the U.S. Federal Deposit Insurance Corporation (the "**FDIC**"), the U.S. Deposit Insurance Fund or any other governmental agency or instrumentality.

In particular, U.S. federal legislation adopted in 1993 provides for a preference in right of payment of certain claims made in the liquidation or other resolution of any FDIC-insured depository institution, which includes JPMorgan Chase Bank, N.A. The statute requires claims to be paid in the following order:

- first, administrative expenses of the receiver;
- second, any deposit liability of the institution;
- third, any other general or senior liability of the institution not described below;
- fourth, any obligation subordinated to depositors or general creditors not described below; and
- fifth, any obligation to shareholders or members (including any depository institution holding company or any shareholder or creditor of such company).

Deposit liabilities have been interpreted by the FDIC to include any deposit payable at an office of the insured depository institution in the United States, and not to include international banking facility deposits or deposits solely payable at an office of the insured depository institution outside the United States.

Limitations of the Guarantee

JPMorgan Chase Bank, N.A.'s guarantee of our structured products is limited in scope to our payment and other obligations in respect of the structured products, and allows the guarantor to avail itself of all exclusions, exceptions and defences available to us under the terms and conditions of the structured products and at law. Further, in certain circumstances, the guarantor will not be obliged under the terms of its guarantee to satisfy our payment or other obligations in respect of the structured products, even where we have failed to perform such obligations. For example, if we are prohibited, unable, or otherwise fail to make any payment, or any portion thereof or to perform any other obligation, because or arising out of an act of war, insurrection or civil strife; an action by a government or any governmental authority or instrumentality thereof (whether de jure or de facto); legal constraint; terrorism; riots; or catastrophe, and we are thereby in default of our payment or other obligations in respect of any of our structured products, the guarantor will be under no obligation under the terms of its guarantee to satisfy our defaulted obligations. See "Form of Guarantee" below.

Risk factors relating to the guarantor.

The risk factors described below as well as the other information included in this document and in any amendment or supplement to this document may be material for the purpose of assessing the business risks that may affect JPMorgan Chase Bank, National Association's business and profitability. The following risk factors are contingencies which may or may not occur and JPMorgan Chase Bank, National Association is not in a position to express a view on the likelihood of any such contingency occurring. References in these risk factors to "JPMorgan Chase" are to JPMorgan Chase & Co. and its subsidiaries, including JPMorgan Chase Bank, National Association.

Regulatory

JPMorgan Chase's businesses are highly regulated, and the laws, rules and regulations that apply to JPMorgan Chase have a significant impact on its business and operations.

JPMorgan Chase is a financial services firm with operations worldwide. JPMorgan Chase must comply with the laws, rules and regulations that apply to its operations in all of the jurisdictions around the world in which it does business, and financial services firms such as JPMorgan Chase are subject to extensive and constantly-evolving regulation and supervision.

The regulation and supervision of JPMorgan Chase significantly affects the way that it conducts its business and structures its operations, and JPMorgan Chase could be required to make changes to its business and operations in response to supervisory expectations or decisions or to new or changed laws, rules and regulations. These types of developments could result in JPMorgan Chase incurring additional costs or experiencing a reduction in revenues to comply with applicable laws, rules and regulations, which could reduce its profitability. Furthermore, JPMorgan Chase's entry into or acquisition of a new business or an increase in its principal investments may require JPMorgan Chase to comply with additional laws, rules, and regulations.

In response to new and existing laws, rules and regulations and expanded supervision, JPMorgan Chase has in the past been and could in the future be, required to:

- limit the products and services that it offers
- reduce the liquidity that it can provide through its market-making activities
- refrain from engaging in business opportunities that it might otherwise pursue

- pay higher taxes (including as part of any minimum global tax regime), assessments, levies or other governmental charges, including in connection with the resolution of tax examinations

- incur losses, including with respect to fraudulent transactions perpetrated against its customers

- dispose of certain assets, and do so at times or prices that are disadvantageous

- impose restrictions on certain business activities, or

- increase the prices that it charges for products and services, which could reduce the demand for them.

Any failure by JPMorgan Chase to comply with the laws, rules and regulations to which it is subject could result in:

- increased regulatory and supervisory scrutiny

- regulatory and governmental enforcement actions

- the imposition of fines, penalties or other sanctions

- increased exposure to litigation, or

- harm to its reputation.

Differences and inconsistencies in financial services regulation and supervision can negatively impact JPMorgan Chase's businesses, operations and financial results.

The content and application of laws, rules and regulations affecting financial services firms can vary according to factors such as the size of the firm, the jurisdiction in which it is organized or operates, and other criteria. For example:

- larger firms such as JPMorgan Chase are often subject to more stringent supervision, regulation and regulatory scrutiny

- financial technology companies and other non-traditional competitors may not be subject to banking regulation, or may be supervised by a national or state regulatory agency that does not have the same resources or regulatory priorities as the regulatory agencies which supervise more diversified financial services firms, or

- the financial services regulatory and supervisory framework in a particular jurisdiction may favor financial institutions that are based in that jurisdiction.

These types of differences in the regulatory and supervisory framework can result in JPMorgan Chase losing market share to competitors that are less regulated or not subject to regulation, especially with respect to unregulated financial products.

There can also be significant differences in the ways that similar regulatory initiatives affecting the financial services industry are implemented in the U.S. and in other countries and regions in which JPMorgan Chase does business. For example, when adopting rules that are intended to implement a global regulatory or supervisory standard, a national regulator may introduce additional or more restrictive requirements, which can create competitive disadvantages for financial services firms, such as JPMorgan Chase, that may be subject to those enhanced regulations.

In addition, certain national and multi-national bodies and governmental agencies outside the U.S. have adopted laws, rules or regulations that may conflict with or prohibit JPMorgan Chase from complying with laws, rules and regulations to which it is otherwise subject, creating conflict of law issues that also increase its risk of non-compliance in those jurisdictions.

Legislative and regulatory initiatives outside the U.S. could require JPMorgan Chase to make significant modifications to its operations and legal entity structure in the relevant countries or regions in order to comply with those requirements. These include laws, rules and regulations that have been adopted or proposed, as well as regulatory expectations, relating to:

- the establishment of locally-based intermediate holding companies or operating subsidiaries
- requirements to maintain minimum amounts of capital or liquidity in locally-based subsidiaries
- the implementation of processes within locally-based subsidiaries to comply with local regulatory requirements or expectations
- the separation (or "ring fencing") of core banking products and services from markets activities
- requirements for the orderly resolution of financial institutions
- requirements for executing or settling transactions on exchanges or through central counterparties ("CCPs"), or for depositing funds with other financial institutions or clearing and settlement systems
- position limits and reporting rules for derivatives
- governance and accountability regimes
- conduct of business and control requirements, and
- restrictions on compensation.

These types of differences, inconsistencies and conflicts in financial services regulation have required and could in the future require JPMorgan Chase to:

- divest assets or restructure its operations
- maintain higher levels of capital and liquidity, or absorb increased capital and liquidity costs
- incur higher operational and compliance costs
- change the prices that it charges for its products and services
- curtail the products and services that it offers to its customers and clients
- curtail other business opportunities, including acquisitions or principal investments, that it otherwise would have pursued
- become subject to regulatory fines, penalties or other sanctions, or
- incur higher costs for complying with different legal and regulatory frameworks.

Any or all of these factors could harm JPMorgan Chase's ability to compete against other firms that are not subject to the same laws, rules and regulations or supervisory oversight, or harm JPMorgan Chase's businesses, results of operations and profitability.

Resolving regulatory investigations can subject JPMorgan Chase to significant penalties and collateral consequences, and could result in higher compliance costs or restrictions on its operations.

JPMorgan Chase is subject to heightened oversight and scrutiny from regulatory authorities in many jurisdictions. JPMorgan Chase has paid significant fines, provided other monetary relief, incurred other penalties and experienced other repercussions in connection with resolving investigations and enforcement actions by governmental agencies. JPMorgan Chase could become subject to similar regulatory or governmental resolutions or other actions in the future, and addressing the requirements of any such resolutions or actions could result in JPMorgan Chase incurring higher operational and compliance costs, including devoting substantial resources to the required remediation or needing to comply with other restrictions.

In connection with resolving specific regulatory investigations or enforcement actions, certain regulators have required JPMorgan Chase and other financial institutions to admit wrongdoing with respect to the activities that gave rise to the resolution. These types of admissions can lead to:

- greater exposure in litigation
- damage to JPMorgan Chase's reputation
- disqualification from doing business with certain clients or customers, or in specific jurisdictions, or
- other direct and indirect adverse effects.

Furthermore, government officials in the U.S. and other countries have demonstrated a willingness to bring criminal actions against financial institutions and have required that institutions plead guilty to criminal offenses or admit other wrongdoing in connection with resolving regulatory investigations or enforcement actions. Resolutions of this type can have significant collateral consequences for the subject financial institution, including:

- loss of clients, customers and business
- restrictions on offering certain products or services, and
- losing permission to operate certain businesses, either temporarily or permanently.

JPMorgan Chase expects that:

- it and other financial services firms will continue to be subject to heightened regulatory scrutiny and governmental investigations and enforcement actions
- governmental authorities will continue to require that financial institutions be penalized for actual or deemed violations of law with formal and punitive enforcement actions, including the imposition of significant monetary and other sanctions, rather than resolving these matters through informal supervisory actions; and

- governmental authorities will be more likely to pursue formal enforcement actions and resolutions against JPMorgan Chase to the extent that it has previously been subject to other governmental investigations or enforcement actions.

If JPMorgan Chase fails to meet the requirements of any resolution of a governmental investigation or enforcement action, or to maintain risk and control processes that meet the heightened standards and expectations of its regulators, it could be required to, among other things:

- enter into further resolutions of investigations or enforcement actions
- pay additional regulatory penalties or enter into judgments, or
- accept material regulatory restrictions on, or changes in the management of, its businesses.

In these circumstances, JPMorgan Chase could also become subject to other sanctions, or to prosecution or civil litigation with respect to the conduct that gave rise to an investigation or enforcement action. In addition, JPMorgan Chase can be subject to higher costs or requests for additional capital in connection with the resolution of governmental investigations and enforcement actions involving newly-acquired businesses, companies in which JPMorgan Chase has made principal investments, parties to joint ventures with JPMorgan Chase, and vendors with which JPMorgan Chase does business.

JPMorgan Chase's operations and financial results can be negatively impacted in jurisdictions with less predictable legal and regulatory frameworks.

JPMorgan Chase conducts existing and new business in certain countries, states, municipalities, territories and other jurisdictions in which the application of the rule of law is inconsistent or less predictable, including with respect to:

- the absence of a statutory or regulatory basis or guidance for engaging in specific types of business or transactions
- conflicting or ambiguous laws, rules and regulations, or the inconsistent application or interpretation of existing laws, rules and regulations
- uncertainty concerning the enforceability of intellectual property rights or contractual or other obligations
- difficulty in competing in economies in which the government controls or protects all or a portion of the local economy or specific businesses, or where graft or corruption may be pervasive
- the threat of regulatory investigations, civil litigations or criminal prosecutions that are arbitrary or otherwise contrary to established legal principles in other parts of the world, and
- the termination of licenses required to operate in the local market or the suspension of business relationships with governmental bodies.

If the application of the laws, rules and regulations in any jurisdiction is susceptible to producing inconsistent or unexpected outcomes, this can create a more difficult environment in which JPMorgan Chase conducts its business and could negatively affect JPMorgan Chase's operations and reduce its earnings with respect to that jurisdiction. For example, conducting business could require JPMorgan

Chase to devote significant additional resources to understanding, and monitoring changes in, local laws, rules and regulations, as well as structuring its operations to comply with local laws, rules and regulations and implementing and administering related internal policies and procedures.

There can be no assurance that JPMorgan Chase will always be successful in its efforts to fully understand and to conduct its business in compliance with the laws, rules and regulations of all of the jurisdictions in which it operates, and the risk of non-compliance can be greater in jurisdictions that have less predictable legal and regulatory frameworks.

Requirements for the orderly resolution of JPMorgan Chase could result in JPMorgan Chase having to restructure or reorganize its businesses and could increase its funding or operational costs or curtail its businesses.

JPMorgan Chase is required under Federal Reserve and FDIC rules to prepare and submit periodically to those agencies a detailed plan for rapid and orderly resolution in bankruptcy, without extraordinary government support, in the event of material financial distress or failure. The evaluation of JPMorgan Chase's resolution plan by these agencies may change, and the requirements for resolution plans may be modified from time to time. Any such determinations or modifications could result in JPMorgan Chase needing to make changes to its legal entity structure or to certain internal or external activities, which could increase its funding or operational costs, or hamper its ability to serve clients and customers.

If the Federal Reserve and the FDIC were both to determine that a resolution plan submitted by JPMorgan Chase has deficiencies, they could jointly impose more stringent capital, leverage or liquidity requirements or restrictions on JPMorgan Chase's growth, activities or operations. The agencies could also require that JPMorgan Chase restructure, reorganize or divest assets or businesses in ways that could materially and adversely affect JPMorgan Chase's operations and strategy.

Holders of JPMorgan Chase & Co.'s debt and equity securities will absorb losses if it were to enter into a resolution.

Federal Reserve rules require that JPMorgan Chase & Co. (the "Parent Company") maintain minimum levels of unsecured external long-term debt and other loss-absorbing capacity with specific terms ("eligible LTD") for purposes of recapitalizing JPMorgan Chase's operating subsidiaries if the Parent Company were to enter into a resolution either:

- in a bankruptcy proceeding under Chapter 11 of the U.S. Bankruptcy Code, or
- in a receivership administered by the FDIC under Title II of the Dodd-Frank Act ("Title II").

If the Parent Company were to enter into a resolution, holders of eligible LTD and other debt and equity securities of the Parent Company will absorb the losses of the Parent Company and its subsidiaries.

The preferred "single point of entry" strategy under JPMorgan Chase's resolution plan contemplates that only the Parent Company would enter bankruptcy proceedings. JPMorgan Chase's subsidiaries would be recapitalized, as needed, so that they could continue normal operations or subsequently be divested or wound down in an orderly manner. As a result, the Parent Company's losses and any losses incurred by its subsidiaries would be imposed first on holders of the Parent Company's equity securities and thereafter on its unsecured creditors, including holders of eligible LTD and other debt securities. Claims of holders of those securities would have a junior position to the claims of creditors of JPMorgan Chase's subsidiaries and to the claims of priority (as determined by statute) and secured creditors of the Parent Company.

Accordingly, in a resolution of the Parent Company in bankruptcy, holders of eligible LTD and other debt securities of the Parent Company would realize value only to the extent available to the Parent Company as a shareholder of JPMorgan Chase Bank, N.A. and its other subsidiaries, and only after any claims of priority and secured creditors of the Parent Company have been fully repaid.

The FDIC has similarly indicated that a single point of entry recapitalization model could be a desirable strategy to resolve a systemically important financial institution, such as the Parent Company, under Title II. However, the FDIC has not formally adopted a single point of entry resolution strategy.

If the Parent Company were to approach, or enter into, a resolution, none of the Parent Company, the Federal Reserve or the FDIC is obligated to follow JPMorgan Chase's preferred resolution strategy, and losses to holders of eligible LTD and other debt and equity securities of the Parent Company, under whatever strategy is ultimately followed, could be greater than they might have been under JPMorgan Chase's preferred strategy.

Political

Economic uncertainty or instability caused by political or geopolitical developments can negatively impact JPMorgan Chase's businesses.

Political developments in the U.S. and other countries can cause uncertainty in the economic environment and market conditions in which JPMorgan Chase operates its businesses. Certain governmental policy initiatives, as well as heightened geopolitical tensions, could significantly affect U.S. and global economic growth and cause higher volatility in the financial markets, including:

- an outbreak or escalation of hostilities, or other geopolitical instabilities
- monetary policies and actions taken by the Federal Reserve and other central banks or governmental authorities, including any sustained large-scale asset purchases or any suspension or reversal of those actions
- fiscal policies, including with respect to taxation and spending
- actions that governments take or fail to take in response to the effects of health emergencies, the spread of infectious diseases, epidemics or pandemics, as well as the effectiveness of any actions taken
- governmental actions or initiatives relating to climate risk, or more generally, the impact of business activities on environmental, social and governance ("**ESG**") matters, and the management of climate and other ESG-related risks
- isolationist foreign policies
- economic or financial sanctions
- the implementation of tariffs and other protectionist trade policies, or
- other governmental policies or actions adopted or taken in response to political or social pressures.

These types of political developments, and uncertainty about the possible outcomes of these developments, could:

- erode investor confidence in the U.S. economy and financial markets, which could potentially undermine the status of the U.S. dollar as a safe haven currency

- provoke retaliatory countermeasures by other countries and otherwise heighten tensions in regulatory, enforcement or diplomatic relations

- increase concerns about whether the U.S. government will be funded, and its outstanding debt serviced, at any particular time

- lead to the withdrawal of government support for agencies and enterprises such as the U.S. Federal National Mortgage Association and the U.S. Federal Home Loan Mortgage Corporation (together, the "U.S. GSEs")

- result in periodic shutdowns of the U.S. government or governments in other countries

- increase investor reliance on actions by the Federal Reserve or other central banks, or influence investor perceptions concerning government support of sectors of the economy or the economy as a whole

- adversely affect the financial condition or credit ratings of clients and counterparties with which JPMorgan Chase does business, or

- cause JPMorgan Chase to refrain from engaging in business opportunities that it might otherwise pursue.

These factors could lead to:

- slower growth rates, rising inflation or recession

- greater market volatility

- a contraction of available credit and the widening of credit spreads

- erosion of adequate risk premium on certain financial assets

- diminished investor and consumer confidence

- lower investments in a particular country or sector of the economy

- large-scale sales of government debt and other debt and equity securities in the U.S. and other countries

- reduced commercial activity among trading partners

- the potential for a currency redenomination by a particular country

- the possible departure of a country from, or the dissolution or formation of, a political or economic alliance or treaty

- potential expropriation or nationalization of assets, including client assets, or

- other market dislocations, including unfavorable economic conditions that could spread from a particular country or region to other countries or regions.

Any of these potential outcomes could cause JPMorgan Chase to suffer losses on its market-making positions or in its investment portfolio, reduce its liquidity and capital levels, increase the allowance for credit losses or lead to higher net charge-offs, hamper its ability to deliver products and services to its clients and customers, and weaken its results of operations and financial condition or credit rating.

JPMorgan Chase's business and results of operations may also be adversely affected by actions or initiatives by national, state or local governmental authorities that:

- seek to discourage financial institutions from doing business with companies engaged in certain industries, or conversely, to penalize financial institutions that elect not to do business with such companies, or
- mandate specific business practices that companies operating in the relevant jurisdiction must adopt.

Because governmental policies in one jurisdiction may differ or conflict with those in other jurisdictions, JPMorgan Chase may face negative consequences regardless of the course of action it takes or elects not to take, including:

- restrictions or prohibitions on doing business within a particular jurisdiction, or with governmental entities in a jurisdiction
- the threat of enforcement actions, including under antitrust or other anti-competition laws, rules and regulations, and
- harm to its reputation arising from public criticism, including from politicians, activists and other stakeholders.

JPMorgan Chase has been prohibited from engaging in certain business activities in specific jurisdictions as a result of these types of governmental actions, and there is no assurance that it will not face similar restrictions on its business and operations in the future.

In addition, JPMorgan Chase's relationships or ability to transact with clients and customers, and with governmental or regulatory bodies in jurisdictions in which JPMorgan Chase does business, could be adversely affected if its decisions with respect to doing business with companies in certain sensitive industries are perceived to harm those companies or to align with particular political viewpoints. Furthermore, JPMorgan Chase's participation in or association with certain environmental and social industry groups or initiatives could be viewed by activists or governmental authorities as boycotting or other discriminatory business behavior.

Market

Economic and market events and conditions can materially affect JPMorgan Chase's businesses and investment and market-making positions.

JPMorgan Chase's results of operations can be negatively affected by adverse changes in any of the following:

- investor, consumer and business sentiment
- events that reduce confidence in the financial markets
- inflation, deflation or recession
- high unemployment or, conversely, a tightening labor market
- the availability and cost of capital, liquidity and credit
- levels and volatility of interest rates, credit spreads and market prices for currencies, equities and commodities, as well as the duration of any such changes
- the economic effects of an outbreak or escalation of hostilities, terrorism or other geopolitical instabilities, cyber attacks, climate change, natural disasters, severe weather conditions, health emergencies, the spread of infectious diseases, epidemics or pandemics or other extraordinary events beyond JPMorgan Chase's control, and
- the strength of the U.S. and global economies.

All of these are affected by global economic, market and political events and conditions, as well as regulatory restrictions.

In addition, JPMorgan Chase's investment portfolio and market-making businesses can suffer losses due to unanticipated market events, including:

- severe declines in asset values
- unexpected credit events
- unforeseen events or conditions that may cause previously uncorrelated factors to become correlated (and vice versa)
- the inability to effectively hedge risks related to market-making and investment portfolio positions, or
- other market risks that may not have been appropriately taken into account in the development, structuring or pricing of a financial instrument.

If JPMorgan Chase experiences significant losses in its investment portfolio or from market-making activities, this could reduce JPMorgan Chase's profitability and its liquidity and capital levels, and thereby constrain the growth of its businesses.

JPMorgan Chase's consumer businesses can be negatively affected by adverse economic conditions and governmental policies.

JPMorgan Chase's consumer businesses are particularly affected by U.S. and global economic conditions, including:

- personal and household income distribution
- unemployment or underemployment
- prolonged periods of exceptionally high or low interest rates
- changes in the value of collateral such as residential real estate and vehicles
- changes in housing prices
- the level of inflation and its effect on prices for goods and services
- consumer and small business confidence levels, and
- changes in consumer spending or in the level of consumer debt.

Heightened levels of unemployment or underemployment that result in reduced personal and household income could negatively affect consumer credit performance to the extent that consumers are less able to service their debts. In addition, sustained low growth, low or negative interest rates, inflationary pressures or recessionary conditions could diminish customer demand for the products and services offered by JPMorgan Chase's consumer businesses.

Adverse economic conditions could also lead to an increase in delinquencies, additions to the allowance for credit losses and higher net charge-offs, which can reduce JPMorgan Chase's earnings. These consequences could be significantly worse in certain geographies, including where declining industrial or manufacturing activity has resulted in or could result in higher levels of unemployment, or where high levels of consumer debt, such as outstanding student loans, could impair the ability of customers to pay their other consumer loan obligations.

JPMorgan Chase's earnings from its consumer businesses could also be adversely affected by governmental policies and actions that affect consumers, including:

- policies and initiatives relating to medical insurance, education, immigration, employment status and housing
- laws, rules and regulations relating specifically to the financial services industry, such as limitations on late payment, overdraft and interchange fees, and
- policies aimed at the economy more broadly, such as higher taxes and increased regulation which could result in reductions in consumer disposable income.

Unfavorable market and economic conditions can have an adverse effect on JPMorgan Chase's wholesale businesses.

In JPMorgan Chase's wholesale businesses, market and economic factors can affect the volume of transactions that JPMorgan Chase executes for its clients or for which it advises clients, and, therefore, the revenue that JPMorgan Chase receives from those transactions. These factors can also influence the willingness of other financial institutions and investors to participate in capital markets transactions that JPMorgan Chase manages, such as loan syndications or securities underwriting. Furthermore, if a significant and sustained deterioration in market conditions were to occur, the profitability of JPMorgan Chase's businesses engaged in capital markets activities, including loan syndication, securities underwriting and leveraged lending activities, could be reduced to the extent that those businesses:

- earn less fee revenue due to lower transaction volumes, including when clients are unwilling or unable to refinance their outstanding debt obligations in unfavorable market conditions, or

- dispose of portions of credit commitments at a loss, or hold larger residual positions in credit commitments that cannot be sold at favorable prices.

The fees that JPMorgan Chase earns from managing client assets or holding assets under custody for clients could be diminished by declining asset values or other adverse macroeconomic conditions. For example, higher interest rates or a downturn in financial markets could affect the valuation of client assets that JPMorgan Chase manages or holds under custody, which, in turn, could affect JPMorgan Chase's revenue from fees that are based on the amount of assets under management or custody. Similarly, adverse macroeconomic or market conditions could prompt outflows from JPMorgan Chase funds or accounts, or cause clients to invest in products that generate lower revenue. Substantial and unexpected withdrawals from a JPMorgan Chase fund can also hamper the investment performance of the fund, particularly if the outflows create the need for the fund to dispose of fund assets at disadvantageous times or prices, and could lead to further withdrawals based on the weaker investment performance.

An adverse change in market conditions in particular segments of the economy, such as a sudden and severe downturn in oil and gas prices or an increase in commodity prices, severe declines in commercial real estate values, or sustained changes in consumer behavior that affect specific economic sectors, could have a material adverse effect on clients of JPMorgan Chase whose operations or financial condition are directly or indirectly dependent on the health or stability of those market segments or economic sectors, as well as clients that are engaged in related businesses. JPMorgan Chase could incur credit losses on its loans and other commitments to clients that operate in, or are dependent on, any sector of the economy that is or comes under stress.

An economic downturn or sustained changes in consumer behavior that results in shifts in consumer and business spending could also have a negative impact on certain of JPMorgan Chase's wholesale clients, and thereby diminish JPMorgan Chase's earnings from its wholesale operations. For example, the businesses of certain of JPMorgan Chase's wholesale clients are dependent on consistent streams of rental income from commercial real estate properties, including offices, which are owned or being built by those clients. Sustained adverse economic conditions or hybrid work models could result in reductions in the rental cash flows that owners or developers receive from their tenants which, in turn, could depress the values of the properties, impair the ability of borrowers to service or refinance their commercial real estate loans and lead to an increase in foreclosures. These consequences could result in JPMorgan Chase experiencing increases in the allowance for credit losses, higher delinquencies, defaults and charge-offs within its commercial real estate loan portfolio and incurring higher costs for servicing a larger volume of delinquent loans in that portfolio. An increase in foreclosures could result in higher operational risk associated with JPMorgan Chase owning and managing real property, and any inadequacy in governance or control over the foreclosed properties could result in regulatory scrutiny and reputational harm.

Changes in interest rates and credit spreads can adversely affect JPMorgan Chase's earnings, its liquidity or its capital levels.

When interest rates are high or increasing, JPMorgan Chase can generally be expected to earn higher net interest income. However, higher interest rates can also lead to:

- fewer originations of commercial and residential real estate loans
- losses on underwriting exposures or incremental client-specific downgrades, or increases in the allowance for credit losses and net charge-offs due to higher financing costs for clients
- the loss of deposits, particularly if customers withdraw deposits because they believe that interest rates offered by JPMorgan Chase are lower than those of competitors or if JPMorgan Chase makes incorrect assumptions about depositor behavior
- losses on available-for-sale ("**AFS**") securities held in the investment securities portfolio
- lower net interest income if central banks introduce interest rate increases more quickly than anticipated and this results in a misalignment in the pricing of short-term and long-term borrowings
- less liquidity in the financial markets, and
- higher funding costs.

All of these outcomes could adversely affect JPMorgan Chase's earnings or its liquidity and capital levels, and any negative outcomes could be more severe in a prolonged period of high interest rates. Higher interest rates can also negatively affect the payment performance on loans within JPMorgan Chase's consumer and wholesale loan portfolios that are linked to variable interest rates. If borrowers of variable rate loans are unable to afford higher interest payments, those borrowers may reduce or stop making payments, thereby causing JPMorgan Chase to incur losses and increased operational costs related to servicing a higher volume of delinquent loans.

On the other hand, a low or negative interest rate environment may cause:

- net interest margins to be compressed, which could reduce the amounts that JPMorgan Chase earns on its investment securities portfolio to the extent that it is unable to reinvest contemporaneously in higher-yielding instruments
- unanticipated or adverse changes in depositor behavior, which could negatively affect JPMorgan Chase's broader asset and liability management strategy, and
- a reduction in the value of JPMorgan Chase's mortgage servicing rights ("MSRs") asset, decreasing revenues.

When credit spreads widen, it becomes more expensive for JPMorgan Chase to borrow. JPMorgan Chase's credit spreads may widen or narrow not only in response to events and circumstances that are specific to JPMorgan Chase but also as a result of general economic and geopolitical events and conditions. Changes in JPMorgan Chase's credit spreads will affect, positively or negatively, JPMorgan Chase's earnings on certain liabilities, such as derivatives, that are recorded at fair value.

JPMorgan Chase's results may be materially affected by market fluctuations and significant changes in the value of financial instruments.

The value of securities, derivatives and other financial instruments which JPMorgan Chase owns or in which it makes markets can be materially affected by market fluctuations. Market volatility, illiquid market conditions and other disruptions in the financial markets may make it extremely difficult to value certain financial instruments. Subsequent valuations of financial instruments in future periods, in light of factors then prevailing, may result in significant changes in the value of these instruments. In addition, at the time of any disposition of these financial instruments, the price that JPMorgan Chase ultimately realizes will depend on the demand and liquidity in the market at that time and may be materially lower than their current fair value. Any of these factors could cause a decline in the value of financial instruments that JPMorgan Chase owns or in which it makes markets, which may have an adverse effect on JPMorgan Chase's results of operations.

JPMorgan Chase's risk management and monitoring processes, including its stress testing framework, seek to quantify and manage JPMorgan Chase's exposure to more extreme market moves. However, JPMorgan Chase's hedging and other risk management strategies may not be effective, and it could incur significant losses, if extreme market events were to occur.

Credit

JPMorgan Chase can be negatively affected by adverse changes in the financial condition of clients, counterparties, custodians and CCPs.

JPMorgan Chase routinely executes transactions with clients and counterparties such as corporations, financial institutions, asset managers, hedge funds, securities exchanges and government entities within and outside the U.S. Many of these transactions expose JPMorgan Chase to the credit risk of its clients and counterparties, and can involve JPMorgan Chase in disputes and litigation if a client or counterparty defaults. JPMorgan Chase can also be subject to losses or liability where a financial institution that it has appointed to provide custodial services for client assets or funds becomes insolvent as a result of fraud or the failure to abide by existing laws and obligations, or where clients are unable to access assets held by JPMorgan Chase as custodian due to governmental actions or other factors.

A default by, or the financial or operational failure of, a CCP through which JPMorgan Chase executes contracts would require JPMorgan Chase to replace those contracts, thereby increasing its operational costs and potentially resulting in losses. In addition, JPMorgan Chase can be exposed to losses if a member of a CCP in which JPMorgan Chase is also a member defaults on its obligations to the CCP because of requirements that each member of the CCP absorb a portion of those losses. Furthermore, JPMorgan Chase can be subject to bearing its share of non-default losses incurred by a CCP, including losses from custodial, settlement or investment activities or due to cyber or other security breaches.

As part of its clearing services activities, JPMorgan Chase is exposed to the risk of nonperformance by its clients, which it seeks to mitigate by requiring clients to provide adequate collateral. JPMorgan Chase is also exposed to intra-day credit risk of its clients in connection with providing cash management, clearing, custodial and other transaction services to those clients. If a client for which JPMorgan Chase provides these services becomes bankrupt or insolvent, JPMorgan Chase may incur losses, become involved in disputes and litigation with one or more CCPs, the client's bankruptcy estate and other creditors, or be subject to regulatory investigations. All of the foregoing events can increase JPMorgan Chase's operational and litigation costs, and JPMorgan Chase may suffer losses to the extent that any collateral that it has received is insufficient to cover those losses.

Transactions with government entities, including national, state, provincial, municipal and local authorities, can expose JPMorgan Chase to enhanced sovereign, credit, operational and reputation risks. Government entities may, among other things, claim that actions taken by government officials were beyond the legal authority of those officials or repudiate transactions authorized by a previous incumbent government. These types of actions have in the past caused, and could in the future cause, JPMorgan Chase to suffer losses or hamper its ability to conduct business in the relevant jurisdiction.

In addition, local laws, rules and regulations could limit JPMorgan Chase's ability to resolve disputes and litigation in the event of a counterparty default or unwillingness to make previously agreed-upon payments, which could subject JPMorgan Chase to losses.

Disputes may arise with counterparties to derivatives contracts with regard to the terms, the settlement procedures or the value of underlying collateral. The disposition of those disputes could cause JPMorgan Chase to incur unexpected transaction, operational and legal costs, or result in credit losses. These consequences can also impair JPMorgan Chase's ability to effectively manage its credit risk exposure from its market activities, or cause harm to JPMorgan Chase's reputation.

The financial or operational failure of a significant market participant, such as a major financial institution or a CCP, or concerns about the creditworthiness of such a market participant or its ability to fulfill its obligations, can cause substantial and cascading disruption within the financial markets, including in circumstances where coordinated action by multiple other market participants is required to address the failure or disruption. JPMorgan Chase's businesses could be significantly disrupted by such an event, particularly if it leads to other market participants incurring significant losses, experiencing liquidity issues or defaulting, and JPMorgan Chase is likely to have significant interrelationships with, and credit exposure to, such a significant market participant.

JPMorgan Chase may suffer losses if the value of collateral declines in stressed market conditions.

During periods of market stress or illiquidity, JPMorgan Chase's credit risk may be further increased when:

- JPMorgan Chase fails to realize the estimated value of the collateral it holds
- collateral is liquidated at prices that are not sufficient to recover the full amount owed to it, or
- counterparties are unable to post collateral, whether for operational or other reasons.

Furthermore, disputes with counterparties concerning the valuation of collateral may increase in times of significant market stress, volatility or illiquidity, and JPMorgan Chase could suffer losses during these periods if it is unable to realize the fair value of collateral or to manage declines in the value of collateral.

JPMorgan Chase could incur significant losses arising from concentrations of credit and market risk.

JPMorgan Chase is exposed to greater credit and market risk to the extent that groupings of its clients or counterparties, or obligors on securities and other financial instruments:

- engage in similar or related businesses, or in businesses in related industries
- do business in the same geographic region, or

- have business profiles, models or strategies that could cause their ability to meet their obligations to be similarly affected by changes in economic conditions.

For example, a significant deterioration in the credit quality of a counterparty, borrower or other obligor could lead to concerns about the creditworthiness of other counterparties, borrowers or obligors in similar, related or dependent industries. This type of interrelationship could exacerbate JPMorgan Chase's credit, liquidity and market risk exposure and potentially cause it to incur losses, including fair value losses in its market-making businesses and investment portfolios. In addition, JPMorgan Chase may be required to increase the allowance for credit losses or establish other reserves with respect to certain clients, industries or country exposures in order to align with directives or expectations of its banking regulators.

Similarly, challenging economic conditions that affect a particular industry or geographic area could lead to concerns about the credit quality of counterparties, borrowers or other obligors not only in that particular industry or geography but in related or dependent industries, wherever located. These conditions could also heighten concerns about the ability of customers of JPMorgan Chase's consumer businesses who live in those areas or work in those affected industries or related or dependent industries to meet their obligations to JPMorgan Chase. JPMorgan Chase regularly monitors various segments of its credit and market risk exposures to assess the potential risks of concentration or contagion, but its ability to diversify or hedge its exposure against those risks may be limited.

JPMorgan Chase's consumer businesses can also be harmed by an excessive expansion of consumer credit by bank or non-bank competitors. Heightened competition for certain types of consumer loans could prompt industry-wide reactions such as significant reductions in the pricing or margins of those loans or the making of loans to less-creditworthy borrowers. If large numbers of consumers subsequently default on their loans, whether due to weak credit profiles, an economic downturn or other factors, this could impair their ability to repay obligations owed to JPMorgan Chase and result in higher charge-offs and other credit-related losses. More broadly, widespread defaults on consumer debt could lead to recessionary conditions in the U.S. economy, and JPMorgan Chase's consumer businesses may earn lower revenues in such an environment.

If JPMorgan Chase is unable to reduce positions effectively during a market dislocation, this can increase both the market and credit risks associated with those positions and the level of risk-weighted-assets ("**RWA**") that JPMorgan Chase holds on its balance sheet. These factors could adversely affect JPMorgan Chase's capital position, funding costs and the profitability of its businesses.

Liquidity

JPMorgan Chase's ability to operate its businesses could be impaired if its liquidity is constrained.

JPMorgan Chase's liquidity can be impacted at any given time as a result of factors such as:

- market-wide illiquidity or disruption

- changes in liquidity or capital requirements, resulting from changes in laws, rules and regulations, including those in response to economic effects of systemic events

- actions taken by the U.S. government or by the Federal Reserve to reduce its balance sheet, which may reduce deposits held by JPMorgan Chase and other financial institutions

- inability to sell assets, or to sell assets at favorable times or prices

- default by a CCP or other significant market participant

- unanticipated outflows of cash or collateral

- unexpected loss of deposits or higher than anticipated draws on lending-related commitments, and

- lack of market or customer confidence in JPMorgan Chase or financial institutions in general.

A reduction in JPMorgan Chase's liquidity may be caused by events over which it has little or no control. For example, periods of market stress, low investor confidence and significant market illiquidity could result in higher funding costs for JPMorgan Chase and could limit its access to some of its traditional sources of liquidity.

JPMorgan Chase may need to raise funding from alternative sources if its access to stable and lower-cost sources of funding, such as deposits and borrowings from Federal Home Loan Banks, is reduced. Alternative sources of funding could be more expensive or limited in availability. JPMorgan Chase's funding costs could also be negatively affected by actions that JPMorgan Chase may take in order to:

- satisfy applicable liquidity coverage ratio and net stable funding ratio requirements

- address obligations under its resolution plan, or

- satisfy regulatory requirements in jurisdictions outside the U.S. relating to the pre-positioning of liquidity in subsidiaries that are material legal entities.

More generally, if JPMorgan Chase fails to effectively manage its liquidity, this could constrain its ability to fund or invest in its businesses and subsidiaries, and thereby adversely affect its results of operations.

JPMorgan Chase & Co. is a holding company and depends on the cash flows of its subsidiaries to make payments on its outstanding securities.

JPMorgan Chase & Co. is a holding company that holds the stock of JPMorgan Chase Bank, N.A. and an intermediate holding company, JPMorgan Chase Holdings LLC (the "IHC"). The IHC in turn generally holds the stock of JPMorgan Chase's subsidiaries other than JPMorgan Chase Bank, N.A. and its subsidiaries. The IHC also owns other assets and provides intercompany lending to the Parent Company.

The Parent Company is obligated to contribute to the IHC substantially all the net proceeds received from securities issuances (including issuances of senior and subordinated debt securities and of preferred and common stock).

The ability of JPMorgan Chase Bank, N.A. and the IHC to make payments to the Parent Company is also limited. JPMorgan Chase Bank, N.A. is subject to regulatory restrictions on its dividend distributions, as well as capital adequacy requirements, such as the Supplementary Leverage Ratio ("SLR"), and liquidity requirements and other regulatory restrictions on its ability to make payments to the Parent Company. The IHC is prohibited from paying dividends or extending credit to the Parent Company if certain capital or liquidity thresholds are breached, or if limits are otherwise imposed by the Parent Company's management or Board of Directors.

As a result of these arrangements, the ability of the Parent Company to make various payments is dependent on its receiving dividends from JPMorgan Chase Bank, N.A. and dividends and borrowings from the IHC. These limitations could affect the Parent Company's ability to:

- pay interest on its debt securities
- pay dividends on its equity securities
- redeem or repurchase outstanding securities, and
- fulfill its other payment obligations.

These arrangements could also result in the Parent Company seeking protection under bankruptcy laws or otherwise entering into resolution proceedings at a time earlier than would have been the case absent the existence of the capital and liquidity thresholds to which JPMorgan Chase Bank, N.A., and the IHC are subject.

Reductions in JPMorgan Chase's credit ratings may adversely affect its liquidity and cost of funding.

JPMorgan Chase & Co. and certain of its principal subsidiaries are rated by credit rating agencies. Rating agencies evaluate general, firm-specific and industry-specific factors when determining credit ratings for a particular financial institution, including:

- expected future profitability
- risk management practices
- legal expenses
- ratings differentials between bank holding companies and their bank and non-bank subsidiaries
- regulatory developments
- assumptions about government support, and
- economic and geopolitical developments.

JPMorgan Chase closely monitors and manages, to the extent that it is able, factors that could influence its credit ratings. However, there is no assurance that JPMorgan Chase's credit ratings will not be downgraded in the future. Furthermore, any such downgrade could occur at times of broader market instability when JPMorgan Chase's options for responding to events may be more limited and general investor confidence is low.

A reduction in JPMorgan Chase's credit ratings could curtail JPMorgan Chase's business activities and reduce its profitability in a number of ways, including:

- reducing its access to capital markets
- materially increasing its cost of issuing and servicing securities
- triggering additional collateral or funding requirements, and
- decreasing the number of investors and counterparties that are willing or permitted to do business with or lend to JPMorgan Chase.

Any rating reduction could also increase the credit spreads charged by the market for taking credit risk on JPMorgan Chase & Co. and its subsidiaries. This could, in turn, adversely affect the value of debt and other obligations of JPMorgan Chase & Co. and its subsidiaries.

Capital

Maintaining the required level and composition of capital may impact JPMorgan Chase's ability to support business activities, meet evolving regulatory requirements and distribute capital to shareholders.

JPMorgan Chase is subject to various regulatory capital requirements, including leverage- and risk-based capital requirements. In addition, as a Global Systemically Important Bank ("GSIB"), JPMorgan Chase is required to hold additional capital buffers, including a GSIB surcharge, a Stress Capital Buffer ("**SCB**"), and a countercyclical buffer, each of which is reassessed at least annually. The amount of capital that JPMorgan Chase is required to hold in order to satisfy these leverage- and risk-based requirements could increase at any given time due to factors such as:

- actions by banking regulators, including changes in laws, rules, and regulations
- changes in the composition of JPMorgan Chase's balance sheet or developments that could increase RWA, such as increased market risk, customer delinquencies, client credit rating downgrades or other factors, and
- increases in estimated stress losses as determined by the Federal Reserve under the Comprehensive Capital Analysis and Review, which could increase JPMorgan Chase's SCB.

Any failure by or inability of JPMorgan Chase to maintain the required level and composition of capital, or unfavorable changes in applicable capital requirements, could have an adverse impact on JPMorgan Chase's shareholders, such as:

- reducing the amount of common stock that JPMorgan Chase is permitted to repurchase
- requiring the issuance of, or prohibiting the redemption of, capital instruments in a manner inconsistent with JPMorgan Chase's capital management strategy
- constraining the amount of dividends that may be paid on common stock, or
- curtailing JPMorgan Chase's business activities or operations.

Banking regulators have released a proposal to amend the Basel III risk-based capital framework which could significantly revise the risk-based capital requirements for banks with assets of $100 billion or more, including JPMorgan Chase. Uncertainty remains as to the manner in which these requirements will ultimately apply to JPMorgan Chase, however it is possible that these requirements could impact JPMorgan Chase's decisions concerning the business activities in which it will engage and its levels of capital distributions to its shareholders.

Operational

JPMorgan Chase's businesses are dependent on the effectiveness of internal and external operational systems.

JPMorgan Chase's businesses rely on the ability of JPMorgan Chase's financial, accounting, transaction execution, data processing and other operational systems to process, record, monitor and report a large number of transactions on a continuous basis, and to do so accurately, quickly and securely. In addition to proper design, installation, maintenance and training, the effective functioning of JPMorgan Chase's operational systems depends on:

- the quality of the information contained in those systems, as inaccurate, outdated, incomplete or corrupted data can significantly compromise the functionality or reliability of a particular system and other systems to which it transmits or from which it receives information, and

- JPMorgan Chase's ability to continue to maintain and upgrade its systems on a regular basis in line with technological advancements and evolving security requirements, carefully manage any changes introduced to its systems to maintain security and operational continuity, and adhere to all applicable legal and regulatory requirements, particularly in regions where JPMorgan Chase may face a heightened risk of malicious activity.

JPMorgan Chase has experienced and expects that it will continue to experience failures and disruptions in the stability of its operational systems, including degraded performance of data processing systems, data quality issues, disruptions of network connectivity and malfunctioning software, as well as disruptions in its ability to access and use the operational systems of third parties. These incidents have resulted in various negative effects for customers, including the inability to access account information or to make transactions through ATM, internet or mobile channels, the exfiltration of customer personal data, the recording of duplicative transactions and extended delays for customers requiring services from call centers. There can be no assurance that these and other types of operational failures or disruptions will not occur in the future.

JPMorgan Chase's ability to effectively manage the stability of its operational systems and infrastructure could be hindered by many factors, any of which could have a negative impact on JPMorgan Chase and its clients, customers and counterparties, including:

- JPMorgan Chase's ability to effectively maintain and upgrade systems and infrastructure can become more challenging as the speed, frequency, volume, interconnectivity and complexity of transactions continue to increase

- attempts by third parties to defraud JPMorgan Chase or its clients and customers are increasing, evolving and becoming more complex, and during periods of market disruption or economic uncertainty, these attempts can be expected to increase in volume

- errors made by JPMorgan Chase or another market participant, whether inadvertent or malicious, could cause widespread system disruption

- failure to detect weaknesses or shortcomings in operational systems in a timely manner

- isolated or seemingly insignificant errors in operational systems could compound, or migrate to other systems over time, to become larger issues

- disruptions in operational systems or in the ability of systems to communicate with each other could be caused by failures in synchronization or encryption software, or degraded performance of microprocessors, and

- attempts by third parties to block the use of key technology solutions by claiming that the use infringes on their intellectual property rights.

JPMorgan Chase also depends on its ability to access and use the operational systems of third parties, including its custodians, vendors (such as those that provide data and cloud computing services, and security and technology services) and other market participants (such as clearing and payment systems, CCPs and securities exchanges), and external operational systems with which JPMorgan is connected, whether directly or indirectly, can be sources of operational risk to JPMorgan Chase. JPMorgan Chase may be exposed not only to a systems failure or cyber attack that may be experienced by a vendor or market infrastructure with which JPMorgan Chase is directly connected, but also to a systems breakdown or cyber attack involving another party to which such a vendor or infrastructure is connected. Similarly, retailers, payment systems and processors, data aggregators and other external parties with which JPMorgan Chase's customers do business can increase JPMorgan Chase's operational risk. This is particularly the case where activities of customers or other parties are beyond JPMorgan Chase's security and control systems, including through the use of the internet, cloud computing services, and personal smart phones and other mobile devices or services.

If an external party obtains access to customer account data on JPMorgan Chase's systems, whether authorized or unauthorized, and that party misappropriates that data, this could result in negative outcomes for JPMorgan Chase and its clients and customers, including a heightened risk of fraudulent transactions using JPMorgan Chase's systems, losses from fraudulent transactions and reputational harm arising from the perception that JPMorgan Chase's systems may not be secure.

As JPMorgan Chase's interconnectivity with clients, customers and other external parties continues to expand, JPMorgan Chase increasingly faces the risk of operational failure or cyber attacks with respect to the systems of those parties. Security breaches affecting JPMorgan Chase's clients or customers, or systems breakdowns or failures, security breaches or human error or misconduct affecting other external parties, may require JPMorgan Chase to take steps to protect the integrity of its own operational systems or to safeguard confidential information, including restricting the access of customers to their accounts. These actions can increase JPMorgan Chase's operational costs and potentially diminish customer satisfaction and confidence in JPMorgan Chase.

Furthermore, the widespread and expanding interconnectivity among financial institutions, clearing banks, CCPs, payments processors, financial technology companies, securities exchanges, clearing houses and other financial market infrastructures increases the risk that the disruption of an operational system involving one institution or entity, including due to a cyber attack, may cause industry-wide operational disruptions that could materially affect JPMorgan Chase's ability to conduct business. In addition, the risks associated with the disruption of an operational system of a third party could be exacerbated to the extent that the services provided by that system are used by a significant number or proportion of market participants.

The ineffectiveness, failure or other disruption of operational systems upon which JPMorgan Chase depends, including due to a systems malfunction, cyber incident or other systems failure, could result in unfavorable ripple effects in the financial markets and for JPMorgan Chase and its clients and customers, including:

- delays or other disruptions in providing services, including the provision of liquidity or information to clients and customers

- impairment of JPMorgan Chase's ability to execute transactions, including delays or failures in the confirmation or settlement of transactions or in obtaining access to funds or other assets required for settlement

- the possibility that funds transfers, capital markets trades or other transactions are executed erroneously

- financial losses, including due to loss-sharing requirements of CCPs, payment systems or other market infrastructures, or as possible restitution to clients and customers

- higher operational costs associated with replacing services provided by a system that has experienced a failure or other disruption

- limitations on JPMorgan Chase's ability to collect data needed for its business and operations

- loss of confidence in the ability of JPMorgan Chase, or financial institutions generally, to protect against and withstand operational disruptions

- dissatisfaction among JPMorgan Chase's clients or customers

- significant exposure to litigation and regulatory fines, penalties or other sanctions, and

- harm to JPMorgan Chase's reputation.

If JPMorgan Chase's operational systems, or those of acquired businesses or of external parties on which JPMorgan Chase's businesses depend, are unable to meet the requirements of JPMorgan Chase's businesses and operations or bank regulatory standards, or if they fail or have other significant shortcomings, JPMorgan Chase could be materially and adversely affected.

A successful cyber attack affecting JPMorgan Chase could cause significant harm to JPMorgan Chase and its clients and customers.

JPMorgan Chase experiences numerous cyber attacks on its computer systems, software, networks and other technology assets on a daily basis from various actors, including groups acting on behalf of hostile countries, cyber-criminals, "hacktivists" (i.e., individuals or groups that use technology to promote a political agenda or social change) and others. These cyber attacks can take many forms, including attempts to introduce computer viruses or malicious code, which are commonly referred to as "malware", into JPMorgan Chase's systems. These attacks are often designed to:

- obtain unauthorized access to confidential information belonging to JPMorgan Chase or its clients, customers, counterparties or employees

- manipulate data

- destroy data or systems with the aim of rendering services unavailable

- disrupt, sabotage or degrade service on JPMorgan Chase's systems

- steal money, or

- extort money through the use of so-called "ransomware".

JPMorgan Chase also experiences:

- distributed denial-of-service attacks intended to disrupt JPMorgan Chase's websites, including those that provide online banking and other services,

- a higher volume and complexity of cyber attacks against the backdrop of heightened geopolitical tensions, and

- a high volume of disruptions to internet-based services used by JPMorgan Chase that are provided by third parties.

JPMorgan Chase has experienced security breaches due to cyber attacks in the past, and it is inevitable that additional breaches will occur in the future. Any such breach could result in serious and harmful consequences for JPMorgan Chase or its clients and customers.

A principal reason that JPMorgan Chase cannot provide absolute security against cyber attacks is that it may not always be possible to anticipate, detect or recognize threats to JPMorgan Chase's systems, or to implement effective preventive measures against all breaches because:

- the techniques used in cyber attacks evolve frequently and are increasingly sophisticated, and therefore may not be recognized until launched or may go undetected for extended periods

- cyber attacks can originate from a wide variety of sources, including JPMorgan Chase's own employees, cyber-criminals, hacktivists, well-resourced groups linked to terrorist organizations or hostile nation-states that can sustain malicious activities for extended periods, or third parties whose objective is to disrupt the operations of financial institutions more generally

- JPMorgan Chase does not have control over the cybersecurity of the systems of the large number of clients, customers, counterparties and third-party service providers with which it does business, and

- it is possible that a third party, after establishing a foothold on an internal network without being detected, may gain access to other networks and systems.

The risk of a security breach due to a cyber attack could increase in the future due to factors such as:

- JPMorgan Chase's ongoing expansion of its mobile banking and other internet-based product offerings and its internal use of internet-based products and applications, including those that use cloud computing services

- advances in artificial intelligence, such as the use of machine learning and generative artificial intelligence by malicious actors to develop more advanced social engineering attacks, including targeted phishing attacks

- the inability to maintain the security of information transmitted by JPMorgan Chase due to advances in quantum computing that may counteract or nullify existing information protections, and

- the acquisition and integration of new businesses.

In addition, a third party could misappropriate confidential information obtained by intercepting signals or communications from mobile devices used by JPMorgan Chase's employees.

The dynamic nature of the cyber threat landscape necessitates continuous enhancement and adaptation of cybersecurity controls. Failure to discover or address known vulnerabilities or shortcomings in cybersecurity controls, or to prioritize or complete enhancements to address them, in each case in a timely manner, may leave JPMorgan Chase vulnerable to cyber attacks, potentially resulting in data breaches, financial losses, reputational damage and regulatory penalties, including the failure to prioritize or complete enhancements relating to:

- preventing unauthorized access and protecting against the misuse of access, including the maintenance and enhancement of controls related to secure software development practices and identity and access management, such as those relating to the management of administrative access to systems

- detecting, escalating and addressing effectively and in a timely manner any vulnerabilities that may be present either in internally-developed software or externally-provided software or services, including vulnerabilities that could allow attackers to exploit unknown security flaws in software and hardware ("zero-day vulnerabilities")

- enhancing early detection of attacks against third-party vendors, including attacks targeting vulnerabilities in third-party open-source software, in support of the secure development and maintenance of internal systems

- maintaining and enhancing controls related to technology asset management and inventory systems to prevent the risk of undetected vulnerabilities that could undermine JPMorgan Chase's ability to operate an effective control process

- upgrading the coverage and capabilities of systems and controls to protect JPMorgan Chase and its clients and customers from the impact of distributed denial-of-service attacks, or to recover from outages that could be caused by a malware or ransomware attack

- strengthening network security and management of outbound connections to reduce the risk of data loss

- identifying, assessing and mitigating insider threat activities that could lead to the misuse of JPMorgan Chase's systems or client and customer information, and

- integrating acquired businesses where system integration may be complex or may require extensive and lengthy remediation or enhancement of controls.

A successful penetration or circumvention of the security of JPMorgan Chase's systems or the systems of a vendor, governmental body or another market participant could cause serious negative consequences, including:

- significant disruption of JPMorgan Chase's operations and those of its clients, customers and counterparties, including losing access to operational systems

- misappropriation of confidential information of JPMorgan Chase or that of its clients, customers, counterparties, employees or regulators

- disruption of or damage to JPMorgan Chase's systems and those of its clients, customers and counterparties

- the inability, or extended delays in the ability, to fully recover and restore data that has been stolen, manipulated or destroyed, or the inability to prevent systems from processing fraudulent transactions

- demands that JPMorgan Chase pay a ransom to a malicious actor that has perpetrated a cybersecurity breach

- unintended violations by JPMorgan Chase of applicable privacy and other laws

- financial loss to JPMorgan Chase or to its clients, customers, counterparties or employees

- loss of confidence in JPMorgan Chase's cybersecurity and business resiliency measures
- dissatisfaction among JPMorgan Chase's clients, customers or counterparties
- significant exposure to litigation and regulatory fines, penalties or other sanctions, and
- harm to JPMorgan Chase's reputation.

The extent of a particular cyber attack, the methods and tools used by various actors, and the steps that JPMorgan Chase may need to take to investigate the attack may not be immediately clear, and it may take a significant amount of time before such an investigation can be completed. While such an investigation is ongoing, JPMorgan Chase may not necessarily know the full extent of the harm caused by the cyber attack, and that damage may continue to spread. These factors may inhibit JPMorgan Chase's ability to provide rapid, full and reliable information about the cyber attack to its clients, customers, counterparties and regulators, as well as the public. Furthermore, it may not be clear how best to contain and remediate the harm caused by the cyber attack, and certain errors or actions could be repeated or compounded before they are discovered and remediated. Any or all of these factors could further increase the costs and consequences of a cyber attack.

JPMorgan Chase can be negatively affected if it fails to identify and address operational risks associated with the introduction of or changes to products, services and delivery platforms or the adoption of new technologies.

When JPMorgan Chase launches a new product or service, introduces a new platform for the delivery or distribution of products or services (including mobile connectivity, electronic trading and cloud computing), acquires or invests in a business, makes changes to an existing product, service or delivery platform, or adopts a new technology, it may not fully appreciate or identify new operational risks that may arise from those changes, including increased reliance on third party providers, or may fail to implement adequate controls to mitigate the risks associated with those changes. Any significant failure in this regard could diminish JPMorgan Chase's ability to operate one or more of its businesses or result in:

- potential liability to clients, counterparties and customers
- higher compliance and operational cost
- higher litigation costs, including regulatory fines, penalties and other sanctions
- damage to JPMorgan Chase's reputation
- impairment of JPMorgan Chase's liquidity
- regulatory intervention, or
- weaker competitive standing.

Any of the foregoing consequences could materially and adversely affect JPMorgan Chase's businesses and results of operations.

JPMorgan Chase's business and operations rely on its ability, and the ability of key external parties, to maintain appropriately-staffed workforces, and on the competence, trustworthiness, health and safety of employees.

JPMorgan Chase's ability to operate its businesses efficiently and profitably, to offer products and services that meet the expectations of its clients and customers, and to maintain an effective risk management framework is highly dependent on its ability to staff its operations appropriately and on the competence, trustworthiness, health and safety of its employees. JPMorgan Chase's businesses and operations similarly rely on the workforces of third parties, including employees of vendors, custodians and financial markets infrastructures, and of businesses that it may seek to acquire. JPMorgan Chase's businesses could be materially and adversely affected by:

- the ineffective implementation of business decisions
- any failure to institute controls that appropriately address risks associated with business activities, or to appropriately train employees with respect to those risks and controls
- staffing shortages, particularly in tight labor markets
- the possibility that significant portions of JPMorgan Chase's workforce are unable to work effectively, including because of illness, quarantines, shelter-in-place arrangements, government actions or other restrictions in connection with health emergencies, the spread of infectious diseases, epidemics or pandemics, or due to extraordinary events beyond JPMorgan Chase's control such as natural disasters or an outbreak or escalation of hostilities
- a significant operational breakdown or failure, theft, fraud or other unlawful conduct, or
- other negative outcomes caused by human error or misconduct by an employee of JPMorgan Chase or of another party on which JPMorgan Chase's businesses or operations rely.

JPMorgan Chase's operations could also be impaired if the measures taken by it or by governmental authorities to protect the health and safety of its employees are ineffective, or if any external party on which JPMorgan Chase relies fails to take appropriate and effective actions to protect the health and safety of its employees.

JPMorgan Chase faces substantial legal and operational risks in the processing and safeguarding of personal information.

JPMorgan Chase's businesses and operations are subject to complex and evolving laws, rules and regulations, both within and outside the U.S., governing the privacy and protection of personal information of individuals. Governmental authorities around the world have adopted and are considering the adoption of numerous legislative and regulatory initiatives concerning privacy, data protection and security. Litigation or enforcement actions relating to these laws, rules and regulations could result in fines or orders requiring that JPMorgan Chase change its data-related practices, which could have an adverse effect on JPMorgan Chase's ability to provide products and otherwise harm its business operations.

Implementing processes relating to JPMorgan Chase's collection, use, sharing and storage of personal information to comply with all applicable laws, rules and regulations in all relevant jurisdictions, including where the laws of different jurisdictions are in conflict, can:

- increase JPMorgan Chase's compliance and operating costs

- hinder the development of new products or services, curtail the offering of existing products or services, or affect how products and services are offered to clients and customers

- demand significant oversight by JPMorgan Chase's management, and

- require JPMorgan Chase to structure its businesses, operations and systems in less efficient ways.

Not all of JPMorgan Chase's clients, customers, vendors, counterparties and other external parties may have appropriate controls in place to protect the confidentiality, integrity or availability of the information exchanged between them and JPMorgan Chase, particularly where information is transmitted by electronic means. JPMorgan Chase could be exposed to litigation or regulatory fines, penalties or other sanctions if personal information of clients, customers, employees or others were to be mishandled or misused, such as situations where such information is:

- erroneously provided to parties who are not permitted to have the information, or

- intercepted or otherwise compromised by unauthorized third parties.

Concerns regarding the effectiveness of JPMorgan Chase's measures to safeguard personal information, or the perception that those measures are inadequate, could cause JPMorgan Chase to lose existing or potential clients and customers or employees, and thereby reduce JPMorgan Chase's revenues. Furthermore, any failure or perceived failure by JPMorgan Chase to comply with applicable privacy or data protection laws, rules and regulations, or any failure to appropriately calibrate, manage and monitor access by employees or third parties to personal information, could subject JPMorgan Chase to inquiries, examinations and investigations that could result in requirements to modify or cease certain operations or practices, significant liabilities or regulatory fines, penalties or other sanctions. Any of these could damage JPMorgan Chase's reputation and otherwise adversely affect its businesses.

In recent years, well-publicized incidents involving the inappropriate collection, use, sharing or storage of personal information have led to expanded governmental scrutiny of practices relating to the processing or safeguarding of personal information by companies in the U.S. and other countries. That scrutiny has in some cases resulted in, and could in the future lead to, the adoption of stricter laws, rules and regulations relating to the collection, use, sharing and storage of personal information. These types of laws, rules and regulations can prohibit or significantly restrict financial services firms such as JPMorgan Chase from transferring information across national borders or sharing information among affiliates or with third parties such as vendors, thereby increase compliance costs and operational risk, or restrict JPMorgan Chase's use of personal information when developing or offering products or services to customers. Some countries are considering or have adopted legislation implementing data protection requirements or requiring local storage and processing of data which could increase the cost and complexity of JPMorgan Chase's delivery of products and services. These restrictions could also inhibit JPMorgan Chase's development or marketing of certain products or services, or increase the costs of offering them to customers.

JPMorgan Chase's operations, results and reputation could be harmed by occurrences of extraordinary events beyond its control.

JPMorgan Chase's business and operational systems could be seriously disrupted, and its reputation could be harmed, by events or contributing factors that are wholly or partially beyond its control, including material instances of:

- cyber attacks

- security breaches of its physical premises, including threats to health and safety

- power, telecommunications or internet outages, or shutdowns of mass transit
- failure of, or loss of access to, technology or operational systems, including any resulting loss of critical data
- damage to or loss of property or assets of JPMorgan Chase or third parties, and any consequent injuries, including in connection with any construction projects undertaken by JPMorgan Chase
- effects of climate change
- natural disasters or severe weather conditions
- accidents such as explosions or structural failures
- health emergencies, the spread of infectious diseases, epidemics or pandemics, or
- events arising from local or larger-scale civil or political unrest, any outbreak or escalation of hostilities, or terrorist acts.

JPMorgan Chase maintains a Firmwide resiliency program that is designed to enable it to prepare for, adapt to, withstand and recover from business disruptions that may impact critical business functions and supporting assets, including staff, technology, third party service providers and facilities, in the event of a business disruption, including due to the occurrence of an extraordinary event beyond its control. There can be no assurance that JPMorgan Chase's resiliency plans will fully mitigate all potential business resiliency risks to JPMorgan Chase, its clients, and customers and third parties with which it does business, or that its resiliency plans will be adequate to address the effects of simultaneous occurrences of multiple business disruption events. In addition, JPMorgan Chase's ability to respond effectively to a business disruption event could be hampered to the extent that the members of its workforce, physical assets or systems and other support infrastructure needed to address the event are geographically dispersed, or conversely, if such an event were to occur in an area in which they are concentrated. Further, should extraordinary events or the factors that cause or contribute to those events become more chronic, the disruptive effects of those events on JPMorgan Chase's business and operations, and on its clients, customers, counterparties and employees, could become more significant and long-lasting.

Any significant failure or disruption of JPMorgan Chase's operations or operational systems, or the occurrence of one or more extraordinary events that are beyond its control, could:

- hinder JPMorgan Chase's ability to provide services to its clients and customers or to transact with its counterparties
- require it to expend significant resources to correct the failure or disruption or to address the event
- cause it to incur losses or liabilities, including from loss of revenue, damage to or loss of property, or injuries
- disrupt market infrastructure systems on which JPMorgan Chase's businesses rely
- expose it to litigation or regulatory fines, penalties or other sanctions, and
- harm its reputation.

The occurrence of one or more extraordinary events could also negatively impact the financial condition or creditworthiness of JPMorgan Chase's clients and customers, and could lead to an increase in delinquencies, additions to the allowance for credit losses and higher net charge-offs, which can reduce JPMorgan Chase's earnings.

JPMorgan Chase's acquisition of certain assets and liabilities of First Republic Bank may not result in all of the benefits anticipated.

On May 1, 2023, JPMorgan Chase Bank, N.A. acquired certain assets and assumed certain liabilities of First Republic Bank from the FDIC (the "First Republic acquisition"). Actual results associated with the First Republic acquisition may differ from the anticipated positive results, including with respect to:

- the settlement of the final purchase price
- the total cost of integration
- the time required to complete the integration
- the overall performance of the assets and liabilities acquired in the First Republic acquisition, or
- an improved price for JPMorgan Chase's common stock.

Integration of an acquired business can be complex and costly, and involves the combination of relevant accounting and data processing systems and management controls, as well as managing relevant relationships with employees, clients, suppliers and other business partners. The integration process could result in the disruption of ongoing businesses or inconsistencies in standards, controls, procedures and policies that could adversely affect JPMorgan Chase's ability to maintain relationships with clients and customers. In addition, the loss of key employees in connection with the First Republic acquisition could adversely affect JPMorgan Chase's ability to successfully conduct its business.

JPMorgan Chase could also incur unanticipated costs or losses in connection with the First Republic acquisition, including if JPMorgan Chase fails to comply with the conditions of the shared-loss agreements with the FDIC related to certain loans and lending-related commitments, which could diminish the coverage of the credit losses these agreements are designed to provide.

Enhanced regulatory and other standards for the oversight of vendors and other service providers can result in higher costs and other potential exposures.

JPMorgan Chase must comply with enhanced regulatory and other standards associated with doing business with vendors and other service providers, including standards relating to the outsourcing of functions as well as the performance of significant banking and other functions by subsidiaries. JPMorgan Chase incurs significant costs and expenses in connection with its initiatives to address the risks associated with oversight of its internal and external service providers. JPMorgan Chase's failure to appropriately assess and manage these relationships, especially those involving significant banking functions, shared services or other critical activities, could materially adversely affect JPMorgan Chase. Specifically, any such failure could result in:

- potential harm to clients and customers, and any liability associated with that harm
- regulatory fines, penalties or other sanctions
- lower revenues, and the opportunity cost from lost revenues

- increased operational costs, or
- harm to JPMorgan Chase's reputation.

JPMorgan Chase's risk management framework and control environment may not be effective in identifying and mitigating every risk to JPMorgan Chase.

Any inadequacy or lapse in JPMorgan Chase's risk management framework, governance structure, practices, models or reporting systems, or in its control environment could expose it to unexpected losses, and its financial condition or results of operations could be materially and adversely affected. Any such inadequacy or lapse could:

- hinder the timely escalation of material risk issues to JPMorgan Chase's senior management and Board of Directors
- lead to business decisions that have negative outcomes for JPMorgan Chase
- require significant resources and time to remediate
- lead to non-compliance with laws, rules and regulations
- attract heightened regulatory scrutiny
- expose JPMorgan Chase to litigation, regulatory investigations or regulatory fines, penalties or other sanctions
- lead to potential harm to customers and clients, and any liability associated with that harm
- harm its reputation, or
- otherwise diminish confidence in JPMorgan Chase.

JPMorgan Chase relies on data to assess its various risk exposures. Any deficiencies in the accuracy, timeliness or completeness of data, or the effectiveness of JPMorgan Chase's data gathering, analysis and validation processes could result in ineffective risk management practices. These deficiencies could also result in inaccurate or untimely risk reporting.

Many of JPMorgan Chase's risk management strategies and techniques consider historical market behavior and to some degree are based on management's subjective judgment or assumptions. For example, many models used by JPMorgan Chase are based on assumptions regarding historical correlations among prices of various asset classes or other market indicators. In times of market stress, including difficult or less liquid market environments, or in the event of other unforeseen circumstances, previously uncorrelated indicators may become correlated. Conversely, previously-correlated indicators may become uncorrelated at those times. Sudden market movements and unanticipated market or economic movements could, in some circumstances, limit the effectiveness of JPMorgan Chase's risk management strategies, causing it to incur losses.

JPMorgan Chase could recognize unexpected losses, its capital levels could be reduced and it could face greater regulatory scrutiny if its models, estimations or judgments, including those used in its financial statements, are inadequate or incorrect.

JPMorgan Chase has developed and uses a variety of models and other analytical and judgment-based estimations to measure, monitor and implement controls over its market, credit, capital, liquidity, operational and other risks. JPMorgan Chase also uses internal models and estimations as a basis for its stress testing and in connection with the preparation of its financial statements under U.S. generally accepted accounting principles ("U.S. GAAP").

These models and estimations are based on a variety of assumptions and historical trends, and are periodically reviewed and modified as necessary. The models and estimations that JPMorgan Chase uses, including those that use machine learning, artificial intelligence or quantum computing, may not be effective in all cases to identify, observe and mitigate risk due to a variety of factors, such as:

- reliance on historical trends that may not persist in the future, including assumptions underlying the models and estimations such as correlations among certain market indicators or asset prices
- inherent limitations associated with forecasting uncertain economic and financial outcomes
- historical trend information may be incomplete, or may not be indicative of severely negative market conditions such as extreme volatility, dislocation or lack of liquidity
- sudden illiquidity in markets or declines in prices of certain loans and securities may make it more difficult to value certain financial instruments
- technology that is introduced to run models or estimations may not perform as expected, or may not be well understood by the personnel using the technology
- models and estimations may contain erroneous data, valuations, formulas or algorithms, and
- review processes may fail to detect flaws in models and estimations.

JPMorgan Chase may experience unexpected losses if models, estimates or judgments used or applied in connection with its risk management activities or the preparation of its financial statements are inadequate or incorrect. For example, where quoted market prices are not available for certain financial instruments that require a determination of their fair value, JPMorgan Chase may make fair value determinations based on internally developed models or other means which ultimately rely to some degree on management estimates and judgment. In addition, JPMorgan Chase may experience increased uncertainty in its estimates if assets acquired differ from those used to develop those models, which may lead to unexpected losses.

Similarly, JPMorgan Chase establishes an allowance for expected credit losses related to its credit exposures which requires significant judgments, including forecasts of how macroeconomic conditions might impair the ability of JPMorgan Chase's clients and customers to repay their loans or other obligations. These types of estimates and judgments may not prove to be accurate due to a variety of factors including when the current and forecasted environments are significantly different from the historical environments upon which the models were developed. The increased uncertainty may necessitate a greater degree of judgment and analytics to inform any adjustments that JPMorgan Chase may make to model outputs than would otherwise be the case.

Some of the models and other analytical and judgment-based estimations used by JPMorgan Chase in managing risks are subject to review by, and require the approval of, JPMorgan Chase's regulators. These reviews are required before JPMorgan Chase may use those models and estimations for calculating market risk RWA, credit risk RWA and operational risk RWA under Basel III. If JPMorgan Chase's models or estimations are not approved by its regulators, it may be subject to higher capital charges, which could adversely affect its financial results or limit the ability to expand its businesses.

Lapses in controls over disclosure or financial reporting could materially affect JPMorgan Chase's profitability or reputation.

JPMorgan Chase's businesses and operations are subject to complex and evolving laws, rules and regulations, both within and outside the U.S., requiring continuous enhancements to various disclosures in its financial statements and regulatory reports.

There can be no assurance that JPMorgan Chase's disclosure controls and procedures will be effective in every circumstance, or that a material weakness or significant deficiency in internal control over financial reporting will not occur. Any such lapses or deficiencies could result in inaccurate financial reporting which, in turn, could:

- materially and adversely affect JPMorgan Chase's business and results of operations or financial condition
- restrict its ability to access the capital markets
- require it to expend significant resources to correct the lapses or deficiencies
- expose it to litigation or regulatory fines, penalties or other sanctions
- harm its reputation, or
- otherwise diminish investor confidence in JPMorgan Chase.

Strategic

If JPMorgan Chase's management fails to develop and execute effective business strategies, and to anticipate changes affecting those strategies, JPMorgan Chase's competitive standing and results could suffer.

JPMorgan Chase's business strategies significantly affect its competitive standing and operations. These strategies relate to:

- the products and services that JPMorgan Chase offers
- the geographies in which it operates
- the types of clients and customers that it serves
- the businesses that it acquires or in which it invests
- the counterparties with which it does business, and
- the methods, distribution channels and third party service providers by or through which it offers products and services.

If management makes choices about these strategies and goals that prove to be incorrect, are based on incomplete, inaccurate or fraudulent information, do not accurately assess the competitive landscape and industry trends, or fail to address changing regulatory and market environments or the expectations of clients, customers, investors, employees and other stakeholders, then the franchise values and growth prospects of JPMorgan Chase's businesses may suffer and its earnings could decline.

JPMorgan Chase's growth prospects also depend on management's ability to develop and execute effective business plans to address these strategic priorities, both in the near term and over longer time horizons. Management's effectiveness in this regard will affect JPMorgan Chase's ability to develop and enhance its resources, control expenses and return capital to shareholders. Each of these objectives could be adversely affected by any failure on the part of management to:

- devise effective business plans and strategies
- offer products and services that meet changing expectations of clients and customers
- allocate capital in a manner that promotes long-term stability to enable JPMorgan Chase to build and invest in market-leading businesses, even in a highly stressed environment
- allocate capital appropriately due to imprecise modeling or subjective judgments made in connection with those allocations
- appropriately assess and monitor principal investments made to enhance or accelerate JPMorgan Chase's business strategies
- conduct appropriate due diligence on prospective business acquisitions or investments, or effectively integrate newly-acquired businesses
- appropriately address concerns of clients, customers, investors, employees and other stakeholders, including with respect to climate and other ESG matters
- react quickly to changes in market conditions or market structures, or
- develop and enhance the operational, technology, risk, financial and managerial resources necessary to grow and manage JPMorgan Chase's businesses.

Furthermore, JPMorgan Chase may incur costs in connection with disposing of excess properties, premises and facilities, and those costs could be material to its results of operations.

JPMorgan Chase faces significant and increasing competition in the rapidly evolving financial services industry.

JPMorgan Chase operates in a highly competitive environment in which it must evolve and adapt to changes in financial regulation, technological advances, increased public scrutiny and changes in economic conditions. JPMorgan Chase expects that competition in the U.S. and global financial services industry will continue to be intense. Competitors include:

- other banks and financial institutions
- trading, advisory and investment management firms
- finance companies
- technology companies, and

- other non-bank firms that are engaged in providing similar as well as new products and services.

JPMorgan Chase cannot provide assurance that the significant competition in the financial services industry will not materially and adversely affect its future results of operations. For example, aggressive or less disciplined lending practices by nonbank competitors could lead to a loss of market share for traditional banks, and in an economic downturn could result in instability in the financial services industry and adversely impact other market participants, including JPMorgan Chase.

New competitors in the financial services industry continue to emerge. For example, technological advances and the growth of e-commerce have made it possible for non-depository institutions to offer products and services that traditionally were banking products. These advances have also allowed financial institutions and other companies to provide electronic and internet-based financial solutions, including electronic securities and cryptocurrency trading, lending and other extensions of credit to consumers, payments processing and online automated algorithmic-based investment advice. Furthermore, both financial institutions and their non-banking competitors face the risk that payments processing and other products and services, including deposits and other traditional banking products, could be significantly disrupted by the use of new technologies, such as cryptocurrencies and other applications using secure distributed ledgers, that may not require intermediation. New technologies have required and could require JPMorgan Chase to spend more to modify or adapt its products to attract and retain clients and customers or to match products and services offered by its competitors, including technology companies. In addition, new technologies may be used by customers, or breached or infiltrated by third parties, in unexpected ways, which can increase JPMorgan Chase's costs for complying with laws, rules and regulations that apply to the offering of products and services through those technologies and reduce the income that JPMorgan Chase earns from providing products and services through those technologies.

Ongoing or increased competition may put pressure on the pricing for JPMorgan Chase's products and services or may cause JPMorgan Chase to lose market share, particularly with respect to traditional banking products. This competition may be based on quality and variety of products and services offered, transaction execution, innovation, reputation and price. The failure of any of JPMorgan Chase's businesses to meet the expectations of clients and customers, whether due to general market conditions, under-performance, a decision not to offer a particular product or service, changes in client and customer expectations or other factors, could affect JPMorgan Chase's ability to attract or retain clients and customers. Any such impact could, in turn, reduce JPMorgan Chase's revenues. Increased competition also may require JPMorgan Chase to make additional capital investments in its businesses, or to extend more of its capital on behalf of its clients to remain competitive.

The effects of climate change could adversely affect JPMorgan Chase's business and operations, both directly and as a result of impacts on its clients and customers.

JPMorgan Chase operates in many regions, countries and communities around the world where its business, and the activities of its clients and customers, could be adversely affected by climate change. Climate change could manifest as a financial risk to JPMorgan Chase either through changes in the physical climate or from the process of transitioning to a low-carbon economy. Both physical risks and transition risks associated with climate change could have negative impacts on the financial condition or creditworthiness of JPMorgan's clients and customers, and on its exposure to those clients and customers.

Physical risks include the increased frequency or severity of acute weather events, such as floods, wildfires and tropical cyclones, and chronic shifts in the climate, such as persistent changes in precipitation levels, rising sea levels, or increases in average ambient temperature. Potential adverse impacts of climate-related physical risks include:

- declines in asset values, including due to the destruction or degradation of property
- reduced availability or increased cost of insurance for clients of JPMorgan Chase
- interruptions to business operations, including supply chain disruption, and
- population migration or unemployment in affected regions.

Transition risks arise from societal adjustment to a low-carbon economy, such as changes in public policy, adoption of new technologies or changes in consumer preferences towards low-carbon goods and services. These risks could also be influenced by changes in the physical climate. Potential adverse impacts of transition risks include:

- sudden devaluation of assets, including unanticipated write-downs ("stranded assets")
- increased operational and compliance costs driven by changes in climate policy
- increased energy costs driven by governmental actions and initiatives such as emission pricing and accelerated decarbonization policies
- negative consequences to business models, and the need to make changes in response to those consequences, and
- damage to JPMorgan Chase's reputation, including due to any perception that its business practices are contrary to public policy or the preferences of different stakeholders.

Climate risks can also arise from inconsistencies and conflicts in the manner in which climate policy and financial regulations are implemented in the many regions where JPMorgan Chase operates, including initiatives to apply and enforce policy and regulation with extraterritorial effect. Additionally, internal models and estimations used in climate risk assessments have an increased level of uncertainty due to limited historical trend information and the absence of standardized, reliable and comprehensive greenhouse gas emissions data, which could lead to inaccurate disclosures or financial reporting.

Conduct

Conduct failure by JPMorgan Chase employees can harm clients and customers, impact market integrity, damage JPMorgan Chase's reputation and trigger litigation and regulatory action.

JPMorgan Chase's employees interact with clients, customers, counterparties and other market and industry participants, and with each other, every day. All employees are expected to demonstrate values and exhibit the behaviors that are an integral part of JPMorgan Chase's Code of Conduct and Business Principles, including JPMorgan Chase's commitment to "do first class business in a first class way." JPMorgan Chase endeavors to embed conduct risk management throughout an employee's life cycle, including recruiting, onboarding, training and development, and performance management. Conduct risk management is also an integral component of JPMorgan Chase's promotion and compensation processes.

Notwithstanding these expectations, policies and practices, certain employees have engaged in improper or illegal conduct in the past. These instances of misconduct have resulted in litigation, and resolutions of governmental investigations or enforcement actions involving consent orders, deferred prosecution agreements, non-prosecution agreements and other civil or criminal sanctions. There is no assurance that further inappropriate or unlawful actions by employees have not occurred or will not occur, lead to a violation of the terms of these resolutions (and associated consequences), or that any such actions will always be detected, deterred or prevented.

JPMorgan Chase's reputation could be harmed, and collateral consequences could result, from a failure by one or more employees to conduct themselves in accordance with JPMorgan Chase's expectations, policies and practices, including by acting in ways that harm clients, customers, other market participants, employees or others. Some examples of this include:

- improperly selling and marketing JPMorgan Chase's products or services
- engaging in insider trading, market manipulation or unauthorized trading
- engaging in improper or fraudulent behavior in connection with government relief programs
- facilitating a transaction where a material objective is to achieve a particular tax, accounting or financial disclosure treatment that may be subject to scrutiny by governmental or regulatory authorities, or where the proposed treatment is unclear or may not reflect the economic substance of the transaction
- failing to fulfill fiduciary obligations or other duties owed to clients or customers
- violating antitrust or anti-competition laws by colluding with other market participants
- using electronic communications channels that have not been approved by JPMorgan Chase
- engaging in discriminatory behavior or harassment with respect to clients, customers or employees, or acting contrary to JPMorgan Chase's goal of fostering a diverse and inclusive workplace
- managing or reporting risks in ways that subordinate JPMorgan Chase's risk appetite to business performance goals or employee compensation objectives, and
- misappropriating property, confidential or proprietary information, or technology assets belonging to JPMorgan Chase, its clients and customers or third parties.

The consequences of any failure by one or more employees to conduct themselves in accordance with JPMorgan Chase's expectations, policies or practices could include litigation, or regulatory or other governmental investigations or enforcement actions. Any of these proceedings or actions could result in judgments, settlements, fines, penalties or other sanctions, or lead to:

- financial losses
- increased operational and compliance costs
- greater scrutiny by regulators and other parties
- regulatory actions that require JPMorgan Chase to restructure, curtail or cease certain of its activities
- the need for significant oversight by JPMorgan Chase's management
- loss of clients or customers, and
- harm to JPMorgan Chase's reputation.

The foregoing risks could be heightened with respect to newly-acquired businesses if JPMorgan Chase fails to successfully integrate employees of those businesses or any of those employees do not conduct themselves in accordance with JPMorgan Chase's expectations, policies and practices.

Reputation

Damage to JPMorgan Chase's reputation could harm its businesses.

Maintaining trust in JPMorgan Chase is critical to its ability to attract and retain clients, customers, investors and employees. Damage to JPMorgan Chase's reputation can therefore cause significant harm to JPMorgan Chase's business and prospects, and can arise from numerous sources, including:

- employee misconduct, including discriminatory behavior or harassment with respect to clients, customers or employees, or actions that are contrary to JPMorgan Chase's goal of fostering a diverse and inclusive workplace
- security breaches, including as a result of cyber attacks
- failure to safeguard client, customer or employee information
- failure to manage risks associated with its client relationships, or with transactions or business activities in which JPMorgan Chase or its clients engage, including transactions or activities that may be unpopular among one or more constituencies
- failure to meet publicly-announced commitments to support ESG initiatives
- non-compliance with laws, rules, and regulations
- operational failures
- litigation or regulatory fines, penalties or other sanctions
- actions taken in executing regulatory and governmental requirements during a global or regional health emergency, spread of infectious disease, epidemic or pandemic
- regulatory investigations or enforcement actions, or resolutions of these matters, and
- failure or perceived failure to comply with laws, rules or regulations by JPMorgan Chase or its clients, customers, counterparties or other parties, including newly-acquired businesses, companies in which JPMorgan Chase has made principal investments, parties to joint ventures with JPMorgan Chase, and vendors with which JPMorgan Chase does business.

JPMorgan Chase's reputation may be significantly damaged by adverse publicity or negative information regarding JPMorgan Chase, whether or not true, that may be published or broadcast by the media or posted on social media, non-mainstream news services or other parts of the internet, or that may be disseminated through disinformation campaigns targeted at JPMorgan Chase. This latter risk can be magnified by the speed and pervasiveness with which information is disseminated through those channels.

Social and environmental activists have been increasingly targeting JPMorgan Chase and other financial services firms with public criticism concerning their business practices, including business relationships with clients that are engaged in certain sensitive industries, such as companies:

- whose products are or are perceived to be harmful to human health, or
- whose activities negatively affect or are perceived to negatively affect the environment, workers' rights or communities.

Activists have also taken actions intended to change or influence JPMorgan Chase's business practices with respect to ESG matters, including public protests at JPMorgan Chase's headquarters and other properties, and submitting specific ESG-related proposals for a vote by JPMorgan Chase's shareholders.

In addition, JPMorgan Chase and other companies have been and continue to be criticized by activists, politicians and other members of the public concerning positions taken with respect to matters of public policy. These criticisms can be more widespread during election years in various jurisdictions, and could have the effect of focusing attention on a company such as JPMorgan Chase as part of a wider public debate on public policy matters.

These and other types of criticism and actions directed at JPMorgan Chase could potentially engender dissatisfaction among clients, customers, investors, employees, government officials and other stakeholders. In all of these cases, JPMorgan Chase's reputation and its business and results of operations could be harmed by:

- greater scrutiny from governmental or regulatory bodies, or further criticism from politicians and other members of the public
- unfavorable coverage or commentary in the media, including through social media campaigns
- certain clients and customers ceasing doing business with JPMorgan Chase, and encouraging others to do so
- impairment of JPMorgan Chase's ability to attract new clients and customers, to expand its relationships with existing clients and customers, or to hire or retain employees, or
- certain investors opting to divest from investments in securities of JPMorgan Chase.

Actions by the financial services industry generally or individuals in the industry can also affect JPMorgan Chase's reputation. For example, the reputation of the industry as a whole can be damaged by concerns that:

- consumers have been treated unfairly by a financial institution, or
- a financial institution has acted inappropriately with respect to the methods used to offer products to customers.

If JPMorgan Chase is perceived to have engaged in these types of behaviors, this could weaken its reputation among clients or customers, employees or other stakeholders.

Failure to effectively manage potential conflicts of interest or to satisfy fiduciary obligations can result in litigation and enforcement actions, as well as damage JPMorgan Chase's reputation.

JPMorgan Chase's ability to manage potential conflicts of interest is highly complex due to the broad range of its business activities which encompass a variety of transactions, obligations and interests with and among JPMorgan Chase's clients and customers. JPMorgan Chase can become subject to litigation, enforcement actions, and heightened regulatory scrutiny, and its reputation can be damaged, by the failure or perceived failure to:

- adequately address or appropriately disclose conflicts of interest, including potential conflicts of interest that may arise in connection with providing multiple products and services in, or having one or more investments related to, the same transaction

- identify and address any conflict of interest that a third party with which it is does business may have with respect to a transaction involving JPMorgan Chase

- deliver appropriate standards of service and quality

- treat clients and customers fairly and with the appropriate standard of care

- use client and customer data responsibly and in a manner that meets legal requirements and regulatory expectations

- provide fiduciary products or services in accordance with the applicable legal and regulatory standards, or

- handle or use confidential information of customers or clients appropriately and in compliance with applicable data protection and privacy laws, rules and regulations.

A failure or perceived failure to appropriately address conflicts of interest or fiduciary obligations could result in customer dissatisfaction, litigation and regulatory fines, penalties or other sanctions, and heightened regulatory scrutiny and enforcement actions, all of which can lead to lost revenue and higher operating costs and cause serious harm to JPMorgan Chase's reputation.

Country

An outbreak or escalation of hostilities between countries or within a country or region could have a material adverse effect on the global economy and on JPMorgan Chase's businesses within the affected region or globally.

Aggressive actions by hostile governments or groups, including armed conflict or intensified cyber attacks, could expand in unpredictable ways by drawing in other countries or escalating into full-scale war with potentially catastrophic consequences, particularly if one or more of the combatants possess nuclear weapons. Depending on the scope of the conflict, the hostilities could result in:

- worldwide economic disruption

- heightened volatility in financial markets

- severe declines in asset values, accompanied by widespread sell-offs of investments

- sudden increases in prices in the energy and commodity markets or for certain safe haven currencies

- substantial depreciation of local currencies, potentially leading to defaults by borrowers and counterparties in the affected region

- disruption of global trade, and

- diminished consumer, business and investor confidence.

Any of the above consequences could have significant negative effects on JPMorgan Chase's operations and earnings, both in the countries or regions directly affected by the hostilities or globally. Further, if the U.S. were to become directly involved in such a conflict, this could lead to a curtailment of any operations that JPMorgan Chase may have in the affected countries or region, as well as in any nation that is aligned against the U.S. in the hostilities. JPMorgan Chase could also experience more numerous and aggressive cyber attacks launched by or under the sponsorship of one or more of the adversaries in such a conflict.

JPMorgan Chase's business and operations in certain countries can be adversely affected by local economic, political, regulatory and social factors.

Some of the countries in which JPMorgan Chase conducts business have economies or markets that are less developed and more volatile or may have political, legal and regulatory regimes that are less established or predictable than other countries in which JPMorgan Chase operates. In addition, in some jurisdictions in which JPMorgan Chase conducts business, the local economy and business activities are subject to substantial government influence or control. Some of these countries have in the past experienced economic disruptions, including:

- extreme currency fluctuations
- high inflation
- low or negative growth
- defaults or reduced ability to service sovereign debt and
- increased fraud or other misrepresentation of value.

The governments in these countries have sometimes reacted to these developments by imposing restrictive policies that adversely affect the local and regional business environment, such as:

- price, capital or exchange controls, including imposition of punitive transfer and convertibility restrictions or forced currency exchange
- expropriation or nationalization of assets or confiscation of property, including intellectual property, and
- changes in laws, rules and regulations.

The impact of these actions could be accentuated in trading markets that are smaller, less liquid and more volatile than more-developed markets. These types of government actions can negatively affect JPMorgan Chase's operations in the relevant country, either directly or by suppressing the business activities of local clients or multi-national clients that conduct business in the jurisdiction.

In addition, emerging markets countries, as well as more developed countries, have been susceptible to unfavorable social developments arising from poor economic conditions or governmental actions, including:

- widespread demonstrations, civil unrest or general strikes
- crime and corruption
- security and personal safety issues
- an outbreak or escalation of hostilities, or other geopolitical instabilities
- overthrow of incumbent governments
- terrorist attacks, and
- other forms of internal discord.

These economic, political, regulatory and social developments have in the past resulted in, and in the future could lead to, conditions that can adversely affect JPMorgan Chase's operations in those countries and impair the revenues, growth and profitability of those operations. In addition, any of these events or circumstances in one country can affect JPMorgan Chase's operations and investments in another country or countries, including in the U.S.

People

JPMorgan Chase's ability to attract and retain qualified and diverse employees is critical to its success.

JPMorgan Chase's employees are its most important resource, and in many areas of the financial services industry, competition for qualified personnel is intense. JPMorgan Chase endeavors to attract talented and diverse new employees and retain, develop and motivate its existing employees. JPMorgan Chase's efforts to hire and retain talented and diverse employees could be hindered by factors such as:

- the emerging need for more-skilled workers in an evolving labor and workplace environment, including due to changes in technology, and

- targeted recruitment of JPMorgan Chase employees by competitors.

If JPMorgan Chase were unable to continue to attract or retain qualified and diverse employees, including successors to the Chief Executive Officer, members of the Operating Committee and other senior leaders, JPMorgan Chase's performance, including its competitive position, could be materially and adversely affected.

JPMorgan Chase's use of hybrid work models could result in deterioration in employee performance or degradation of JPMorgan Chase's control environment which may have a material and adverse effect on its business and operations. Alternatively, discontinuing hybrid work models could harm JPMorgan Chase's ability to attract and retain employees.

Unfavorable changes in immigration or travel policies could adversely affect JPMorgan Chase's businesses and operations.

JPMorgan Chase relies on the skills, knowledge and expertise of employees located throughout the world. Changes in immigration or travel policies in the U.S. and other countries that unduly restrict or otherwise make it more difficult for employees or their family members to work in, or travel to or transfer between, jurisdictions in which JPMorgan Chase has operations or conducts its business could inhibit JPMorgan Chase's ability to attract and retain qualified employees, and thereby dilute the quality of its workforce, or could prompt JPMorgan Chase to make structural changes to its worldwide or regional operating models that cause its operations to be less efficient or more costly.

Legal

JPMorgan Chase faces significant legal risks from litigation and formal and informal regulatory and government investigations.

JPMorgan Chase is named as a defendant or is otherwise involved in many legal proceedings, including class actions, derivative actions and other litigation or disputes with third parties, as well as criminal proceedings. Actions currently pending against JPMorgan Chase may result in judgments, settlements, fines, penalties or other sanctions adverse to JPMorgan Chase. Any of these matters could materially and adversely affect JPMorgan Chase's business, financial condition or results of operations, or cause serious reputational harm. As a participant in the financial services industry, it is likely that JPMorgan Chase will continue to experience a high level of litigation and regulatory and government investigations related to its businesses and operations.

Regulators and other government agencies conduct examinations of JPMorgan Chase and its subsidiaries both on a routine basis and in targeted exams, and JPMorgan Chase's businesses and operations are subject to heightened regulatory oversight. This heightened regulatory scrutiny, or the results of such an investigation or examination, may lead to additional regulatory investigations or enforcement actions. There is no assurance that those actions will not result in resolutions or other enforcement actions against JPMorgan Chase. Furthermore, a single event involving a potential violation of law or regulation may give rise to numerous and overlapping investigations and proceedings, either by multiple federal, state or local agencies and officials in the U.S. or, in some instances, regulators and other governmental officials in non-U.S. jurisdictions.

If another financial institution violates a law or regulation relating to a particular business activity or practice, this will often give rise to an investigation by regulators and other governmental agencies of the same or similar activity or practice by JPMorgan Chase.

These and other initiatives by U.S. and non-U.S. governmental authorities may subject JPMorgan Chase to judgments, settlements, fines, penalties or other sanctions, and may require JPMorgan Chase to restructure its operations and activities or to cease offering certain products or services. All of these potential outcomes could harm JPMorgan Chase's reputation or lead to higher operational costs, thereby reducing JPMorgan Chase's profitability, or result in collateral consequences. In addition, the extent of JPMorgan Chase's exposure to legal and regulatory matters can be unpredictable and could, in some cases, exceed the amount of reserves that JPMorgan Chase has established for those matters.

JPMorgan Chase Bank, N.A. is affected by the risks that affect its parent company.

JPMorgan Chase Bank, N.A. and its subsidiaries are also subject to each of the risks above, in addition to further risks. Risks that affect JPMorgan Chase can also affect JPMorgan Chase Bank, N.A. as there is substantial overlap in the businesses of JPMorgan Chase Bank, N.A. and JPMorgan Chase. Further, JPMorgan Chase Bank, N.A. can be negatively affected by risks and other events affecting JPMorgan Chase even where JPMorgan Chase Bank, N.A. is not directly affected. For example, where JPMorgan Chase's reputation is damaged, JPMorgan Chase Bank, N.A.'s reputation would likely also be damaged which could negatively affect JPMorgan Chase Bank, N.A.

TAXATION

We have based this summary of Hong Kong, The Netherlands and United States tax on current law and practice. It is intended to give potential investors an overview of what Hong Kong, The Netherlands and United States tax they might have to pay if they hold our structured products. It is not complete and we are not giving any tax advice. Any potential investors should consult their own tax adviser for more information about the tax consequences of acquiring, owning and disposing of the structured products in their particular circumstances, particularly if they are subject to special tax rules (for example, if they are a bank, dealer, insurance company or a tax-exempt entity). This summary assumes that each transaction with respect to the structured products is at arm's length.

HONG KONG

Withholding Tax

We are not required under current law to make any withholding on account of Hong Kong tax from payments in respect of our structured products.

Capital Gains Tax

No tax is payable in Hong Kong on any capital gains arising from a sale or disposal of our structured products.

Profits Tax

Hong Kong profits tax may be chargeable on any gains arising from a sale or disposal of our structured products where the sale or disposal is or forms part of a trade, profession or business carried on in Hong Kong.

Stamp Duty

Our cash-settled structured products are not subject to Hong Kong stamp duty either when issued or on any subsequent transfer.

THE NETHERLANDS TAXATION

The following discussion is a summary of certain material Dutch tax considerations relating to structured products issued by J.P. Morgan Structured Products B.V. ("**JPMSP**") held by a holder of structured products (a "**Holder**") who is not a resident of The Netherlands, including where those structured products are held through a paying agent or custodian located in The Netherlands.

This summary is based on the laws and practice in force as of the date of this base listing document and is subject to any changes in law and the interpretation and application thereof, which changes could be made with retroactive effect. This summary does not purport to be a comprehensive description of all the tax considerations that may be relevant to a decision to acquire, hold or dispose of a structured product, and does not purport to deal with the tax consequences applicable to all categories of investors, some of which may be subject to special rules.

This summary does not address the Dutch tax consequences for a Holder who is an affiliated (*gelieerde*) entity of JPMSP within the meaning of the Withholding Tax Act 2021 (*Wet bronbelasting 2021*). Generally, a Holder is regarded as 'affiliated' for these purposes if such Holder, whether alone or together with related parties or as part of a collaborating group (*samenwerkende groep*), can exercise decisive influence over JPMSP's activities (or if JPMSP can, either alone or together with related parties or as part of a collaborating group, exercise such influence over the activities of such Holder, or if there is a third party, either alone or together with related parties or as part of a collaborating group, that can exercise such control over both JPMSP and such Holder).

For the purpose of the paragraph "Taxes on Income and Capital Gains" below it is assumed that no Holder, being an individual or an entity, has or will have a substantial interest *(aanmerkelijk belang)*, or – in the case of a Holder being an entity – a deemed substantial interest, in JPMSP and that no connected person (*verbonden persoon*) to the Holder has or will have a substantial interest in JPMSP.

With respect to structured products for which it is specified that physical delivery of shares of a company is applicable, it is furthermore assumed that where such company is a Dutch resident company no Holder has or will have a substantial interest *(aanmerkelijk belang)* or a deemed substantial interest in such company and that no connected person *(verbonden persoon)* to such Holder being an individual has or will have a substantial interest in such company.

Generally speaking, an individual has a substantial interest (*aanmerkelijk belang*) in a company if (a) such individual, either alone or together with his partner, directly or indirectly has, or is deemed to have or (b) certain relatives of such individual or his partner directly or indirectly have or are deemed to have (i) the ownership of, a right to acquire the ownership of, or certain rights over, shares representing 5 per cent. or more of either the total issued and outstanding capital of the company or the issued and outstanding capital of any class of shares of the company, or (ii) the ownership of, or certain rights over, profit participating certificates (*winstbewijzen*) that relate to 5 per cent. or more of either the annual profit or the liquidation proceeds of the company.

Generally speaking, an entity has a substantial interest (*aanmerkelijk belang*) in a company if such entity, directly or indirectly has (i) the ownership of, a right to acquire the ownership of, or certain rights over, shares representing 5 per cent. or more of either the total issued and outstanding capital of the company or the issued and outstanding capital of any class of shares of the company, or (ii) the ownership of, or certain rights over, profit participating certificates (*winstbewijzen*) that relate to 5 per cent. or more of either the annual profit or the liquidation proceeds of the company. An entity has a deemed substantial interest in a company if such entity has disposed of or is deemed to have disposed of all or part of a substantial interest on a non-recognition basis.

For the purpose of this summary, the term "entity" means a corporation as well as any other person that is taxable as a corporation for Dutch corporate tax purposes.

Where this summary refers to a Holder of a structured product, an individual holding a structured product or an entity holding a structured product, such reference is restricted to an individual or entity holding legal title to as well as an economic interest in such structured product or otherwise being regarded as owning a structured product for Dutch tax purposes. It is noted that for purposes of Dutch income, corporate, gift and inheritance tax, assets legally owned by a third party such as a trustee, foundation or similar entity, may be treated as assets owned by the (deemed) settlor, grantor or similar originator or the beneficiaries in proportion to their interest in such arrangement.

Where the summary refers to "The Netherlands" or "Dutch", it refers only to the European part of the Kingdom of the Netherlands.

This summary does not address the tax consequences of any Holder of structured products who is a resident of any non-European part of the Kingdom of the Netherlands.

Withholding Tax

All payments made by JPMSP under the structured products can be made free of withholding or deduction of any taxes of whatsoever nature imposed, levied, withheld or assessed by The Netherlands or any political subdivision or taxing authority thereof or therein, unless the structured products qualify as debt that effectively functions as equity for purposes of article 10, paragraph 1, sub-paragraph (d) of the Corporate Tax Act (*Wet op de vennootschapsbelasting 1969*) or represent, are linked (to the performance of) or are convertible (in part or in whole) into (rights to purchase) (a) shares; (b) profit certificates (*winstbewijzen*); and/or (c) debt instruments having a maturity legally or de facto of more than 50 years, in each case issued by JPMSP or any other entity related to JPMSP. According to Supreme Court case law, the structured products effectively function as equity if (a) the structured products are subordinated to all other non-subordinated creditors of JPMSP, (b) the structured products do not have a fixed maturity or have a maturity of more than 50 years, and (c) payments under the structured products are entirely or almost entirely dependent on JPMSP's profits.

Taxes on Income and Capital Gains

A Holder who is not, and is not deemed to be resident in The Netherlands for the relevant tax purposes will not be subject to taxation on income or a capital gain derived from a structured product unless:

(i) the income or capital gain is attributable to an enterprise or part thereof which is either effectively managed in The Netherlands or carried on, in whole or in part, through a permanent establishment (*vaste inrichting*) or a permanent representative (*vaste vertegenwoordiger*) in The Netherlands; or

(ii) the Holder is an individual and the income or capital gain qualifies as income from miscellaneous activities (*belastbaar resultaat uit overige werkzaamheden*) in The Netherlands as defined in the Income Tax Act 2001 (*Wet inkomstenbelasting 2001*), including, without limitation, activities that exceed normal, active asset management (*normaal, actief vermogensbeheer*).

Stamp/Transfer Taxes

The subscription, issue, placement, allotment, delivery or transfer of a structured product will not be subject to stamp tax, transfer tax or any other similar tax or duty payable in The Netherlands.

Gift and Inheritance Taxes

Dutch gift or inheritance taxes will not be levied on the occasion of the transfer of a structured product by way of gift by, or on the death of, a Holder, unless:

(i) the Holder is, or is deemed to be, resident in The Netherlands for the purpose of the relevant provisions; or

(ii) in the case of a gift of structured products by an individual who at the date of the gift was neither resident nor deemed to be resident in The Netherlands, such individual dies within 180 days after the date of the gift, while being resident or deemed to be resident in The Netherlands.

For purposes of Dutch gift and inheritance tax, an individual with Dutch nationality will be deemed to be resident in The Netherlands if he has been resident in The Netherlands at any time during the ten years preceding the date of the gift or his death.

For purposes of Dutch gift tax, an individual not holding Dutch nationality will be deemed to be resident in The Netherlands if he has been resident in The Netherlands at any time during the twelve months preceding the date of the gift.

For purposes of Dutch gift and inheritance tax, a gift that is made under a condition precedent is deemed to have been made at the moment such condition precedent is satisfied. If the condition precedent is fulfilled after the death of the donor, the gift is deemed to be made upon the death of the donor.

Exchange of information

On 9 December 2014, the Council of the European Union adopted a Directive (EC Council Directive 2014/107/EU amending EU Council Directive 2011/16/EU) on the mandatory automatic exchange of information to implement the OECD measures known as the "**Common Reporting Standard**". Member States were required to implement this Directive in respect of taxable periods from 1 January 2016 and to begin exchanging information pursuant to such Directive no later than 30 September 2017.

In accordance with the Common Reporting Standard, The Netherlands will provide to the tax authorities of another EU Member State (and certain non-EU countries and associated territories specified in said directive) details of payments of interest or other similar income paid by a person within The Netherlands to, or collected by such a person for, an individual resident in such other state.

UNITED STATES OF AMERICA

Section 871(m)

Under Section 871(m) of the Internal Revenue Code, enacted under the United States Hiring Incentives to Restore Employment Act of 2010, a "**dividend equivalent**" payment generally is treated as a dividend from sources within the United States and such dividend equivalent payments (including deemed payments) generally would be subject to a 30 per cent. United States withholding tax if paid to a Non-U.S. Holder (as defined below). Under the U.S. Treasury regulations and related official guidance issued pursuant to Section 871(m) of the Internal Revenue Code, payments (including deemed payments) with respect to certain financial instruments linked to U.S. equities or indices that include U.S. equities may be treated as dividend equivalents. Section 871(m) provides certain exceptions to this withholding regime, including for instruments linked to certain broad-based indices that meet requirements set forth in the applicable U.S. Treasury regulations. Additionally, the applicable regulations and guidance exclude from the scope of Section 871(m) instruments issued before 1 January 2025 that do not have a delta of one with respect to underlying securities that could pay U.S.-source dividends for U.S. federal income tax purposes (each an "**Underlying Security**"). However, it is possible that the structured products could be treated as deemed reissued for U.S. federal income tax purposes upon the occurrence of certain events affecting the Underlying Security or the structured products, and following such occurrence, the structured products could then be subject to withholding on dividend equivalent payments. The regulations provide that the delta of an instrument is the ratio of the change in fair market value of the instrument to the change in the fair market value of the property referenced by the instrument. The regulations and guidance are extremely complex, and significant aspects of their application to the structured products are uncertain. In addition, their application may depend on your particular circumstances, including whether you enter into other transactions with respect to an Underlying Security. Holders are urged to consult with their own tax advisors regarding the possible implications of these regulations and guidance on their investment in the structured products.

If any payments are treated as dividend equivalents subject to withholding, we (or any applicable withholding agent) would be entitled to withhold taxes without being required to pay any additional amounts with respect to amounts so withheld.

The Foreign Account Tax Compliance Act

The Foreign Account Tax Compliance Act ("**FATCA**") (Sections 1471 through 1474 of the Internal Revenue Code) generally imposes a 30 per cent. United States withholding tax on certain United States source payments, including interest (and original issue discount), dividends (and "**dividend equivalent**" payments), or other fixed or determinable annual or periodical gain, profits, and income, and on the gross proceeds from a disposition (subject to the discussions below relating to the Proposed Regulations) of property of a type which can produce United States source interest or dividends ("**Withholdable Payments**"), if paid to a foreign financial institution (including amounts paid to a foreign financial institution on behalf of a holder), unless such institution enters into an agreement with the U.S. Treasury to collect and provide to the U.S. Treasury substantial information regarding United States account holders (including certain account holders that are foreign entities with United States owners) with such institution, or such institution otherwise complies with its obligations under FATCA. A structured product may constitute an account for these purposes. FATCA also generally imposes a withholding tax of 30 per cent. on Withholdable Payments made to a nonfinancial foreign entity unless such entity provides the withholding agent with a certification that it does not have any substantial United States owners or a certification identifying the direct and indirect substantial United States owners of the entity, or otherwise establishes an exemption. Under certain circumstances, a holder may be eligible for refunds or credits of such taxes.

The U.S. Treasury Department and the U.S. Internal Revenue Service have announced that FATCA withholding on payments of gross proceeds from the sale or disposition of a structured product will only apply to payments made after 31 December 2018. However, recently proposed regulations (which have not yet been finalized) (the "**Proposed Regulations**") have eliminated this withholding requirement. Taxpayers are permitted to rely on the Proposed Regulations until final regulations are issued; however, final regulations could reinstate this withholding obligation (or otherwise modify the Proposed Regulations) at any time, possibly with retroactive effect.

In addition, under FATCA, "**passthru payments**" made by a foreign financial institution to "**recalcitrant holders**" or noncompliant foreign financial institutions are subject to a 30 per cent. United States withholding tax. A "**recalcitrant holder**" generally is a holder of an account with a foreign financial institution that fails to comply with certain requests for information that will help enable the relevant foreign financial institution to comply with its obligations under FATCA (a structured product may constitute an account for these purposes). Pursuant to U.S. Treasury regulations, a passthru payment is any Withholdable Payment and any "**foreign passthru payment**", which has yet to be defined. This withholding tax, however, will not be imposed on payments that are treated as Withholdable Payments for FATCA purposes solely because such payments are treated as "dividend equivalent" payments under Section 871(m) of the Internal Revenue Code, if the obligations giving rise to such payments are executed on or before the date that is six months after the date on which such obligations are first treated as giving rise to "dividend equivalent" payments.

Under the current U.S. Treasury regulations and related official guidance issued by the U.S. Internal Revenue Service, the 30 per cent. United States withholding tax on "**recalcitrant holders**" or noncompliant foreign financial institutions generally may be imposed on "**foreign passthru payments**" made by us with respect to the structured products after the date of publication in the U.S. Federal Register of final regulations defining the term "**foreign passthru payment.**" However, payments on an obligation will not be treated as "**foreign passthru payments**" if such obligation is executed on or before the date that is six months after the date on which final regulations defining the term "**foreign passthru payment**" are filed with the U.S. Federal Register.

Under the Proposed Regulations, withholding on foreign passthru payments would not be required with respect to payments made before the date that is two years after the date of publication in the U.S. Federal Register of final regulations defining the term "foreign passthru payment". Taxpayers are permitted to rely on the Proposed Regulations until final regulations are issued; however, final regulations could reinstate these withholding obligations (or otherwise modify the Proposed Regulations) at any time, possibly with retroactive effect.

If we determine that withholding is appropriate with respect to the structured products, we (or an applicable withholding agent) will withhold tax at the applicable statutory rate without being required to pay any additional amounts with respect to amounts so withheld.

Foreign financial institutions and nonfinancial foreign entities located in jurisdictions that have an intergovernmental agreement with the United States governing FATCA may be subject to different rules. Holders are urged to consult with their own tax advisors regarding the possible implications of FATCA on their investment in the structured products.

The above summary only applies to you if you are a Non-U.S. Holder. You are a Non-U.S. Holder unless you are: (1) an individual citizen or resident of the United States; (2) a corporation, partnership or other entity (excluding a trust) that is formed or organised under the laws of the United States or any political subdivision of the United States (or is taxable as an entity so formed or organised); (3) an estate, the income of which is subject to U.S. federal income taxation regardless of its source; (4) a trust that is subject to the jurisdiction of a U.S. court and for which one or more "**United States persons**" (as defined in the Internal Revenue Code) control all of the substantial decisions, or has otherwise made an appropriate election under the U.S. tax regulations.

GENERAL INFORMATION ABOUT US

History, Development and Organisational Structure

J.P. Morgan Structured Products B.V. (JPMSP) was incorporated as a private limited liability company (*besloten vennootschap met beperkte aansprakelijkheid*) in Amsterdam, The Netherlands, on 6 November 2006 to exist for an unlimited duration. JPMSP mainly operates under the Dutch Civil Code *(Burgerlijk Wetboek)* and the Dutch Financial Supervision Act *(Wet op het financieel toezicht)* JPMSP was and remains registered at the Chamber of Commerce of Amsterdam under registered number 34259454 and has its registered offices at Luna ArenA, Herikerbergweg 238, 1101 CM Amsterdam, The Netherlands (telephone number +31 20 575 5600).

JPMSP is an indirect, wholly-owned subsidiary of JPMorgan Chase Bank, N.A. JPMorgan Chase Bank, N.A. is one of the principal bank subsidiaries of JPMorgan Chase & Co., a company incorporated in the State of Delaware in the United States of America.

Investment Policy

JPMSP may undertake independent investments in its sole discretion with the proceeds (net of third party costs) of an issuance of notes, warrants or certificates, subject to compliance with certain legal, tax and regulatory restrictions.

Principal Activities

JPMSP's business principally consists of the issuance of securitised derivatives comprising notes, warrants and certificates, including equity-linked, reverse convertible and market participation notes (together, and for the purposes of this section only, the "**Securities**") and the subsequent hedging of those risk positions. All issuances which have been closed to date are subject to hedging arrangements. The proceeds of the sale of the Securities are used for general corporate purposes, including the entry into hedging arrangements with other J.P. Morgan affiliates. JPMSP anticipates that the hedging arrangements will be sufficient to hedge itself against the market risk of its securities issuance activities. JPMSP also has receipts from and makes payments to other J.P. Morgan affiliates.

It is anticipated that JPMSP will, for each issuance, enter into hedging arrangements with other J.P. Morgan affiliates, and that such arrangements will be sufficient to hedge its market risk for each such issuance. Accordingly, the ability of JPMSP to perform its obligations under the Securities may be affected by any inability or failure to perform, pursuant to its hedging arrangements, by such other J.P. Morgan affiliate.

Principal Markets

During the financial year ended 31 December 2023, JPMSP issued Securities in the Asia Pacific region, Europe, the Middle East, Africa, Latin America and the United States of America.

Trend Information

JPMSP's primary objective in 2024 will be the continued development of securitised products to be offered and sold to retail, "**high net worth**" and institutional investors principally outside of the United States of America, linked to a range of underlying reference assets including equity, credit, interest rates, commodities and so called "**alternatives**" such as funds and hedge funds.

Directors and Officers

The administrative, management and supervisory bodies of JPMSP comprise its Board of Directors. Set forth below are the names and positions of JPMSP's Directors:

Name	Function	Business address
Steffen Engelbertus Johannes Ruigrok	Managing Director	Luna ArenA, Herikerbergweg 238, 1101 CM Amsterdam, The Netherlands
Priscilla Marisa Schraal	Managing Director	Luna ArenA, Herikerbergweg 238, 1101 CM Amsterdam, The Netherlands
Jozef Cornelis Petrus van Uffelen	Managing Director	Luna ArenA, Herikerbergweg 238, 1101 CM Amsterdam, The Netherlands
Sim Ee Cheah	Managing Director	26/F Chater House, 8 Connaught Road Central, Hong Kong

The principal outside activities of Mr. Ruigrok, Ms. Schraal and Mr. van Uffelen are as employees of TMF Netherlands B.V., a trust company which was established in The Netherlands in 1970. Ms. Cheah is a Managing Director at the Investment Bank division at JPMorgan Chase and there are no principal outside activities performed by Ms. Cheah which are significant to JPMSP as Issuer. All Directors hold office until removed.

Subject in the case of Mr. Ruigrok, Ms. Schraal and Mr. van Uffelen to their duties to TMF Netherlands B.V., there are no material potential conflicts of interest between any duties owed to JPMSP by the Directors of JPMSP identified above and their private interests and/or outside duties.

Corporate Governance

JPMSP complies with established and accepted principles of corporate governance in The Netherlands. The Board of Directors of JPMSP conducts itself in accordance with general principles of Dutch corporate law.

The Board of Directors has appointed a committee to authorise and transact issuances of Securities. No other committees made up for specific purposes or to perform specific functions have been appointed.

Capital Structure

The authorised share capital of JPMSP is euro 90,000, divided into 90,000 ordinary shares of euro 1.00 each. At incorporation 18,000 ordinary shares were issued. By a notarial deed of share issuance dated 30 March 2007 an additional 2,000 ordinary shares were issued in consideration of U.S.$500,000,000. The total issued and fully paid up share capital therefore amounts to 20,000 ordinary shares. JPMSP does not hold any of its own shares.

Memorandum and Articles of Association

JPMSP's objects as set out in Article 3 of its Articles of Association are:

(a) to incorporate, to participate in any manner whatsoever, to manage, to supervise, to cooperate with, to acquire, to maintain, to dispose of, to transfer or to administer in any other manner whatsoever all sorts of participations and interests in businesses, legal entities and companies as well as to enter into joint ventures;

(b) to finance businesses, legal entities and companies;

(c) to borrow, to lend and to raise funds, to participate in all sorts of financial transactions, including the issue of bonds, promissory notes or other securities, to invest in securities in the widest sense of the word, and to enter into agreements and financial instruments in connection with the foregoing;

(d) to enter into swaps and any other derivative transactions whatsoever to hedge the Company's exposure under any agreements, securities or other instruments whatsoever to which it is a party;

(e) to grant guarantees, to bind the Company and to grant security over the assets of the Company for the benefit of legal entities and companies with which the Company forms a group and for the benefit of third parties;

(f) to advise and to render services to legal entities and companies with which the Company forms a group and to third parties;

(g) to acquire, to administer, to operate, to encumber, to dispose of and to transfer moveable assets and real property and any right to or interest therein;

(h) to trade in currencies, securities and financial assets in general;

(i) to obtain, to exploit, to dispose of and to transfer patents and other industrial and intellectual property rights, to obtain and to grant licenses, sub-licenses and similar rights of whatever name and description and, if necessary, to protect the rights derived from patents and other industrial and intellectual property rights, licenses, sub-licenses and similar rights against infringements by third parties;

(j) to carry out all sorts of industrial, financial and commercial activities, including the import, export, purchase, sale, distribution and marketing of products and raw materials,

and all matters related or conductive to the above, with the objects to be given their most expansive possible interpretation. In pursuing its objects, the Company shall also take into account the interests of the legal entities and companies with which it forms a group.

Principal Establishments and Real Estate owned

JPMSP does not own any principal establishments, which account for more than 10 per cent. (ten per cent.) of its revenues, nor does JPMSP own any real estate directly.

Dividends

JPMSP has not paid any dividends since its incorporation on 6 November 2006.

J.P. MORGAN STRUCTURED PRODUCTS B.V.
Amsterdam, the Netherlands

(Chamber of Commerce Number: 34259454)

Financial statements for the six month period ended 30 June 2023

J.P. MORGAN STRUCTURED PRODUCTS B.V.
Interim report for the six month period ended 30 June 2023

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J.P. MORGAN STRUCTURED PRODUCTS B.V.
Directors' report

The directors present their report and the interim financial statements of J.P. Morgan Structured Products B.V. (the "Company") for the six month period ended 30 June 2023.

Principal activity

The Company's primary activity is the management and issuance of structured products comprising certificates, warrants and market participation notes, and the subsequent hedging ("hedge", "hedging") of these positions.

Review of business

During the period, the Company continued to issue structured products. The proceeds from the sale of the structured products were used to fund the activities of other JPMorgan Chase & Co. together with its subsidiaries ("Firm" or "JPMorgan Chase undertakings" or "the group"). The funding activity is done through certain economic hedging arrangements. The principal purpose of these hedging arrangements is to hedge against various risks associated with the issuance activity. During the period, the Company issued structured products to private investors or listed on exchanges in the Asia Pacific region, Europe, the Middle East, Africa, Latin America and the United States of America.

The Company's ultimate controlling entity is JPMorgan Chase & Co. which is incorporated in Delaware (headquartered in New York).

Key performance indicators ("KPI")

As the Company is managed as part of the Corporate Investment Bank of JPMorgan Chase there are no KPI's that are specific to the Company. The results are monitored against expectations of the business activities. A more detailed description of the Firm's key performance indicators may be found within the JPMorgan Chase & Co. 2022 Annual Report.

Business environment, strategy and future outlook

The primary objective of the Company is the continued development of structured products to be offered and sold to retail, 'high net worth' and institutional investors principally outside of the United States of America, linked to a range of underlying reference assets including equity, credit, interest rates, commodities and 'alternatives' such as funds and hedge funds.

War in Ukraine

The duration and potential outcomes of the war in Ukraine remain uncertain. The Firm has taken and continues to take steps to close positions and reduce certain of its business activities and exposures connected with the war, and to assist clients with fulfilling any pre-existing obligations and managing their Russia-related risks.

The Firm continues to monitor and manage the operational risks associated with the war, including compliance with the financial and economic sanctions and the increased risk of cyber-attacks.

The Company does not have exposure to Russia and Russia-associated clients and counterparties.

Principal risks and uncertainties

The Company's issuance activities expose it to financial and operational risks, which are managed by the Board of Directors, using the Firm's risk management framework. The Board of Directors monitor the Company's financial and operational risks and has responsibility for ensuring effective risk management and control (Refer note 17).

Risk Management

The following sections outline the key risks that are inherent in the Company's business activities. A detailed description of the policies and processes adopted by the Firm may be found within the Firm's 2022 Annual Report on Form 10-K. The report is available at https://jpmorganchaseco.gcs-web.com/financial-information/sec-filings.

Operational risk

Operational risk is the risk of an adverse outcome resulting from inadequate or failed internal processes or systems; human factors; or external events impacting the Firm's processes or systems; Operational Risk includes compliance, conduct, legal and estimations and model risk.

Operational risk is inherent in the Company's activities and can manifest itself in various ways, including fraudulent acts, business disruptions (including those caused by extraordinary events beyond the Firm's control), cyber-attacks, inappropriate employee behaviour, failure to comply with applicable laws, and regulations or failure of vendors or other third-party providers to perform in accordance with their agreements. Operational Risk Management attempts to manage operational risk at appropriate levels in light of the Company's financial position, the characteristics of its businesses, and the markets and regulatory environments in which it operates.

Risk Management (continued)

Operational risk (continued)

Operational Risk Management Framework

The Company leverages the Firm's Compliance, Conduct, and Operational Risk ("CCOR") Management Framework which is designed to enable the Firm to govern, identify, measure, monitor and test, manage and report on the Firm's operational risk.

Operational risk can manifest itself in various ways. Operational risk subcategories such as Compliance risk, Conduct risk, Legal risk and Estimations and Model risk, as well as other operational risks, can lead to losses which are captured through the Firm's operational risk measurement processes. More information on these risk subcategories, where relevant, can be found in the respective risk management sections.

Cybersecurity risk

Cybersecurity risk is the risk of the Firm's exposure to harm or loss resulting from misuse or abuse of technology by malicious actors. Cybersecurity risk is an important and continuously evolving focus for the Firm and Company. Significant resources are devoted to protecting and enhancing the security of computer systems, software, networks, storage devices and other technology assets. The Firm's security efforts are designed to protect against, among other things, cybersecurity attacks by unauthorised parties attempting to obtain access to confidential information, destroy data, disrupt or degrade service, sabotage systems or cause other damage.

The Firm has experienced, and expects that it will continue to experience, a higher volume and complexity of cyber attacks against the backdrop of heightened geopolitical tensions. The Firm has implemented precautionary measures and controls reasonably designed to address this increased risk, such as enhanced threat monitoring.

Ongoing business expansions may expose the Firm to potential new threats as well as expanded regulatory scrutiny including the introduction of new cybersecurity requirements. The Firm continues to make significant investments in enhancing its cyber defense capabilities and to strengthen its partnerships with the appropriate government and law enforcement agencies and other businesses in order to understand the full spectrum of cybersecurity risks in the operating environment, enhance defenses and improve resiliency against cybersecurity threats. The Firm actively participates in discussions and simulations of cybersecurity risks both internally and with law enforcement, government officials, peer and industry groups, and has significantly increased efforts to educate employees and certain clients on the topic of cybersecurity risks. The Company benefits directly from the Firm's continuous focus.

Third parties with which the Firm does business or that facilitate the Firm's business activities (e.g. vendors, supply chain, exchanges, clearing houses, central depositories, and financial intermediaries) are also sources of cybersecurity risk to the Firm and the Company. Third party cybersecurity incidents such as system breakdowns or failures, misconduct by the employees of such parties, or cyberattacks, including ransomware and supply-chain compromises, could affect their ability to deliver a product or service to the Firm or result in lost or compromised information of the Firm or its clients. Clients are also sources of cybersecurity risk to the Firm and its information assets, particularly when their activities and systems are beyond the Firm's own security and control systems. As a result, the Firm engages in regular and ongoing discussions with certain vendors and clients regarding cybersecurity risks and opportunities to improve security. However, where cybersecurity incidents occur as a result of client failures to maintain the security of their own systems and processes, clients are responsible for losses incurred.

To help safeguard the confidentiality, integrity and availability of the Firm's infrastructure, resources and information, the Firm maintains a Information Security Program designed to prevent, detect, and respond to cyberattacks. The Audit Committee is periodically provided with updates on the Firm's Information Security Program, recommended changes, cybersecurity policies and practices, ongoing efforts to improve security, as well as its efforts regarding significant cybersecurity events. In addition, the Firm has a cybersecurity incident response plan ("IRP") designed to enable the Firm to respond to attempted cybersecurity incidents, coordinate such responses with law enforcement and other government agencies, and notify clients and customers, as applicable. Among other key focus areas, the IRP is designed to mitigate the risk of insider trading connected to a cybersecurity incident, and includes various escalation points.

Business and technology resiliency risk

Disruptions can occur due to forces beyond the Firm's and Company's control such as the spread of infectious diseases or pandemics, severe weather, power or telecommunications loss, failure of a third party to provide expected services, cyberattacks and terrorism. The Firmwide Business Resiliency Program is designed to enable the Firm to prepare for, adapt to, withstand and recover from business disruptions including occurrence of an extraordinary event beyond its control that may impact critical business functions and supporting assets (i.e., staff, technology, facilities and third parties). The program includes governance, awareness training, planning and testing of recovery strategies, as well as strategic and tactical initiatives to identify, assess, and manage business interruption and public safety risks. The Company benefits of the program.

Risk Management (continued)

Operational risk (continued)

War in Ukraine and Sanctions

In response to the war in Ukraine, numerous financial and economic sanctions have been imposed on Russia and Russia-associated entities and individuals by various governments around the world, including the authorities in the U.S., UK and EU. These sanctions are complex and continue to evolve. The Firm continues to face increased operational risk associated with addressing these complex compliance-related matters. To manage this increased risk, the Firm has implemented controls reasonably designed to mitigate the risk of non-compliance and to prevent dealing with sanctioned persons or in property subject to sanctions, as well as to block or restrict payments as required by the applicable regulations.

Compliance risk

Compliance risk, a subcategory of operational risk, is the risk of failing to comply with laws, rules, regulations or codes of conduct and standards of self-regulatory organisations applicable to the business activities of the Firm and the Company.

Each of the Line of Businesses and Corporate within the Company holds primary ownership of and accountability for managing compliance risk. The Firm’s Operational Risk and Compliance Organisation ("Operational Risk and Compliance"), which is independent of the LOBs and Corporate, provides independent review, monitoring and oversight of business operations with a focus on compliance with the laws, rules and regulations applicable to the delivery of the Firm’s products and services to clients and customers.

These compliance risks relate to a wide variety of laws, rules and regulations varying across the LOBs, Corporate and jurisdiction, and include those related to financial products and services, relationships and interactions with clients and customers, and employee activities. For example, compliance risks include those associated with anti-money laundering compliance, trading activities, market conduct, and complying with the laws, rules and regulations related to the offering of products and services across jurisdictional borders. Compliance risk is also inherent in the Firm’s and the Company's fiduciary activities, including the failure to exercise an applicable standard of care to act in the best interest of fiduciary clients and customers or to treat fiduciary clients and customers fairly.

Other functions provide oversight of significant regulatory obligations that are specific to their respective areas of responsibility.

Operational Risk and Compliance implements policies and standards designed to govern, identify, measure, monitor and test, manage, and report compliance risk.

Governance and oversight

Operational Risk and Compliance is led by the Firm's Chief Compliance Officer (“CCO”) and the Firmwide Risk Executive for Operational Risk who reports to the Firm’s Chief Risk Officer (CRO). The regional CCOR Heads, including the EMEA CCO, are part of this governance structure.

The Firm maintains oversight and coordination of its compliance risk through the implementation of the CCOR Risk Management Framework.

Code of Conduct

The Firm has a Code of Conduct (the “Code”) that sets out the Firm’s expectation that employees will conduct themselves with integrity at all times and provides the principles that govern employee conduct with clients, customers, shareholders and one another, as well as with the markets and communities in which the Firm and the Company does business. The Code requires employees to promptly report any known or suspected violation of the Code, any internal Firm policy, or any law or regulation applicable to the Firm’s business. It also requires employees to report any illegal conduct, or conduct that violates the underlying principles of the Code, by any of the Firm’s and Company employees, customers, suppliers, contract workers, business partners, or agents.

Training is assigned to newly hired employees upon joining the Firm, and to current employees periodically on an ongoing basis. Employees are required to affirm their compliance with the Code annually. Employees can report any potential or actual violations of the Code through the Code Reporting Hotline by phone or the internet. It is administered by an outside service provider. The Code prohibits retaliation against anyone who raises an issue or concern in good faith.

Risk management (continued)

Legal Risk

Legal risk, a subcategory of operational risk, is the risk of loss primarily caused by the actual or alleged failure to meet legal obligations that arise from the rule of law in jurisdictions in which the Firm and the Company operates, agreements with clients and customers, and products and services offered by the Firm and the Company.

Overview

The global Legal function ("Legal") provides legal services and advice to the Company and the Firm. Legal is responsible for managing the Firm's exposure to legal risk by:

- Managing actual and potential litigation and enforcement matters, including internal reviews and investigations related to such matters;
- Advising on products and services, including contract negotiation and documentation;
- Advising on offering and marketing documents and new business initiatives;
- Managing dispute resolution;
- Interpreting existing laws, rules and regulations, and advising on changes thereto;
- Advising on advocacy in connection with contemplated and proposed laws, rules and regulations; and
- Providing legal advice to the LOBs, Corporate and Board.

Legal selects, engages and manages outside counsel for the Firm on all matters in which outside counsel is engaged. In addition, Legal advises the Firm's Conflicts Office which reviews the Firm's wholesale transactions that may have the potential to create conflicts of interest for the Firm.

Governance and oversight

The Firm's General Counsel reports to the CEO and is a member of the Operating Committee, the Firmwide Risk Committee and the Firmwide Control Committee. The Firm's General Counsel and other members of Legal report on significant legal matters to the Firm's Board of Directors and to the Audit Committee. Each region, including EMEA, has a General Counsel who is responsible for managing legal risk across all lines of business and functions in the region and operating in the Company. Legal serves on and advises various committees and advises the Firm's LOBs and Corporate on potential reputation risk issues.

Reputation risk

Reputation risk is the risk that an action or inaction may negatively impact perception of the Firm's integrity and reduce confidence in the Firm's competence by various constituents, including clients, counterparties, customers, investors, regulators, employees, communities or the broader public. Reputation risk is assessed and defined at the Firmwide level and is applicable to the Company.

Organisation and management

Reputation Risk Management establishes the governance framework for managing reputation risk across the Firm's LOBs and Corporate. Reputation risk is inherently challenging to identify, manage, and quantify.

The Firm's reputation risk management function includes the following activities:

- Maintaining a Firmwide Reputation Risk Governance policy and a standard consistent with the reputation risk framework
- Overseeing the governance execution through processes and infrastructure that support consistent identification, escalation, management and monitoring of reputation risk issues Firmwide.

The types of events that result in reputation risk are wide-ranging and may be introduced by the Firm's employees and the clients, customers and counterparties with which the Firm does business. These events could result in financial losses, litigation, regulatory enforcement actions, fines, penalties or other sanctions, as well as other harm to the Firm.

Governance and oversight

The Reputation Risk Governance policy establishes the principles for managing reputation risk for the Firm. It is the responsibility of employees in each LOB and Corporate to consider the reputation of the Firm when deciding whether to offer a new product, engage in a transaction or client relationship, enter a new jurisdiction, initiate a business process or consider any other activity.

Environmental impacts and social concerns are increasingly important considerations in assessing the Firm's reputation risk, and are a component of the Firm's reputation risk governance.

Reputation risk issues that are deemed to be material are escalated as appropriate.

Risk management (continued)

Climate-related financial risk

Climate risk is the risk associated with the impacts of climate change on the Firm's and the Company's clients, customers, operations and business strategy. Climate change is viewed as a driver of risk that may impact existing types of risks managed by the Firm and the Company. Climate risk is categorised into physical risk and transition risk.

Physical risk refers to economic costs and financial loss associated with a changing climate. Acute physical risk drivers include the increased frequency or severity of climate and weather events, such as floods, wildfires and tropical storms. Chronic physical risk drivers include more gradual shifts in the climate, such as rising sea levels, persistent changes in precipitation levels and average ambient temperature increases.

Transition risk refers to the financial and economic implications associated with a societal adjustment to a low-carbon economy. Transition risk drivers include possible changes in public policy, adoption of new technologies and shifts in consumer preferences. Transition risks may also be influenced by changes in the physical climate.

Other responsibilities of Climate Risk Management include:

- Setting policies, standards, procedures and processes to support identification, escalation, monitoring and management of climate risk across the Firm;
- Developing metrics, scenarios, and stress testing mechanisms designed to assess the range of potential climate-related financial and economic impacts to the Firm; and
- Establishing a Firmwide climate risk data strategy and the supporting climate risk technology infrastructure.

The LOBs and Corporate are responsible for the identification, assessment and management of climate risks present in their business activities and for adherence to applicable climate-related laws, rules and regulations.

Owing to the nature of its business, the Company may potentially be exposed to climate change predominantly through its financial and broader linkages with JPMorgan Chase.

The impact of climate change has been considered in preparing the Company's accounts. There is no significant impact identified on the results and balance sheet of the Company.

Financial Risks

Further details on the financial risks of the Company are set out in note 17 to the financial statements.

Results and dividends

The results for the period are set out on page 8 and show the Company's profit for the period after taxation is $11.7 million (2022: $2.6 million).

No dividend was paid or proposed during the period (2022: $nil).

Events after the reporting period

The Directors are not aware of any events or circumstances which have taken place after 30 June 2023, but before these financial statements have been approved for issue, that could materially affect the financial position or results of the Company and which would require specific disclosure in these financial statements.

Directors

The directors of the Company who served during the period and up to the date of signing the financial statements were as follows:

J.C.P. van Uffelen	(Appointed 6 March 2007)
S. E. Cheah	(Appointed 13 December 2018)
S.E.J. Ruigrok	(Appointed 14 July 2021)
D.M.A Spreeuwers	(Appointed 21 January 2022)

Composition of the Board

The size and composition of the Board of Directors and the combined experience and expertise should reflect the best fit for the profile and strategy of the Company. The Board of Directors of the Company consisted of two male and two female directors. The Board of Directors recognizes the importance of gender balanced compositions and will take this again into account when selecting potential nominees in case of future changes in the Board.

Registered address

Herikerbergweg 238
Luna Arena, 1101CM
Amsterdam

Expected developments of the Company

The directors of the Company expect that:

a) the Company will continue to issue structured products;
b) the Company will not enter into fixed asset investments; and
c) the interest income will continue to fluctuate in line with the development in market interest rates.

Statement under the Transparency Directive (as implemented in Dutch law)

The directors confirm to the best of their knowledge that:

a) the attached financial statements are prepared in accordance with International Financial Reporting Standards ("IFRS") as endorsed by the European Union and give a true and fair view of the assets, liabilities, financial position and profit of the Company for the period ended 30 June 2023, and
b) the interim report for the period ended 30 June 2023, consisting of the directors report and the financial statements, gives a true and fair view of the position as per the balance sheet date 30 June 2023.

The directors further herewith report their arrangements for an audit committee (the "Audit Committee") as follows:

Audit Committee

The Company makes use of the exemption to the requirement to establish its own Audit Committee based on Article 3a of the Royal Decree of 26 July 2008 implementing article 41 of the EU Directive 2006/43EG, as the Audit Committee of JPMorgan Chase & Co. fulfils the requirements at group level. The Audit Committee of JPMorgan Chase & Co., which covers the Firm, including the Company and is formed of entirely non-management, independent directors in compliance with the recommendations from the EU Commission. Details of the Charter, Membership, Duties and Responsibilities can be found on the Firm's website.

The financial statements on pages 7 to 35 were approved by the Board of Directors on 19 September 2023 and signed on its behalf by:

S.E.J. Ruigrok

J.C.P. van Uffelen

Date: 19 September 2023

J.P. MORGAN STRUCTURED PRODUCTS B.V.
Balance sheet
(before profit appropriation)

	Notes	Unaudited 30 June 2023 $'000	31 December 2022 $'000
Assets			
Non-current assets			
Trade and other receivables	7	—	3,500,000
Current assets			
Financial assets held at fair value through profit and loss	6	23,144,972	25,432,597
Trade and other receivables	7	84,208	92,231
Cash and cash equivalents	8	3,332,652	2,949,704
Current tax assets		10,904	1,903
Total assets		**26,572,736**	**31,976,435**
Liabilities			
Non-current Liabilities			
Trade and other payables		500,000	—
Current liabilities			
Financial liabilities designated at fair value through profit or loss	9	17,469,433	18,703,642
Financial liabilities held at fair value through profit and loss	10	5,675,539	6,728,955
Trade and other payables	12	2,263,776	5,924,898
Bank overdraft	8	45,422	12,075
Total liabilities		**25,954,170**	**31,369,570**
Equity			
Capital and reserves attributable to equity shareholders of the Company			
Share capital	13	26	26
Share premium reserve		499,997	499,997
Legal reserve		2	2
Retained earnings		106,840	92,758
Net results		11,701	14,082
Total equity		**618,566**	**606,865**
Total liabilities and equity		**26,572,736**	**31,976,435**

Chamber of Commerce Number: 34259454

The notes on pages 11 - 35 form an integral part of the financial statements.

J.P. MORGAN STRUCTURED PRODUCTS B.V.
Income statement (unaudited)

Six month period ended	Notes	**Unaudited 30 June 2023** **$'000**	**Unaudited 30 June 2022** **$'000**
Fee and commission income	14	10,865	12,946
Administrative expense		(10,969)	(12,572)
Net foreign exchange (loss)/gain		(52)	6
Operating profit		**(156)**	**380**
Interest income	15	133,329	19,559
Interest expense	15	(117,424)	(16,471)
Net interest income		**15,905**	**3,088**
Profit before income tax		**15,749**	**3,468**
Income tax expense	16	(4,048)	(849)
Profit for the period attributable to equity shareholders of the Company		**11,701**	**2,619**

The profit for the period resulted from continuing operations.

Statement of comprehensive income

There were no other items of comprehensive income or expense other than the profit for the financial period shown above (June 2022: $nil). As a result, profit for the financial period represents total comprehensive income in both the current and prior financial period.

The notes on pages 11 - 35 form an integral part of the financial statements.

J.P. MORGAN STRUCTURED PRODUCTS B.V.
Statement of changes in equity (unaudited)

	Share capital	Share premium reserve	Legal reserve	Retained earnings	Total equity
	$'000	**$'000**	**$'000**	**$'000**	**$'000**
Balance at 1 January 2022	**26**	**499,997**	**2**	**92,758**	**592,783**
Profit for the period	—	—	—	2,619	2,619
Balance as at 30 June 2022	**26**	**499,997**	**2**	**95,377**	**595,402**
Balance as at 1 January 2023	**26**	**499,997**	**2**	**106,840**	**606,865**
Profit for the period	—	—	—	11,701	11,701
Balance as at 30 June 2023	**26**	**499,997**	**2**	**118,541**	**618,566**

The notes on pages 11 - 35 form an integral part of the financial statements.

J.P. MORGAN STRUCTURED PRODUCTS B.V.

Statement of cash flows (unaudited)

	Notes	Unaudited 30 June 2023 $'000	Unaudited 30 June 2022 Restated $'000
Cash flow from operating activities			
Profit before income tax		**15,749**	**3,468**
Income tax paid		(13,049)	(1,978)
Interest income	15	(133,329)	(19,559)
Interest expense	15	117,424	16,471
Net foreign exchange (gain)/loss **		52	(6)
		(13,153)	**(1,604)**
Changes in working capital			
Decrease/(increase) in financial assets held at fair value through profit and loss		2,287,625	(3,589,322)
Decrease in trade and other receivables		7,971	107,979
(Decrease)/increase in financial liabilities held at fair value through profit and loss		(1,053,416)	1,509,865
(Decrease)/increase in financial liabilities designated at fair value through profit or loss		(1,234,209)	2,079,458
(Decrease)/increase in trade and other payables		(3,661,122)	652,545
		(3,653,151)	**760,525**
Net cash generated from operating activity		**(3,666,304)**	**758,921**
Cash flow generated from investing activities			
Change in amounts owed by JPMorgan Chase undertakings		3,500,000	(1,500,000)
Interest received	15	133,329	19,559
Net cash generated from/(used in) investing activities		**3,633,329**	**(1,480,441)**
Cash flow from financing activities			
Change in amounts owed to JPMorgan Chase undertakings*		500,000	—
Interest expense	15	(117,424)	(16,471)
Net cash generated (used in)/from financing activities		**382,576**	**(16,471)**
Net Increase/(decrease) in cash and cash equivalents		**349,601**	**(737,991)**
Net cash and cash equivalents at the beginning of the period		2,937,629	4,511,820
Net cash and cash equivalents at the end of the period	8	**3,287,230**	**3,773,829**

*Following a review of amounts owed to JPMorgan Chase undertakings from 2022, it has been identified that portion of the balance needs to be reclassified from cash flow from financing activities to cash flow from operating activities amounting to $343,970. **Additionally, in 2022 net foreign exchange gain/(loss) has been reclassified from cash and cash equivalents to cash flow from operating activities. Adjustment to prior year amounts have been made to confirm with current year presentation.

The notes on pages 11 - 35 form an integral part of the financial statements.

1. General information

J.P. Morgan Structured Products B.V. (the "Company") was incorporated on 6 November 2006 as a private company with limited liability and is incorporated in The Netherlands, with registration number 34259454. The Company's immediate parent undertaking is J.P. Morgan International Finance Limited which is incorporated in the state of Delaware in the United States of America. The Company's ultimate parent undertaking of the largest group in which the results of the Company are consolidated is J.P. Morgan Chase & Co. (together with its subsidiaries, the "Firm" or "JPMorgan Chase"), which is also incorporated in the state of Delaware in the United States of America. The parent undertaking of the smallest group in which the Company's results are consolidated is J.P. Morgan International Finance Limited. The largest and the smallest group's consolidated financial statements can be obtained from 25 Bank Street, Canary Wharf, London E14 5JP, England.

The Company's main activity is the issuance of structured products comprising certificates, warrants and market participation notes, and the subsequent economic hedging of the risk associated with these notes through hedging with other JPMorgan Chase companies. The valuation of a structured product will have no impact on the income statement, capital or net assets; as a change in valuation of a structured product will have an equal offsetting change in the value of the hedging transaction with other JPMorgan Chase undertakings.

These financial statements reflect the operations of the Company during the period from 1 January 2023 to 30 June 2023 and have been approved for issue by the Board of Directors on 19 September 2023.

2. Accounting convention

The financial statements have been prepared in accordance with International Financial Reporting Standards ("IFRS") as endorsed by the European Union and prepared in accordance with Book 2, Title 9 of the Dutch Civil Code. The financial statements have been prepared on a going concern basis under the historical cost convention, except that financial instruments are stated at fair value. Relevant facts and circumstances relating to the financial position on 31 December 2022 and for a period of at least 12 months from the date of signing of the financial statements were assessed in order to reach the going concern assumption. The main areas assessed are the financial performance and financial position of the Company. Reclassification of and adjustments to prior year amounts have been made to conform with current year presentations and to provide additional transparency and information on the nature of the balances in these financial statements.

The preparation of financial statements in conformity with IFRS requires the use of certain critical accounting estimates. It also requires management to exercise its judgement in the process of applying the Company's accounting policies. The areas involving a higher degree of judgement or complexity, or areas where assumptions and estimates are significant to the financial statements are disclosed in note 4.

3. Summary of significant accounting policies

The following are the principal accounting policies applied in the preparation of these financial statements. These policies have been applied consistently to all the years presented, unless otherwise stated.

3.1 Functional and presentation currency

Items included in the financial statements of the Company are measured using the currency of the primary economic environment in which the entity operates (the "functional currency").

U.S. dollars is considered as the functional and presentation currency of the Company.

3.2 Foreign currency translation

Monetary assets and monetary liabilities in foreign currencies are translated into United States ("U.S.") dollars at rates of exchange ruling on the balance sheet date. Income and expense items denominated in foreign currencies are translated into U.S. dollars at exchange rates prevailing at the date of the transactions. Any gains or losses arising on translation are taken directly to the income statement.

Non-monetary items denominated in foreign currencies that are stated at historical cost are translated into U.S. dollars at the exchange rate ruling at the date when the transaction was initially recognised.

Non-monetary items denominated in foreign currencies that are stated at fair value are translated into U.S. dollars at foreign exchange rates ruling at the dates when the fair values were determined. Translation differences arising on non-monetary items measured at fair value are recognised in the income statement.

3. Summary of significant accounting policies (continued)

3.3 Financial instruments

3.3.1 Financial assets and financial liabilities

i. Recognition of financial assets and financial liabilities

The Company recognises financial assets and financial liabilities when it becomes a party to the contractual provisions of the instrument. Regular way purchases and sales of securities are recognised on the trade-date, which is the date on which the Company commits to purchase or sell an asset.

ii. Classification and measurement of financial assets and financial liabilities

On initial recognition, financial assets are measured at fair value. Subsequently, financial assets are classified and measured at amortised cost, fair value through other comprehensive income ("FVOCI") or fair value through profit or loss ("FVTPL"). The classification is based on both the business model for managing the financial assets and their contractual cash flow characteristics. Factors considered by the Company in determining the business model for a group of assets include past experience on how the cash flows for these assets were collected, how the assets' performance is evaluated and reported to key management personnel, how risks are assessed and managed, and how managers are compensated.

On initial recognition, financial liabilities are classified as measured at either amortised cost or FVTPL.

iii. Financial assets and financial liabilities measured at amortised cost

Financial assets are measured at amortised cost if they are held under a business model with the objective to collect contractual cash flows ("Hold-to-Collect") and they have contractual terms under which cash flows are solely payments of principal and interest ("SPPI"). In making the SPPI assessment, the Company considers whether the contractual cash flows are consistent with a basic lending arrangement (i.e. interest includes only consideration for the time value of money, credit risk, other basic lending risks and a profit margin that is consistent with a basic lending arrangement). Where the contractual terms introduce exposure to risk or volatility that are inconsistent with a basic lending arrangement, the related financial asset is classified and measured at FVTPL. Financial assets with embedded derivatives are considered in their entirety when determining whether their cash flows are SPPI. As a result of the application of these criteria, only debt financial assets are eligible to be measured at amortised cost.

Financial assets measured at amortised cost include trade and other receivables and cash and cash equivalents.

Financial liabilities are measured at amortised cost unless they are held for trading or are designated as measured at FVTPL. Financial liabilities measured at amortised cost include trade and other payables and bank overdraft.

Financial assets and financial liabilities measured at amortised cost are initially recognised at fair value including transaction costs (which are explained below). The initial amount recognised is subsequently reduced for principal repayments and adjusted for accrued interest using the effective interest method (see below). In addition, the carrying amount of financial assets is adjusted by recognising an expected credit loss allowance through profit or loss.

The effective interest method is used to allocate interest income or interest expense over the relevant period. The effective interest rate is the rate that discounts estimated future cash payments or receipts through the expected life of the financial asset or financial liability or a shorter period when appropriate, to the net carrying amount of the financial asset or financial liability. The effective interest rate is established on initial recognition of the financial asset or financial liability. The calculation of the effective interest rate includes all fees and commissions paid or received, transaction costs, and discounts or premiums that are an integral part of the effective interest rate. Transaction costs are incremental costs that are directly attributable to the acquisition, issuance or disposal of a financial asset or financial liability.

Gains and losses arising on the disposal of financial assets measured at amortised cost are recognised in 'trading profit' or other non-interest revenue as relevant.

3. Summary of significant accounting policies (continued)

3.3 Financial instruments (continued)

3.3.1 Financial assets and financial liabilities (continued)

iv. Financial assets and financial liabilities measured at fair value through profit or loss

Financial assets and financial liabilities are measured at FVTPL if they are held for trading. Under IFRS 9, a financial asset or a financial liability is defined as "held for trading" if it is acquired or incurred principally for the purpose of selling or repurchasing it in the near term, or forms part of a portfolio of identified financial instruments that are managed together and for which there is evidence of a recent actual pattern of short-term profit taking or it is a derivative. However, such financial instruments are used by the Company predominantly in connection with its client-driven market-making and/or for hedging certain assets, liabilities, positions, cash flows or anticipated transactions (i.e. risk management activities).

In addition, certain financial assets that are not held for trading are measured at FVTPL if they do not meet the criteria to be measured at amortised cost or FVOCI. For example, if the financial assets are managed on a fair value basis, have contractual cash flows that are not SPPI or are equity securities.

Financial instruments measured at FVTPL are initially recognised at fair value in the balance sheet. Transaction costs and any subsequent fair value gains or losses are recognised in profit or loss as they arise.

The Company manages cash instruments, in the form of debt and equity securities, and derivatives on a unified basis, including hedging relationships between cash securities and derivatives. Accordingly, the Firm reports the gains and losses on the cash instruments and the gains and losses on the derivatives on a net basis in trading profits.

v. Financial assets and financial liabilities designated at fair value through profit or loss

Subject to certain criteria, the Company can designate financial assets and financial liabilities to be measured at FVTPL. Designation is only possible when the financial instrument is initially recognised and cannot subsequently be reclassified. Financial assets can be designated as measured at FVTPL only if such designation eliminates or significantly reduces a measurement or recognition inconsistency. Financial liabilities can be designated as measured at FVTPL only if such designation (a) eliminates or significantly reduces a measurement or recognition inconsistency; or (b) applies to a group of financial assets, financial liabilities or both that the Company manages and evaluates on a fair value basis; or (c) relates to an instrument that contains an embedded derivative unless the embedded derivative does not significantly modify the cash flows required by the contract or when a similar hybrid instrument is considered that separation of the embedded derivative is prohibited.

Financial assets and financial liabilities that the Company designates as measured at FVTPL are recognised at fair value at initial recognition, with transaction costs being recognised in profit or loss and subsequently measured at fair value. Gains and losses on financial assets and financial liabilities designated at FVTPL are recognised in profit or loss as they arise.

3.3.2 Interest income and interest expense

Unless a financial asset is credit-impaired, interest income is recognised by applying the effective interest method to the carrying amount of a financial asset before adjusting for any allowance for expected credit losses. If a financial asset is credit-impaired, interest income is recognised by applying the effective interest rate to the carrying amount of the financial asset including any allowance for expected credit losses.

Interest expense on financial liabilities is recognised by applying the effective interest method to the amortised cost of financial liabilities.

3.3.3 Trading profit

Profits and losses resulting from the purchase and sale of securities and the revaluation of financial instruments are recognised in trading profit on a trade-date basis, including related transaction costs.

3. Summary of significant accounting policies (continued)

3.3 Financial instruments (continued)

3.3.4 Impairment of financial assets

The Company recognises ECL for financial assets that are measured at amortised cost.

The ECL is determined on in-scope financial instruments measured at amortized cost. ECL are measured collectively via a portfolio-based (modelled) approach for Stage 1 and 2 assets but are generally measured individually for Stage 3 assets. ECL are forecasted over the 12-month term (Stage 1) or expected life (Stage 2 or 3) of in-scope financial instruments, where the forecast horizon includes the reasonable and supportable (R&S) forecast period, the reversion period and the residual period and considers the time value of money. In determining the ECL measurement and staging for a financial instrument, the Company applies the definition of default consistent with the Basel definition of default to maintain uniformity of the definition across the Firm. Determining the appropriateness of the allowance is complex and requires judgment by management about the effect of circumstances that are inherently uncertain. Further, estimating the allowance involves consideration of a range of possible outcomes, which management evaluates to determine its best estimate.

The Company must consider the appropriateness of decisions and judgements regarding methodology and inputs utilised in developing estimates of ECL at each reporting period and document them appropriately.

3.4 Fair value

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

Fair values are determined by reference to observable market prices where available and reliable. Fair values of financial assets and financial liabilities are based on quoted market prices or dealer price quotations for financial instruments traded in active markets. Where market prices are unavailable, fair value is based on valuation models that consider relevant transaction characteristics (such as maturity) and use as inputs observable or unobservable market parameters, including but not limited to yield curves, interest rates, volatilities, equity or debt prices, foreign exchange rates and credit curves. Valuation adjustments may be made to ensure that financial instruments are recorded at fair value. The Company manages certain portfolios of financial instruments on the basis of net open risk exposure and has elected to estimate the fair value, of such portfolios on the basis of a transfer of the entire net open risk position in an orderly transaction.

For financial assets and liabilities held at fair value, most market parameters in the valuation model are either directly observable or are implied from instrument prices. When input values do not directly correspond to the most actively traded market parameters the model may perform numerical procedures in the pricing such as interpolation.

The Company classifies its assets and liabilities according to a hierarchy that has been established under IFRS for disclosure of fair value measurements. The fair value hierarchy is based on the transparency of inputs to the valuation of an asset or liability as of the measurement date. The fair value hierarchy gives the highest priority to quoted prices (unadjusted) in active markets for identical assets or liabilities (Level 1) and the lowest priority to unobservable inputs (Level 3 inputs).

A financial instrument's categorisation within the fair value hierarchy is based on the lowest level of input that is significant to the fair value measurement.

Further details on fair value measurements are provided in note 11 to the financial statements.

3.5 Fee and commission income and expense

Fee and commissions obtained through Firm attribution agreements are recognised when the underlying contract becomes legally binding or at the agreed due date if later.

3.6 Derecognition of financial assets and financial liabilities

Financial assets are derecognised when the contractual right to receive cash flows from the asset has expired, or has been transferred with either of the following conditions met:

a) the Company has transferred substantially all the risks and rewards of ownership of the asset; or

b) the Company has neither retained nor transferred substantially all of the risks and rewards; but has relinquished control of the asset.

Financial liabilities are derecognised when they are extinguished, that is when the obligation is discharged, cancelled or expires.

3. Summary of significant accounting policies (continued)

3.7 Recognition of deferred day one profit and loss

The Company enters into transactions where fair value is determined using valuation models that use significant unobservable inputs. Such a financial instrument is initially recognised at the transaction price, although the value obtained from the relevant valuation model may differ. The difference between the transaction price and the model value, commonly referred to as 'day one profit and loss', is not recognised immediately in the income statement.

The timing of recognition of deferred day one profit and loss is determined for each class of financial asset and liability. It is either amortised over the life of the transaction, deferred until the instrument's fair value can be determined using market observable inputs, or realised through settlement. The financial instrument is subsequently measured at fair value, adjusted for the deferred day one profit and loss.

3.8 Cash and cash equivalents

Cash and cash equivalents include cash and balances at banks with maturities of three months or less.

3.9 Share capital

The share capital of the Company consists of ordinary shares, classified as equity.

3.10 Current income tax

Income tax payable on taxable profits (current tax) is recognised as an expense in the period in which the profits arise. Income tax recoverable on tax allowable losses is recognised as a current tax asset only to the extent that it is regarded as recoverable by offset against taxable profits arising in the current or prior period. Current tax is measured using tax rates and tax laws that have been enacted or substantively enacted at the balance sheet date.

4. Critical accounting estimates and judgements

In the process of applying the Company’s accounting policies, management makes judgements, estimates and assumptions for certain categories of assets and liabilities. These judgements, estimates and assumptions affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the balance sheet date, and the reported amounts of revenue and expenses during the reporting period. Making judgements, estimates and assumptions can involve levels of uncertainty and subjectivity and therefore actual results could differ from the reported amounts. The Company’s significant accounting policies are described in Note 3.

Some of the judgements, estimates and assumptions management makes when preparing the Company’s financial statements involve high levels of subjectivity and assessments about the future and other sources of uncertainty. Those that may have a material impact on the Company’s financial condition, changes in financial condition or results of operations are described below.

Fair value measurement

The Company carries a significant portion of its assets and liabilities at fair value on a recurring basis. Certain financial instruments are classified on the basis of valuation techniques that feature one or more significant market inputs that are unobservable, and for them, the measurement of fair value is more judgemental:

- Judgements:
    - In classifying a financial instrument in the valuation hierarchy judgement is applied in determining whether one or more inputs are observable and significant to the fair value measurement. A financial instrument's categorisation within the valuation hierarchy is based on the lowest level of input that is significant to the fair value measurement.
    - For instruments classified in levels 2 and 3, management judgement must be applied to assess the appropriate models and level of valuation adjustments. Refer to note 11.
- Estimates:
    - Detail on the Company's level 3 financial instruments and the sensitivity of their valuation to the effect of applying reasonable possible alternative assumptions in determining their fair value are set out in note 11.

5. Segmental analysis

Business segments

The Company's activities comprise only one business segment, namely Corporate and Investment Banking services. The Company issues structured notes, of which the majority are issued within EMEA. All fee and commission income is received from JPMorgan Chase undertakings within the EMEA region. Therefore segmental analysis of the Company's revenue and assets by business is not necessary.

Geographical segments

The Company operates in three geographic regions as listed below:

- EMEA (Europe, Middle east and Africa)
- AMERICAS
- APAC (Asia-Pacific)

The following table presents revenues from business activities and total assets by geographic area.

	EMEA		AMERICAS		APAC		Total	
	Unaudited 30 June 2023	Unaudited June 30 2022	Unaudited 30 June 2023	Unaudited June 30 2022	Unaudited 30 June 2023	Unaudited June 30 2022	Unaudited 30 June 2023	Unaudited June 30 2022
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Interest income	133,329	21,088	—	—	—	(1,529)	133,329	19,559
Fees and commissions income	10,865	12,946	—	—	—	—	10,865	12,946

	Unaudited 30 June 2023	31 December 2022	Unaudited 30 June 2023	31 December 2022	Unaudited 30 June 2023	31 December 2022	Unaudited 30 June 2023	31 December 2022
	$'000	$'000	$'000	$'000	$'000	$'000	$'000	$'000
Total assets	14,659,857	17,765,154	4,344,096	4,907,664	7,568,783	9,303,617	26,572,736	31,976,435

6. Financial assets held at fair value through profit and loss

	Unaudited 30 June 2023	31 December 2022
	$'000	$'000
Debt and equity instruments	17,559,175	16,042,357
Derivative receivables	5,585,797	9,390,240
Financial assets held at fair value through profit and loss	**23,144,972**	**25,432,597**

Financial assets held at fair value through profit and loss predominantly represent derivatives and fully funded over the counter ("OTC") financial instruments with other JPMorgan Chase undertakings, see note 11. Credit valuation adjustments (“CVA”) are necessary to reflect counterparty credit quality in the valuation of assets measured at fair value. CVA for the current period for financial assets held at fair value through profit and loss is $ 6.36 million (2022: $0.9 million) which is fully offset by an equal and opposite amount in financial liabilities designated at fair value through profit or loss (Refer note 9 and 10).

7. Trade and other receivables

Trade and other receivables are recognised initially at fair value and subsequently measured at amortised cost using the effective interest method.

	Unaudited 30 June 2023	31 December 2022
	$'000	$'000
Trade and other receivables: amounts falling due after one year		
Amounts owed by JPMorgan Chase undertakings	—	3,500,000
	—	**3,500,000**
Trade and other receivables: amounts falling due within one year		
Trade and other receivables	7,813	9,468
Amounts owed by JPMorgan Chase undertakings	76,395	82,763
	84,208	**92,231**

None of the amounts within trade and other receivables were past due or impaired as at 30 June 2023 and 31 December 2022.

8. Net cash and cash equivalents

Cash and cash equivalents include cash and balances at banks and loans and advances to banks with maturities of three months or less.

	Unaudited 30 June 2023	31 December 2022
	$'000	$'000
Cash held with JPMorgan Chase undertakings	3,285,266	2,888,897
Cash held with third parties	47,386	60,807
	3,332,652	**2,949,704**
Bank overdraft		
Balances due to JPMorgan Chase undertakings	(16,877)	(11,149)
Balances due to third parties	(28,545)	(926)
	(45,422)	**(12,075)**
Net cash and cash equivalents as reported for the period/year	**3,287,230**	**2,937,629**

9. Financial liabilities designated at fair value through profit or loss

	Unaudited 30 June 2023	31 December 2022
	$'000	**$'000**
Structured notes	**17,469,433**	**18,703,642**

Financial liabilities designated at fair value through profit and loss include short term and long term structured notes. In certain instances, the customers have the rights to exercise put options. Other securities include early redemption clauses. As a result, the notes have been disclosed as having a maturity within one year in the table above. The contractual payments associated with the notes issued by the Company are predominantly guaranteed by JPMorgan Chase Bank, N.A. and may be repayable on customer demand. The details of each note are set out in the prospectus for each issuance.

Debit valuation adjustments and funding valuation adjustments are necessary to reflect the credit quality of the Company in the valuation of such liabilities. The directors consider that the Company is fully hedged and that there would, in the normal course of business, be no impact to the results of the Company due to movements in the fair value of the financial liabilities designated at fair value through profit or loss. As such also the relevant concentration risk is minimal.

The cumulative changes in its own credit and funding risk in the financial liabilities designated at fair value through profit or loss and held at fair value through profit and loss for the period ended 30 June 2023 is $6.36 million (31 December 2022: $0.9 million). This is fully offset by an equal and opposite amount in financial assets held at fair value through profit and loss (refer to note 6) leading to $nil impact in income statement.

10. Financial liabilities held at fair value through profit and loss

	Unaudited 30 June 2022	31 December 2022
	$'000	**$'000**
Derivative Payables	**5,675,539**	**6,728,955**

Financial liabilities held at fair value through profit or loss consists of warrants and derivatives.

11. Assets and liabilities measured at fair value

Valuation process

The Company carries a portion of its assets and liabilities at fair value on a recurring basis.

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is based on quoted market prices or inputs, where available. If prices or quotes are not available, fair value is based on valuation models and other valuation techniques that consider relevant transaction characteristics (such as maturity) and use as inputs observable or unobservable market parameters, including yield curves, interest rates, volatilities, prices (such as commodity, equity or debt prices), correlations, foreign exchange rates and credit curves. Valuation adjustments may be made to ensure that financial instruments are recorded at fair value, as described below.

The level of precision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Company believes its valuation methods are appropriate and consistent with those of other market participants, the methods and assumptions used reflect management judgement and may vary across the Company's businesses and portfolios.

The Company uses various methodologies and assumptions in the determination of fair value. The use of different methodologies or assumptions to those used by the Company could result in a different estimate of fair value at the reporting date.

Risk-taking functions are responsible for providing fair value estimates for assets and liabilities carried on the balance sheet at fair value. The Firm's valuation control function, which is part of the Firm's Finance function and independent of the risk-taking functions, is responsible for verifying these estimates and determining any fair value adjustments that may be required to ensure that the Firm's positions are recorded at fair value. The valuation control function verifies fair value estimates provided by the risk-taking functions by leveraging independently derived prices, valuation inputs and other market data, where available.

11. Assets and liabilities measured at fair value (continued)

Valuation process (continued)

Where independent prices or inputs are not available, the Company's valuation control function performs additional review to ensure the reasonableness of the estimates. The additional review may include evaluating the limited market activity including client unwinds, benchmarking valuation inputs to those used for similar instruments, decomposing the valuation of structured instruments into individual components, comparing expected to actual cash flows, reviewing profit and loss trends, and reviewing trends in collateral valuation. There are also additional levels of management review for more significant or complex positions.

Debit valuation adjustments ("DVA") are taken to reflect the credit quality of the Company in the valuation of liabilities measured at fair value. The Company also incorporates the impact of funding in its valuation estimates where there is evidence that a market participant in the principal market would incorporate it in a transfer of the instrument. Credit valuation adjustments (“CVA”) are necessary to reflect counterparty credit quality in the valuation of assets measured at fair value.

Valuation model review and approval

If prices or quotes are not available for an instrument or a similar instrument, fair value is generally determined using valuation models that consider relevant transaction terms such as maturity and use as inputs market-based or independently sourced parameters. The Model Risk Governance and Review function is independent of the model owners and reviews and approves valuation models used by the Company.

Fair value hierarchy

The Company classifies its assets and liabilities according to a valuation hierarchy that reflects the observability of significant market inputs. The three levels are defined as follows:

Level 1 - inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities in active markets.

Level 2 - inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument.

Level 3 - one or more inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument’s categorisation within the valuation hierarchy is based on the lowest level of input that is significant to the fair value measurement.

11. Assets and liabilities measured at fair value (continued)

Valuation methodologies

The following table describes the valuation methodologies used by the Firm to measure its more significant products/ instruments at fair value, including the general classification of such instruments pursuant to the valuation hierarchy.

Product / Instrument	Valuation methodology, inputs and assumptions	Classifications in the valuation hierarchy
Structured notes	• Valuations are based on discounted cash flow analysis that consider the embedded derivative and the terms and payment structure of the note. • The embedded derivative features are considered using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that use observable or unobservable valuation inputs, depending on the embedded derivative. The specific inputs used vary according to the nature of the embedded derivative features, as described in the discussion below regarding derivative valuation. Adjustments are then made to this base valuation to reflect the Firm's own credit risk (DVA).	Level 2 or 3
Equity securities	Quoted market prices are used.	Level 1
Derivatives and fully funded OTC financial instruments	Derivatives that are valued using models such as the Black-Scholes option pricing model, simulation models, or a combination of models, that use observable or unobservable valuation inputs as well as considering the contractual terms. The key valuation inputs used will depend on the type of derivative and the nature of the underlying instruments and may include equity prices, commodity prices, interest rate yield curves, foreign exchange rates, volatilities, correlations, credit default swaps ("CDS") spreads and recovery rates. Additionally, the credit quality of the counterparty and of the Firm's as well as market funding levels may also be considered. In addition, specific inputs used for derivatives that are valued based on models with significant unobservable inputs are as follows: Equity option specific inputs include: • Forward equity price • Equity volatility • Equity correlation • Equity - FX correlation • Equity - IR correlation	Level 2 or 3

The following tables present the assets and liabilities reported at fair value as of 30 June 2023 and 31 December 2022, by major product category and fair value hierarchy.

Assets and liabilities measured at fair value on a recurring basis

	Level 1	Level 2	Level 3	Total
	$'000	**$'000**	**$'000**	**$'000**
Unaudited at 30 June 2023				
Financial assets held at fair value through profit and loss:				
Debt and equity instruments	195,045	8,011,038	9,353,092	17,559,175
Derivative receivables	—	4,982,089	603,708	5,585,797
Total financial assets	**195,045**	**12,993,127**	**9,956,800**	**23,144,972**
Financial liabilities held at fair value through profit and loss:				
Derivatives payables	—	(4,967,507)	(708,032)	(5,675,539)
Financial liabilities designated at fair value through profit or loss:				
Structured notes	—	(8,195,778)	(9,273,655)	(17,469,433)
Total financial liabilities	**—**	**(13,163,285)**	**(9,981,687)**	**(23,144,972)**

11. Assets and liabilities measured at fair value (continued)

Assets and liabilities measured at fair value on a recurring basis (continued)

	Level 1	Level 2	Level 3	Total
	$'000	$'000	$'000	$'000
At 31 December 2022				
Financial assets held at fair value through profit and loss:				
Debt and equity instruments	133,173	8,258,594	7,650,590	16,042,357
Derivative receivables	—	5,948,285	3,441,955	9,390,240
Total financial assets	**133,173**	**14,206,879**	**11,092,545**	**25,432,597**
Financial liabilities held at fair value through profit and loss:				
Derivatives payables	—	(5,439,205)	(1,289,750)	(6,728,955)
Financial liabilities designated at fair value through profit or loss:				
Structured notes	—	(8,960,501)	(9,743,141)	(18,703,642)
Total financial liabilities	**—**	**(14,399,706)**	**(11,032,891)**	**(25,432,597)**

The Company hedges all structured note issuances by entering into hedging transactions with other JPMorgan Chase companies. The hedging transactions can be booked as multiple elements in order to ensure the risk associated with the notes is fully hedged. Each of these elements is classified in the fair value hierarchy in line with the requirements of IFRS 13 'Fair Value Measurement', and as such the fair value hierarchy of the structured notes and hedges can differ.

Level 3 valuations

The Firm has established well structured processes for determining fair value, including for instruments where fair value is estimated using significant unobservable inputs (level 3).

Estimating fair value requires the application of judgement. The type and level of judgement required is largely dependent on the amount of observable market information available to the Company. For instruments valued using internally developed valuation models and other valuation techniques that use significant unobservable inputs are classified within level 3 of the fair value hierarchy, judgements used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate valuation model or other valuation technique to use. Second, due to the lack of observability of significant inputs, management must assess relevant empirical data in deriving valuation inputs including transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, prices (such as commodity, equity or debt prices), valuations of comparable instruments, foreign exchange rates and credit curves.

The following table presents the Company’s primary level 3 financial instruments, the valuation techniques used to measure the fair value of those financial instruments, the significant unobservable inputs, the range of values for those inputs and, for certain instruments, the weighted averages of such inputs. While the determination to classify an instrument within level 3 is based on the significance of the unobservable inputs to the overall fair value measurement, level 3 financial instruments typically include observable components (that is, components that are actively quoted and can be validated to external sources) in addition to the unobservable components.

The range of values presented in the table is representative of the highest and lowest level input used to value the significant groups of instruments within a product/ instrument classification. Where provided, the weighted averages of the input values presented in the table are calculated based on the fair value of the instruments that the input is being used to value.

In the Company’s view, the input range and the weighted average value do not reflect the degree of input uncertainty or an assessment of the reasonableness of the Company’s estimates and assumptions. Rather, they reflect the characteristics of the various instruments held by the Company and the relative distribution of instruments within the range of characteristics. For example, two option contracts may have similar levels of market risk exposure and valuation uncertainty, but may have significantly different implied volatility levels because the option contracts have different underlyings, tenors, or strike prices.

11. Assets and liabilities measured at fair value (continued)

Level 3 valuations (continued)

The input range and weighted average values will therefore vary from period-to-period and parameter to parameter based on the characteristics of the instruments held by the Company at each balance sheet date.

Product/instrument	Asset	Liability	Net fair value	Principal valuation technique	Unobservable input	Range of input values	Average (a)
Unaudited at 30 June 2023	**$'000**	**$'000**	**$'000**				
Derivatives and fully funded OTC financial instruments	9,956,800	(708,032)	9,248,768	Option pricing	Equity correlation	33% - 100%	67%
					Equity - FX correlation	(86)% - 49%	-32%
					Equity - Interest rate correlation	-5% - 5%	-5%
					Equity volatility	13% - 107%	38%
					Interest rate spread volatility	32 bps - 149 bps	76 bps
					FX Derivatives - Interest Rate - FX correlation	0% - 50%	14%
					Interest Rate - FX correlation	(20)% - 20%	0%
					Interest rate correlation	1% - 60%	25%
Structured notes	—	(9,273,655)	(9,273,655)	Option pricing	Equity correlation	33% - 100%	67%
					Equity - FX correlation	(86)% - 49%	-32%
					Equity - Interest rate correlation	-5% - 5%	-5%
					Equity volatility	13% - 107%	38%
					Interest rate spread volatility	32 bps - 149 bps	76 bps
					FX Derivatives - Interest Rate - FX correlation	0% - 50%	14%
					Interest Rate - FX correlation	(20)% - 20%	0%
					Interest rate correlation	1% - 60%	25%
Total	**9,956,800**	**(9,981,687)**	**(24,887)**				

Product/instrument	Asset	Liability	Net fair value	Principal valuation technique	Unobservable input	Range of input values	Average (a)
At 31 December 2022	**$'000**	**$'000**	**$'000**				
Derivatives and fully funded OTC financial instruments	11,092,545	(1,289,750)	9,802,795	Option pricing	Equity correlation	33% - 100%	67%
					Equity - FX correlation	(86)% - 49%	-32%
					Equity - Interest rate correlation	-5% - 5%	-5%
					Equity volatility	13% - 107%	38%
					Interest rate spread volatility	32 bps - 149 bps	76 bps
					FX Derivatives - Interest Rate - FX correlation	0% - 50%	14%
					Interest Rate - FX correlation	(20)% - 20%	0%
					Interest rate correlation	1% - 60%	25%
Structured notes	—	(9,743,141)	(9,743,141)	Option pricing	Equity correlation	33% - 100%	67%
					Equity - FX correlation	(86)% - 49%	-32%
					Equity - Interest rate correlation	-5% - 5%	-5%
					Equity volatility	13% - 107%	38%
					Interest rate spread volatility	32 bps - 149 bps	76 bps
					FX Derivatives - Interest Rate - FX correlation	0% - 50%	14%
					Interest Rate - FX correlation	(20)% - 20%	0%
					Interest rate correlation	1% - 60%	25%
Total	**11,092,545**	**(11,032,891)**	**59,654**				

(a) Amounts represent arithmetic averages.

11. Assets and liabilities measured at fair value (continued)

Level 3 valuations (continued)

The categories presented in the tables have been aggregated based upon the product type, which may differ from their classification on the balance sheet and fair values are shown net.

Given significant economic hedging between derivatives and structured notes, the inputs considered are consistent across both.

Changes in and ranges of unobservable inputs

The following discussion provides a description of the impact on fair value measurement of a change in each unobservable input in isolation, and the interrelationship between unobservable inputs, where relevant and significant. The impact of changes in inputs may not be independent as a change in one unobservable input may give rise to a change in another unobservable input. Where relationships exist between two unobservable inputs, those relationships are discussed below. Relationships may also exist between observable and unobservable inputs (for example, as observable interest rates rise, unobservable prepayment rates decline); such relationships have not been included in the discussion below. In addition, for each of the individual relationships described below, the inverse relationship would also generally apply.

<u>Correlation</u> - Correlation is a measure of the relationship between the movements of two variables. Correlation is a pricing input for a derivative product where the payoff is driven by one or more underlying risks. Correlation inputs are related to the type of derivative due to the nature of the underlying risks. When parameters are positively correlated, an increase in one parameter will result in an increase in the other parameter. When parameters are negatively correlated, an increase in one parameter will result in a decrease in the other parameter. An increase in correlation can result in an increase or a decrease in a fair value measurement. For example, a short correlation position, where volatility increases, in isolation, would generally result in a decrease in a fair value measurement.

<u>Volatility</u> - Volatility is a measure of the variability in possible returns for an instrument, parameter or market index given how much the particular instrument, parameter or index changes in value over time. Volatility is a pricing input for options, including equity options and interest rate options. Generally, the higher the volatility of the underlying, the riskier the instrument. Given a long position in an option, an increase in volatility, in isolation, would generally result in an increase in a fair value measurement.

Fair value of financial instruments valued using techniques that incorporate unobservable inputs

Price risk from the issued instruments is matched by entering into equal and offsetting OTC financial transactions with other JPMorgan Chase companies so that any price risk is effectively hedged. As at 30 June 2022, the use of alternative inputs would not change the results of the Company. Consequently, no sensitivity analysis for level 3 financial instruments is disclosed.

11. Assets and liabilities measured at fair value (continued)

Level 3 valuations (continued)

Movement in assets and liabilities in Level 3 during six month period ended 30 June 2023 (unaudited)

Financial assets	Debt & Equity Instrument	Derivative receivables	Total financial assets
	$'000	$'000	$'000
At 1 January	**7,650,590**	**3,441,955**	**11,092,545**
Total loss recognised in income statement *	(127,807)	(406,330)	(534,137)
Purchases	4,153,267	549,838	4,703,105
Settlements	(2,362,423)	(2,475,407)	(4,837,830)
Transfers in to level 3	179,760	259,369	439,129
Transfers out of level 3	(140,295)	(765,717)	(906,012)
At 30 June	**9,353,092**	**603,708**	**9,956,800**
Change in unrealised gain related to financial instruments held at 30 June*	**214,288**	**29,370**	**243,658**

Financial liabilities	Derivative payables	Financial liabilities designated at FVTPL	Total financial liabilities
	$'000	$'000	$'000
At 1 January	**1,289,750**	**9,743,141**	**11,032,891**
Total (gain)/loss recognised in income statement *	(242,227)	286,093	43,866
Purchases	393,181	—	393,181
Issuances	—	4,065,075	4,065,075
Settlements	(565,683)	(4,886,591)	(5,452,274)
Transfers in to level 3	2,142	110,015	112,157
Transfers out of level 3	(169,131)	(44,078)	(213,209)
At 30 June	**708,032**	**9,273,655**	**9,981,687**
Change in unrealised loss related to financial instruments held at 30 June *	**32,798**	**234,863**	**267,661**

11. Assets and liabilities measured at fair value (continued)

Level 3 valuations (continued)

Movement in assets and liabilities in Level 3 during year ended 31 December 2022

Financial assets	Debt & Equity Instrument	Derivative receivables	Total financial assets
	$'000	$'000	$'000
At 1 January	**10,111,063**	**2,256,652**	**12,367,715**
Total loss recognised in income statement *	(1,566,674)	(1,128,525)	(2,695,199)
Purchases	6,901,565	2,507,337	9,408,902
Settlements	(7,797,989)	(169,211)	(7,967,200)
Transfers in to level 3	340,044	20,639	360,683
Transfers out of level 3	(337,419)	(44,937)	(382,356)
At 31 December	**7,650,590**	**3,441,955**	**11,092,545**
Change in unrealised gain related to financial instruments held at 31 December*	**(143,929)**	**(187,762)**	**(331,691)**

Financial liabilities	Derivative payables	Financial liabilities designated at FVTPL	Total financial liabilities
	$'000	$'000	$'000
At 1 January	**1,044,812**	**11,326,631**	**12,371,443**
Total gain recognised in income statement *	(592,423)	(1,423,067)	(2,015,490)
Purchases	1,468,892	—	1,468,892
Issuances	—	8,224,947	8,224,947
Settlements	(573,662)	(8,470,124)	(9,043,786)
Transfers in to level 3	1,100	325,908	327,008
Transfers out of level 3	(58,969)	(241,154)	(300,123)
At 31 December	**1,289,750**	**9,743,141**	**11,032,891**
Change in unrealised loss related to financial instruments held at 31 December *	**185,349**	**(521,807)**	**(336,458)**

* As explained above, the Company's hedging transactions are booked as multiple elements in order to ensure the risk associated with the notes is fully hedged, and as such the levelling of the structured notes and hedges can differ. The gain recognised in the income statement as a result of changes in fair value related to level 3 financial instruments, including any changes to unrealised gain is offset by an equal and opposite impact as a result of changes in fair value of the related hedging instruments that are classified across multiple fair value levels.

11. Assets and liabilities measured at fair value (continued)

Transfers between levels for instruments carried at fair value on a recurring basis

For the period ended 30 June 2023 and 31 December 2022, there were no transfers between levels 1 and 2.

For the period ended 30 June 2023, transfers from level 2 to level 3 included the following:

- $439 million of assets driven by reduction in observability of derivatives and fully funded OTC financial instruments.
- $112 million of liabilities driven by a reduction in observability of structured notes.

For the period ended 30 June 2023, transfers from level 3 to level 2 included the following:

- $906 million of assets driven by increase in observability of derivatives and fully funded OTC financial instruments.
- $213 million of liabilities driven by increase in observability of structured notes.

During the year ended 31 December 2022, transfers from level 2 to level 3 included the following:

- $361 million of assets driven by reduction in observability of derivatives and fully funded OTC financial instruments.
- $327 million of liabilities driven by a reduction in observability of structured notes.

During the year ended 31 December 2022, transfers from level 3 to level 2 included the following:

- $382 million of assets driven by increase in observability of derivatives and fully funded OTC financial instruments.
- $300 million of liabilities driven by increase in observability of structured notes.

All transfers are assumed to occur at the beginning of the period in which they occur.

Fair value of financial instruments not carried on balance sheet at fair value

Certain financial instruments that are not carried at fair value on balance sheet are carried at amounts that approximate fair value, due to their short term nature and generally negligible credit risk. These instruments include trade and other receivables, cash and cash equivalents, trade and other payables and bank overdraft.

The company has $3,416.9 million (31 December 2022: $6,541.9 million) of financial assets and $2,809.2 million (31 December 2022: $5,937.0 million) of current financial liabilities that are not measured at fair value. Given the short-term nature of these instruments, their carrying amounts in the balance sheet are a reasonable approximation of fair value.

Offsetting financial assets and financial liabilities

No financial assets and liabilities have been offset in the balance sheet as at 30 June 2023 (31 December 2022: $nil).

Financial instruments, recognised within financial assets and liabilities held at fair value through profit and loss, which were subject to master netting arrangements or other similar agreements but not offset, as at 30 June 2023, amounted to $5,164.0 million (31 December 2022: $6,260.5 million).

12. Trade and other payables

Trade and other payables are recognised initially at fair value and subsequently measured at amortised cost using the effective interest method.

	Unaudited 30 June 2023	31 December 2022
	$'000	**$'000**
Trade and other payables: amounts falling due after one year		
Amounts owed to JPMorgan Chase undertakings	500,000	—
	500,000	**—**
Trade and other payables:amounts falling due within one year		
Trade payables	85,979	25,417
Amounts owed to JPMorgan Chase undertakings	2,177,797	5,899,481
	2,263,776	**5,924,898**

Current period trade and other payables predominantly consist of variation margin received from other JPMorgan Chase undertakings.

13. Share capital

	Unaudited 30 June 2023	31 December 2022
	€'000	**€'000**
Authorised share capital		
90,000 (2022: 90,000) Ordinary shares of €1.00 each	**90**	**90**

	Unaudited 30 June 2023	31 December 2022
	$'000	**$'000**
Issued and fully paid share capital		
20,000 (2022: 20,000) Ordinary shares of €1.00 each	**26**	**26**

In accordance with the requirements of Article 373 Book 2 of the Dutch Civil Code, the Company holds an amount of $2,000 in a legal reserve in respect of revaluation of the Euro denominated share capital. There has been no change in the amount of authorised share capital during the period.

14. Operating profit/(loss)

Included in trading profit are net gains/(losses) from financial liabilities designated at FVTPL and financial assets and liabilities held at FVTPL:

	Unaudited 30 June 2023	Unaudited 30 June 2022
	$'000	$'000
Net (loss)/gain on financial liabilities designated at FVTPL	(660,421)	2,601,462
Net gain/(loss) on financial assets and liabilities mandatory at FVTPL	660,421	(2,601,462)
	—	—

All fee and commission income is received from other JPMorgan Chase undertakings.

All fee and commission expense is paid by other JPMorgan Chase undertakings and reimbursed by the Company.

15. Interest income and expenses

All interest income and expenses are from financial instruments held at amortised cost, which are receivable from or due to JPMorgan Chase undertakings respectively.

16. Income tax expense

	Unaudited 30 June 2023	Unaudited 30 June 2022
	$'000	$'000
Income tax expense:		
Current tax	4,048	849
Adjustment in respect of previous period	—	—
Tax on profit on ordinary activities	**4,048**	**849**
Profit for the period before tax	**15,749**	**3,470**
Tax calculated at applicable tax rates	4,048	849
Adjustments in respect of previous period	—	—
Income tax expense	**4,048**	**849**

The standard tax rate in the Netherlands is 25.8% (2022: 25.8%). A tax rate of 19% (2022: 15%) is applied to the first €200,000 (2022: €395,000).

17. Financial risk management

Risk is an inherent part of the Company's business activities. The Company's overall objective is to manage its businesses, and the associated risks, in a manner that balances serving the interests of its clients, customers and investors and protecting the safety and soundness of the Company.

JPMorgan Chase and the Company believe that effective risk management requires, among other things:

- Acceptance of responsibility, including identification and escalation of risks by all individuals within the Company;
- Ownership of risk identification, assessment, data and management within each of the lines of business ("LOB") and Corporate; and
- Firmwide risk governance and oversight structure.

JPMorgan Chase's risk governance structure is based on the principle that each LOB is responsible for managing the risk inherent in its business, albeit with appropriate corporate oversight. Each LOB risk committee is responsible for decisions regarding its business risk strategy, policies (as appropriate) and controls. Therefore, each LOB within the Company forms part of the Firmwide risk governance structure. The Company exercises oversight through the Board of Directors which are aligned to the Firm risk management framework and regulatory requirements.

The following sections outline the key financial risks that are inherent in the Company's business activities.

Credit risk

Credit risk is the risk associated with the default or change in credit profile of a client, counterparty or customer. Credit risk management monitors, measures and manages credit risk throughout the Firm and defines credit risk policies and procedures. The credit risk function reports to the Firm's Chief Risk Officer ("CRO").

Expected credit loss measurement

Approach to measuring expected credit losses

The Company estimates credit impairment through an allowance for expected credit losses ("ECLs"). ECLs are recognised for financial assets that are measured at amortised cost. The measurement of ECLs must reflect:

(a) An unbiased and probability weighted amount that is determined by evaluating a range of possible outcomes;

(b) The time value of money; and

(c) Reasonable and evidence-based information about past events, current (economic) conditions, and forecasts of future economic conditions.

The measurement of ECL also reflects how the Company manages the financial instruments it uses for credit risk purposes such as Traditional Credit Products ("TCP"), and non-traditional credit products ("Non-TCP"). The Company does not hold any TCP instruments. Non-TCP consist of financial assets measured at amortised cost which include trade and other receivables and cash instruments.

The following table sets out the balances of the Company's financial assets that are measured at amortised cost within the Non-TCP category:

	Non-TCP	
Balance sheet categories	**June 2023**	**Dec 2022**
	$'000	**$'000**
Assets		
Trade and other receivables	84,208	3,592,231
Cash and cash equivalents	3,332,652	2,949,704

For Non-TCPs, the Company utilises a combination of an established provision matrix, as well as quantitative and qualitative considerations to estimate ECLs.

During the period, the Company did not recognise any ECL on Non-TCP balances as the ECL related to these exposures is assessed as immaterial. The Company's approach to measuring ECLs for Non-TCP portfolios depends on the type of instrument. Refer to the Credit exposures section below for an analysis per balance sheet line item.

17. Financial risk management (continued)

Credit risk (continued)

Credit exposures

Balance sheet exposure by financial asset

The table below presents the Company's gross balance sheet exposure to financial assets without taking account of any collateral or economic hedges in place.

	June 2023	Dec 2022
	$'000	$'000
Financial assets held at fair value through profit and loss	22,949,927	25,299,424
Trade and other receivables	84,208	3,592,231
Cash and cash equivalents	3,332,652	2,949,704
	26,366,787	**31,841,359**

Included within the above assets, are balances held with other JPMorgan Chase undertakings of $26,309 million (2022: $31,743 million).

Financial assets held at fair value through profit and loss does not include equity securities captured under market risk.

The Company's credit exposures and credit risk mitigants are further described below. As no material ECL allowance is recognised on Non-TCP financial assets, refer below for further discussion.

Trade and other receivables

Trade and other receivables mainly consist of amounts due from brokers/dealers such as failed sales, unsettled cash and amounts due from JPMorgan Chase undertakings.

Failed sale receivables generally have minimal credit risk due to the low probability of default of a clearing organisation default and failure to deliver, the short-term nature of receivables related to securities settlements which are predominately on a delivery versus payment basis.

Unsettled cash receivables relate to cash collateral paid to counterparties in respect of derivative financial instruments. Margin posted in cash is reflected as a receivable from the counterparty and is carried at amortised cost. The Company includes these receivables in Stage 1 due to the robust multi-layered credit protection inherent in the design and operations of the margin posted model.

The majority of amounts due from JPMorgan Chase undertakings are with a borrower who is a Material Legal Entity ("MLE"). As MLEs are adequately capitalised to ensure the MLE can fulfil all of its obligations even in the event of an orderly liquidation of JPMorgan Chase, and are of investment grade, these intercompany receivables are included in Stage 1 as they are held with MLEs and considered to not have an increase in credit risk that would result in material expected credit losses. Receivables from MLEs would only be included in Stage 2 if the obligor is no longer considered an MLE and there is evidence of credit deterioration of the obligor, or if certain support triggers defined in the JPMorgan Chase's Resolution Plan occur. Receivables from MLEs are not credit-impaired as the Firm ensures MLEs are more than adequately capitalised as required by the Firms Resolution Plan. The Company recognises no allowance on these balances.

Cash and cash equivalents

The Company places substantially all of its deposits with banks which are of investment-grade. The Company includes cash and cash equivalents in Stage 1 as investment-grade institutions are considered to have high quality credit with low risk of default and therefore a significant increase in credit risk is not deemed probable or material. The Company recognises no allowance on these balances.

17. Financial risk management (continued)

Liquidity risk

Liquidity risk is the risk that the Company will be unable to meet its contractual and contingent financial obligations as they arise or that it does not have the appropriate amount, composition and tenor of funding and liquidity to support its assets and liabilities.

Liquidity risk management

The Firm has a Liquidity Risk Management ("LRM") function whose primary objective is to provide independent oversight of liquidity risk across the Firm. LRM's responsibilities include, but are not limited to:

- Defining, monitoring and reporting liquidity risk metrics;
- Independently establishing and monitoring limits and indicators including liquidity risk appetite;
- Developing a process to classify, monitor and report limit breaches;
- Performing an independent review of liquidity risk management processes to evaluate their adequacy and effectiveness based on the LRM's Independent Review Framework;
- Monitoring and reporting internal Firmwide and legal entity liquidity stress tests, regulatory defined metrics, as well as liquidity positions, balance sheet variances, and funding activities; and
- Approving or escalating for review new or updated liquidity stress assumptions.

Liquidity management

Treasury and CIO is responsible for liquidity management. The primary objectives of the Firm's liquidity management are to:

- Ensure that the Firm's core businesses and material legal entities are able to operate in support of client needs and meet contractual and contingent financial obligations through normal economic cycles as well as during stress events, and
- Manage an optimal funding mix, and availability of liquidity sources.

As part of the Firm's overall liquidity management strategy, the Firm manages liquidity and funding using a centralised, global approach designed to:

- Optimise liquidity sources and uses;
- Monitor exposures;
- Identify constraints on the transfer of liquidity between the Firm's legal entities; and
- Maintain the appropriate amount of surplus liquidity at a Firmwide and legal entity level, where relevant.

In the context of the Firm's liquidity management, Treasury and Chief Investment Office ("T/CIO") is responsible for:

- Analysing and understanding the liquidity characteristics of the assets and liabilities of the Firm, lines of business and legal entities, taking into account legal, regulatory, and operational restrictions;
- Developing internal liquidity stress testing assumptions;
- Defining and monitoring Firmwide and legal entity-specific liquidity strategies, policies, reporting and contingency funding plans;
- Managing liquidity within the firm's approved liquidity risk appetite tolerances and limits;
- Managing compliance with regulatory requirements related to funding and liquidity risk; and
- Setting funds transfer pricing (FTP) in accordance with underlying liquidity characteristics of balance sheet assets and liabilities as well as certain off-balance sheet items.

The Company's issuances are economically hedged with the OTC transactions with other JPMorgan Chase undertakings. To the extent that settlement-related timing differences between issuances and the OTC hedge may result in funding requirements, these are funded by other Firm companies involved in the transactions. The contractual payments associated with the notes issued by the Company are predominantly guaranteed by other JPM Affiliates.

17. Financial risk management (continued)

Liquidity risk (continued)

The following table provides details on the maturity of all financial liabilities.

	June 2023 More than 1 year	June 2023 Less than 1 year	Dec 2022 Less than 1 year
	$'000	$'000	$'000
Financial liabilities designated at fair value through profit or loss	—	17,469,433	18,703,642
Financial liabilities held at fair value through profit and loss	—	5,675,539	6,728,955
Bank overdraft	—	45,422	12,075
Trade and other payables	500,000	2,263,776	5,924,898
	500,000	**25,454,170**	**31,369,570**

Included with the above liabilities, the balances held with other JPMorgan Chase undertakings are $10,216 million (2022: $14,549 million).

Market risk

Market Risk is the risk associated with the effect of changes in market factors such as interest and foreign exchange rates, equity and commodity prices, credit spreads or implied volatilities, on the value of assets and liabilities held for both the short and long term.

Where the Company is exposed to market risk it is managed as part of the Enterprise-wide Market Risk management framework.

Interbank offered rate ("IBOR") Transition

The Financial Stability Board ("FSB") and the Financial Stability Oversight Council (“FSOC”) have observed that the secular decline in interbank short-term funding poses structural risks for unsecured benchmark interest rates such as Interbank Offered Rates (“IBORs”), and therefore regulators and market participants in various jurisdictions identified alternative reference rates that are compliant with the International Organization of Securities Commission’s standards for transaction-based benchmarks.

On 5 March 2021, the Financial Conduct Authority (“FCA”) confirmed the delay to the cessation of the principal tenors of U.S. dollar LIBOR (i.e., overnight, one-month, three-month, six-month and 12-month LIBOR) until 30 June 2023.

Cessation of non-USD LIBOR settings occurred at the end of 2021 with “synthetic” 1-, 3-, 6-month U.K. sterling and Japanese yen LIBOR rates published on a non-representative basis for use in all legacy LIBOR contracts, other than cleared derivatives, that had not been transitioned to replacement rates by 1 January 2022. The use of these synthetic LIBORs, allowed market participants additional time to complete their transition to replacement rates or otherwise to reduce their exposure to contracts that do not have robust fallback mechanisms and that are difficult to amend.

The Firm established a Firmwide LIBOR Transition program in early 2018. The Firmwide CFO and the CEO of the Corporate & Investment Bank (“CIB”) oversee the program as senior sponsors. Following non-USD LIBOR cessation, in 2022 the Firm successfully transitioned substantially all of its remaining non-USD LIBOR referencing contracts to alternative benchmark rates by way of industry standard fallback language. For those contracts which utilised “synthetic” UK sterling or Japanese yen settings the Firm has either proactively remediated the contract or the contract will mature prior to the cessation date of the rates as confirmed by the FCA on 23 November 2022.

The Firm has made significant progress towards reducing its exposure to U.S. dollar LIBOR referencing contracts, including in derivatives, bilateral and syndicated loans, securities, and debt and preferred stock issuances, and is on-track to meet its internal milestones for contract remediation as well as the industry milestones and recommendations published by National Working Groups. In connection with the transition from U.S. dollar LIBOR, as of 31 December 2022 the Firm had remediated substantially all of the notional amount of its bilateral derivatives contracts linked to U.S. dollar LIBOR, and continues its client outreach with respect to U.S. dollar LIBOR linked loans. The Firm delivered its planned conversion of cleared derivatives referencing U.S. dollar LIBOR during the second quarter of 2023.

17. Financial risk management (continued)

Market risk (continued)

Interbank offered rate ("IBOR") Transition (continued)

The Federal Reserve, the OCC and the FDIC and the FCA encouraged banks to cease entering into new contracts that use U.S. dollar LIBOR as a reference rate by 31 December 2021, and in connection with this, the Firm now offers various floating rate products, and provides and arranges various types of floating rate debt financings, that reference the Secured Overnight Financing Rate ("SOFR") across its businesses. The Firm continued to engage with clients in relation to U.S. dollar LIBOR transition in 2022 and will continue to support clients as they transition to SOFR in 2023.

On 27 August 2020, the International Accounting Standards Board ("IASB") issued guidance that provides practical expedients to contracts and hedge accounting relationships affected by the reference rate reform. These practical expedients are intended to simplify the operational impact of applying existing IFRS requirements to transactions impacted by the reference rate reform, and the Company applied the practical expedients from 1 January 2021.

The Company follows the Firm's transition plan and the table below shows the outstanding principal amounts of non-derivative financial instruments and the gross notional values of derivative financial instruments held by the Company as of 30 June 2023 and 31 December 2022, respectively, that are subject to IBOR reform that have yet to transition. The table includes financial instruments with a contractual maturity date later than the relevant agreed IBOR cessation date and includes contracts that have been changed to incorporate the new alternative reference rates but which have yet to become effective as of 30 June 2023 and 31 December 2022 respectively. Substantially all of these contracts have fallback mechanisms that will transition the IBOR-referencing contracts to the new alternative reference rates at the next fixing date subsequent to the relevant cessation date.

As at 30 June 2023 (unaudited)	**USD LIBOR**	**USD ICE Swap Rate/CMS**	**Multiple basis [1]**
	$'000	**$'000**	**$'000**
Non-derivative financial liabilities (outstanding principal amount):			
Debt issuance	228,010	1,057,520	285,200
Total non-derivative financial liabilities	**228,010**	**1,057,520**	**285,200**
Derivative financial instruments (gross notional value [2])			
Interest rate derivatives - OTC (Intercompany)	33,450	642,560	—
Total derivative financial instruments	**33,450**	**642,560**	**—**

[1] Multiple basis rates to underlying contracts utilising multiple benchmarks subject to reform
[2] Represents the sum of gross long and gross short notional derivative contracts

17. Financial risk management (continued)

Market risk (continued)

Interbank offered rate ("IBOR") Transition (continued)

As at 31 December 2022	USD LIBOR	Multiple basis [1]
	$'000	$'000
Non-derivative financial liabilities (outstanding principal amount):		
Debt issuance	164,630	297,600
Total non-derivative financial liabilities	**164,630**	**297,600**
Derivative financial instruments (gross notional value [2])		
Interest rate derivatives - OTC (Intercompany)	164,630	297,600
Total derivative financial instruments	**164,630**	**297,600**

[1] Multiple basis rates to underlying contracts utilising multiple benchmarks subject to reform
[2] Represents the sum of gross long and gross short notional derivative contracts

18. Managed capital

Total equity of $618.6 million (2022: $606.9 million) constitutes the managed capital of the Company, which consists entirely of issued share capital, share premium reserve, legal reserve and retained earnings.

The directors are responsible for setting the objectives, policies and processes relating to the management of the Company's capital and maintain a set of policy documents to assist in discharging their responsibilities.

The Company is not subject to any externally imposed capital requirements.

19. Related party transactions

Related parties comprise:

(a) Directors and shareholders of the Company and companies in which they have an ownership interest;

(b) Other JPMorgan Chase undertakings.

None of the Directors received remuneration from the Company during the period (2022: $nil). The Company did not employ any staff in 2023 or 2022.

The Company's parent undertaking is detailed in note 1. There were no transactions with the parent undertaking during the period.

19. Related party transactions (continued)

Related party transactions, outstanding balances at period end, and income and expenses for the period, all related to normal business activities at arm's length, are as follows:

(i) Outstanding balances at period end

	Unaudited JPMorgan Chase undertakings 30 June 2023	JPMorgan Chase undertakings 31 December 2022
	$'000	$'000
Financial assets held at fair value through profit and loss	22,947,740	25,271,206
Trade and other receivables	76,395	3,582,763
Cash and cash equivalents	3,285,266	2,888,897
Financial liabilities held at fair value through profit and loss	(5,170,324)	(6,260,251)
Financial liabilities designated at fair value through profit or loss	(2,350,550)	(2,378,553)
Trade and other payables	(2,677,797)	(5,899,481)
Bank overdraft	(16,877)	(11,149)

(ii) Income and expenses

	Unaudited JPMorgan Chase undertakings 30 June 2023	Unaudited JPMorgan Chase undertakings 30 June 2022
	$'000	$'000
Net gain/(loss)	456,270	(2,267,069)
Fees and commission income	10,865	12,946
Net Interest income	15,905	3,088

20. Proposed appropriation of net results

Management propose to appropriate the current period profit to the retained earnings. No dividend was paid or proposed during the period (2022: $nil).

By order of the Board of Directors

S.E.J. Ruigrok

J.C.P. van Uffelen

Date: 19 September 2023

Other Information

Profit appropriation according to the Articles of Association

Article 20 Chapter VIII of The Articles of Association of the Company require that the allocation of profits be determined in a general meeting of the shareholders. The Management Board may resolve to pay interim dividends up to an amount which does not exceed the amount of the distributable part of the net assets. Dividends shall be paid after adoption of the annual financial statements from which it appears that payment of dividends is permissible.

INFORMATION RELATING TO THE GUARANTOR

History, Development and Organisational Structure

JPMorgan Chase Bank, National Association ("**JPMorgan Chase Bank, N.A.**") is a wholly-owned bank subsidiary of JPMorgan Chase & Co. ("**JPMorgan Chase**"), which is a leading financial services firm based in the United States of America ("**U.S.**"), with operations worldwide. JPMorgan Chase Bank, N.A.'s main office is located in Columbus, Ohio, and it has U.S. branches in 48 states and Washington, D.C. as of 31 December 2023. JPMorgan Chase Bank, N.A. operates throughout the U.S. as well as through non-U.S. bank branches and subsidiaries, representative offices and subsidiary foreign banks. JPMorgan Chase Bank, N.A. either directly or through such branches, subsidiaries and offices offers a wide range of banking services to its U.S. and non-U.S. customers, including investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. Under the J.P. Morgan and Chase brands, JPMorgan Chase Bank, N.A. serves millions of customers, predominantly in the U.S., and many of the world's most prominent corporate, institutional and government clients globally. JPMorgan Chase Bank, N.A.'s principal operating subsidiaries outside of the U.S. are J.P. Morgan Securities plc, and J.P. Morgan SE which are based in the United Kingdom and Germany respectively.

JPMorgan Chase Bank, N.A. is a national banking association organised under U.S. federal law. JPMorgan Chase Bank, N.A. was initially organised as a New York banking corporation on 26 November 1968, and converted into a national banking association on 13 November 2004. JPMorgan Chase Bank, N.A. is chartered and its business is subject to examination and regulation by the Office of the Comptroller of the Currency (the "**OCC**"), a bureau of the U.S. Department of the Treasury. JPMorgan Chase Bank, N.A. is a member of the U.S. Federal Reserve System and its U.S. domestic deposits are insured by the Federal Deposit Insurance Corporation (the "**FDIC**"). Its U.S. Federal Reserve Bank Identification Number is 852218.

The powers of JPMorgan Chase Bank, N.A. are set forth in the U.S. National Bank Act and include all such incidental powers as shall be necessary to carry on the business of banking; by discounting and negotiating promissory notes, drafts, bills of exchange, and other evidences of debt; by receiving deposits; by buying and selling exchange, coin, and bullion; by loaning money on personal security; and by obtaining, issuing, and circulating notes.

The registered office of JPMorgan Chase Bank, N.A. is located at 1111 Polaris Parkway, Columbus, Ohio 43240, U.S.A. JPMorgan Chase Bank, N.A.'s principal place of business is located at 383 Madison Avenue, New York, New York 10179, U.S.A. and its telephone number is +1 212 270 2479.

Principal Activities and Principal Markets

JPMorgan Chase Bank, N.A.'s activities are organised and integrated with the businesses of JPMorgan Chase and consequently JPMorgan Chase Bank, N.A. is dependent on JPMorgan Chase (including subsidiaries of JPMorgan Chase & Co. and JPMorgan Chase Bank, N.A.) to conduct its business. A description of these businesses, and the products and services they provide to their respective client bases, follows.

Consumer & Community Banking

Consumer & Community Banking ("**CCB**") offers products and services to consumers and small businesses through bank branches, automated teller machines, digital (including mobile and online) and telephone banking. CCB is organized into Banking & Wealth Management (including Consumer Banking, J.P. Morgan Wealth Management and Business Banking), Home Lending (including Home Lending Production, Home Lending Servicing and Real Estate Portfolios) and Card Services & Auto. Banking & Wealth Management offers deposit, investment and lending products, cash management, payments and services. Home Lending includes mortgage origination and servicing activities, as well as portfolios consisting of residential mortgages and home equity loans. Card Services issues credit cards and offers travel services. Auto originates and services auto loans and leases.

Corporate & Investment Bank

The Corporate & Investment Bank ("**CIB**"), which consists of Banking and Markets & Securities Services, offers a broad suite of investment banking, market-making, prime brokerage, lending, and treasury and securities products and services to a global client base of corporations, investors, financial institutions, merchants, government and municipal entities. Banking offers a full range of investment banking products and services in all major capital markets, including advising on corporate strategy and structure, capital-raising in equity and debt markets, as well as loan origination and syndication. Banking also includes Payments, which provides services, that enable clients to manage payments globally across liquidity and account solutions, commerce solutions, clearing, trade and working capital. Markets & Securities Services includes Markets, a global market-maker across products, including cash and derivative instruments, which also offers sophisticated risk management solutions, prime brokerage, clearing and research. Markets & Securities Services also includes Securities Services, a leading global custodian which provides custody, fund accounting and administration, and securities lending products principally for asset managers, insurance companies and public and private investment funds.

Commercial Banking

Commercial Banking ("**CB**") provides comprehensive financial solutions, including lending, payments, investment banking and asset management products across three primary client segments: Middle Market Banking, Corporate Client Banking and Commercial Real Estate Banking. Other includes amounts not aligned with a primary client segment. Middle Market Banking covers small and midsized companies, local governments and nonprofit clients. Corporate Client Banking covers large corporations. Commercial Real Estate Banking covers investors, developers, and owners of multifamily, office, retail, industrial and affordable housing properties.

Asset & Wealth Management

Asset & Wealth Management ("**AWM**"), with client assets of $5.0 trillion, is a global leader in investment and wealth management.

Asset Management offers multi-asset investment management solutions across equities, fixed income, alternatives and money market funds to institutional and retail investors providing for a broad range of clients' investment needs.

Global Private Bank provides retirement products and services, brokerage, custody, estate planning, lending, deposits and investment management to high net worth clients. The majority of AWM's client assets are in actively managed portfolios.

Corporate

The Corporate segment consists of Treasury and Chief Investment Office ("**CIO**") and Other Corporate. Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing JPMorgan Chase's liquidity, funding, capital, structural interest rate and foreign exchange risks. Other Corporate includes staff functions and expense that is centrally managed as well as certain JPMorgan Chase initiatives and activities not solely aligned to a specific line of business ("**LOB**"). The major Other Corporate functions include Real Estate, Technology, Legal, Corporate Finance, Human Resources, Internal Audit, Risk Management, Compliance, Control Management, Corporate Responsibility and various other Corporate groups.

Executive Officers and Directors

Executive Officers

The following persons are the Executive Officers of JPMorgan Chase Bank, N.A. as at 31 December 2023. The business address of each Executive Officer is 383 Madison Avenue, New York, New York 10179, U.S.A.

Name	Title
James Dimon	Chief Executive Officer and President
Ashley Bacon	Chief Risk Officer
Jeremy Barnum	Chief Financial Officer
Lori A. Beer	Chief Information Officer
Mary Callahan Erdoes	Chief Executive Officer of Asset & Wealth Management
Stacey Friedman	General Counsel
Marianne Lake	Co-Chief Executive Officer of Consumer & Community Banking
Robin Leopold	Head of Human Resources
Douglas B. Petno	Chief Executive Officer of Commercial Banking
Jennifer A. Piepszak	Co-Chief Executive Officer of Consumer & Community Banking
Daniel E. Pinto	President and Chief Operating Officer and Chief Executive Officer of Corporate & Investment Bank
Peter L. Scher	Vice Chair

Directors

The following persons are the members of the Board of Directors of JPMorgan Chase Bank, N.A. as at 31 December 2023. The business address of each Director is JPMorgan Chase Bank, N.A., 383 Madison Avenue, New York, New York 10179, U.S.A.

Name	Principal Occupation
Linda B. Bammann	Retired Deputy Head of Risk Management of JPMorgan Chase & Co.
Stephen B. Burke, Non-Executive Chairman of the Board	Retired Chairman and Chief Executive Officer of NBCUniversal, LLC
Todd A. Combs	President and Chief Executive Officer of GEICO and Investment Officer at Berkshire Hathaway Inc.
Alicia Boler Davis	Chief Executive Officer of Alto Pharmacy, LLC
James Dimon	Chairman of the Board and Chief Executive Officer of JPMorgan Chase & Co.
Timothy P. Flynn	Retired Chairman and Chief Executive Officer of KPMG International
Alex Gorsky	Retired Chairman and Chief Executive Officer of Johnson & Johnson
Mellody Hobson	Co-Chief Executive Officer and President of Ariel Investments, LLC
Michael A. Neal	Retired Vice Chairman of General Electric Company and Retired Chairman and Chief Executive Officer of GE Capital
Phebe N. Novakovic	Chairman and Chief Executive Officer of General Dynamics Corporation
Virginia M. Rometty	Retired Executive Chairman, President and Chief Executive Officer of International Business Machines Corporation

On January 16, 2024, JPMorgan Chase announced that Mark Weinberger, 62, had been elected to its Board of Directors, effective immediately. He will also serve as a member of the Board's Audit Committee. Mr. Weinberger served as the Global Chairman and Chief Executive Officer of Ernst & Young from 2013 to 2019.

Financial Information

JPMorgan Chase Bank, N.A. prepares annual and semiannual consolidated financial statements in accordance with accounting principles generally accepted in the U.S. ("**U.S. GAAP**"). Additionally, where applicable, the accounting and financial reporting policies of JPMorgan Chase Bank, N.A. conform to the accounting and reporting guidelines prescribed by the U.S. bank regulatory authorities. The audited consolidated financial statements of JPMorgan Chase Bank, N.A. as at and for the year ended 31 December 2023 comprising consolidated balance sheets at 31 December 2023 and 2022 and the related consolidated statements of income, changes in stockholder's equity, comprehensive income and cash flows for each of the three years ended 31 December 2023 are included in this base listing document. In addition, JPMorgan Chase Bank, N.A.'s annual and semiannual consolidated financial statements, as they become available, can be viewed on the websites of the Luxembourg Stock Exchange (*www.luxse.com*), the U.K. National Storage Mechanism (*www.morningstar.co.uk/uk/nsm*) and Euronext

Dublin (*www.ise.ie*), and on the Investor Relations section of JPMorgan Chase's website (*https://jpmorganchaseco.gcs-web.com/ir/sec-other-filings/financial-statements*). JPMorgan Chase Bank, N.A. files quarterly Consolidated Reports of Condition and Income for A Bank With Domestic and Foreign Offices ("**Call Reports**") with the U.S. Federal Financial Institutions Examination Council (the "**FFIEC**"). The non-confidential portions of the Call Reports can be viewed on the FFIEC's website at *https://cdr.ffiec.gov/public/*. The Call Reports are prepared in accordance with regulatory instructions issued by the FFIEC and not U.S. GAAP. The Call Reports are supervisory and regulatory documents; they are not primarily accounting documents, do not conform with U.S. GAAP and do not provide a complete range of financial disclosure about JPMorgan Chase Bank, N.A. The Call Reports are not incorporated by reference in, and shall not be deemed to be part of, this base listing document.

Risk Management

Risk is an inherent part of JPMorgan Chase's business activities. When JPMorgan Chase extends a consumer or wholesale loan, advises customers and clients on their investment decisions, makes markets in securities, or offers other products or services, JPMorgan Chase takes on some degree of risk. JPMorgan Chase's overall objective is to manage its businesses, and the associated risks, in a manner that balances serving the interests of its clients, customers and investors, and protecting the safety and soundness of JPMorgan Chase.

JPMorgan Chase believes that effective risk management requires, among other things:

- Acceptance of responsibility, including identification and escalation of risks by all individuals within JPMorgan Chase;
- Ownership of risk identification, assessment, data and management within each of LOBs and Corporate; and
- A Firmwide risk governance and oversight structure.

JPMorgan Chase follows a disciplined and balanced compensation framework with strong internal governance and independent oversight by the Board of Directors (the "**Board**"). The impact of risk and control issues is carefully considered in JPMorgan Chase's performance evaluation and incentive compensation processes.

Risk governance framework

JPMorgan Chase's risk governance framework involves understanding drivers of risks, types of risks, and impacts of risks.

Drivers of Risks are factors that cause a risk to exist. Drivers of risks include, but are not limited to, the economic environment, regulatory or government policy, competitor or market evolution, business decisions, process or judgment error, deliberate wrongdoing, dysfunctional markets, and natural disasters.

Types of Risks are categories by which risks manifest themselves. JPMorgan Chase's risks are generally categorized in the following four risk types:

- Strategic risk is the risk to earnings, capital, liquidity or reputation associated with poorly designed or failed business plans or an inadequate response to changes in the operating environment.

- Credit and investment risk is the risk associated with the default or change in credit profile of a client, counterparty or customer; or loss of principal or a reduction in expected returns on investments, including consumer credit risk, wholesale credit risk, and investment portfolio risk.

- Market risk is the risk associated with the effect of changes in market factors, such as interest and foreign exchange rates, equity and commodity prices, credit spreads or implied volatilities, on the value of assets and liabilities held for both the short and long term.

- Operational risk is the risk of an adverse outcome resulting from inadequate or failed internal processes or systems; human factors; or external events impacting JPMorgan Chase's processes or systems. Operational risk includes cybersecurity, compliance, conduct, legal, and estimations and model risk.

Impacts of Risks are consequences of risks, both quantitative and qualitative. There may be many consequences of risks manifesting, including quantitative impacts such as a reduction in earnings and capital, liquidity outflows, and fines or penalties, or qualitative impacts such as damage to JPMorgan Chase's reputation, loss of clients and customers, and regulatory and enforcement actions.

JPMorgan Chase's risk governance framework is managed on a Firmwide basis. JPMorgan Chase has an Independent Risk Management ("**IRM**") function, which is comprised of the Risk Management and Compliance. JPMorgan Chase's Chief Executive Officer ("**CEO**") appoints, subject to approval by the Risk Committee of the Board of Directors (the "**Board Risk Committee**"), JPMorgan Chase's Chief Risk Officer ("**CRO**") to lead the IRM function and maintain the risk governance framework of JPMorgan Chase. The framework is subject to approval by the Board Risk Committee through its review and approval of the Risk Governance and Oversight Policy. JPMorgan Chase's CRO oversees and delegates authority to the Firmwide Risk Executives ("**FREs**"), the Chief Risk Officers of the LOBs and Corporate ("**LOB CROs**") and JPMorgan Chase's Chief Compliance Officer ("**CCO**"), who, in turn, establish Risk Management and Compliance organizations, develop JPMorgan Chase's risk governance policies and standards, and define and oversee the implementation of JPMorgan Chase's risk governance framework. The LOB CROs oversee risks that arise in their LOBs and Corporate, while FREs oversee risks that span across the LOBs and Corporate, as well as functions and regions. Each area of JPMorgan Chase giving rise to risk is expected to operate within the parameters identified by the IRM function, and within the risk and control standards established by its own management.

Three lines of defense

JPMorgan Chase's "three lines of defense" are as follows:

The first line of defense consists of each LOB, Treasury and CIO, and certain other Corporate initiatives, including their aligned Operations, Technology and Control Management. The first line of defense owns the identification of risks within their respective organizations and the design and execution of controls to manage those risks.

Responsibilities also include adherence to applicable laws, rules and regulations and implementation of the risk governance framework established by IRM, which may include policies, standards, limits, thresholds and controls.

The second line of defense is the IRM function, which is separate from the first line of defense and is responsible for independently measuring risk, as well as assessing and challenging the risk management practices of the first line of defense. IRM is also responsible for the identification of risks within its respective organization, adherence to applicable laws, rules and regulations and for the development and implementation of policies and standards with respect to its own processes.

The third line of defense is Internal Audit, an independent function that provides objective assessment of the adequacy and effectiveness of Firmwide processes, controls, governance and risk management. The Internal Audit function is headed by the General Auditor, who reports to the Audit Committee and administratively to the CEO.

In addition, there are other functions that contribute to the Firmwide control environment but are not considered part of a particular line of defense, including Finance, Human Resources and Legal. These other functions are responsible for the identification of risks within their respective organizations, adherence to applicable laws, rules and regulations and implementation of the risk governance framework established by IRM.

Risk identification and ownership

The LOBs and Corporate own the identification of risks within their respective organizations, as well as the design and execution of controls, including IRM-specified controls, to manage those risks. To support this activity, JPMorgan Chase has a risk identification framework designed to facilitate each LOB and Corporate's responsibility to identify material risks inherent to JPMorgan Chase's business and operational activities, catalog them in a central repository and review material risks on a regular basis. The IRM function reviews and challenges the LOB and Corporate's identified risks, maintains the central repository and provides the consolidated Firmwide results to the Firmwide Risk Committee ("FRC") and the Board Risk Committee.

Risk appetite

JPMorgan Chase's overall appetite for risk is governed by "Risk Appetite" frameworks for quantitative and qualitative risks. Periodically JPMorgan Chase's risk appetite is periodically set and approved by senior management (including the CEO and CRO) and approved by the Board Risk Committee. Quantitative and qualitative risks are assessed to monitor and measure JPMorgan Chase's capacity to take risk consistent with its stated risk appetite. Risk appetite results are reported to the Board Risk Committee.

Risk governance and oversight structure

The independent status of the IRM function is supported by a risk governance and oversight structure that provides channels for the escalation of risks and issues to senior management, the FRC, and the Board of Directors, as appropriate.

JPMorgan Chase's Operating Committee, which consists of JPMorgan Chase's CEO, CRO, CFO, General Counsel, CEOs of the LOBs and other senior executives, is accountable to and may refer matters to JPMorgan Chase's Board of Directors. The Operating Committee and certain other members of senior management are responsible for escalating to the Board the information necessary to facilitate the Board's exercise of its duties.

Board oversight

JPMorgan Chase's Board of Directors actively oversees the business and affairs of JPMorgan Chase. This includes monitoring JPMorgan Chase's financial performance and condition and reviewing the strategic objectives and plans of JPMorgan Chase. The Board carries out a significant portion of its oversight responsibilities through its principal standing committees, each of which consists solely of independent members of the Board. The Board Risk Committee is the principal committee that oversees risk matters. The Audit Committee oversees the control environment, and the Compensation & Management Development Committee oversees compensation and other management-related matters. Each committee of the Board oversees reputation risks, conduct risks, and ESG matters within its scope of responsibility.

The JPMorgan Chase Bank, N.A. Board of Directors is responsible for the oversight of management of the bank which it discharges both acting directly and through the principal standing committees of JPMorgan Chase's Board of Directors. Risk and control oversight on behalf of JPMorgan Chase Bank, N.A. is primarily the responsibility of the Board Risk Committee and the Audit Committee, respectively, and, with respect to compensation and other management-related matters, the Compensation & Management Development Committee.

The Board Risk Committee assists the Board in its oversight of management's responsibility to implement a global risk management framework reasonably designed to identify, assess and manage JPMorgan Chase's risks. The Board Risk Committee's responsibilities include approval of applicable primary risk policies and review of certain associated frameworks, analysis and reporting established by management. Breaches in risk appetite and parameters, issues that may have a material adverse impact on JPMorgan Chase, including capital and liquidity issues, and other significant risk-related matters are escalated to the Board Risk Committee, as appropriate.

The Audit Committee assists the Board in its oversight of management's responsibility to ensure that there is an effective system of controls reasonably designed to safeguard JPMorgan Chase's assets and income, ensure the integrity of JPMorgan Chase's financial statements, and maintain compliance with JPMorgan Chase's ethical standards, policies, plans and procedures, and with laws, rules and regulations. It also assists the Board in its oversight of the qualifications, independence and performance of JPMorgan Chase's independent registered public accounting firm, and of the performance of JPMorgan Chase's Internal Audit function.

*The Compensation & Management Development Committee ("**CMDC**")* assists the Board in its oversight of JPMorgan Chase's compensation principles and practices. The CMDC reviews and approves JPMorgan Chase's compensation and qualified benefits programs. The Committee reviews the performance of Operating Committee members against their goals, and approves their compensation awards. In addition, the CEO's award is subject to ratification by the independent directors of the Board. The CMDC also reviews the development of and succession for key executives. As part of the Board's role of reinforcing, demonstrating and communicating the "tone at the top", the CMDC oversees JPMorgan Chase's culture, including reviewing updates from management regarding significant conduct issues and any related actions with respect to employees, including compensation actions.

The Public Responsibility Committee oversees and reviews JPMorgan Chase's positions and practices on public responsibility matters such as community investment, fair lending, sustainability, consumer practices and other public policy issues that reflect JPMorgan Chase's values and character and could impact JPMorgan Chase's reputation among its stakeholders. The Committee also provides guidance on these matters to management and the Board, as appropriate.

The Corporate Governance & Nominating Committee exercises general oversight with respect to the governance of the Board of Directors. It reviews the qualifications of and recommends to the Board proposed nominees for election to the Board. The Committee evaluates and recommends to the Board corporate governance practices applicable to JPMorgan Chase. It also reviews the framework for assessing the Board's performance and self-evaluation.

Management oversight

JPMorgan Chase's senior management-level committees that are primarily responsible for key risk-related functions include:

The Firmwide Risk Committee is JPMorgan Chase's highest management-level risk committee. It oversees the risks inherent in JPMorgan Chase's business and provides a forum for discussion of topics and issues that are raised or escalated by its members and other committees.

The Firmwide Control Committee is an escalation committee for senior management to review and discuss the Firmwide compliance and operational risk environment including identified issues, compliance and operational risk metrics and significant events that have been escalated.

Line of Business and Regional Risk Committees are responsible for overseeing the governance, limits, and controls that have been established within the scope of their respective activities. These committees review the ways in which the particular LOB or the businesses operating in a particular region could be exposed to adverse outcomes, with a focus on identifying, accepting, escalating and/or requiring remediation of matters brought to these committees.

Line of Business and Corporate Function Control Committees oversee the risk and control environment of their respective business or function, inclusive of Operational Risk, Compliance and Conduct Risks. As part of that mandate, they are responsible for reviewing indicators of elevated or emerging risks and other data that may impact the level of compliance and operational risk in a business or function, addressing key compliance and operational risk issues, with an emphasis on processes with control concerns and overseeing control remediation.

The Asset and Liability Committee is responsible for overseeing JPMorgan Chase's asset and liability management ("**ALM**"), including the activities and frameworks supporting management of the balance sheet, liquidity risk, interest rate risk, and capital risk.

The Firmwide Valuation Governance Forum is composed of senior finance and risk executives and is responsible for overseeing the management of risks arising from valuation activities conducted across JPMorgan Chase.

Supervision and regulation

JPMorgan Chase Bank, N.A. operates and is subject to regulation under federal and state banking and other laws in the United States, including the National Banking Act and the Federal Deposit Insurance Act, as well as the applicable laws of each of the various jurisdictions outside the United States in which it does business. For additional information concerning the supervision and regulation of JPMorgan Chase Bank, N.A. and the significant laws and regulations to which it is subject, see "Supervision and regulation" in Note 1 to the Consolidated Financial Statements of JPMorgan Chase Bank, N.A. for the year ended 31 December 2023 included in this base listing document.

Financial Information

Selected financial information

The selected consolidated financial data set forth in the below table have been extracted from the audited Consolidated Financial Statements of JPMorgan Chase Bank, N.A. for the year ended 31 December 2023. This information should be read in conjunction with the notes to the Consolidated Financial Statements and the other detailed financial information concerning JPMorgan Chase Bank, N.A.

Selected income statement data (in USD millions)	**Year ended 31 December 2023**	**2022**
Total net revenue	U.S.$147,021	U.S.$118,977
Provision for credit losses	8,996	6,347
Total noninterest expense	78,460	68,736
Income before income tax expense	59,565	43,894
Net income	47,496	34,342

Selected balance sheet data (in USD millions)	**Year ended 31 December 2023**	**2022**
Trading assets	U.S.$329,809	U.S.$288,420
Investment securities, net of allowance for credit losses	571,524	631,095
Loans, net of allowance for loan losses	1,297,809	1,113,271
Total assets	3,395,126	3,201,942
Deposits	2,498,231	2,440,722
Long-term debt	206,945	75,138
Total stockholders' equity	299,279	303,620

Independent Accountants

The consolidated financial statements of JPMorgan Chase Bank, N.A. as of 31 December 2023 and 2022 and for each of the three years ended 31 December 2023, included in this document, have been audited by PricewaterhouseCoopers LLP, independent accountants, as stated in their report appearing herein.

Litigation

For a summary of certain significant legal proceedings involving JPMorgan Chase Bank, N.A., see Note 28 to the Consolidated Financial Statements of JPMorgan Chase Bank, N.A. for the year ended 31 December 2023 included in this base listing document.

Credit Ratings

The structured products to be offered by the Issuer and guaranteed by JPMorgan Chase Bank, N.A. will not be rated, unless otherwise specified in the launch announcement and supplemental listing document relating to such structured products. The following table, which is presented solely for the convenience of prospective purchasers of structured products of the Issuer, sets forth the credit ratings for JPMorgan Chase Bank, N.A.'s long term debt (as of the day immediately preceding the date of this base listing document). Credit ratings are determined by the rating agencies based upon information furnished to them by the relevant obligor as well as information obtained by the rating agencies from other sources. Credit ratings are not a recommendation to purchase, hold or sell any security, and may be changed, superseded or withdrawn at any time by any of the rating agencies. **Prospective purchasers should check the current credit ratings of JPMorgan Chase Bank, N.A. before purchasing any structured products of the Issuer.** Information concerning the current ratings of JPMorgan Chase Bank, N.A.'s debt can be obtained from the relevant rating agencies and can also be viewed on JPMorgan Chase & Co.'s investor relations website at *https://www.jpmorganchase.com/corporate/investor-relations/fixed-income.htm.* Neither the Issuer nor JPMorgan Chase Bank, N.A. undertakes to update the information set forth in the below table.

Rating agency	**Current credit ratings of the guarantor's long-term debt (as of the day immediately preceding the date of this base listing document)**
S&P Global Ratings	A+ (stable outlook)
Moody's Investors Service, Inc.	Aa2 (negative outlook)

Additional Information

Additional information concerning JPMorgan Chase Bank, N.A., including the Annual Reports on Form 10-K, Quarterly Reports on Form 10-Q and Current Reports on Form 8-K of JPMorgan Chase & Co. filed by JPMorgan Chase & Co. with the U.S. Securities and Exchange Commission ("**Periodic Reports**"), as they become available, can be viewed on the SEC's website at *www.sec.gov*. Those reports and additional information concerning JPMorgan Chase Bank, N.A. can also be viewed on JPMorgan Chase & Co.'s investor relations website at *https://jpmorganchaseco.gcs-web.com/financial-information/sec-filings*. No websites that are cited or referred to herein shall be deemed to form part of, or to be incorporated by reference in, this base listing document. **The Periodic Reports are not included or incorporated by reference in and shall not be deemed to be part of, this base listing document.**

JPMORGAN CHASE BANK, NATIONAL ASSOCIATION

(a wholly-owned subsidiary of JPMorgan Chase & Co.)

CONSOLIDATED FINANCIAL STATEMENTS

For the three years ended December 31, 2023

FOR THE THREE YEARS ENDED DECEMBER 31, 2023

Report of Independent Auditors

To the Board of Directors and Shareholder of JPMorgan Chase Bank, National Association

Opinion

We have audited the accompanying consolidated financial statements of JPMorgan Chase Bank, National Association and its subsidiaries (the "Company"), which comprise the consolidated balance sheets as of December 31, 2023 and 2022, and the related consolidated statements of income, comprehensive income, changes in stockholder's equity and cash flows for each of the three years in the period ended December 31, 2023, including the related notes (collectively referred to as the "consolidated financial statements").

In our opinion, the accompanying consolidated financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2023 and 2022, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2023 in accordance with accounting principles generally accepted in the United States of America.

Basis for Opinion

We conducted our audit in accordance with auditing standards generally accepted in the United States of America (US GAAS). Our responsibilities under those standards are further described in the Auditors' Responsibilities for the Audit of the Consolidated Financial Statements section of our report. We are required to be independent of the Company and to meet our other ethical responsibilities, in accordance with the relevant ethical requirements relating to our audit. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Responsibilities of Management for the Consolidated Financial Statements

Management is responsible for the preparation and fair presentation of the consolidated financial statements in accordance with accounting principles generally accepted in the United States of America, and for the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of consolidated financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the consolidated financial statements, management is required to evaluate whether there are conditions or events, considered in the aggregate, that raise substantial doubt about the Company's ability to continue as a going concern for one year after the date the consolidated financial statements are available to be issued.

Auditors' Responsibilities for the Audit of the Consolidated Financial Statements

Our objectives are to obtain reasonable assurance about whether the consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance but is not absolute assurance and therefore is not a guarantee that an audit conducted in accordance with US GAAS will always detect a material misstatement when it exists. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control. Misstatements are considered material if there is a substantial likelihood that, individually or in the aggregate, they would influence the judgment made by a reasonable user based on the consolidated financial statements.

In performing an audit in accordance with US GAAS, we:

- Exercise professional judgment and maintain professional skepticism throughout the audit.
- Identify and assess the risks of material misstatement of the consolidated financial statements, whether due to fraud or error, and design and perform audit procedures responsive to those risks. Such procedures include examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control. Accordingly, no such opinion is expressed.
- Evaluate the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluate the overall presentation of the consolidated financial statements.
- Conclude whether, in our judgment, there are conditions or events, considered in the aggregate, that raise substantial doubt about the Company's ability to continue as a going concern for a reasonable period of time.

We are required to communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit, significant audit findings, and certain internal control-related matters that we identified during the audit.

PricewaterhouseCoopers LLP

February 16, 2024

PricewaterhouseCoopers LLP • 300 Madison Avenue • New York, NY 10017

Consolidated statements of income

JPMorgan Chase Bank, National Association
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)	2023	2022	2021
Revenue			
Investment banking fees	$ 2,525	$ 2,955	$ 5,232
Principal transactions	20,903	17,895	13,677
Lending- and deposit-related fees	7,410	7,095	7,031
Asset management fees	2,591	2,479	2,389
Commissions and other fees	12,418	11,456	11,632
Investment securities losses	(3,180)	(2,380)	(345)
Mortgage fees and related income	1,176	1,250	2,170
Card income	4,784	4,421	5,102
Other income	5,410	5,384	5,511
Noninterest revenue	54,037	50,555	52,399
Interest income	151,415	84,097	53,870
Interest expense	58,431	15,675	2,064
Net interest income	92,984	68,422	51,806
Total net revenue	147,021	118,977	104,205
Provision for credit losses	8,996	6,347	(9,296)
Noninterest expense			
Compensation expense	37,605	34,000	31,212
Occupancy expense	4,315	4,469	4,313
Technology, communications and equipment expense	8,414	8,646	9,304
Professional and outside services	6,798	6,983	6,510
Marketing	4,551	3,877	2,936
Other expense	16,777	10,761	10,170
Total noninterest expense	78,460	68,736	64,445
Income before income tax expense	59,565	43,894	49,056
Income tax expense	12,069	9,552	11,001
Net income	$ 47,496	$ 34,342	$ 38,055

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of comprehensive income

JPMorgan Chase Bank, National Association
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)	2023	2022	2021
Net income	**$ 47,496**	$ 34,342	$ 38,055
Other comprehensive income/(loss), after-tax			
Unrealized gains/(losses) on investment securities	**5,387**	(11,751)	(5,516)
Translation adjustments, net of hedges	**339**	(555)	(442)
Cash flow hedges	**1,723**	(5,359)	(2,679)
Defined benefit pension and OPEB plans	**188**	(742)	688
DVA on fair value option elected liabilities	**133**	265	(291)
Total other comprehensive income/(loss), after-tax	**7,770**	(18,142)	(8,240)
Comprehensive income	**$ 55,266**	$ 16,200	$ 29,815

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated balance sheets

JPMorgan Chase Bank, National Association
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

December 31, (in millions, except share data)		2023		2022
Assets				
Cash and due from banks	**$**	**28,784**	$	27,258
Deposits with banks		**593,706**		538,715
Federal funds sold and securities purchased under resale agreements (included **$162,977** and $193,945 at fair value)		**226,683**		259,460
Securities borrowed (included **$20,541** and $22,454 at fair value)		**61,199**		53,642
Trading assets (included assets pledged of **$75,500** and $39,458)		**329,809**		288,420
Available-for-sale securities (amortized cost of **$205,401** and $216,103, included assets pledged of **$11,880** and $15,274		**201,676**		205,790
Held-to-maturity securities		**369,848**		425,305
Investment securities, net of allowance for credit losses		**571,524**		631,095
Loans (included **$38,591** and $41,795 at fair value)		**1,320,120**		1,132,985
Allowance for loan losses		**(22,311)**		(19,714)
Loans, net of allowance for loan losses		**1,297,809**		1,113,271
Accrued interest and accounts receivable		**67,147**		89,373
Premises and equipment		**28,828**		26,347
Goodwill, mortgage servicing rights and other intangible assets		**50,295**		48,600
Other assets (included **$11,315** and $12,667 at fair value and assets pledged of **$3,159** and $2,505)		**139,342**		125,761
Total assets[(a)]	**$**	**3,395,126**	$	3,201,942
Liabilities				
Deposits (included **$78,524** and $28,742 at fair value)	**$**	**2,498,231**	$	2,440,722
Federal funds purchased and securities loaned or sold under repurchase agreements (included **$67,067** and $75,327 at fair value)		**74,609**		85,902
Short-term borrowings (included **$10,260** and $7,796 at fair value)		**11,919**		10,074
Trading liabilities		**110,862**		116,629
Accounts payable and other liabilities (included **$8,255** and $7,760 at fair value)		**170,119**		156,433
Beneficial interests issued by consolidated variable interest entities		**23,162**		13,424
Long-term debt (included **$28,999** and $27,145 at fair value)		**206,945**		75,138
Total liabilities[(a)]		**3,095,847**		2,898,322
Commitments and contingencies (refer to Notes 26, 27 and 28)				
Stockholder's equity				
Preferred stock ($1 par value; authorized 15,000,000 shares: issued **0** shares)		**—**		—
Common stock ($12 par value; authorized 200,000,000 shares; issued **168,971,750** shares)		**2,028**		2,028
Additional paid-in capital		**119,356**		118,293
Retained earnings		**188,089**		201,263
Accumulated other comprehensive losses		**(10,194)**		(17,964)
Total stockholder's equity		**299,279**		303,620
Total liabilities and stockholder's equity	**$**	**3,395,126**	$	3,201,942

(a) The following table presents information on assets and liabilities related to variable interest entities ("VIEs") that are consolidated by the Bank at December 31, 2023 and 2022. The assets of the consolidated VIEs are used to settle the liabilities of those entities. The holders of the beneficial interests generally do not have recourse to the general credit of the Bank. The assets and liabilities in the table below include third-party assets and liabilities of consolidated VIEs (including balances with related parties) and exclude intercompany balances that eliminate in consolidation. Refer to Note 15 for a further discussion.

December 31, (in millions)		2023		2022
Assets				
Trading assets	**$**	**2,057**	$	2,089
Loans		**37,602**		34,394
All other assets		**340**		290
Total assets	**$**	**39,999**	$	36,773
Liabilities				
Beneficial interests issued by consolidated VIEs	**$**	**23,162**	$	13,424
All other liabilities		**119**		132
Total liabilities	**$**	**23,281**	$	13,556

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of changes in stockholder's equity

JPMorgan Chase Bank, National Association
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)	2023	2022	2021
Common stock			
Balance at January 1 and December 31	**$ 2,028**	$ 2,028	$ 2,028
Additional paid-in capital			
Balance at January 1	**118,293**	118,221	115,248
Cash capital contribution from JPMorgan Chase & Co.	**–**	–	3,000
Adjustments to capital due to transactions with JPMorgan Chase & Co.	**1,063**	72	(27)
Balance at December 31	**119,356**	118,293	118,221
Retained earnings			
Balance at January 1	**201,263**	182,421	144,366
Cumulative effect of change in accounting principles	**451**	–	–
Net income	**47,496**	34,342	38,055
Cash dividends paid to JPMorgan Chase & Co.	**(61,000)**	(15,500)	–
Other	**(121)**	–	–
Balance at December 31	**188,089**	201,263	182,421
Accumulated other comprehensive income/(loss)			
Balance at January 1	**(17,964)**	178	8,418
Other comprehensive income/(loss), after-tax	**7,770**	(18,142)	(8,240)
Balance at December 31	**(10,194)**	(17,964)	178
Total stockholder's equity	**$ 299,279**	$ 303,620	$ 302,848

Effective January 1, 2023, the Bank adopted the Financial Instruments – Credit Losses: Troubled Debt Restructurings and Derivatives and Hedging: Fair Value Hedging – Portfolio Layer Method accounting guidance. Refer to Note 1 for further information.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of cash flows

JPMorgan Chase Bank, National Association
(a wholly-owned subsidiary of JPMorgan Chase & Co.)

Year ended December 31, (in millions)	2023	2022	2021
Operating activities			
Net income	**$ 47,496**	$ 34,342	$ 38,055
Adjustments to reconcile net income to net cash provided by operating activities:			
Provision for credit losses	**8,996**	6,347	(9,296)
Depreciation and amortization	**6,969**	6,590	7,535
Deferred tax (benefit)/expense	**(4,194)**	(3,542)	2,147
Bargain purchase gain associated with the First Republic acquisition	**(2,775)**	–	–
Other	**1,200**	2,380	345
Originations and purchases of loans held-for-sale	**(114,496)**	(149,091)	(347,864)
Proceeds from sales, securitizations and paydowns of loans held-for-sale	**116,142**	167,713	336,404
Net change in:			
Trading assets	**(28,386)**	14,114	25,806
Securities borrowed	**(7,421)**	10,973	(20,978)
Accrued interest and accounts receivable	**24,481**	(13,088)	(4,722)
Other assets	**(5,279)**	(29,954)	21,442
Trading liabilities	**(6,672)**	7,404	(38,612)
Accounts payable and other liabilities	**2,359**	46,646	12,529
Other operating adjustments	**3,959**	8	284
Net cash provided by operating activities	**42,379**	100,842	23,075
Investing activities			
Net change in:			
Federal funds sold and securities purchased under resale agreements	**32,961**	(32,211)	116,694
Held-to-maturity securities:			
Proceeds from paydowns and maturities	**53,056**	48,626	50,897
Purchases	**(4,141)**	(33,676)	(111,756)
Available-for-sale securities:			
Proceeds from paydowns and maturities	**53,740**	39,048	49,505
Proceeds from sales	**108,406**	84,616	162,642
Purchases	**(115,499)**	(126,258)	(248,784)
Proceeds from sales and securitizations of loans held-for-investment	**47,228**	44,910	35,843
Other changes in loans, net	**(87,815)**	(128,952)	(91,019)
Net cash used in First Republic acquisition	**(9,920)**	–	–
All other investing activities, net	**(13,900)**	(8,017)	(3,849)
Net cash provided by/(used in) investing activities	**64,116**	(111,914)	(39,827)
Financing activities			
Net change in:			
Deposits	**(44,217)**	(111,772)	274,351
Federal funds purchased and securities loaned or sold under repurchase agreements	**(11,429)**	(15,795)	(33,459)
Short-term borrowings	**(1,011)**	(2,122)	1,886
Beneficial interests issued by consolidated VIEs	**8,353**	3,042	(4,255)
Proceeds from long-term borrowings	**81,171**	16,363	29,783
Payments of long-term borrowings	**(25,017)**	(20,459)	(29,389)
Cash capital contribution from JPMorgan Chase & Co.	**–**	–	3,000
Dividends paid to JPMorgan Chase & Co.	**(61,000)**	(15,500)	–
All other financing activities, net	**1,311**	576	(148)
Net cash provided by/(used in) financing activities	**(51,839)**	(145,667)	241,769
Effect of exchange rate changes on cash and due from banks and deposits with banks	**1,861**	(16,605)	(11,469)
Net increase/(decrease) in cash and due from banks and deposits with banks	**56,517**	(173,344)	213,548
Cash and due from banks and deposits with banks at the beginning of the period	**565,973**	739,317	525,769
Cash and due from banks and deposits with banks at the end of the period	**$ 622,490**	$ 565,973	$ 739,317
Cash interest paid	**$ 54,028**	$ 13,717	$ 1,822
Cash income taxes paid, net[(a)]	**11,831**	9,586	16,496

(a) Includes $12.6 billion, $12.5 billion and $13.3 billion paid to JPMorgan Chase & Co. in 2023, 2022 and 2021, respectively. Refer to Note 23 for discussion of income taxes.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Note 1 – Overview and basis of presentation

JPMorgan Chase Bank, National Association ("JPMorgan Chase Bank, N.A.") and its subsidiaries, (collectively, the "Bank"), is a wholly-owned bank subsidiary of JPMorgan Chase & Co. ("JPMorgan Chase"), which is a leading financial services firm based in the United States of America ("U.S."), with operations worldwide. JPMorgan Chase Bank, N.A. is a national banking association that is chartered by the Office of the Comptroller of the Currency ("OCC"), a bureau of the U.S. Department of the Treasury. JPMorgan Chase Bank, N.A.'s main office is located in Columbus, Ohio, and it has U.S. branches in 48 states and Washington, D.C. as of December 31, 2023. JPMorgan Chase Bank, N.A. operates nationally as well as through non-U.S. bank overseas branches and subsidiaries, representative offices and subsidiary foreign banks. The Bank either directly or through such branches, subsidiaries and offices offers a wide range of banking services to its U.S. and non-U.S. customers including investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. Under the J.P. Morgan and Chase brands, the Bank serves millions of customers, predominantly in the U.S. and many of the world's most prominent corporate, institutional and government clients globally. JPMorgan Chase Bank, N.A.'s principal operating subsidiaries outside of the U.S. are J.P. Morgan Securities plc and J.P. Morgan SE, which are based in the United Kingdom ("U.K.") and Germany, respectively.

The JPMorgan Chase Bank, N.A. Board of Directors is responsible for the oversight of management of JPMorgan Chase Bank, N.A., which it discharges both acting directly and through the principal standing committees of JPMorgan Chase's Board of Directors. Risk and control oversight on behalf of JPMorgan Chase Bank, N.A. is primarily the responsibility of the Board Risk Committee and the Audit Committee, respectively, and, with respect to compensation and other management-related matters, the Compensation & Management Development Committee. Each committee of JPMorgan Chase's Board of Directors oversees reputational risks, conduct risks, and ESG matters within its scope of responsibility.

The accounting and financial reporting policies of the Bank conform to accounting principles generally accepted in the U.S. ("U.S. GAAP"). Additionally, where applicable, the policies conform to the accounting and reporting guidelines prescribed by regulatory authorities.

First Republic acquisition

On May 1, 2023, JPMorgan Chase Bank, N.A. acquired certain assets and assumed certain liabilities of First Republic Bank (the "First Republic acquisition") from the Federal Deposit Insurance Corporation ("FDIC"), as receiver.

The Bank's Consolidated Financial Statements as of and for the period ended December 31, 2023 reflect the impact of First Republic. Where meaningful to the disclosure, the impact of the First Republic acquisition, as well as subsequent related business and activities, are disclosed in various sections of these Bank financial statements. The Bank continues to convert certain operations, and to integrate clients, products and services associated with the First Republic acquisition, to align with the Bank's businesses and operations. Accordingly, reporting classification and internal risk rating profiles in the wholesale portfolio may change in future periods. Refer to Note 29 for additional information on the First Republic acquisition.

Supervision and regulation

The Bank is subject to regulation under U.S. federal and state laws, as well as the applicable laws of the jurisdictions outside the U.S. in which the Bank does business.

In the U.S., the Bank is supervised and regulated by the OCC and, with respect to certain matters, by the Federal Deposit Insurance Corporation (the "FDIC"). J.P. Morgan Securities plc is regulated by the U.K. Prudential Regulation Authority (the "PRA") and the U.K. Financial Conduct Authority (the "FCA").

The Bank's other non-U.S. subsidiaries are regulated by the banking, securities, prudential and conduct regulatory authorities in the countries in which they operate.

In the U.K., the Bank operates a retail bank through J.P. Morgan Europe Limited ("JPMEL"). JPMEL is regulated by the PRA, and by the FCA with respect to its conduct of financial services in the U.K., including obligations relating to the fair treatment of customers. JPMEL is also regulated by the U.K. Payment Systems Regulator with respect to its operation and use of payment systems. In addition, the retail business of JPMEL is subject to U.K. consumer-protection legislation.

JPMorgan Chase Bank, N.A. is registered with the Commodity Futures Trading Commission ("CFTC") as a "swap dealer" and with the Securities and Exchange Commission ("SEC") as a "security-based swap dealer." As a result, JPMorgan Chase Bank, N.A. is subject to a comprehensive regulatory framework for its swap and security-based swap activities.

Restrictions on transactions with affiliates. The Bank is subject to restrictions imposed by federal law on extensions of credit to, investments in stock or securities of, and derivatives, securities lending and certain other transactions with, JPMorgan Chase & Co. and certain other affiliates. These restrictions prevent JPMorgan Chase & Co. and other affiliates from borrowing from such subsidiaries unless the loans are secured in specified amounts and comply with certain other requirements.

Refer to “Supervision and regulation” in the Annual Report on Form 10-K of JPMorgan Chase for the year ended December 31, 2023, filed with the U.S. Securities and Exchange Commission on February 16, 2024 for additional information concerning the supervision and regulation of JPMorgan Chase Bank, N.A.

Consolidation

The Consolidated Financial Statements include the accounts of the Bank and other entities in which the Bank has a controlling financial interest. All material intercompany balances and transactions between the consolidated Bank group of entities have been eliminated. The Bank regularly enters into transactions with JPMorgan Chase and its various subsidiaries collectively, JPMorgan Chase affiliates. These transactions are considered to be related party transactions. Refer to Note 21 for further discussion of the Bank’s related party transactions.

Assets held for clients in an agency or fiduciary capacity by the Bank are not assets of the Bank and are not included on the Consolidated balance sheets.

The Bank determines whether it has a controlling financial interest in an entity by first evaluating whether the entity is a voting interest entity or a variable interest entity.

Voting interest entities

Voting interest entities are entities that have sufficient equity and provide the equity investors voting rights that enable them to make significant decisions relating to the entity’s operations. For these types of entities, the Bank’s determination of whether it has a controlling interest is primarily based on the amount of voting equity interests held. Entities in which the Bank has a controlling financial interest, through ownership of the majority of the entities’ voting equity interests, or through other contractual rights that give the Bank control, are consolidated by the Bank.

Investments in companies in which the Bank has significant influence over operating and financing decisions (but does not own a majority of the voting equity interests) are accounted for (i) in accordance with the equity method of accounting, or (ii) at fair value if the fair value option was elected. These investments are generally included in other assets, with income or loss included in noninterest revenue.

Certain Bank-sponsored asset management funds are structured as limited partnerships or limited liability companies. The Bank does not generally consolidate these funds as the Bank is not the general partner or managing member and therefore does not have a controlling financial interest.

Variable interest entities

VIEs are entities that, by design, either (1) lack sufficient equity to permit the entity to finance its activities without additional subordinated financial support from other parties, or (2) have equity investors that do not have the ability to make significant decisions relating to the entity’s operations through voting rights, or do not have the obligation to absorb the expected losses, or do not have the right to receive the residual returns of the entity.

The most common type of VIE is a special purpose entity (“SPE”). SPEs are commonly used in securitization transactions in order to isolate certain assets and distribute the cash flows from those assets to investors. The basic SPE structure involves a company selling assets to the SPE; the SPE funds the purchase of those assets by issuing securities to investors. The legal documents that govern the transaction specify how the cash earned on the assets must be allocated to the SPE’s investors and other parties that have rights to those cash flows. SPEs are generally structured to insulate investors from claims on the SPE’s assets by creditors of other entities, including the creditors of the seller of the assets.

The primary beneficiary of a VIE (i.e., the party that has a controlling financial interest) is required to consolidate the assets and liabilities of the VIE. The primary beneficiary is the party that has both (1) the power to direct the activities of the VIE that most significantly impact the VIE’s economic performance; and (2) through its interests in the VIE, the obligation to absorb losses or the right to receive benefits from the VIE that could potentially be significant to the VIE.

To assess whether the Bank has the power to direct the activities of a VIE that most significantly impact the VIE’s economic performance, the Bank considers all the facts and circumstances, including its role in establishing the VIE and its ongoing rights and responsibilities. This assessment includes, first, identifying the activities that most significantly impact the VIE’s economic performance; and second, identifying which party, if any, has power over those activities. In general, the parties that make the most significant decisions affecting the VIE (such as asset managers, collateral managers, servicers, or owners of call options or liquidation rights over the VIE’s assets) or have the right to unilaterally remove those decision-makers are deemed to have the power to direct the activities of a VIE.

To assess whether the Bank has the obligation to absorb losses of the VIE or the right to receive benefits from the VIE that could potentially be significant to the VIE, the Bank considers all of its economic interests, including debt and equity investments, servicing fees, and derivatives or other arrangements deemed to be variable interests in the VIE. This assessment requires that the Bank apply judgment in determining whether these interests, in the aggregate, are considered potentially significant to the VIE. Factors considered in assessing significance include: the design of the VIE, including its capitalization structure; subordination of interests; payment priority; relative share of interests held across various classes within the VIE’s capital structure; and the reasons why the interests are held by the Bank.

The Bank performs on-going reassessments of: (1) whether entities previously evaluated under the majority voting-interest framework have become VIEs, based on certain events, and are therefore subject to the VIE consolidation framework; and (2) whether changes in the facts and circumstances regarding the Bank's involvement with a VIE cause the Bank's consolidation conclusion to change.

Refer to Note 15 for further discussion of Bank-sponsored VIEs.

Revenue recognition

Interest income

The Bank recognizes interest income on loans, debt securities, and other debt instruments, generally on a level-yield basis, based on the underlying contractual rate. Refer to Note 8 for further information.

Revenue from contracts with customers

The Bank recognizes noninterest revenue from certain contracts with customers, in investment banking fees, deposit-related fees, asset management fees, commissions and other fees, and components of card income, when the Bank's related performance obligations are satisfied. Refer to Note 7 for further discussion of the Bank's revenue from contracts with customers.

Principal transactions revenue

The Bank carries a portion of its assets and liabilities at fair value. Changes in fair value are reported primarily in principal transactions revenue. Refer to Notes 3 and 4 for further discussion of fair value measurement. Refer to Note 7 for further discussion of principal transactions revenue.

Use of estimates in the preparation of consolidated financial statements

The preparation of the Consolidated Financial Statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, revenue and expense, and disclosures of contingent assets and liabilities. Actual results could be different from these estimates.

Foreign currency translation

The Bank revalues assets, liabilities, revenue and expense denominated in non-U.S. currencies into U.S. dollars using applicable exchange rates.

Gains and losses relating to translating functional currency financial statements for U.S. reporting are included in the Consolidated statements of comprehensive income. Gains and losses relating to nonfunctional currency transactions, including non-U.S. operations where the functional currency is the U.S. dollar, are reported in the Consolidated statements of income.

Offsetting assets and liabilities

U.S. GAAP permits entities to present derivative receivables and derivative payables with the same counterparty and the related cash collateral receivables and payables on a net basis on the Consolidated balance sheets when a legally enforceable master netting agreement exists. U.S. GAAP also permits securities sold and purchased under repurchase agreements and securities borrowed or loaned under securities loan agreements to be presented net when specified conditions are met, including the existence of a legally enforceable master netting agreement. The Bank has elected to net such balances where it has determined that the specified conditions are met.

The Bank uses master netting agreements with third parties and affiliates to mitigate counterparty credit risk in certain transactions, including derivative contracts, resale, repurchase, securities borrowed and securities loaned agreements. A master netting agreement is a single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due). Upon the exercise of derivatives termination rights by the non-defaulting party (i) all transactions are terminated, (ii) all transactions are valued and the positive values of "in the money" transactions are netted against the negative values of "out of the money" transactions and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount. Upon exercise of default rights under repurchase agreements and securities loan agreements in general (i) all transactions are terminated and accelerated, (ii) all values of securities or cash held or to be delivered are calculated, and all such sums are netted against each other and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount.

Typical master netting agreements for these types of transactions also often contain a collateral/margin agreement that provides for a security interest in, or title transfer of, securities or cash collateral/margin to the party that has the right to demand margin (the "demanding party"). The collateral/margin agreement typically requires a party to transfer collateral/margin to the demanding party with a value equal to the amount of the margin deficit on a net basis across all transactions governed by the master netting agreement, less any threshold. The collateral/margin agreement grants to the demanding party, upon default by the counterparty, the right to set-off any amounts payable by the counterparty against any posted collateral or the cash equivalent of any posted collateral/margin. It also grants to the demanding party the right to liquidate collateral/margin and to apply the proceeds to an amount payable by the counterparty.

Refer to Note 6 for further discussion of the Bank's derivative instruments. Refer to Note 12 for further discussion of the Bank's securities financing agreements.

Statements of cash flows

For the Bank's Consolidated statements of cash flows, cash is defined as those amounts included in cash and due from banks and deposits with banks on the Consolidated balance sheets.

Regulatory developments

U.S. Basel III Finalization

In July 2023, the Federal Reserve, the OCC and the FDIC released a proposal to amend the risk-based capital framework, entitled "Regulatory capital rule: Amendments applicable to large banking organizations and to banking organizations with significant trading activity," which is referred to in these Bank financial statements as "U.S. Basel III proposal". Under the proposal, changes to the framework would include replacement of the Advanced approach with an expanded risk-based approach, which would not permit the use of internal models for the calculation of risk-weighted assets ("RWA"), other than for market risk. In addition, the stress capital buffer requirement would be applicable to both the expanded risk-based approach and the Standardized approach. The proposal would significantly revise risk-based capital requirements for all banks with assets of $100 billion or more. The proposed effective date is July 1, 2025, with a three-year transition period applicable to the expanded risk-based approach.

In addition to the release of the U.S. proposal, the European Union ("EU") and U.K. regulators have also largely finalized the rules implementing their Basel III frameworks. The proposed effective dates are January 1, 2025, in the EU and July 1, 2025, in the U.K., with certain transitional arrangements applicable until 2030 and 2032, respectively.

Accounting standards adopted January 1, 2023

Derivatives and Hedging: Fair Value Hedging – Portfolio Layer Method

The adoption of this guidance expanded the ability to hedge a portfolio of fixed-rate assets to allow more types of assets to be included in the portfolio, and to allow more of the portfolio to be hedged. This guidance also clarified the types of derivatives that could be used as hedges, and the balance sheet presentation and disclosure requirements for the hedge accounting adjustments. As permitted by the guidance, the Bank elected to transfer held-to-maturity ("HTM") securities to available-for-sale ("AFS") and designated those securities in a portfolio layer method hedge upon adoption. The adoption impact of the transfer on retained earnings was not material.

Refer to Note 6 and Note 11 for additional information.

Financial Instruments – Credit Losses: Troubled Debt Restructurings ("TDRs")

The adoption of this guidance eliminated the accounting and disclosure requirements for TDRs, including the requirement to measure the allowance using a discounted cash flow ("DCF") methodology, and allowed the option of a non-DCF portfolio-based approach for modified loans to troubled borrowers. If a DCF methodology is still applied for these modified loans, the discount rate must be the post-modification effective interest rate, instead of the pre-modification effective interest rate.

The Bank elected to apply its non-DCF, portfolio-based allowance approach for modified loans to troubled borrowers for all portfolios except collateral-dependent loans and nonaccrual risk-rated loans which the Bank elected to continue applying a DCF methodology. Refer to Note 14 for a description of the portfolio-based allowance approach and the asset-specific allowance approach.

This guidance was adopted on January 1, 2023 under the modified retrospective method which resulted in a net decrease to the allowance for credit losses of $587 million and an increase to retained earnings of $446 million, after-tax, predominantly driven by residential real estate and credit card.

The adoption of this guidance eliminated the disclosure requirements for TDRs including the requirement to assess whether a modification is reasonably expected or involves a concession. The new guidance requires disclosure for loan modifications to borrowers experiencing financial difficulty consisting of principal forgiveness, interest rate reduction, other-than-insignificant payment delay, term extension or a combination of these modifications. The Bank has defined these types of modifications as financial difficulty modifications ("FDMs"). As a result of the elimination of the requirement to assess whether a modification is reasonably expected or involves a concession, the population of loans considered FDMs differs from those previously considered TDRs. This guidance also requires disclosure of current period gross charge-offs by vintage origination year.

Refer to Note 13 for further information.

Accounting standard adopted since January 1, 2021

Reference rate reform

The adoption of the guidance provided various elective options, referred to as “practical expedients,” that are intended to simplify the operations impact of applying generally accepted accounting principles to contracts and hedge relationships affected by reference rate reform. This guidance also provided an election to account for derivatives modified to change the rate used for discounting, margining, or contract price alignment (collectively “discounting transition”) as modifications.

The Bank elected to apply certain of the practical expedients related to contract modifications and hedge accounting relationships and discounting transition. The main purpose of the practical expedients is to ease the administrative burden of accounting for contracts impacted by reference rate reform. These elections did not have a material impact on the Consolidated Financial Statements.

Significant accounting policies

The following table identifies the Bank’s other significant accounting policies and the Note and page where a detailed description of each policy can be found.

Fair value measurement	Note 3	page 14
Fair value option	Note 4	page 33
Derivative instruments	Note 6	page 38
Noninterest revenue and noninterest expense	Note 7	page 54
Interest income and Interest expense	Note 8	page 56
Pension and other postretirement employee benefit plans	Note 9	page 57
Employee share-based incentives	Note 10	page 60
Investment securities	Note 11	page 62
Securities financing activities	Note 12	page 67
Loans	Note 13	page 70
Allowance for credit losses	Note 14	page 91
Variable interest entities	Note 15	page 97
Goodwill, mortgage servicing rights, and other intangible assets	Note 16	page 105
Premises and equipment	Note 17	page 109
Leases	Note 19	page 110
Long-term debt	Note 20	page 112
Related party transactions	Note 21	page 113
Income taxes	Note 23	page 117
Off-balance sheet lending-related financial instruments, guarantees and other commitments	Note 26	page 123
Litigation	Note 28	page 130

Note 2 - Accounting and reporting developments

FASB Standards Issued but not yet Adopted as of December 31, 2023

Standard	Summary of guidance	Effects on financial statements
Investments - Equity Method and Joint Ventures: Accounting for Investments in Tax Credit Structures Using the Proportional Amortization Method *Issued March 2023*	• Expands the ability to elect proportional amortization for more types of tax-oriented investments (beyond low income housing tax credit investments) on program-by-program basis. • May be adopted using a full retrospective method, or a modified retrospective method wherein the effect of adoption is reflected as an adjustment to retained earnings at the effective date.	• Adopted under the modified retrospective method on January 1, 2024, which resulted in a decrease to retained earnings of approximately $100 million.
Income Taxes: Improvements to Income tax disclosures *Issued December 2023*	• Requires disclosure of income taxes paid disaggregated by 1) federal, state, and foreign taxes and 2) individual jurisdiction on the basis of a quantitative threshold of equal to or greater than 5 percent of total income taxes paid (net of refunds received). • Requires disclosure of the effective tax rate reconciliation by specific categories, at a minimum, with accompanying qualitative disclosures, and separate disclosure of reconciling items based on quantitative thresholds. • Requires categories within the effective rate reconciliation to be further disaggregated if quantitative thresholds are met.	• Required effective date: Annual financial statements for the year ending December 31, 2025.[a] • The guidance can be applied on a prospective basis with the option to apply the standard retrospectively. • The Bank is evaluating the potential impact on the Consolidated Financial Statements disclosures, as well as the Bank's planned date of adoption.

(a) Early adoption is permitted.

Note 3 – Fair value measurement

The Bank carries a portion of its assets and liabilities at fair value. These assets and liabilities are predominantly carried at fair value on a recurring basis (i.e., assets and liabilities that are measured and reported at fair value on the Bank's Consolidated balance sheets). Certain assets, liabilities and unfunded lending-related commitments are measured at fair value on a nonrecurring basis; that is, they are not measured at fair value on an ongoing basis but are subject to fair value adjustments only in certain circumstances (for example, when there is evidence of impairment).

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is based on quoted market prices or inputs, where available. If prices or quotes are not available, fair value is based on valuation models and other valuation techniques that consider relevant transaction characteristics (such as maturity) and use, as inputs, observable or unobservable market parameters, including yield curves, interest rates, volatilities, prices (such as commodity, equity or debt prices), correlations, foreign exchange rates and credit curves. Fair value may also incorporate valuation adjustments.

The level of precision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Bank believes its valuation methods are appropriate and consistent with those of other market participants, the methods and assumptions used reflect management judgment and may vary across the Bank's businesses and portfolios.

The Bank uses various methodologies and assumptions in the determination of fair value. The use of different methodologies or assumptions by other market participants compared with those used by the Bank could result in the Bank deriving a different estimate of fair value at the reporting date.

Valuation process

Risk-taking functions are responsible for providing fair value estimates for assets and liabilities carried on the Consolidated balance sheets at fair value. JPMorgan Chase's Valuation Control Group ("VCG"), which is part of JPMorgan Chase's Finance function and independent of the risk-taking functions, is responsible for verifying these estimates and determining any fair value adjustments that may be required to ensure that the Bank's positions are recorded at fair value. In addition, JPMorgan Chase's Valuation Governance Forum ("VGF"), which is composed of senior finance and risk executives, is responsible for overseeing the management of risks arising from valuation activities conducted across JPMorgan Chase. The Firmwide VGF is chaired by the Firmwide head of the VCG (under the direction of JPMorgan Chase's Controller).

Price verification process

The VCG verifies fair value estimates provided by the risk-taking functions by leveraging independently derived prices, valuation inputs and other market data, where available. Where independent prices or inputs are not available, the VCG performs additional review to ensure the reasonableness of the estimates. The additional review may include evaluating the limited market activity including client unwinds, benchmarking valuation inputs to those used for similar instruments, decomposing the valuation of structured instruments into individual components, comparing expected to actual cash flows, reviewing profit and loss trends, and reviewing trends in collateral valuation. There are also additional levels of management review for more significant or complex positions.

The VCG determines any valuation adjustments that may be required to the estimates provided by the risk-taking functions. No adjustments to quoted prices are applied for instruments classified within level 1 of the fair value hierarchy (refer to the discussion below for further information on the fair value hierarchy). For other positions, judgment is required to assess the need for valuation adjustments to appropriately reflect liquidity considerations, unobservable parameters, and, for certain portfolios that meet specified criteria, the size of the net open risk position. The determination of such adjustments follows a consistent framework across the Bank:

- Liquidity valuation adjustments are considered where an observable external price or valuation parameter exists but is of lower reliability, potentially due to lower market activity. Liquidity valuation adjustments are made based on current market conditions. Factors that may be considered in determining the liquidity adjustment include analysis of: (1) the estimated bid-offer spread for the instrument being traded; (2) alternative pricing points for similar instruments in active markets; and (3) the range of reasonable values that the price or parameter could take.
- The Bank manages certain portfolios of financial instruments on the basis of net open risk exposure and, as permitted by U.S. GAAP, has elected to estimate the fair value of such portfolios on the basis of a transfer of the entire net open risk position in an orderly transaction. Where this is the case, valuation adjustments may be necessary to reflect the cost of exiting a larger-than-normal market-size net open risk position. Where applied, such adjustments are based on factors that a relevant market participant would consider in the transfer of the net open risk position, including the size of the adverse market move that is likely to occur during the period required to sufficiently reduce the net open risk position.

- Uncertainty adjustments related to unobservable parameters may be made when positions are valued using prices or input parameters to valuation models that are unobservable due to a lack of market activity or because they cannot be implied from observable market data. Such prices or parameters must be estimated and are, therefore, subject to management judgment. Adjustments are made to reflect the uncertainty inherent in the resulting valuation estimate.
- Where appropriate, the Bank also applies adjustments to its estimates of fair value in order to appropriately reflect counterparty credit quality (credit valuation adjustments ("CVA")), the Bank's own creditworthiness (debit valuation adjustments ("DVA")) and the impact of funding (funding valuation adjustments ("FVA")), using a consistent framework across the Bank.

Valuation model review and approval

If prices or quotes are not available for an instrument or a similar instrument, fair value is generally determined using valuation models that consider relevant transaction terms such as maturity and use as inputs market-based or independently sourced parameters. Where this is the case the price verification process described above is applied to the inputs in those models.

Under the Bank's Estimations and Model Risk Management Policy, Model Risk Governance and Review ("MRGR") reviews and approves new models, as well as material changes to existing models, prior to implementation in the operating environment. In certain circumstances exceptions may be granted to the Bank's policy to allow a model to be used prior to review or approval. MRGR may also require the user to take appropriate actions to mitigate the model risk if it is to be used in the interim. These actions will depend on the model and may include, for example, limitation of trading activity.

Fair value hierarchy

A three-level fair value hierarchy has been established under U.S. GAAP for disclosure of fair value measurements. The fair value hierarchy is based on the observability of inputs to the valuation of an asset or liability as of the measurement date. The three levels are defined as follows.

- Level 1 – inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities in active markets.
- Level 2 – inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument.
- Level 3 – one or more inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument's categorization within the fair value hierarchy is based on the lowest level of input that is significant to the fair value measurement.

The following table describes the valuation methodologies generally used by the Bank to measure its significant products/instruments at fair value, including the general classification of such instruments pursuant to the fair value hierarchy.

Product/instrument	Valuation methodology	Classifications in the fair value hierarchy
Securities financing agreements	Valuations are based on discounted cash flows, which consider: • Derivative features: refer to the discussion of derivatives below for further information • Market rates for the respective maturity • Collateral characteristics	Predominantly level 2
Loans and lending-related commitments – wholesale Loans carried at fair value (trading loans and non-trading loans) and associated lending-related commitments	Where observable market data is available, valuations are based on: • Observed market prices (circumstances are infrequent) • Relevant broker quotes • Observed market prices for similar instruments Where observable market data is unavailable or limited, valuations are based on discounted cash flows, which consider the following: • Credit spreads derived from the cost of credit default swaps ("CDS"); or benchmark credit curves developed by the Bank, by industry and credit rating • Prepayment speed • Collateral characteristics	Level 2 or 3
Loans – consumer Loans carried at fair value – conforming residential mortgage loans expected to be sold	Fair value is based on observable market prices for mortgage-backed securities ("MBS") with similar collateral and incorporates adjustments to these prices to account for differences between the securities and the value of the underlying loans, which include credit characteristics, portfolio composition, and liquidity.	Predominantly level 2
Investment and trading securities	Quoted market prices	Level 1
	In the absence of quoted market prices, securities are valued based • Observable market prices for similar securities • Relevant broker quotes • Discounted cash flows In addition, the following inputs to discounted cash flows are used for the following products: Mortgage- and asset-backed securities ("ABS") specific inputs: • Collateral characteristics • Deal-specific payment and loss allocations • Current market assumptions related to yield, prepayment speed, conditional default rates and loss severity Collateralized loan obligations ("CLOs") specific inputs: • Collateral characteristics • Deal-specific payment and loss allocations • Expected prepayment speed, conditional default rates, loss • Credit spreads • Credit rating data	Level 2 or 3
Physical commodities	Valued using observable market prices or data.	Level 1 or 2

Product/instrument	Valuation methodology	Classifications in the fair value hierarchy
Derivatives	Actively traded derivatives, e.g., exchange traded derivatives, that are valued using quoted prices.	Level 1
	Derivatives that are valued using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs as well as considering the contractual terms. The key valuation inputs used will depend on the type of derivative and the nature of the underlying instruments and may include equity prices, commodity prices, foreign exchange rates, volatilities, correlations, CDS spreads, recovery rates and prepayment speed. In addition, specific inputs used for derivatives that are valued based on models with significant unobservable inputs are as follows: Interest rate and FX exotic derivatives specific inputs include: • Interest rate curve • Interest rate volatility • Interest rate spread volatility • Bermudan switch value • Interest rate correlation • Interest rate-FX correlation • Foreign exchange correlation Credit derivatives specific inputs include: • Credit correlation between the underlying debt instruments Equity derivatives specific inputs include: • Forward equity price • Equity volatility • Equity correlation • Equity-FX correlation • Equity-IR correlation Commodity derivatives specific inputs include: • Forward commodity price • Commodity volatility • Commodity correlation Additionally, adjustments are made to reflect counterparty credit quality (CVA) and the impact of funding (FVA).	Level 2 or 3
Mortgage servicing rights (“MSRs”)	Refer to Mortgage servicing rights in Note 16.	Level 3
Fund investments (e.g., mutual/ collective investment funds, private equity funds, hedge funds, and real estate funds)	Net asset value (“NAV”)	
	• NAV is supported by the ability to redeem and purchase at the NAV level	Level 1
	• Adjustments to the NAV as required, for restrictions on redemption (e.g., lock-up periods or withdrawal limitations) or where observable activity is limited	Level 2 or 3[(a)]
Beneficial interests issued by consolidated VIEs	Valued using observable market information, where available. In the absence of observable market information, valuations are based on the fair value of the underlying assets held by the VIE.	Level 2 or 3
Structured notes (included in deposits, short-term borrowings and long-term debt)	• Valuations are based on discounted cash flow analyses that consider the embedded derivative and the terms and payment structure of the note. • The embedded derivative features are considered using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs, depending on the embedded derivative. The specific inputs used vary according to the nature of the embedded derivative features, as described in the discussion above regarding derivatives valuation. Adjustments are then made to this base valuation to reflect the Bank’s own credit risk (DVA).	Level 2 or 3

(a) Excludes certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient.

The following table presents the assets and liabilities reported at fair value as of December 31, 2023 and 2022, by major product category and fair value hierarchy.

Assets and liabilities measured at fair value on a recurring basis

	Fair value hierarchy				
December 31, 2023 (in millions)	Level 1	Level 2	Level 3	Derivative netting adjustments[e]	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 162,977	$ –	$ –	$ 162,977
Securities borrowed	–	20,541	–	–	20,541
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	–	9,465	758	–	10,223
Residential – nonagency	–	756	4	–	760
Commercial – nonagency	–	278	5	–	283
Total mortgage-backed securities	–	10,499	767	–	11,266
U.S. Treasury, GSEs and government agencies[a]	37,419	769	–	–	38,188
Obligations of U.S. states and municipalities	–	3,565	5	–	3,570
Certificates of deposit, bankers' acceptances and commercial paper	–	278	–	–	278
Non-U.S. government debt securities	24,846	55,178	179	–	80,203
Corporate debt securities	–	24,261	211	–	24,472
Loans	–	7,831	606	–	8,437
Asset-backed securities	–	399	–	–	399
Total debt instruments	62,265	102,780	1,768	–	166,813
Equity securities	84,503	546	41	–	85,090
Physical commodities[b]	1,380	2,433	–	–	3,813
Other	–	18,776	142	–	18,918
Total debt and equity instruments[c]	148,148	124,535	1,951	–	274,634
Derivative receivables:					
Interest rate	817	301,350	4,322	(280,229)	26,260
Credit	–	8,376	1,056	(8,867)	565
Foreign exchange	149	208,604	1,097	(191,832)	18,018
Equity	–	54,205	6,447	(55,278)	5,374
Commodity	–	19,498	189	(14,729)	4,958
Total derivative receivables	966	592,033	13,111	(550,935)	55,175
Total trading assets	149,114	716,568	15,062	(550,935)	329,809
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	–	85,170	–	–	85,170
Residential – nonagency	–	3,639	–	–	3,639
Commercial – nonagency	–	2,803	–	–	2,803
Total mortgage-backed securities	–	91,612	–	–	91,612
U.S. Treasury and government agencies	57,683	122	–	–	57,805
Obligations of U.S. states and municipalities	–	21,367	–	–	21,367
Non-U.S. government debt securities	13,095	8,187	–	–	21,282
Corporate debt securities	–	87	–	–	87
Asset-backed securities:					
Collateralized loan obligations	–	6,752	–	–	6,752
Other	–	2,771	–	–	2,771
Total available-for-sale securities	70,778	130,898	–	–	201,676
Loans	–	35,537	3,054	–	38,591
Mortgage servicing rights	–	–	8,522	–	8,522
Other assets[d]	7,957	3,131	179	–	11,267
Total assets measured at fair value on a recurring basis	$ 227,849	$ 1,069,652	$ 26,817	$ (550,935)	$ 773,383
Deposits	$ –	$ 76,688	$ 1,836	$ –	$ 78,524
Federal funds purchased and securities loaned or sold under repurchase agreements	–	67,067	–	–	67,067
Short-term borrowings	–	8,712	1,548	–	10,260
Trading liabilities:					
Debt and equity instruments[c]	51,341	24,127	30	–	75,498
Derivative payables:					
Interest rate	1,087	281,813	6,375	(278,417)	10,858
Credit	–	11,366	776	(11,068)	1,074
Foreign exchange	147	216,916	1,164	(205,622)	12,605
Equity	–	55,392	6,827	(56,669)	5,550
Commodity	–	19,518	481	(14,722)	5,277
Total derivative payables	1,234	585,005	15,623	(566,498)	35,364
Total trading liabilities	52,575	609,132	15,653	(566,498)	110,862
Accounts payable and other liabilities	7,361	845	49	–	8,255
Long-term debt	–	18,209	10,790	–	28,999
Total liabilities measured at fair value on a recurring basis	$ 59,936	$ 780,653	$ 29,876	$ (566,498)	$ 303,967

	Fair value hierarchy				
December 31, 2022 (in millions)	Level 1	Level 2	Level 3	Derivative netting adjustments[e]	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 193,945	$ –	$ –	$ 193,945
Securities borrowed	–	22,454	–	–	22,454
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	–	6,746	742	–	7,488
Residential – nonagency	–	1,200	4	–	1,204
Commercial – nonagency	–	354	–	–	354
Total mortgage-backed securities	–	8,300	746	–	9,046
U.S. Treasury, GSEs and government agencies[a]	9,402	16	–	–	9,418
Obligations of U.S. states and municipalities	–	4,825	5	–	4,830
Certificates of deposit, bankers' acceptances and commercial paper	–	210	–	–	210
Non-U.S. government debt securities	18,213	48,224	155	–	66,592
Corporate debt securities	–	18,687	201	–	18,888
Loans	–	5,720	687	–	6,407
Asset-backed securities	–	596	1	–	597
Total debt instruments	27,615	86,578	1,795	–	115,988
Equity securities	57,996	1,942	166	–	60,104
Physical commodities[b]	8,454	16,205	–	–	24,659
Other	–	19,416	347	–	19,763
Total debt and equity instruments[c]	94,065	124,141	2,308	–	220,514
Derivative receivables:					
Interest rate	856	354,320	4,089	(331,521)	27,744
Credit	–	9,252	717	(8,885)	1,084
Foreign exchange	169	241,003	1,427	(219,326)	23,273
Equity	–	43,962	8,537	(45,459)	7,040
Commodity	–	34,517	369	(26,121)	8,765
Total derivative receivables	1,025	683,054	15,139	(631,312)	67,906
Total trading assets	95,090	807,195	17,447	(631,312)	288,420
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	3	71,500	–	–	71,503
Residential – nonagency	–	4,620	–	–	4,620
Commercial – nonagency	–	1,958	–	–	1,958
Total mortgage-backed securities	3	78,078	–	–	78,081
U.S. Treasury and government agencies	92,060	–	–	–	92,060
Obligations of U.S. states and municipalities	–	6,758	–	–	6,758
Non-U.S. government debt securities	10,591	9,105	–	–	19,696
Corporate debt securities	–	97	239	–	336
Asset-backed securities:					
Collateralized loan obligations	–	5,792	–	–	5,792
Other	–	3,067	–	–	3,067
Total available-for-sale securities	102,654	102,897	239	–	205,790
Loans	–	40,401	1,394	–	41,795
Mortgage servicing rights	–	–	7,973	–	7,973
Other assets[d]	7,105	5,411	143	–	12,659
Total assets measured at fair value on a recurring basis	$ 204,849	$ 1,172,303	$ 27,196	$ (631,312)	$ 773,036
Deposits	$ –	$ 26,576	$ 2,166	$ –	$ 28,742
Federal funds purchased and securities loaned or sold under repurchase agreements	–	75,327	–	–	75,327
Short-term borrowings	–	6,539	1,257	–	7,796
Trading liabilities:					
Debt and equity instruments[c]	46,832	21,730	76	–	68,638
Derivative payables:					
Interest rate	556	331,488	5,787	(322,378)	15,453
Credit	–	9,409	618	(9,294)	733
Foreign exchange	161	252,605	866	(234,810)	18,822
Equity	–	45,037	7,431	(45,582)	6,886
Commodity	–	30,918	543	(25,364)	6,097
Total derivative payables	717	669,457	15,245	(637,428)	47,991
Total trading liabilities	47,549	691,187	15,321	(637,428)	116,629
Accounts payable and other liabilities	7,084	623	53	–	7,760
Long-term debt	–	15,497	11,648	–	27,145
Total liabilities measured at fair value on a recurring basis	$ 54,633	$ 815,749	$ 30,445	$ (637,428)	$ 263,399

(a) At December 31, 2023 and 2022, included total U.S. GSE obligations of $37.3 billion and $27.7 billion, respectively, which were mortgage-related.

(b) Physical commodities inventories are generally accounted for at the lower of cost or net realizable value. "Net realizable value" is a term defined in U.S. GAAP as not exceeding fair value less costs to sell ("transaction costs"). Transaction costs for the Bank's physical commodities inventories are either not applicable or immaterial to the value of the inventory. Therefore, net realizable value approximates fair value for the Bank's physical commodities inventories. When fair value hedging has been applied (or when net realizable value is below cost), the carrying value of physical commodities approximates fair value, because under fair value hedge accounting, the cost basis is adjusted for changes in fair value. Refer to Note 6 for a further discussion of the Bank's hedge accounting relationships. To provide consistent fair value disclosure information, all physical commodities inventories have been included in each period presented.

(c) Balances reflect the reduction of securities owned (long positions) by the amount of identical securities sold but not yet purchased (short positions).

(d) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not required to be classified in the fair value hierarchy. At December 31, 2023 and 2022 the fair values of these investments, which include certain hedge funds, private equity funds, real estate and other funds, were $48 million and $8 million, respectively.
(e) As permitted under U.S. GAAP, the Bank has elected to net derivative receivables and derivative payables and the related cash collateral received and paid when a legally enforceable master netting agreement exists. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral. Additionally, includes derivative receivables and payables with affiliates on a net basis. Refer to Note 21 for information regarding our derivative activities with affiliates.

Level 3 valuations

The Bank has established well-structured processes for determining fair value, including for instruments where fair value is estimated using significant unobservable inputs (level 3). Refer to pages 14-17 of this Note for further information on the Bank's valuation process and a detailed discussion of the determination of fair value for individual financial instruments.

Estimating fair value requires the application of judgment. The type and level of judgment required is largely dependent on the amount of observable market information available to the Bank. For instruments valued using internally developed valuation models and other valuation techniques that use significant unobservable inputs and are therefore classified within level 3 of the fair value hierarchy, judgments used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate valuation model or other valuation technique to use. Second, due to the lack of observability of significant inputs, management must assess relevant empirical data in deriving valuation inputs including transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, prices (such as commodity, equity or debt prices), valuations of comparable instruments, foreign exchange rates and credit curves.

The following table presents the Bank's primary level 3 financial instruments, the valuation techniques used to measure the fair value of those financial instruments, the significant unobservable inputs, the range of values for those inputs and the weighted or arithmetic averages of such inputs. While the determination to classify an instrument within level 3 is based on the significance of the unobservable inputs to the overall fair value measurement, level 3 financial instruments typically include observable components (that is, components that are actively quoted and can be validated to external sources) in addition to the unobservable components. The level 1 and/or level 2 inputs are not included in the table. In addition, the Bank manages the risk of the observable components of level 3 financial instruments using securities and derivative positions that are classified within levels 1 or 2 of the fair value hierarchy.

The range of values presented in the table is representative of the highest and lowest level input used to value the significant groups of instruments within a product/instrument classification. Where provided, the weighted averages of the input values presented in the table are calculated based on the fair value of the instruments that the input is being used to value.

In the Bank's view, the input range, weighted and arithmetic average values do not reflect the degree of input uncertainty or an assessment of the reasonableness of the Bank's estimates and assumptions. Rather, they reflect the characteristics of the various instruments held by the Bank and the relative distribution of instruments within the range of characteristics. For example, two option contracts may have similar levels of market risk exposure and valuation uncertainty, but may have significantly different implied volatility levels because the option contracts have different underlyings, tenors, or strike prices. The input range and weighted and arithmetic average values will therefore vary from period-to-period and parameter-to-parameter based on the characteristics of the instruments held by the Bank at each balance sheet date.

Level 3 inputs[a]

December 31, 2023						
Product/Instrument	Fair value (in millions)	Principal valuation technique	Unobservable inputs[g]	Range of input values		Average[i]
Residential mortgage-backed securities and loans[b]	$ 1,739	Discounted cash flows	Yield	0%	72%	7%
			Prepayment speed	3%	12%	9%
			Conditional default rate	0%	6%	0%
			Loss severity	0%	110%	3%
Commercial mortgage-backed securities and loans[c]	1,431	Market comparables	Price	$32	$84	$81
Corporate debt securities	211	Market comparables	Price	$0	$242	$86
Loans[d]	1,257	Market comparables	Price	$0	$108	$79
Non-U.S. government debt securities	179	Market comparables	Price	$2	$109	$91
Net interest rate derivatives	(2,060)	Option pricing	Interest rate volatility	25bps	420bps	120bps
			Interest rate spread volatility	37bps	77bps	64bps
			Bermudan switch value	0%	54%	21%
			Interest rate correlation	(82)%	90%	19%
			IR-FX correlation	(35)%	60%	5%
	7	Discounted cash flows	Prepayment speed	0%	20%	5%
Net credit derivatives	248	Discounted cash flows	Credit correlation	35%	70%	51%
			Credit spread	0bps	3,617bps	384bps
			Recovery rate	10%	90%	55%
	32	Market comparables	Price	$0	$115	$71
Net foreign exchange derivatives	(1)	Option pricing	IR-FX correlation	(40)%	60%	21%
	(66)	Discounted cash flows	Prepayment speed	11%		11%
			Interest rate curve	2%	6%	4%
Net equity derivatives	(380)	Option pricing	Forward equity price[h]	74%	148%	100%
			Equity volatility	3%	151%	27%
			Equity correlation	15%	100%	58%
			Equity-FX correlation	(88)%	65%	(31)%
			Equity-IR correlation	(19)%	20%	12%
Net commodity derivatives	(292)	Option pricing	Oil commodity forward	$84 / BBL	$270 / BBL	$177 / BBL
			Natural gas commodity forward	$2 / MMBTU	$6 / MMBTU	$4 / MMBTU
			Commodity volatility	17%	20%	18%
			Commodity correlation	(35)%	98%	31%
MSRs	8,522	Discounted cash flows	Refer to Note 16			
Long-term debt, short-term borrowings, and deposits[e]	12,977	Option pricing	Interest rate volatility	25bps	420bps	120bps
			Bermudan switch value	0%	54%	21%
			Interest rate correlation	(82)%	90%	19%
			IR-FX correlation	(35)%	60%	5%
			Equity correlation	15%	100%	58%
			Equity-FX correlation	(88)%	65%	(31)%
			Equity-IR correlation	(19)%	20%	12%
	1,197	Discounted cash flows	Credit correlation	35%	70%	51%
			Yield	5%	20%	12%
			Loss severity	0%	100%	50%
Other level 3 assets and liabilities, net[f]	288					

(a) The categories presented in the table have been aggregated based upon the product type, which may differ from their classification on the Consolidated balance sheets. Furthermore, the inputs presented for each valuation technique in the table are, in some cases, not applicable to every instrument valued using the technique as the characteristics of the instruments can differ.
(b) Comprises U.S. GSE and government agency securities of $758 million, nonagency securities of $4 million and non-trading loans of $977 million.
(c) Comprises nonagency securities of $5 million, trading loans of $65 million and non-trading loans of $1.4 billion.
(d) Comprises trading loans of $541 million and non-trading loans of $716 million.
(e) Long-term debt, short-term borrowings and deposits include structured notes issued by the Bank that are financial instruments that typically contain embedded derivatives. The estimation of the fair value of structured notes includes the derivative features embedded within the instrument. The significant unobservable inputs are broadly consistent with those presented for derivative receivables.
(f) Includes other equity instruments of $120 million with level 3 inputs comparable to net equity derivatives. All other level 3 assets and liabilities are insignificant both individually and in aggregate.
(g) Price is a significant unobservable input for certain instruments. When quoted market prices are not readily available, reliance is generally placed on price-based internal valuation techniques. The price input is expressed assuming a par value of $100.
(h) Forward equity price is expressed as a percentage of the current equity price.
(i) Amounts represent weighted averages except for derivative related inputs where arithmetic averages are used.

Changes in and ranges of unobservable inputs

The following discussion provides a description of the impact on a fair value measurement of a change in each unobservable input in isolation, and the interrelationship between unobservable inputs, where relevant and significant. The impact of changes in inputs may not be independent, as a change in one unobservable input may give rise to a change in another unobservable input. Where relationships do exist between two unobservable inputs, those relationships are discussed below. Relationships may also exist between observable and unobservable inputs (for example, as observable interest rates rise, unobservable prepayment rates decline); such relationships have not been included in the discussion below. In addition, for each of the individual relationships described below, the inverse relationship would also generally apply.

The following discussion also provides a description of attributes of the underlying instruments and external market factors that affect the range of inputs used in the valuation of the Bank's positions.

Yield – The yield of an asset is the interest rate used to discount future cash flows in a discounted cash flow calculation. An increase in the yield, in isolation, would result in a decrease in a fair value measurement.

Credit spread – The credit spread is the amount of additional annualized return over the market interest rate that a market participant would demand for taking exposure to the credit risk of an instrument. The credit spread for an instrument forms part of the discount rate used in a discounted cash flow calculation. Generally, an increase in the credit spread would result in a decrease in a fair value measurement.

The yield and the credit spread of a particular mortgage-backed security primarily reflect the risk inherent in the instrument. The yield is also impacted by the absolute level of the coupon paid by the instrument (which may not correspond directly to the level of inherent risk). Therefore, the range of yield and credit spreads reflects the range of risk inherent in various instruments owned by the Bank. The risk inherent in mortgage-backed securities is driven by the subordination of the security being valued and the characteristics of the underlying mortgages within the collateralized pool, including borrower FICO scores, loan-to-value ("LTV") ratios for residential mortgages and the nature of the property and/or any tenants for commercial mortgages. For corporate debt securities, obligations of U.S. states and municipalities and other similar instruments, credit spreads reflect the credit quality of the obligor and the tenor of the obligation.

Prepayment speed – The prepayment speed is a measure of the voluntary unscheduled principal repayments of a prepayable obligation in a collateralized pool. Prepayment speeds generally decline as borrower delinquencies rise. An increase in prepayment speeds, in isolation, would result in a decrease in a fair value measurement of assets valued at a premium to par and an increase in a fair value measurement of assets valued at a discount to par.

Prepayment speeds may vary from collateral pool to collateral pool, and are driven by the type and location of the underlying borrower, and the remaining tenor of the obligation as well as the level and type (e.g., fixed or floating) of interest rate being paid by the borrower. Typically collateral pools with higher borrower credit quality have a higher prepayment rate than those with lower borrower credit quality, all other factors being equal.

Conditional default rate – The conditional default rate is a measure of the reduction in the outstanding collateral balance underlying a collateralized obligation as a result of defaults. While there is typically no direct relationship between conditional default rates and prepayment speeds, collateralized obligations for which the underlying collateral has high prepayment speeds will tend to have lower conditional default rates. An increase in conditional default rates would generally be accompanied by an increase in loss severity and an increase in credit spreads. An increase in the conditional default rate, in isolation, would result in a decrease in a fair value measurement. Conditional default rates reflect the quality of the collateral underlying a securitization and the structure of the securitization itself. Based on the types of securities owned in the Bank's market-making portfolios, conditional default rates are most typically at the lower end of the range presented.

Loss severity – The loss severity (the inverse concept is the recovery rate) is the expected amount of future realized losses resulting from the ultimate liquidation of a particular loan, expressed as the net amount of loss relative to the outstanding loan balance. An increase in loss severity is generally accompanied by an increase in conditional default rates. An increase in the loss severity, in isolation, would result in a decrease in a fair value measurement.

The loss severity applied in valuing a mortgage-backed security depends on factors relating to the underlying mortgages, including the LTV ratio, the nature of the lender's lien on the property and other instrument-specific factors.

Correlation – Correlation is a measure of the relationship between the movements of two variables. Correlation is a pricing input for a derivative product where the payoff is driven by one or more underlying risks. Correlation inputs are related to the type of derivative (e.g., interest rate, credit, equity, foreign exchange and commodity) due to the nature of the underlying risks. When parameters are positively correlated, an increase in one parameter will result in an increase in the other parameter. When parameters are negatively correlated, an increase in one parameter will result in a decrease in the other parameter. An increase in correlation can result in an increase or a decrease in a fair value measurement. Given a short correlation position, an increase in correlation, in isolation, would generally result in a decrease in a fair value measurement.

The level of correlation used in the valuation of derivatives with multiple underlying risks depends on a number of factors including the nature of those risks. For example, the correlation between two credit risk exposures would be different than that between two interest rate risk exposures. Similarly, the tenor of the transaction may also impact the correlation input, as the relationship between the underlying risks may be different over different time periods. Furthermore, correlation levels are very much dependent on market conditions and could have a relatively wide range of levels within or across asset classes over time, particularly in volatile market conditions.

Volatility – Volatility is a measure of the variability in possible returns for an instrument, parameter or market index given how much the particular instrument, parameter or index changes in value over time. Volatility is a pricing input for options, including equity options, commodity options, and interest rate options. Generally, the higher the volatility of the underlying, the riskier the instrument. Given a long position in an option, an increase in volatility, in isolation, would generally result in an increase in a fair value measurement.

The level of volatility used in the valuation of a particular option-based derivative depends on a number of factors, including the nature of the risk underlying the option (e.g., the volatility of a particular equity security may be significantly different from that of a particular commodity index), the tenor of the derivative as well as the strike price of the option.

Bermudan switch value – The switch value is the difference between the overall value of a Bermudan swaption, which can be exercised at multiple points in time, and its most expensive European swaption and reflects the additional value that the multiple exercise dates provide the holder. Switch values are dependent on market conditions and can vary greatly depending on a number of factors, such as the tenor of the underlying swap as well as the strike price of the option. An increase in switch value, in isolation, would generally result in an increase in a fair value measurement.

Interest rate curve – The interest rate curve represents the relationship of interest rates over differing tenors. The interest rate curve is used to set interest rate and foreign exchange derivative cash flows and is also a pricing input used in the discounting of any derivative cash flow.

Forward price – The forward price is the price at which the buyer agrees to purchase the asset underlying a forward contract on the predetermined future delivery date, and is such that the value of the contract is zero at inception.

The forward price is used as an input in the valuation of certain derivatives and depends on a number of factors including interest rates, the current price of the underlying asset, and the expected income to be received and costs to be incurred by the seller as a result of holding that asset until the delivery date. An increase in the forward can result in an increase or a decrease in a fair value measurement.

Changes in level 3 recurring fair value measurements

The following tables include a rollforward of the Consolidated balance sheets amounts (including changes in fair value) for financial instruments classified by the Bank within level 3 of the fair value hierarchy for the years ended December 31, 2023, 2022 and 2021. When a determination is made to classify a financial instrument within level 3, the determination is based on the significance of the unobservable inputs to the overall fair value measurement. However, level 3 financial instruments typically include, in addition to the unobservable or level 3 components, observable components (that is, components that are actively quoted and can be validated to external sources); accordingly, the gains and losses in the table below include changes in fair value due in part to observable factors that are part of the valuation methodology. The Bank risk-manages the observable components of level 3 financial instruments using securities and derivative positions that are classified within level 1 or 2 of the fair value hierarchy; as these level 1 and level 2 risk management instruments are not included below, the gains or losses in the following tables do not reflect the effect of the Bank's risk management activities related to such level 3 instruments.

	Fair value measurements using significant unobservable inputs								
Year ended December 31, 2023 (in millions)	Fair value at January 1, 2023	Total realized/ unrealized gains/ (losses)	Purchases[g]	Sales	Settlements[h]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2023	Change in unrealized gains/ (losses) related to financial instruments held at Dec. 31, 2023
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 742	$ 4	$ 224	$ (126)	$ (86)	$ –	$ –	$ 758	$ 4
Residential – nonagency	4	5	–	(6)	–	1	–	4	–
Commercial – nonagency	–	(1)	–	–	–	6	–	5	(1)
Total mortgage-backed securities	746	8	224	(132)	(86)	7	–	767	3
Obligations of U.S. states and municipalities	5	–	–	–	–	–	–	5	–
Non-U.S. government debt securities	155	74	217	(254)	–	22	(35)	179	74
Corporate debt securities	201	16	196	(192)	–	70	(80)	211	11
Loans	687	5	954	(467)	(457)	384	(500)	606	26
Asset-backed securities	1	–	6	(10)	–	3	–	–	–
Total debt instruments	1,795	103	1,597	(1,055)	(543)	486	(615)	1,768	114
Equity securities	166	(30)	100	(181)	(16)	157	(155)	41	(37)
Other	347	(107)	160	–	(220)	6	(44)	142	25
Total trading assets – debt and equity instruments	2,308	(34) (c)	1,857	(1,236)	(779)	649	(814)	1,951	102 (c)
Net derivative receivables:[b]									
Interest rate	(1,698)	218	252	(470)	996	(1,062)	(289)	(2,053)	11
Credit	99	305	(56)	(32)	(28)	(33)	25	280	224
Foreign exchange	561	(26)	151	(229)	(220)	117	(421)	(67)	(176)
Equity	1,106	(326)	2,911	(2,785)	(1,219)	629	(696)	(380)	(825)
Commodity	(174)	(177)	61	(294)	87	(2)	207	(292)	(122)
Total net derivative receivables	(106)	(6) (c)	3,319	(3,810)	(384)	(351)	(1,174)	(2,512)	(888) (c)
Available-for-sale securities:									
Corporate debt securities	239	24	–	(225)	–	–	(38)	–	–
Total available-for-sale securities	239	24 (d)	–	(225)	–	–	(38)	–	– (d)
Loans	1,394	288 (c)	2,398	(120)	(1,147)	1,305	(1,064)	3,054	274 (c)
Mortgage servicing rights	7,973	467 (e)	1,281	(188)	(1,011)	–	–	8,522	467 (e)
Other assets	143	36 (c)	–	–	–	–	–	179	36 (c)

	Fair value measurements using significant unobservable inputs									
Year ended December 31, 2023 (in millions)	Fair value at January 1, 2023	Total realized/ unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements[h]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2023	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2023
Liabilities:[a]										
Deposits	$ 2,166	$ 97 (c)(f)	$ –	$ –	$ 940	$ (1,042)	$ –	$ (325)	$ 1,836	$ 74 (c)(f)
Short-term borrowings	1,257	141 (c)(f)	–	–	4,192	(4,031)	2	(13)	1,548	(4) (c)(f)
Trading liabilities – debt and equity instruments	76	(14) (c)	(31)	7	–	–	9	(17)	30	(2) (c)
Accounts payable and other liabilities	53	(4) (c)	–	–	–	–	–	–	49	(4) (c)
Long-term debt	11,648	845 (c)(f)	–	–	4,626	(5,981)	51	(399)	10,790	650 (c)(f)

Year ended December 31, 2022 (in millions)	Fair value at January 1, 2022	Total realized/ unrealized gains/ (losses)	Purchases[g]	Sales	Settlements[h]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2022	Change in unrealized gains/ (losses) related to financial instruments held at Dec. 31, 2022
	Fair value measurements using significant unobservable inputs								
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 254	$ 29	$ 643	$ (102)	$ (82)	$ –	$ –	$ 742	$ 29
Residential – nonagency	9	(1)	–	–	–	–	(4)	4	–
Commercial – nonagency	1	–	–	–	–	2	(3)	–	–
Total mortgage-backed securities	264	28	643	(102)	(82)	2	(7)	746	29
Obligations of U.S. states and municipalities	5	–	–	–	–	–	–	5	–
Non-U.S. government debt securities	81	(92)	494	(338)	(4)	84	(70)	155	(145)
Corporate debt securities	267	(24)	126	(170)	(61)	147	(84)	201	(48)
Loans	654	(38)	596	(582)	(228)	920	(635)	687	(11)
Asset-backed securities	4	–	–	–	–	1	(4)	1	–
Total debt instruments	1,275	(126)	1,859	(1,192)	(375)	1,154	(800)	1,795	(175)
Equity securities	32	(835)	357	(270)	–	923	(41)	166	(652)
Other	602	(47)	702	–	(902)	3	(11)	347	(85)
Total trading assets – debt and equity instruments	1,909	(1,008) (c)	2,918	(1,462)	(1,277)	2,080	(852)	2,308	(912) (c)
Net derivative receivables:[b]									
Interest rate	(2,834)	1,142	311	(967)	306	718	(374)	(1,698)	1,155
Credit	88	225	16	(10)	(196)	6	(30)	99	170
Foreign exchange	(356)	773	214	(175)	98	3	4	561	495
Equity	(778)	2,530	2,933	(3,210)	(23)	343	(689)	1,106	1,628
Commodity	(962)	756	114	(331)	242	7	–	(174)	555
Total net derivative receivables	(4,842)	5,426 (c)	3,588	(4,693)	427	1,077	(1,089)	(106)	4,003 (c)
Available-for-sale securities:									
Corporate debt securities	161	5	88	–	(15)	–	–	239	5
Total available-for-sale securities	161	5 (d)	88	–	(15)	–	–	239	5 (d)
Loans	1,904	(108) (c)	454	(261)	(818)	1,053	(830)	1,394	(76) (c)
Mortgage servicing rights	5,494	2,039 (e)	2,198	(822)	(936)	–	–	7,973	2,039 (e)
Other assets	77	68 (c)	–	–	(2)	–	–	143	68 (c)

Year ended December 31, 2022 (in millions)	Fair value at January 1, 2022	Total realized/ unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements[h]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2022	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2022
	Fair value measurements using significant unobservable inputs									
Liabilities:[a]										
Deposits	$ 2,329	$ (296) (c)(f)	$ –	$ –	$ 531	$ (115)	$ –	$ (283)	$ 2,166	$ (76) (c)(f)
Short-term borrowings	2,376	(461) (c)(f)	–	–	3,859	(4,519)	16	(14)	1,257	86 (c)(f)
Trading liabilities – debt and equity instruments	29	(45) (c)	(22)	69	–	–	52	(7)	76	76 (c)
Accounts payable and other liabilities	69	(16) (c)	–	–	–	–	–	–	53	(16) (c)
Long-term debt	13,925	(1,696) (c)(f)	–	–	5,283	(5,836)	549	(577)	11,648	(1,360) (c)(f)

	Fair value measurements using significant unobservable inputs								
Year ended December 31, 2021 (in millions)	Fair value at January 1, 2021	Total realized/ unrealized gains/ (losses)	Purchases[g]	Sales	Settlements[h]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2021	Change in unrealized gains/ (losses) related to financial instruments held at Dec. 31, 2021
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 387	$ (28)	$ –	$ –	$ (105)	$ –	$ –	$ 254	$ (28)
Residential – nonagency	13	(1)	–	(2)	–	–	(1)	9	(1)
Commercial – nonagency	1	–	–	–	–	–	–	1	–
Total mortgage-backed securities	401	(29)	–	(2)	(105)	–	(1)	264	(29)
Obligations of U.S. states and municipalities	5	–	–	–	–	–	–	5	–
Non-U.S. government debt securities	182	(14)	359	(332)	(7)	–	(107)	81	(10)
Corporate debt securities	441	(33)	390	(485)	(4)	152	(194)	267	(15)
Loans	874	18	935	(669)	(259)	629	(874)	654	5
Asset-backed securities	3	19	35	(55)	–	2	–	4	(1)
Total debt instruments	1,906	(39)	1,719	(1,543)	(375)	783	(1,176)	1,275	(50)
Equity securities	124	(17)	42	(181)	–	120	(56)	32	(66)
Other	344	79	1,067	–	(814)	27	(101)	602	43
Total trading assets – debt and equity instruments	2,374	23 [c]	2,828	(1,724)	(1,189)	930	(1,333)	1,909	(73) [c]
Net derivative receivables:[b]									
Interest rate	(2,509)	1,947	194	(718)	(1,773)	113	(88)	(2,834)	615
Credit	(205)	129	6	(12)	142	34	(6)	88	140
Foreign exchange	(372)	(252)	112	(123)	273	(20)	26	(356)	1
Equity	(1,175)	2,815	3,418	(7,562)	996	446	284	(778)	2,400
Commodity	(770)	(669)	148	(495)	840	3	(19)	(962)	(445)
Total net derivative receivables	(5,031)	3,970 [c]	3,878	(8,910)	478	576	197	(4,842)	2,711 [c]
Available-for-sale securities:									
Corporate debt securities	–	(1)	162	–	–	–	–	161	(1)
Total available-for-sale securities	–	(1)	162	–	–	–	–	161	(1)
Loans	2,274	(89) [c]	552	(437)	(903)	1,298	(791)	1,904	(59) [c]
Mortgage servicing rights	3,276	98 [e]	3,022	(114)	(788)	–	–	5,494	98 [e]
Other assets	57	20 [c]	–	–	–	–	–	77	19 [c]

	Fair value measurements using significant unobservable inputs									
Year ended December 31, 2021 (in millions)	Fair value at January 1, 2021	Total realized/ unrealized (gains)/ losses	Purchases	Sales	Issuances	Settlements[g]	Transfers into level 3	Transfers (out of) level 3	Fair value at Dec. 31, 2021	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2021
Liabilities:[a]										
Deposits	$ 2,948	$ (77) [c][f]	$ –	$ –	$ 432	$ (487)	$ 2	$ (489)	$ 2,329	$ (73) [c][f]
Short-term borrowings	2,314	(1,430) [c][f]	–	–	6,665	(5,108)	9	(74)	2,376	(97) [c][f]
Trading liabilities – debt and equity instruments	49	(7) [c]	(97)	32	–	–	63	(11)	29	(184) [c]
Accounts payable and other liabilities	60	9 [c]	–	–	–	–	–	–	69	9 [c]
Long-term debt	14,397	(52) [c][f]	–	–	7,569	(7,443)	79	(625)	13,925	37 [c][f]

(a) Level 3 assets at fair value as a percentage of total Bank assets at fair value (including assets measured at fair value on a nonrecurring basis) were 4% at both December 31, 2023 and 2022 and 3% at December 31, 2021. Level 3 liabilities at fair value as a percentage of total Bank liabilities at fair value (including liabilities measured at fair value on a nonrecurring basis) were 10%, 12% and 14% at December 31, 2023, 2022 and 2021, respectively.
(b) All level 3 derivatives are presented on a net basis, irrespective of the underlying counterparty.

(c) Predominantly reported in principal transactions revenue, except for changes in fair value for mortgage loans, and lending-related commitments originated with the intent to sell, and mortgage loan purchase commitments, which are reported in mortgage fees and related income.
(d) Realized gains/(losses) on AFS securities are reported in investment securities gains/(losses). Unrealized gains/(losses) are reported in OCI. Realized and unrealized gains/(losses) recorded on level 3 AFS securities were not material for the years ended December 31, 2023, 2022 and 2021.
(e) Changes in fair value for MSRs are reported in mortgage fees and related income.
(f) Realized (gains)/losses due to DVA for fair value option elected liabilities are reported in principal transactions revenue, and were not material for the years ended December 31, 2023, 2022 and 2021. Unrealized (gains)/losses are reported in OCI, and were $(79) million, $(143) million, and $235 million for the years ended December 31, 2023, 2022 and 2021, respectively.
(g) Loan originations are included in purchases.
(h) Includes financial assets and liabilities that have matured, been partially or fully repaid, impacts of modifications, deconsolidations associated with beneficial interests in VIEs and other items.

Level 3 analysis

Consolidated balance sheets changes

The following describes significant changes to level 3 assets since December 31, 2022, for those items measured at fair value on a recurring basis. Refer to Assets and liabilities measured at fair value on a nonrecurring basis on page 29 for further information on changes impacting items measured at fair value on a nonrecurring basis.

For the year ended December 31, 2023

Level 3 assets were $26.8 billion at December 31, 2023, reflecting a decrease of $379 million from December 31, 2022.

The decrease for the year ended December 31, 2023 was driven by:

- $2.0 billion decrease in gross derivative receivables due to settlements and net transfers largely offset by gains and purchases.

predominantly offset by:

- $1.7 billion increase in non-trading loans largely due to $1.1 billion of loans in CIB associated with First Republic.

Refer to the sections below for additional information.

Transfers between levels for instruments carried at fair value on a recurring basis

During the year ended December 31, 2023, significant transfers from level 2 into level 3 included the following:

- $1.0 billion of gross interest rate derivative receivables as a result of a decrease in observability and an increase in the significance of unobservable inputs and $2.1 billion of gross interest rate derivative payables as a result of transition to term SOFR for certain interest rate options.
- $2.1 billion of gross equity derivative receivables and $1.5 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $1.3 billion of non-trading loans driven by a decrease in observability.

During the year ended December 31, 2023, significant transfers from level 3 into level 2 included the following:

- $814 million of total debt and equity instruments, largely due to trading loans, driven by an increase in observability.
- $978 million of gross interest rate derivative receivables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $3.3 billion of gross equity derivative receivables and $2.6 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $1.1 billion of non-trading loans as a result of an increase in observability and a decrease in the significance of unobservable inputs.

During the year ended December 31, 2022, significant transfers from level 2 into level 3 included the following:

- $2.1 billion of total debt and equity instruments, predominantly due to equity securities of $923 million driven by a decrease in observability as a result of restricted access to certain markets and trading loans of $920 million driven by a decrease in observability.
- $1.6 billion of gross interest rate derivative receivables and $909 million of gross interest rate derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $3.0 billion of gross equity derivative receivables and $2.6 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $1.1 billion of non-trading loans driven by a decrease in observability.

During the year ended December 31, 2022, significant transfers from level 3 into level 2 included the following:

- $852 million of total debt and equity instruments, largely due to trading loans, driven by an increase in observability.
- $1.2 billion of gross interest rate derivative receivables and $811 million of gross interest rate derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $3.6 billion of gross equity derivative receivables and $2.9 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $830 million of non-trading loans driven by an increase in observability.

During the year ended December 31, 2021, significant transfers from level 2 into level 3 included the following:

- $930 million of total debt and equity instruments, largely due to trading loans, driven by a decrease in observability.
- $2.2 billion of gross equity derivative receivables and $1.7 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $1.3 billion of non-trading loans driven by a decrease in observability.

During the year ended December 31, 2021, significant transfers from level 3 into level 2 included the following:

- $1.3 billion of total debt and equity instruments, largely due to trading loans, driven by an increase in observability.
- $2.9 billion of gross equity derivative receivables and $3.2 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $791 million of non-trading loans driven by an increase in observability

All transfers are based on changes in the observability and/or significance of the valuation inputs and are assumed to occur at the beginning of the quarterly reporting period in which they occur.

Gains and losses

The following describes significant components of total realized/unrealized gains/(losses) for instruments measured at fair value on a recurring basis for the years ended December 31, 2023, 2022 and 2021.

These amounts exclude any effects of the Bank's risk management activities where the financial instruments are classified as level 1 and 2 of the fair value hierarchy. Refer to Changes in level 3 recurring fair value measurements rollforward tables on pages 23–27 for further information on these instruments.

2023

- $775 million of net gains on assets, largely driven by gains in MSRs reflecting lower prepayment speeds on higher rates.
- $1.1 billion of net losses on liabilities, predominantly driven by losses in long-term debt due to market movements.

2022

- $6.4 billion of net gains on assets, largely driven by gains in net equity derivative receivables due to market movements and gains in MSRs reflecting lower prepayment speeds on higher rates.
- $2.5 billion of net gains on liabilities, largely driven by a decline in the fair value of long-term debt due to market movements.

2021

- $4.0 billion of net gains on assets, driven by gains in net interest rate derivative receivables and net equity derivative receivables due to market movements.
- $1.6 billion of net gains on liabilities, predominantly driven by gains in short-term borrowings due to market movements.

Refer to Note 16 for information on MSRs.

Assets and liabilities measured at fair value on a nonrecurring basis

The following tables present the assets and liabilities held as of December 31, 2023 and 2022, for which nonrecurring fair value adjustments were recorded during the years ended December 31, 2023 and 2022, by major product category and fair value hierarchy.

December 31, 2023 (in millions)	Fair value hierarchy			
	Level 1	Level 2	Level 3	Total fair value
Loans	**$ –**	**$ 464**	**$ 1,051**	**$ 1,515**
Other assets[a]	**–**	**32**	**859**	**891**
Total assets measured at fair value on a nonrecurring basis	**$ –**	**$ 496**	**$ 1,910**	**$ 2,406**
Accounts payable and other liabilities	**–**	**–**	**–**	**–**
Total liabilities measured at fair value on a nonrecurring basis	**$ –**	**$ –**	**$ –**	**$ –**

December 31, 2022 (in millions)	Fair value hierarchy			
	Level 1	Level 2	Level 3	Total fair value
Loans	$ –	$ 630	$ 450	$ 1,080
Other assets	–	36	535	571
Total assets measured at fair value on a nonrecurring basis	$ –	$ 666	$ 985	$ 1,651
Accounts payable and other liabilities	–	–	84	84
Total liabilities measured at fair value on a nonrecurring basis	$ –	$ –	$ 84	$ 84

(a) Included impairments on certain equity method investments, as well as equity securities without readily determinable fair values that were adjusted based on observable price changes in orderly transactions from an identical or similar investment of the same issuer (measurement alternative). Of the $859 million in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2023, $200 million related to equity securities adjusted based on the measurement alternative. These equity securities are classified as level 3 due to the infrequency of the observable prices and/or the restrictions on the shares.

Nonrecurring fair value changes

The following table presents the total change in value of assets and liabilities for which fair value adjustments have been recognized for the years ended December 31, 2023, 2022 and 2021, related to assets and liabilities held at those dates.

December 31, (in millions)	**2023**	2022	2021
Loans	**$ (271)**	$ (57)	$ (48)
Other assets[a]	**(323)**	(4)	(36)
Accounts payable and other liabilities	**–**	(83)	5
Total nonrecurring fair value gains/(losses)	**$ (594)**	$ (144)	$ (79)

(a) At both December 31, 2023 and 2022, included $62 million of net gains/(losses) as a result of the measurement alternative, and was not material for the year ended December 31, 2021. The current period also included impairments on certain equity method investments.

Refer to Note 13 for further information about the measurement of collateral-dependent loans.

Equity securities without readily determinable fair values

The Bank measures certain equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer (i.e., measurement alternative), with such changes recognized in other income.

In its determination of the new carrying values upon observable price changes, the Bank may adjust the prices if deemed necessary to arrive at the Bank's estimated fair values. Such adjustments may include adjustments to reflect the different rights and obligations of similar securities, and other adjustments that are consistent with the Bank's valuation techniques for private equity direct investments.

The following table presents the carrying value of equity securities without readily determinable fair values held as of December 31, 2023 and 2022, that are measured under the measurement alternative and the related adjustments recorded during the periods presented for those securities with observable price changes. These securities are included in the nonrecurring fair value tables when applicable price changes are observable.

As of or for the year ended December 31, (in millions)	2023	2022
Other assets		
Carrying value[(a)]	**$ 452**	$ 639
Upward carrying value changes[(b)]	**62**	63
Downward carrying value changes/impairment[(c)]	**–**	(1)

(a) The period-end carrying values reflect cumulative purchases and sales in addition to upward and downward carrying value changes.
(b) The cumulative upward carrying value changes between January 1, 2018 and December 31, 2023 were $180 million.
(c) The cumulative downward carrying value changes/impairment between January 1, 2018 and December 31, 2023 were $(21) million.

Included in other assets above is the Bank's interest in approximately 37 million Visa Class B common shares ("Visa B shares"). These shares are subject to certain transfer restrictions and are convertible into Visa Class A common shares ("Visa A shares") at a specified conversion rate upon final resolution of certain litigation matters involving Visa. The conversion rate of Visa B shares to Visa A shares was 1.5875 at December 31, 2023 and may be adjusted by Visa depending on developments related to the litigation matters. The outcome of those litigation matters, and the effect that the resolution of those matters may have on the conversion rate, is unknown. Accordingly, as of December 31, 2023, there is significant uncertainty regarding when the transfer restrictions on Visa B shares may be terminated and what the final conversion rate for the Visa B shares will be. As a result of these considerations, as well as differences in voting rights, Visa B shares are not considered to be similar to Visa A shares, and they continue to be held at their nominal carrying value.

In connection with prior sales of Visa B shares, the Bank has entered into derivative instruments with the purchasers of the shares under which the Bank retains the risk associated with changes in the conversion rate. Under the terms of the derivative instruments, the Bank will (a) make or receive payments based on subsequent changes in the conversion rate and (b) make periodic interest payments to the purchasers of the Visa B shares. The payments under the derivative instruments will continue as long as the Visa B shares remain subject to transfer restrictions. The derivative instruments are accounted for at fair value using a discounted cash flow methodology based upon the Bank's estimate of the timing and magnitude of final resolution of the litigation matters. The derivative instruments are recorded in trading liabilities, and changes in fair value are recognized in other income. As of December 31, 2023, the Bank held derivative instruments associated with 23 million Visa B shares that the Bank had previously sold, which are all subject to similar terms and conditions.

On January 24, 2024, Visa filed a Current Report on Form 8-K with the SEC announcing that Visa's stockholders approved amendments to its Certificate of Incorporation that redenominate the Visa B shares to Visa Class B-1 common shares ("Visa B-1 shares") and authorize Visa to conduct one or more exchange offers ("the Program") which, if conducted, would have the effect of releasing transfer restrictions on a portion of Visa's B-1 shares through an exchange for Visa Class C common shares ("Visa C shares"). The Program would entitle the Bank to exchange its Visa B-1 shares, for Visa Class B-2 common shares ("Visa B-2 shares") and Visa C shares, through an initial exchange offer if and when conducted by Visa. The Visa B-2 shares would continue to be subject to the transfer restrictions associated with the Visa B shares. The Bank is then entitled to sell the Visa C shares received after a brief lock-up period expires, and Visa is also authorized to extend offers for potential future exchanges, each enabling the release of additional Visa B shares if certain conditions are met. The timing and likelihood of any initial or future exchange offer is dependent upon actions taken by Visa and other factors that may be outside of the Bank's control.

Additional disclosures about the fair value of financial instruments that are not carried on the Consolidated balance sheets at fair value

U.S. GAAP requires disclosure of the estimated fair value of certain financial instruments, which are included in the following table. However, this table does not include other items, such as nonfinancial assets, intangible assets, certain financial instruments, and customer relationships. In the opinion of management, these items, in the aggregate, add significant value to the Bank.

Financial instruments for which carrying value approximates fair value

Certain financial instruments that are not carried at fair value on the Consolidated balance sheets are carried at amounts that approximate fair value, due to their short-term nature and generally negligible credit risk. These instruments include cash and due from banks, deposits with banks, federal funds sold, securities purchased under resale agreements and securities borrowed, short-term receivables and accrued interest receivable, short-term borrowings, federal funds purchased, securities loaned and sold under repurchase agreements, accounts payable, and accrued liabilities. In addition, U.S. GAAP requires that the fair value of deposit liabilities with no stated maturity (i.e., demand, savings and certain money market deposits) be equal to their carrying value; recognition of the inherent funding value of these instruments is not permitted.

The following table presents, by fair value hierarchy classification, the carrying values and estimated fair values at December 31, 2023 and 2022, of financial assets and liabilities, excluding financial instruments that are carried at fair value on a recurring basis, and their classification within the fair value hierarchy.

	December 31, 2023					December 31, 2022				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value
Financial assets										
Cash and due from banks	**$ 28.8**	**$ 28.8**	**$ –**	**$ –**	**$ 28.8**	$ 27.3	$ 27.3	$ –	$ –	$ 27.3
Deposits with banks	**593.7**	**593.2**	**0.5**	**–**	**593.7**	538.7	538.5	0.2	–	538.7
Accrued interest and accounts receivable	**66.9**	**–**	**66.8**	**0.1**	**66.9**	89.0	–	88.9	0.1	89.0
Federal funds sold and securities purchased under resale agreements	**63.7**	**–**	**63.7**	**–**	**63.7**	65.5	–	65.5	–	65.5
Securities borrowed	**40.7**	**–**	**40.7**	**–**	**40.7**	31.2	–	31.2	–	31.2
Investment securities, held-to-maturity	**369.8**	**160.6**	**182.2**	**–**	**342.8**	425.3	189.1	199.5	–	388.6
Loans, net of allowance for loan losses[(a)]	**1,259.2**	**–**	**282.1**	**961.8**	**1,243.9**	1,071.5	–	191.0	851.7	1,042.7
Other	**71.2**	**–**	**70.0**	**1.4**	**71.4**	63.5	–	62.4	1.1	63.5
Financial liabilities										
Deposits	**$ 2,419.7**	**$ –**	**$ 2,420.1**	**$ –**	**$ 2,420.1**	$ 2,412.0	$ –	$ 2,411.9	$ –	$ 2,411.9
Federal funds purchased and securities loaned or sold under repurchase agreements	**7.5**	**–**	**7.5**	**–**	**7.5**	10.6	–	10.6	–	10.6
Short-term borrowings[(b)]	**1.7**	**–**	**1.7**	**–**	**1.7**	2.3	–	2.3	–	2.3
Accounts payable and other liabilities	**127.5**	**–**	**119.0**	**8.0**	**127.0**	120.1	–	113.9	5.5	119.4
Beneficial interests issued by consolidated VIEs	**23.2**	**–**	**23.2**	**–**	**23.2**	13.4	–	13.4	–	13.4
Long-term debt[(b)]	**177.9**	**–**	**125.8**	**51.3**	**177.1**	48.0	–	45.1	2.8	47.9

(a) Fair value is typically estimated using a discounted cash flow model that incorporates the characteristics of the underlying loans (including principal, contractual interest rate and contractual fees) and other key inputs, including expected lifetime credit losses, interest rates, prepayment rates, and primary origination or secondary market spreads. For certain loans, the fair value is measured based on the value of the underlying collateral. Carrying value of the loan takes into account the loan's allowance for loan losses, which represents the loan's expected credit losses over its remaining expected life. The difference between the estimated fair value and carrying value of a loan is generally attributable to changes in market interest rates, including credit spreads, market liquidity premiums and other factors that affect the fair value of a loan but do not affect its carrying value.

(b) Includes FHLB advances in level 2 of Long-term debt and Short-term borrowings and the Purchase Money Note in level 3 of Long-term debt associated with First Republic. Refer to Notes 20 and 29 for additional information.

The majority of the Bank's lending-related commitments are not carried at fair value on a recurring basis on the Consolidated balance sheets. The carrying value and the estimated fair value of these wholesale lending-related commitments were as follows for the periods indicated.

	December 31, 2023					December 31, 2022				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	Carrying value[a][b][c]	Level 1	Level 2	Level 3	Total estimated fair value	Carrying value[a][b]	Level 1	Level 2	Level 3	Total estimated fair value
Wholesale lending-related commitments	**$ 3.0**	**$ –**	**$ –**	**$ 4.8**	**$ 4.8**	$ 2.3	$ –	$ –	$ 3.1	$ 3.1

(a) Excludes the current carrying values of the guarantee liability and the offsetting asset, each of which is recognized at fair value at the inception of the guarantees.
(b) Includes the wholesale allowance for lending-related commitments.
(c) As of December 31, 2023, includes fair value adjustments associated with First Republic for other unfunded commitments to extend credit totaling $1.1 billion recorded in accounts payable and other liabilities on the Consolidated balance sheets. Refer to Notes 26 and 29 for additional information.

The Bank does not estimate the fair value of consumer off-balance sheet lending-related commitments. In many cases, the Bank can reduce or cancel these commitments by providing the borrower notice or, in some cases as permitted by law, without notice. Refer to page 16 of this Note for a further discussion of the valuation of lending-related commitments.

Note 4 – Fair value option

The fair value option provides an option to elect fair value for selected financial assets, financial liabilities, unrecognized firm commitments, and written loan commitments.

The Bank has elected to measure certain instruments at fair value for several reasons including to mitigate income statement volatility caused by the differences between the measurement basis of elected instruments (e.g., certain instruments that otherwise would be accounted for on an accrual basis) and the associated risk management arrangements that are accounted for on a fair value basis, as well as to better reflect those instruments that are managed on a fair value basis.

The Bank's election of fair value includes the following instruments:

- Loans purchased or originated as part of securitization warehousing activity, subject to bifurcation accounting, or managed on a fair value basis, including lending-related commitments
- Certain securities financing agreements
- Owned beneficial interests in securitized financial assets that contain embedded credit derivatives, which would otherwise be required to be separately accounted for as a derivative instrument
- Structured notes and other hybrid instruments, which are predominantly financial instruments that contain embedded derivatives, that are issued or transacted as part of client-driven activities
- Certain long-term beneficial interests issued by consolidated securitization trusts where the underlying assets are carried at fair value

Changes in fair value under the fair value option election

The following table presents the changes in fair value included in the Consolidated statements of income for the years ended December 31, 2023, 2022 and 2021, for items for which the fair value option was elected. The profit and loss information presented below only includes the financial instruments that were elected to be measured at fair value; related risk management instruments, which are required to be measured at fair value, are not included in the table.

	2023			2022			2021		
December 31, (in millions)	Principal transactions	All other income	Total changes in fair value recorded[e]	Principal transactions	All other income	Total changes in fair value recorded[e]	Principal transactions	All other income	Total changes in fair value recorded[e]
Federal funds sold and securities purchased under resale agreements	**$ 184**	**$ –**	**$ 184**	$ (209)	$ –	$ (209)	$ (70)	$ –	$ (70)
Securities borrowed	**135**	**–**	**135**	(497)	–	(497)	(200)	–	(200)
Trading assets:									
Debt and equity instruments, excluding loans	**3,251**	**–**	**3,251**	(2,009)	–	(2,009)	(2,189)	(1) [c]	(2,190)
Loans reported as trading assets:									
Changes in instrument-specific credit risk	**278**	**–**	**278**	(137)	–	(137)	361	–	361
Other changes in fair value	**(3)**	**5** [c]	**2**	(59)	–	(59)	(1)	–	(1)
Loans:									
Changes in instrument-specific credit risk	**309**	**(4)** [c]	**305**	(243)	21 [c]	(222)	586	(7) [c]	579
Other changes in fair value	**428**	**216** [c]	**644**	(1,338)	(794) [c]	(2,132)	(162)	2,056 [c]	1,894
Other assets	**250**	**–**	**250**	1	–	1	5	(1) [d]	4
Deposits[a]	**(2,593)**	**–**	**(2,593)**	908	–	908	(211)	–	(211)
Federal funds purchased and securities loaned or sold under repurchase agreements	**(137)**	**–**	**(137)**	570	–	570	184	–	184
Short-term borrowings[a]	**(532)**	**–**	**(532)**	1,226	–	1,226	(386)	–	(386)
Trading liabilities	**–**	**–**	**–**	(1)	–	(1)	1	–	1
Other liabilities	**(16)**	**–**	**(16)**	(11)	–	(11)	(17)	–	(17)
Long-term debt[a][b]	**(3,063)**	**(79)** [c][d]	**(3,142)**	2,494	103 [c][d]	2,597	(1,167)	4 [c][d]	(1,163)

(a) Unrealized gains/(losses) due to instrument-specific credit risk (DVA) for liabilities for which the fair value option has been elected are recorded in OCI, while realized gains/(losses) are recorded in principal transactions revenue. Realized gains/(losses) due to instrument-specific credit risk recorded in principal transactions revenue were not material for the years ended December 31, 2023, 2022 and 2021.
(b) Long-term debt measured at fair value predominantly relates to structured notes. Although the risk associated with the structured notes is actively managed, the gains/(losses) reported in this table do not include the income statement impact of the risk management instruments used to manage such risk.
(c) Reported in mortgage fees and related income.
(d) Reported in other income.
(e) Changes in fair value exclude contractual interest, which is included in interest income and interest expense for all instruments other than certain hybrid financial instruments. Refer to Note 8 for further information regarding interest income and interest expense.

Determination of instrument-specific credit risk for items for which the fair value option was elected

The following describes how the gains and losses that are attributable to changes in instrument-specific credit risk, were determined.

- Loans and lending-related commitments: For floating-rate instruments, all changes in value are attributed to instrument-specific credit risk. For fixed-rate instruments, an allocation of the changes in value for the period is made between those changes in value that are interest rate-related and changes in value that are credit-related. Allocations are generally based on an analysis of borrower-specific credit spread and recovery information, where available, or benchmarking to similar entities or industries.
- Long-term debt: Changes in value attributable to instrument-specific credit risk were derived principally from observable changes in the Bank's credit spread as observed in the bond market.
- Securities financing agreements: Generally, for these types of agreements, there is a requirement that collateral be maintained with a market value equal to or in excess of the principal amount loaned; as a result, there would be no adjustment or an immaterial adjustment for instrument-specific credit risk related to these agreements.

Difference between aggregate fair value and aggregate remaining contractual principal balance outstanding

The following table reflects the difference between the aggregate fair value and the aggregate remaining contractual principal balance outstanding as of December 31, 2023 and 2022, for loans, long-term debt and long-term beneficial interests for which the fair value option has been elected.

December 31, (in millions)	2023 Contractual principal outstanding	2023 Fair value	2023 Fair value over/(under) contractual principal outstanding	2022 Contractual principal outstanding	2022 Fair value	2022 Fair value over/(under) contractual principal outstanding
Loans						
Nonaccrual loans						
Loans reported as trading assets	$ 2,295	$ 518	$ (1,777)	$ 1,890	$ 297	$ (1,593)
Loans	832	730	(102)	881	826	(55)
Subtotal	3,127	1,248	(1,879)	2,771	1,123	(1,648)
90 or more days past due and government guaranteed						
Loans[(a)]	65	58	(7)	202	115	(87)
All other performing loans[(b)]						
Loans reported as trading assets	9,058	7,919	(1,139)	7,365	6,110	(1,255)
Loans	38,656	37,803	(853)	42,272	40,854	(1,418)
Subtotal	47,714	45,722	(1,992)	49,637	46,964	(2,673)
Total loans	$ 50,906	$ 47,028	$ (3,878)	$ 52,610	$ 48,202	$ (4,408)
Long-term debt						
Principal-protected debt	$ 7,033 [(d)]	$ 6,751	$ (282)	$ 6,364 [(d)]	$ 5,900	$ (464)
Nonprincipal-protected debt[(c)]	NA	22,248	NA	NA	21,245	NA
Total long-term debt	NA	$ 28,999	NA	NA	$ 27,145	NA

(a) These balances are excluded from nonaccrual loans as the loans are insured and/or guaranteed by U.S. government agencies.
(b) There were no performing loans that were ninety days or more past due as of December 31, 2023 and 2022.
(c) Remaining contractual principal is not applicable to nonprincipal-protected structured notes. Unlike principal-protected structured notes, for which the Bank is obligated to return a stated amount of principal at maturity, nonprincipal-protected structured notes do not obligate the Bank to return a stated amount of principal at maturity, but to return an amount based on the performance of an underlying variable or derivative feature embedded in the note. However, investors are exposed to the credit risk of the Bank as issuer for both nonprincipal-protected and principal-protected notes.
(d) Where the Bank issues principal-protected zero-coupon or discount notes, the balance reflects the contractual principal payment at maturity or, if applicable, the contractual principal payment at the Bank's next call date.

At December 31, 2023 and 2022, the contractual amount of lending-related commitments for which the fair value option was elected was $9.5 billion and $7.4 billion, respectively, with a corresponding fair value of $95 million and $24 million, respectively. Refer to Note 26 for further information regarding off-balance sheet lending-related financial instruments.

Note 5 – Credit risk concentrations

Concentrations of credit risk arise when a number of clients, counterparties or customers are engaged in similar business activities or activities in the same geographic region, or when they have similar economic features that would cause their ability to meet contractual obligations to be similarly affected by changes in economic conditions.

The Bank regularly monitors various segments of its credit portfolios to assess potential credit risk concentrations and to obtain additional collateral when deemed necessary and permitted under the Bank's agreements. Senior management is significantly involved in the credit approval and review process, and risk levels are adjusted as needed to reflect the Bank's risk appetite.

In the Bank's consumer portfolio, concentrations are managed primarily by product and by U.S. geographic region, with a key focus on trends and concentrations at the portfolio level, where potential credit risk concentrations can be remedied through changes in underwriting policies and portfolio guidelines. Refer to Note 13 for additional information on the geographic composition of the Bank's consumer loan portfolios. In the wholesale portfolio, credit risk concentrations are evaluated primarily by industry and monitored regularly on both an aggregate portfolio level and on an individual client or counterparty basis.

The Bank's wholesale exposure is managed through loan syndications and participations, loan sales, securitizations, credit derivatives, master netting agreements, collateral and other risk-reduction techniques. Refer to Note 13 for additional information on loans.

The Bank does not believe that its exposure to any particular loan product or industry segment results in a significant concentration of credit risk.

Terms of loan products and collateral coverage are included in the Bank's assessment when extending credit and establishing its allowance for credit losses. Refer to Note 14 for additional information on the allowance for credit losses.

The table below presents both on-balance sheet and off-balance sheet consumer and wholesale credit exposure by the Bank's three credit portfolio segments as of December 31, 2023 and 2022. The wholesale industry of risk category is generally based on the client or counterparty's primary business activity.

	2023				2022			
		On-balance sheet				On-balance sheet		
December 31, (in millions)	Credit exposure[h][i]	Loans	Derivatives	Off-balance sheet[k]	Credit exposure[h]	Loans	Derivatives	Off-balance sheet[k]
Consumer, excluding credit card	**$ 455,475**	**$ 410,072**	**$ –**	**$ 45,403**	$ 344,861	$ 311,343 [j]	$ –	$ 33,518
Credit card[a]	**1,126,793**	**211,123**	**–**	**915,670**	1,006,459	185,175	–	821,284
Total consumer[a]	**1,582,268**	**621,195**	**–**	**961,073**	1,351,320	496,518	–	854,802
Wholesale[b]								
Real Estate	**208,146**	**166,257**	**420**	**41,469**	170,857	131,681	249	38,927
Individuals and Individual Entities[c]	**144,315**	**124,853**	**725**	**18,737**	129,987	119,597	433	9,957
Asset Managers	**128,374**	**52,173**	**9,905**	**66,296**	91,952	39,970	14,065	37,917
Consumer & Retail	**127,049**	**46,260**	**2,014**	**78,775**	120,551	45,865	1,647	73,039
Technology, Media & Telecommunications	**77,046**	**22,450**	**2,451**	**52,145**	71,996	21,622	2,950	47,424
Industrials	**75,067**	**26,545**	**1,335**	**47,187**	72,479	26,955	1,770	43,754
Healthcare	**64,846**	**23,092**	**1,574**	**40,180**	62,449	22,919	1,648	37,882
Banks & Finance Companies	**57,450**	**33,872**	**3,339**	**20,239**	51,770	32,248	3,104	16,418
Utilities	**35,864**	**7,018**	**3,297**	**25,549**	35,867	8,975	3,114	23,778
State & Municipal Govt[d]	**35,854**	**19,887**	**442**	**15,525**	33,650	17,954	582	15,114
Oil & Gas	**34,475**	**8,480**	**705**	**25,290**	38,667	9,633	5,118	23,916
Automotive	**33,977**	**17,459**	**428**	**16,090**	33,287	14,735	529	18,023
Chemicals & Plastics	**20,698**	**6,442**	**441**	**13,815**	19,946	5,766	398	13,782
Insurance	**20,351**	**2,425**	**7,138**	**10,788**	20,823	2,387	7,859	10,577
Central Govt	**17,704**	**5,463**	**10,668**	**1,573**	19,078	3,167	12,938	2,973
Transportation	**16,053**	**5,073**	**555**	**10,425**	15,004	4,999	567	9,438
Metals & Mining	**15,507**	**4,655**	**274**	**10,578**	15,903	5,398	462	10,043
Securities Firms	**7,020**	**721**	**3,282**	**3,017**	6,037	406	3,371	2,260
Financial Markets Infrastructure	**4,248**	**86**	**2,152**	**2,010**	4,942	13	3,030	1,899
All other[e]	**134,288**	**96,542**	**4,030**	**33,716**	122,854	87,103	4,072	31,679
Subtotal	**1,258,332**	**669,753**	**55,175**	**533,404**	1,138,099	601,393	67,906	468,800
Loans held-for-sale and loans at fair value	**29,172**	**29,172**	**–**	**–**	35,074	35,074	–	–
Receivables from customers[f]	**10,934**	**–**	**–**	**–**	10,969	–	–	–
Total wholesale	**1,298,438**	**698,925**	**55,175**	**533,404**	1,184,142	636,467	67,906	468,800
Total exposure[g][h]	**$ 2,880,706**	**$1,320,120**	**$ 55,175**	**$1,494,477**	$ 2,535,462	$1,132,985	$ 67,906	$1,323,602

(a) Also includes commercial card lending-related commitments.
(b) The industry rankings presented in the table as of December 31, 2022, are based on the industry rankings of the corresponding exposures at December 31, 2023, not actual rankings of such exposures at December 31, 2022.
(c) Individuals and Individual Entities predominantly consists of global private bank clients and includes exposure to personal investment companies and personal and testamentary trusts.
(d) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2023 and 2022, noted above, the Bank held: $3.6 billion and $4.8 billion, respectively, of trading assets; $21.4 billion and $6.8 billion, respectively, of AFS securities; and $9.9 billion and $19.7 billion, respectively, of HTM securities, issued by U.S. state and municipal governments. Refer to Note 3 and Note 11 for further information.
(e) All other includes: SPEs and Private education and civic organizations, representing approximately 94% and 6%, respectively, at December 31, 2023 and 95% and 5%, respectively, at December 31, 2022. Refer to Note 15 for more information on exposures to SPEs.
(f) Receivables from customers reflect held-for-investment margin loans to brokerage clients that are collateralized by assets maintained in the clients' brokerage accounts (including cash on deposit, and primarily liquid and readily marketable debt or equity securities).
(g) Excludes cash placed with banks of $612.4 billion and $555.4 billion, at December 31, 2023 and 2022, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.
(h) Credit exposure is net of risk participations and excludes the benefit of credit derivatives used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.
(i) Included credit exposure associated with First Republic consisting of $102.2 billion in the consumer, excluding credit card portfolio, and $89.6 billion in the wholesale portfolio predominantly in Real Estate, Asset Managers, and Individuals and Individual Entities.
(j) At December 31, 2023 and 2022, included $94 million and $350 million of loans in Business Banking under the PPP, respectively. PPP loans are guaranteed by the SBA. Other than in certain limited circumstances, the Bank typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.
(k) Represents lending-related financial instruments.

Note 6 – Derivative instruments

Derivative contracts derive their value from underlying asset prices, indices, reference rates, other inputs or a combination of these factors and may expose counterparties to risks and rewards of an underlying asset or liability without having to initially invest in, own or exchange the asset or liability. The Bank makes markets in derivatives for clients and also uses derivatives to hedge or manage its own risk exposures. Predominantly all of the Bank's derivatives are entered into for market-making or risk management purposes.

Market-making derivatives
The majority of the Bank's derivatives are entered into for market-making purposes. Clients use derivatives to mitigate or modify interest rate, credit, foreign exchange, equity and commodity risks. The Bank actively manages the risks from its exposure to these derivatives by entering into other derivative contracts or by purchasing or selling other financial instruments that partially or fully offset the exposure from client derivatives.

Risk management derivatives
The Bank manages certain market and credit risk exposures using derivative instruments, including derivatives in hedge accounting relationships and other derivatives that are used to manage risks associated with specified assets and liabilities.

The Bank generally uses interest rate derivatives to manage the risk associated with changes in interest rates. Fixed-rate assets and liabilities appreciate or depreciate in market value as interest rates change. Similarly, interest income and expense increase or decrease as a result of variable-rate assets and liabilities resetting to current market rates, and as a result of the repayment and subsequent origination or issuance of fixed-rate assets and liabilities at current market rates. Gains and losses on the derivative instruments related to these assets and liabilities are expected to substantially offset this variability.

Foreign currency derivatives are used to manage the foreign exchange risk associated with certain foreign currency–denominated (i.e., non-U.S. dollar) assets and liabilities and forecasted transactions, as well as the Bank's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. As a result of fluctuations in foreign currencies, the U.S. dollar-equivalent values of the foreign currency–denominated assets and liabilities or the forecasted revenues or expenses increase or decrease. Gains or losses on the derivative instruments related to these foreign currency–denominated assets or liabilities, or forecasted transactions, are expected to substantially offset this variability.

Commodities derivatives are used to manage the price risk of certain commodities inventories. Gains or losses on these derivative instruments are expected to substantially offset the depreciation or appreciation of the related inventory.

Credit derivatives are used to manage the counterparty credit risk associated with loans and lending-related commitments. Credit derivatives compensate the purchaser when the entity referenced in the contract experiences a credit event, such as bankruptcy or a failure to pay an obligation when due. Credit derivatives primarily consist of CDS. Refer to the Credit derivatives section on pages 49-51 of this Note for a further discussion of credit derivatives.

Refer to the risk management derivatives gains and losses table on page 49 and the hedge accounting gains and losses tables on pages 46-49 of this Note for more information about risk management derivatives.

Derivative counterparties and settlement types
The Bank enters into over-the-counter ("OTC") derivatives with third parties and JPMorgan Chase affiliates, which are negotiated and settled bilaterally with the derivative counterparty. The Bank also enters into, as principal, certain exchange-traded derivatives ("ETD") such as futures and options, and "cleared" over-the-counter ("OTC-cleared") derivative contracts with central counterparties ("CCPs"). ETD contracts are generally standardized contracts traded on an exchange and cleared by the CCP, which is the Bank's counterparty from the inception of the transactions. OTC-cleared derivatives are traded on a bilateral basis and then novated to the CCP for clearing.

Derivative clearing services
The Bank provides clearing services for clients in which the Bank acts as a clearing member at certain exchanges and clearing houses. The Bank does not reflect the clients' derivative contracts in its Consolidated Financial Statements. Refer to Note 26 for further information on the Bank's clearing services.

Accounting for derivatives

All free-standing derivatives that the Bank executes for its own account are required to be recorded on the Consolidated balance sheets at fair value.

As permitted under U.S. GAAP, the Bank nets derivative assets and liabilities, and the related cash collateral receivables and payables, when a legally enforceable master netting agreement exists between the Bank and the derivative counterparty. Refer to Note 1 for further discussion of the offsetting of assets and liabilities. The accounting for changes in value of a derivative depends on whether or not the transaction has been designated and qualifies for hedge accounting. Derivatives that are not designated as hedges are reported and measured at fair value through earnings. The tabular disclosures on pages 42-49 of this Note provide additional information on the amount of, and reporting for, derivative assets, liabilities, gains and losses. Refer to Notes 3 and 4 for a further discussion of derivatives embedded in structured notes.

Derivatives designated as hedges

The Bank applies hedge accounting to certain derivatives executed for risk management purposes – generally interest rate, foreign exchange and commodity derivatives. However, the Bank does not seek to apply hedge accounting to all of the derivatives associated with its risk management activities. For example, the Bank does not apply hedge accounting to purchased CDS used to manage the credit risk of loans and lending-related commitments, because of the difficulties in qualifying such contracts as hedges. For the same reason, the Bank does not apply hedge accounting to certain interest rate and foreign exchange derivatives used for risk management purposes.

To qualify for hedge accounting, a derivative must be highly effective at reducing the risk associated with the exposure being hedged. In addition, for a derivative to be designated as a hedge, the risk management objective and strategy must be documented. Hedge documentation must identify the derivative hedging instrument, the asset or liability or forecasted transaction and type of risk to be hedged, and how the effectiveness of the derivative is assessed prospectively and retrospectively. To assess effectiveness, the Bank uses statistical methods such as regression analysis, nonstatistical methods such as dollar-value comparisons of the change in the fair value of the derivative to the change in the fair value or cash flows of the hedged item, and qualitative comparisons of critical terms and the evaluation of any changes in those terms. The extent to which a derivative has been, and is expected to continue to be, highly effective at offsetting changes in the fair value or cash flows of the hedged item must be assessed and documented at least quarterly. If it is determined that a derivative is not highly effective at hedging the designated exposure, hedge accounting is discontinued.

There are three types of hedge accounting designations: fair value hedges, cash flow hedges and net investment hedges. The Bank uses fair value hedges primarily to hedge fixed-rate long-term debt, AFS securities and certain commodities inventories. For qualifying fair value hedges, the changes in the fair value of the derivative, and in the value of the hedged item for the risk being hedged, are recognized in earnings. Certain amounts excluded from the assessment of effectiveness are recorded in OCI and recognized in earnings over the life of the derivative. If the hedge relationship is terminated, then the adjustment to the hedged item continues to be reported as part of the basis of the hedged item and, for interest-bearing financial instruments, is amortized to earnings as a yield adjustment. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily net interest income and principal transactions revenue.

Effective January 1, 2023, the Bank adopted the new portfolio layer method hedge accounting guidance which expanded the ability to hedge a portfolio of fixed-rate assets to allow more types of assets to be included in the portfolio, and to allow more of the portfolio to be hedged. The Bank employs the Portfolio Layer Method to manage the interest rate risk of portfolios of fixed-rate assets. Throughout the life of the open hedge, basis adjustments are maintained at the portfolio level and are only allocated to individual assets under certain circumstances. These include instances where the portfolio amount falls below the hedged layer amounts, or in cases of voluntary de-designation.

The Bank uses cash flow hedges primarily to hedge the exposure to variability in forecasted cash flows from floating-rate assets and liabilities and foreign currency–denominated revenue and expense. For qualifying cash flow hedges, changes in the fair value of the derivative are recorded in OCI and recognized in earnings as the hedged item affects earnings. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily noninterest revenue, net interest income and compensation expense. If the hedge relationship is terminated, then the change in value of the derivative recorded in accumulated other comprehensive income/(loss) ("AOCI") is recognized in earnings when the cash flows that were hedged affect earnings. For hedge relationships that are discontinued because a forecasted transaction is expected to not occur according to the original hedge forecast, any related derivative values recorded in AOCI are immediately recognized in earnings.

The Bank uses net investment hedges to protect the value of the Bank's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. For qualifying net investment hedges, changes in the fair value of the derivatives due to changes in spot foreign exchange rates are recorded in OCI as translation adjustments. Amounts excluded from the assessment of effectiveness are recorded directly in earnings.

The following table outlines the Bank's primary uses of derivatives and the related hedge accounting designation or disclosure category.

Type of Derivative	Use of Derivative	Designation and disclosure	Page reference
Manage specifically identified risk exposures in qualifying hedge accounting relationships:			
• Interest rate	Hedge fixed-rate assets and liabilities	Fair value hedge	46-47
• Interest rate	Hedge floating-rate assets and liabilities	Cash flow hedge	48
• Foreign exchange	Hedge foreign currency-denominated assets and liabilities	Fair value hedge	46-47
• Foreign exchange	Hedge foreign currency-denominated forecasted revenue and expense	Cash flow hedge	48
• Foreign exchange	Hedge the value of the Bank's investments in non-U.S. dollar functional currency entities	Net investment hedge	49
• Commodity	Hedge commodity inventory	Fair value hedge	46-47
Manage specifically identified risk exposures not designated in qualifying hedge accounting relationships:			49
• Interest rate	Manage the risk associated with mortgage commitments, warehouse loans and MSRs	Specified risk management	49
• Credit	Manage the credit risk associated with wholesale lending exposures	Specified risk management	49
• Interest rate and foreign exchange	Manage the risk associated with certain other specified assets and liabilities	Specified risk management	49
Market-making derivatives and other activities:			
• Various	Market-making and related risk management	Market-making and other	49
• Various	Other derivatives	Market-making and other	49

Notional amount of derivative contracts

The following table summarizes the notional amount of free-standing derivative contracts outstanding as of December 31, 2023 and 2022.

	Notional amounts[b]	
December 31, (in billions)	**2023**	2022
Interest rate contracts		
Swaps	**$ 24,044**	$ 25,377
Futures and forwards	**2,239**	2,149
Written options	**3,378**	3,054
Purchased options	**3,378**	3,006
Total interest rate contracts	**33,039**	33,586
Credit derivatives[a]	**1,053**	1,136
Foreign exchange contracts		
Cross-currency swaps	**4,765**	4,230
Spot, futures and forwards	**6,990**	7,046
Written options	**831**	776
Purchased options	**799**	760
Total foreign exchange contracts	**13,385**	12,812
Equity contracts		
Swaps	**876**	727
Futures and forwards	**140**	114
Written options	**600**	498
Purchased options	**577**	486
Total equity contracts	**2,193**	1,825
Commodity contracts		
Swaps	**252**	297
Spot, futures and forwards	**156**	138
Written options	**146**	131
Purchased options	**126**	107
Total commodity contracts	**680**	673
Total derivative notional amounts	**$ 50,350**	$ 50,032

(a) Refer to the Credit derivatives discussion on pages 49-51 for more information on volumes and types of credit derivative contracts.
(b) Represents the sum of gross long and gross short notional derivative contracts with third-parties and JPMorgan Chase affiliates. Refer to Note 21 for additional information on related party derivatives.

While the notional amounts disclosed above give an indication of the volume of the Bank's derivatives activity, the notional amounts significantly exceed, in the Bank's view, the possible losses that could arise from such transactions. For most derivative contracts, the notional amount is not exchanged; it is simply a reference amount used to calculate payments.

Impact of derivatives on the Consolidated balance sheets

The tables below include derivative receivables and payables with affiliates on a net basis. Refer to Note 21 for information regarding our derivative activities with affiliates.

The following table summarizes information on derivative receivables and payables (before and after netting adjustments) that are reflected on the Bank's Consolidated balance sheets as of December 31, 2023 and 2022, by accounting designation (e.g., whether the derivatives were designated in qualifying hedge accounting relationships or not) and contract type.

Free-standing derivative receivables and payables[(a)]

	Gross derivative receivables				Gross derivative payables			
December 31, 2023 (in millions)	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	**$ 306,489**	**$ –**	**$ 306,489**	**$ 26,260**	**$ 289,275**	**$ –**	**$ 289,275**	**$ 10,858**
Credit	**9,432**	**–**	**9,432**	**565**	**12,142**	**–**	**12,142**	**1,074**
Foreign exchange	**209,731**	**119**	**209,850**	**18,018**	**216,785**	**1,442**	**218,227**	**12,605**
Equity	**60,652**	**–**	**60,652**	**5,374**	**62,219**	**–**	**62,219**	**5,550**
Commodity	**19,533**	**154**	**19,687**	**4,958**	**19,946**	**53**	**19,999**	**5,277**
Total fair value of trading assets and liabilities	**$ 605,837**	**$ 273**	**$ 606,110**	**$ 55,175**	**$ 600,367**	**$ 1,495**	**$ 601,862**	**$ 35,364**

	Gross derivative receivables				Gross derivative payables			
December 31, 2022 (in millions)	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	$ 359,265	$ –	$ 359,265	$ 27,744	$ 337,831	$ –	$ 337,831	$ 15,453
Credit	9,969	–	9,969	1,084	10,027	–	10,027	733
Foreign exchange	242,220	379	242,599	23,273	251,129	2,503	253,632	18,822
Equity	52,499	–	52,499	7,040	52,468	–	52,468	6,886
Commodity	33,192	1,694	34,886	8,765	29,141	2,320	31,461	6,097
Total fair value of trading assets and liabilities	$ 697,145	$ 2,073	$ 699,218	$ 67,906	680,596	$ 4,823	$ 685,419	$ 47,991

(a) Balances exclude structured notes for which the fair value option has been elected. Refer to Note 4 for further information.
(b) As permitted under U.S. GAAP, the Bank has elected to net derivative receivables and derivative payables and the related cash collateral receivables and payables when a legally enforceable master netting agreement exists.

Derivatives netting

The following tables present, as of December 31, 2023 and 2022, gross and net derivative receivables and payables by contract and settlement type. Derivative receivables and payables, as well as the related cash collateral from the same counterparty, have been netted on the Consolidated balance sheets where the Bank has obtained an appropriate legal opinion with respect to the master netting agreement. Where such a legal opinion has not been either sought or obtained, amounts are not eligible for netting on the Consolidated balance sheets, and those derivative receivables and payables are shown separately in the tables below.

In addition to the cash collateral received and transferred that is presented on a net basis with derivative receivables and payables, the Bank receives and transfers additional collateral (financial instruments and cash). These amounts mitigate counterparty credit risk associated with the Bank's derivative instruments, but are not eligible for net presentation:

- collateral that consists of liquid securities and other cash collateral held at third-party custodians, which are shown separately as "Collateral not nettable on the Consolidated balance sheets" in the tables below, up to the fair value exposure amount;
- the amount of collateral held or transferred that exceeds the fair value exposure at the individual counterparty level, as of the date presented, which is excluded from the tables below; and
- collateral held or transferred that relates to derivative receivables or payables where an appropriate legal opinion has not been either sought or obtained with respect to the master netting agreement, which is excluded from the tables below.

	2023			2022		
December 31, (in millions)	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables
U.S. GAAP nettable derivative receivables						
Interest rate contracts:						
OTC	**$ 234,039**	**$ (209,657)**	**$ 24,382**	$ 263,938	$ (238,610)	$ 25,328
OTC-cleared	**70,328**	**(70,184)**	**144**	92,984	(92,607)	377
Exchange-traded[(a)]	**399**	**(388)**	**11**	553	(304)	249
Total interest rate contracts	**304,766**	**(280,229)**	**24,537**	357,475	(331,521)	25,954
Credit contracts:						
OTC	**7,434**	**(6,990)**	**444**	8,118	(7,181)	937
OTC-cleared	**1,904**	**(1,877)**	**27**	1,746	(1,704)	42
Total credit contracts	**9,338**	**(8,867)**	**471**	9,864	(8,885)	979
Foreign exchange contracts:						
OTC	**207,705**	**(191,371)**	**16,334**	239,012	(217,908)	21,104
OTC-cleared	**469**	**(459)**	**10**	1,461	(1,417)	44
Exchange-traded[(a)]	**6**	**(2)**	**4**	15	(1)	14
Total foreign exchange contracts	**208,180**	**(191,832)**	**16,348**	240,488	(219,326)	21,162
Equity contracts:						
OTC	**47,021**	**(45,141)**	**1,880**	38,886	(36,334)	2,552
Exchange-traded[(a)]	**11,516**	**(10,137)**	**1,379**	10,491	(9,125)	1,366
Total equity contracts	**58,537**	**(55,278)**	**3,259**	49,377	(45,459)	3,918
Commodity contracts:						
OTC	**12,317**	**(9,416)**	**2,901**	24,000	(17,264)	6,736
OTC-cleared	**133**	**(123)**	**10**	121	(112)	9
Exchange-traded[(a)]	**5,214**	**(5,190)**	**24**	9,103	(8,745)	358
Total commodity contracts	**17,664**	**(14,729)**	**2,935**	33,224	(26,121)	7,103
Derivative receivables with appropriate legal opinion	**598,485**	**(550,935)**	**47,550** [(d)]	690,428	(631,312)	59,116 [(d)]
Derivative receivables where an appropriate legal opinion has not been either sought or obtained	**7,625**		**7,625**	8,790		8,790
Total derivative receivables recognized on the Consolidated balance sheets	**$ 606,110**		**$ 55,175**	$ 699,218		$ 67,906
Collateral not nettable on the Consolidated balance sheets[(b)(c)]			**(22,444)**			(22,953)
Net amounts			**$ 32,731**			$ 44,953

	2023			2022		
December 31, (in millions)	Gross derivative payables	Amounts netted on the Consolidated balance sheets	Net derivative payables	Gross derivative payables	Amounts netted on the Consolidated balance sheets	Net derivative payables
U.S. GAAP nettable derivative payables						
Interest rate contracts:						
OTC	**$ 212,611**	**$ (203,535)**	**$ 9,076**	$ 239,068	$ (225,920)	$ 13,148
OTC-cleared	**74,771**	**(74,494)**	**277**	96,413	(96,154)	259
Exchange-traded[(a)]	**434**	**(388)**	**46**	322	(304)	18
Total interest rate contracts	**287,816**	**(278,417)**	**9,399**	335,803	(322,378)	13,425
Credit contracts:						
OTC	**10,439**	**(9,432)**	**1,007**	8,109	(7,649)	460
OTC-cleared	**1,639**	**(1,636)**	**3**	1,674	(1,645)	29
Total credit contracts	**12,078**	**(11,068)**	**1,010**	9,783	(9,294)	489
Foreign exchange contracts:						
OTC	**215,357**	**(205,152)**	**10,205**	248,604	(233,393)	15,211
OTC-cleared	**552**	**(470)**	**82**	1,488	(1,417)	71
Exchange-traded[(a)]	**6**	**–**	**6**	20	–	20
Total foreign exchange contracts	**215,915**	**(205,622)**	**10,293**	250,112	(234,810)	15,302
Equity contracts:						
OTC	**49,230**	**(46,532)**	**2,698**	38,846	(36,469)	2,377
Exchange-traded[(a)]	**10,313**	**(10,137)**	**176**	9,287	(9,113)	174
Total equity contracts	**59,543**	**(56,669)**	**2,874**	48,133	(45,582)	2,551
Commodity contracts:						
OTC	**12,426**	**(9,410)**	**3,016**	20,601	(16,494)	4,107
OTC-cleared	**120**	**(120)**	**–**	112	(112)	–
Exchange-traded[(a)]	**5,376**	**(5,192)**	**184**	9,021	(8,758)	263
Total commodity contracts	**17,922**	**(14,722)**	**3,200**	29,734	(25,364)	4,370
Derivative payables with appropriate legal opinion	**593,274**	**(566,498)**	**26,776** [(d)]	673,565	(637,428)	36,137 [(d)]
Derivative payables where an appropriate legal opinion has not been either sought or obtained	**8,588**		**8,588**	11,854		11,854
Total derivative payables recognized on the Consolidated balance sheets	**$ 601,862**		**$ 35,364**	$ 685,419		$ 47,991
Collateral not nettable on the Consolidated balance sheets[(b)(c)]			**(4,276)**			(2,610)
Net amounts			**$ 31,088**			$ 45,381

(a) Exchange-traded derivative balances that relate to futures contracts are settled daily.
(b) Includes liquid securities and other cash collateral held at third-party custodians related to derivative instruments where an appropriate legal opinion has been obtained. For some counterparties, the collateral amounts of financial instruments may exceed the derivative receivables and derivative payables balances. Where this is the case, the total amount reported is limited to the net derivative receivables and net derivative payables balances with that counterparty.
(c) Derivative collateral relates only to OTC and OTC-cleared derivative instruments.
(d) Net derivatives receivable included cash collateral netted of $55.3 billion and $67.5 billion at December 31, 2023 and 2022, respectively. Net derivatives payable included cash collateral netted of $70.8 billion and $73.6 billion at December 31, 2023 and 2022, respectively. Derivative cash collateral relates to OTC and OTC-cleared derivative instruments.

Liquidity risk and credit-related contingent features

In addition to the specific market risks introduced by each derivative contract type, derivatives expose the Bank to credit risk – the risk that derivative counterparties may fail to meet their payment obligations under the derivative contracts and the collateral, if any, held by the Bank proves to be of insufficient value to cover the payment obligation. It is the policy of the Bank to actively pursue, where possible, the use of legally enforceable master netting arrangements and collateral agreements to mitigate derivative counterparty credit risk inherent in derivative receivables.

While derivative receivables expose the Bank to credit risk, derivative payables expose the Bank to liquidity risk, as the derivative contracts typically require the Bank to post cash or securities collateral with counterparties as the fair value of the contracts moves in the counterparties' favor or upon specified downgrades in JPMorgan Chase Bank, N.A.'s and its subsidiaries' respective credit ratings. Certain derivative contracts also provide for termination of the contract, generally upon a downgrade of either the Bank or the counterparty, at the fair value of the derivative contracts. The following table shows the aggregate fair value of net derivative payables related to OTC and OTC-cleared derivatives that contain contingent collateral or termination features that may be triggered upon a ratings downgrade, and the associated collateral the Bank has posted in the normal course of business, at December 31, 2023 and 2022.

OTC and OTC-cleared derivative payables containing downgrade triggers

(in millions)	**December 31, 2023**	December 31, 2022
Aggregate fair value of net derivative payables	**$ 14,628**	$ 15,518
Collateral posted	**14,645**	14,673

The following table shows the impact of a single-notch and two-notch downgrade of the long-term issuer ratings of the Bank and its subsidiaries at December 31, 2023 and 2022, related to OTC and OTC-cleared derivative contracts with contingent collateral or termination features that may be triggered upon a ratings downgrade. Derivatives contracts generally require additional collateral to be posted or terminations to be triggered when the predefined rating threshold is breached. A downgrade by a single rating agency that does not result in a rating lower than a preexisting corresponding rating provided by another major rating agency will generally not result in additional collateral (except in certain instances in which additional initial margin may be required upon a ratings downgrade), nor in termination payment requirements. The liquidity impact in the table is calculated based upon a downgrade below the lowest current rating of the rating agencies referred to in the derivative contract.

Liquidity impact of downgrade triggers on OTC and OTC-cleared derivatives

	December 31, 2023		December 31, 2022	
(in millions)	Single-notch downgrade	Two-notch downgrade	Single-notch downgrade	Two-notch downgrade
Amount of additional collateral to be posted upon downgrade[(a)]	**$ 75**	**$ 1,153**	$ 128	$ 1,293
Amount required to settle contracts with termination triggers upon downgrade[(b)]	**93**	**583**	88	907

(a) Includes the additional collateral to be posted for initial margin.
(b) Amounts represent fair values of derivative payables, and do not reflect collateral posted.

Derivatives executed in contemplation of a sale of the underlying financial asset

In certain instances the Bank enters into transactions in which it transfers financial assets but maintains the economic exposure to the transferred assets by entering into a derivative with the same counterparty in contemplation of the initial transfer. The Bank generally accounts for such transfers as collateralized financing transactions as described in Note 12, but in limited circumstances they may qualify to be accounted for as a sale and a derivative under U.S. GAAP. The amount of such transfers accounted for as a sale where the associated derivative was outstanding was not material at both December 31, 2023 and 2022.

Impact of derivatives on the Consolidated statements of income

The following tables provide information related to gains and losses recorded on derivatives based on their hedge accounting designation or purpose. Refer to Note 21 for information regarding our derivative activities with affiliates.

Fair value hedge gains and losses

The following tables present derivative instruments, by contract type, used in fair value hedge accounting relationships, as well as pre-tax gains/(losses) recorded on such derivatives and the related hedged items for the years ended December 31, 2023, 2022 and 2021, respectively. The Bank includes gains/(losses) on the hedging derivative in the same line item in the Consolidated statements of income as the related hedged item.

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2023 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	**$ (656)**	**$ 1,041**	**$ 385**	**$ –**	**$ 280**	**$ –**
Foreign exchange[c]	**(280)**	**519**	**239**	**–**	**239**	**–**
Commodity[d]	**1,028**	**(549)**	**479**	**–**	**478**	**–**
Total	**$ 92**	**$ 1,011**	**$ 1,103**	**$ –**	**$ 997**	**$ –**

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2022 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	$ 7,253	$ (7,463)	$ (210)	$ –	$ (63)	$ –
Foreign exchange[c]	982	(877)	105	–	105	–
Commodity[d]	(35)	112	77	–	77	–
Total	$ 8,200	$ (8,228)	$ (28)	$ –	$ 119	$ –

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2021 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	$ 2,523	$ (2,852)	$ (329)	$ –	$ (311)	$ –
Foreign exchange[c]	758	(726)	32	–	32	–
Commodity[d]	(8,013)	8,025	12	–	11	–
Total	$ (4,732)	$ 4,447	$ (285)	$ –	$ (268)	$ –

(a) Primarily consists of hedges of the benchmark (e.g., Secured Overnight Financing Rate ("SOFR")) interest rate risk of fixed-rate long-term debt and AFS securities. Gains and losses were recorded in net interest income.
(b) Includes the amortization of income/expense associated with the inception hedge accounting adjustment applied to the hedged item. Excludes the accrual of interest on interest rate swaps and the related hedged items.
(c) Primarily consists of hedges of the foreign currency risk of AFS securities for changes in spot foreign currency rates. Gains and losses related to the derivatives and the hedged items due to changes in foreign currency rates and the income statement impact of excluded components were recorded primarily in principal transactions revenue and net interest income.
(d) Consists of overall fair value hedges of physical commodities inventories that are generally carried at the lower of cost or net realizable value (net realizable value approximates fair value). Gains and losses were recorded in principal transactions revenue.
(e) The assessment of hedge effectiveness excludes certain components of the changes in fair values of the derivatives and hedged items such as forward points on foreign exchange forward contracts, time values and cross-currency basis spreads. Excluded components may impact earnings either through amortization of the initial amount over the life of the derivative or through fair value changes recognized in the current period.
(f) Represents the change in value of amounts excluded from the assessment of effectiveness under the amortization approach, predominantly cross-currency basis spreads. The amount excluded at inception of the hedge is recognized in earnings over the life of the derivative.

As of December 31, 2023 and 2022, the following amounts were recorded on the Consolidated balance sheets related to certain cumulative fair value hedge basis adjustments that are expected to reverse through the income statement in future periods as an adjustment to yield.

December 31, 2023 (in millions)	Carrying amount of the hedged items[(a)(b)]	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items:		
		Active hedging relationships[(d)]	Discontinued hedging relationships[(d)(e)]	Total
Assets				
Investment securities - AFS	**$ 151,752** [(c)]	**$ 549**	**$ (2,010)**	**$ (1,461)**
Liabilities				
Long-term debt	**$ 3,786**	**$ 22**	**$ 61**	**$ 83**

December 31, 2022 (in millions)	Carrying amount of the hedged items[(a)(b)]	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items:		
		Active hedging relationships[(d)]	Discontinued hedging relationships[(d)(e)]	Total
Assets				
Investment securities - AFS	$ 84,073 [(c)]	$ (4,149)	$ (1,542)	$ (5,691)
Liabilities				
Long-term debt	$ 992	$ –	$ 82	$ 82

(a) Excludes physical commodities with a carrying value of $3.6 billion and $24.3 billion at December 31, 2023 and 2022, respectively, to which the Bank applies fair value hedge accounting. As a result of the application of hedge accounting, these inventories are carried at fair value, thus recognizing unrealized gains and losses in current periods. Since the Bank exits these positions at fair value, there is no incremental impact to net income in future periods.

(b) Excludes hedged items where only foreign currency risk is the designated hedged risk, as basis adjustments related to foreign currency hedges will not reverse through the income statement in future periods. At December 31, 2023 and 2022, the carrying amount excluded for AFS securities is $19.3 billion and $20.3 billion, respectively.

(c) Carrying amount represents the amortized cost, net of allowance if applicable. Effective January 1, 2023, the Bank adopted the portfolio layer method hedge accounting guidance. At December 31, 2023, the amortized cost of the portfolio layer method closed portfolios was $83.9 billion, of which $68.0 billion was designated as hedged. The amount designated as hedged is the sum of the notional amounts of all outstanding layers in each portfolio, which includes both spot starting and forward starting layers. The cumulative amount of basis adjustments was $(165) million, which is comprised of $73 million and $(238) million for active and discontinued hedging relationships, respectively. Refer to Note 1 and Note 11 for additional information.

(d) Positive (negative) amounts related to assets represent cumulative fair value hedge basis adjustments that will reduce (increase) net interest income in future periods. Positive (negative) amounts related to liabilities represent cumulative fair value hedge basis adjustments that will increase (reduce) net interest income in future periods.

(e) Represents basis adjustments existing on the balance sheet date associated with hedged items that have been de-designated from qualifying fair value hedging relationships.

Cash flow hedge gains and losses

The following tables present derivative instruments, by contract type, used in cash flow hedge accounting relationships, and the pre-tax gains/(losses) recorded on such derivatives, for the years ended December 31, 2023, 2022 and 2021, respectively. The Bank includes the gains/(losses) on the hedging derivative in the same line item in the Consolidated statements of income as the change in cash flows on the related hedged item.

	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
Year ended December 31, 2023 (in millions)	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[(a)]	**$ (1,838)**	**$ 274**	**$ 2,112**
Foreign exchange[(b)]	**64**	**209**	**145**
Total	**$ (1,774)**	**$ 483**	**$ 2,257**

	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
Year ended December 31, 2022 (in millions)	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[(a)]	$ (152)	$ (7,131)	$ (6,979)
Foreign exchange[(b)]	(267)	(340)	(73)
Total	$ (419)	$ (7,471)	$ (7,052)

	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
Year ended December 31, 2021 (in millions)	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[(a)]	$ 1,032	$ (2,370)	$ (3,402)
Foreign exchange[(b)]	190	67	(123)
Total	$ 1,222	$ (2,303)	$ (3,525)

(a) Primarily consists of hedges of SOFR-indexed floating-rate assets. Gains and losses were recorded in net interest income.
(b) Primarily consists of hedges of the foreign currency risk of non-U.S. dollar-denominated revenue and expense. The income statement classification of gains and losses follows the hedged item – primarily noninterest revenue and compensation expense.

The Bank did not experience any forecasted transactions that failed to occur for the years ended 2023, 2022 and 2021.

Over the next 12 months, the Bank expects that approximately $(1.6) billion (after-tax) of net losses recorded in AOCI at December 31, 2023, related to cash flow hedges will be recognized in income. For cash flow hedges that have been terminated, the maximum length of time over which the derivative results recorded in AOCI will be recognized in earnings is approximately six years, corresponding to the timing of the originally hedged forecasted cash flows. For open cash flow hedges, the maximum length of time over which forecasted transactions are hedged is approximately seven years. The Bank's longer-dated forecasted transactions relate to core lending and borrowing activities.

Net investment hedge gains and losses

The following table presents hedging instruments, by contract type, that were used in net investment hedge accounting relationships, and the pre-tax gains/(losses) recorded on such instruments for the years ended December 31, 2023, 2022 and 2021.

Year ended December 31, (in millions)	**2023**		2022		2021	
	Amounts recorded in income[(a)(b)]	Amounts recorded in OCI	Amounts recorded in income[(a)(b)]	Amounts recorded in OCI	Amounts recorded in income[(a)(b)]	Amounts recorded in OCI
Foreign exchange derivatives	**$ 347**	**$ (1,543)**	$ (77)	$ 2,845	$ (168)	$ 2,303

(a) Certain components of hedging derivatives are permitted to be excluded from the assessment of hedge effectiveness, such as forward points on foreign exchange forward contracts. The Bank elects to record changes in fair value of these amounts directly in other income.
(b) Excludes amounts reclassified from AOCI to income on the sale or liquidation of hedged entities. During the year ended December 31, 2023, there were no sales or liquidations of legal entities that resulted in reclassification. The amounts reclassified for the years ended December 31, 2022 and 2021 were not material. Refer to Note 22 for further information.

Gains and losses on derivatives used for specified risk management purposes

The following table presents pre-tax gains/(losses) recorded on a limited number of derivatives, not designated in hedge accounting relationships, that are used to manage risks associated with certain specified assets and liabilities, including certain risks arising from mortgage commitments, warehouse loans, MSRs, wholesale lending exposures, and foreign currency denominated assets and liabilities.

Year ended December 31, (in millions)	Derivatives gains/(losses) recorded in income		
	2023	2022	2021
Contract type			
Interest rate[(a)]	**$ (135)**	$ (830)	$ 1,078
Credit[(b)]	**(441)**	51	(94)
Foreign exchange[(c)]	**(63)**	51	73
Total	**$ (642)**	$ (728)	$ 1,057

(a) Primarily represents interest rate derivatives used to hedge the interest rate risk inherent in mortgage commitments, warehouse loans and MSRs, as well as written commitments to originate warehouse loans. Gains and losses were recorded predominantly in mortgage fees and related income.
(b) Relates to credit derivatives used to mitigate credit risk associated with lending exposures in the Bank's wholesale businesses. These derivatives do not include credit derivatives used to mitigate counterparty credit risk arising from derivative receivables, which is included in gains and losses on derivatives related to market-making activities and other derivatives. Gains and losses were recorded in principal transactions revenue.
(c) Primarily relates to derivatives used to mitigate foreign exchange risk of specified foreign currency-denominated assets and liabilities. Gains and losses were recorded in principal transactions revenue.

Gains and losses on derivatives related to market-making activities and other derivatives

The Bank makes markets in derivatives in order to meet the needs of customers and uses derivatives to manage certain risks associated with net open risk positions from its market-making activities, including the counterparty credit risk arising from derivative receivables. All derivatives not included in the hedge accounting or specified risk management categories above are included in this category. Gains and losses on these derivatives are primarily recorded in principal transactions revenue. Refer to Note 7 for information on principal transactions revenue.

Credit derivatives

Credit derivatives are financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) and which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Credit derivatives expose the protection purchaser to the creditworthiness of the protection seller, as the protection seller is required to make payments under the contract when the reference entity experiences a credit event, such as a bankruptcy, a failure to pay its obligation or a restructuring. The seller of credit protection receives a premium for providing protection but has the risk that the underlying instrument referenced in the contract will be subject to a credit event.

The Bank is both a purchaser and seller of protection in the credit derivatives market and uses these derivatives for two primary purposes. First, in its capacity as a market-maker, the Bank actively manages a portfolio of credit derivatives by purchasing and selling credit protection, predominantly on corporate debt obligations, to meet the needs of customers. Second, as an end-user, the Bank uses credit derivatives to manage credit risk associated with lending exposures (loans and unfunded commitments) in its wholesale and consumer activities and derivatives counterparty exposures in its wholesale activities, and to manage the credit risk arising from certain financial instruments in the Bank's market-making activities. Following is a summary of various types of credit derivatives.

Credit default swaps

Credit derivatives may reference the credit of either a single reference entity ("single-name"), broad-based index or portfolio. The Bank purchases and sells protection on both single- name and index-reference obligations. Single-name CDS and index CDS contracts are either OTC or OTC-cleared derivative contracts. Single-name CDS are used to manage the default risk of a single reference entity, while index CDS contracts are used to manage the credit risk associated with the broader credit markets or credit market segments. Like the S&P 500 and other market indices, a CDS index consists of a portfolio of CDS across many reference entities. New series of CDS indices are periodically established with a new underlying portfolio of reference entities to reflect changes in the credit markets. If one of the reference entities in the index experiences a credit event, then the reference entity that defaulted is removed from the index. CDS can also be referenced against specific portfolios of reference names or against customized exposure levels: for example, to provide protection against the first $1 million of realized credit losses in a $10 million portfolio of exposure. Such structures are commonly known as tranche CDS.

For both single-name CDS contracts and index CDS contracts, upon the occurrence of a credit event, under the terms of a CDS contract neither party to the CDS contract has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value of the reference obligation at settlement of the credit derivative contract, also known as the recovery value. The protection purchaser does not need to hold the debt instrument of the underlying reference entity in order to receive amounts due under the CDS contract when a credit event occurs.

Credit-related notes

A credit-related note is a funded derivative with a credit risk component where the issuer of the credit-related note purchases from the note investor credit protection on a reference entity or an index. Under the contract, the investor pays the issuer the par value of the note at the inception of the transaction, and in return, the issuer makes periodic payments to the investor, based on the credit risk of the referenced entity. The issuer also repays the investor the par value of the note at maturity unless the reference entity (or one of the entities that makes up a reference index) experiences a specified credit event. If a credit event occurs, the issuer is not obligated to repay the par value of the note, but rather, the issuer pays the investor the difference between the par value of the note and the fair value of the defaulted reference obligation at the time of settlement. Neither party to the credit-related note has recourse to the defaulting reference entity.

The following tables present a summary of the notional amounts of credit derivatives and credit-related notes the Bank sold and purchased as of December 31, 2023 and 2022. Upon a credit event, the Bank as a seller of protection would typically pay out a percentage of the full notional amount of net protection sold, as the amount actually required to be paid on the contracts takes into account the recovery value of the reference obligation at the time of settlement. The Bank manages the credit risk on contracts to sell protection by purchasing protection with identical or similar underlying reference entities. Other purchased protection referenced in the following tables includes credit derivatives bought on related, but not identical, reference positions (including indices, portfolio coverage and other reference points) as well as protection purchased by the Bank through credit-related notes. Other purchased protection also includes credit protection against certain loans in the retained lending portfolio through the issuance of credit derivatives and credit-related notes.

The Bank does not use notional amounts of credit derivatives as the primary measure of risk management for such derivatives, because the notional amount does not take into account the probability of the occurrence of a credit event, the recovery value of the reference obligation, or related cash instruments and economic hedges, each of which reduces, in the Bank's view, the risks associated with such derivatives.

Total credit derivatives and credit-related notes

	Maximum payout/Notional amount			
December 31, 2023 (in millions)	Protection sold	Protection purchased with identical underlyings[(b)]	Net protection (sold)/ purchased[(c)]	Other protection purchased[(d)]
Credit derivatives				
Credit default swaps	**$ (448,674)**	**$ 472,484**	**$ 23,810**	**$ 7,548**
Other credit derivatives[(a)]	**(44,252)**	**63,891**	**19,639**	**15,816**
Total credit derivatives	**(492,926)**	**536,375**	**43,449**	**23,364**
Credit-related notes	**–**	**–**	**–**	**8,562**
Total	**$ (492,926)**	**$ 536,375**	**$ 43,449**	**$ 31,926**

	Maximum payout/Notional amount			
December 31, 2022 (in millions)	Protection sold	Protection purchased with identical underlyings[(b)]	Net protection (sold)/ purchased[(c)]	Other protection purchased[(d)]
Credit derivatives				
Credit default swaps	$ (492,104)	$ 505,795	$ 13,691	$ 3,014
Other credit derivatives[(a)]	(57,814)	67,118	9,304	10,522
Total credit derivatives	(549,918)	572,913	22,995	13,536
Credit-related notes	–	–	–	7,198
Total	$ (549,918)	$ 572,913	$ 22,995	$ 20,734

(a) Other credit derivatives predominantly consist of credit swap options and total return swaps.
(b) Represents the total notional amount of protection purchased where the underlying reference instrument is identical to the reference instrument on protection sold; the notional amount of protection purchased for each individual identical underlying reference instrument may be greater or lower than the notional amount of protection sold.
(c) Does not take into account the fair value of the reference obligation at the time of settlement, which would generally reduce the amount the seller of protection pays to the buyer of protection in determining settlement value.
(d) Represents protection purchased by the Bank on referenced instruments (single-name, portfolio or index) where the Bank has not sold any protection on the identical reference instrument.

The following tables summarize the notional amounts by the ratings, maturity profile, and total fair value, of credit derivatives as of December 31, 2023 and 2022, where the Bank is the seller of protection. The maturity profile is based on the remaining contractual maturity of the credit derivative contracts. The ratings profile is based on the rating of the reference entity on which the credit derivative contract is based. The ratings and maturity profile of credit derivatives where the Bank is the purchaser of protection are comparable to the profile reflected below.

Protection sold – credit derivatives ratings[(a)]/maturity profile

December 31, 2023 (in millions)	**<1 year**	**1–5 years**	**>5 years**	**Total notional amount**	**Fair value of receivables[(b)]**	**Fair value of payables[(b)]**	**Net fair value**
Risk rating of reference entity							
Investment-grade	**$ (90,961)**	**$ (270,544)**	**$ (25,596)**	**$ (387,101)**	**$ 3,758**	**$ (1,290)**	**$ 2,468**
Noninvestment-grade	**(31,763)**	**(71,494)**	**(2,568)**	**(105,825)**	**2,594**	**(1,124)**	**1,470**
Total	**$ (122,724)**	**$ (342,038)**	**$ (28,164)**	**$ (492,926)**	**$ 6,352**	**$ (2,414)**	**$ 3,938**

December 31, 2022 (in millions)	<1 year	1-5 years	>5 years	Total notional amount	Fair value of receivables[(b)]	Fair value of payables[(b)]	Net fair value
Risk rating of reference entity							
Investment-grade	$ (97,396)	$ (300,062)	$ (27,282)	$ (424,740)	$ 2,397	$ (1,985)	$ 412
Noninvestment-grade	(33,518)	(88,788)	(2,872)	(125,178)	1,326	(2,539)	(1,213)
Total	$ (130,914)	$ (388,850)	$ (30,154)	$ (549,918)	$ 3,723	$ (4,524)	$ (801)

(a) The ratings scale is primarily based on external credit ratings defined by S&P and Moody's.
(b) Amounts are shown on a gross basis, before the benefit of legally enforceable master netting agreements including cash collateral netting.

Note 7 – Noninterest revenue and noninterest expense

Noninterest revenue

The Bank records noninterest revenue from certain contracts with customers in investment banking fees, deposit-related fees, asset management fees, commissions and other fees, and components of card income. The related contracts are often terminable on demand and the Bank has no remaining obligation to deliver future services. For arrangements with a fixed term, the Bank may commit to deliver services in the future. Revenue associated with these remaining performance obligations typically depends on the occurrence of future events or underlying asset values, and is not recognized until the outcome of those events or values are known.

Investment banking fees

This revenue category includes debt and equity underwriting and advisory fees. As an underwriter, the Bank helps clients raise capital via public offering and private placement of various types of debt and equity instruments. Underwriting fees are primarily based on the issuance price and quantity of the underlying instruments, and are recognized as revenue typically upon execution of the client's transaction. The Bank also manages and syndicates loan arrangements. Credit arrangement and syndication fees, included within debt underwriting fees, are recorded as revenue after satisfying certain retention, timing and yield criteria.

The Bank also provides advisory services, by assisting its clients with mergers and acquisitions, divestitures, restructuring and other complex transactions. Advisory fees are recognized as revenue typically upon execution of the client's transaction.

The following table presents the components of investment banking fees.

Year ended December 31, (in millions)	2023	2022	2021
Underwriting			
Equity	$ 257	$ 239	$ 945
Debt	1,489	1,689	2,886
Total underwriting	1,746	1,928	3,831
Advisory	779	1,027	1,401
Total investment banking fees	$ 2,525	$ 2,955	$ 5,232

Principal transactions

Principal transactions revenue is driven by many factors, including:

- the bid-offer spread, which is the difference between the price at which a market participant is willing and able to sell an instrument to the Bank and the price at which another market participant is willing and able to buy it from the Bank, and vice versa; and
- realized and unrealized gains and losses on financial instruments and commodities transactions, including those accounted for under the fair value option, primarily used in client-driven market-making activities.
  - Realized gains and losses result from the sale of instruments, closing out or termination of transactions, or interim cash payments.
  - Unrealized gains and losses result from changes in valuation.

In connection with its client-driven market-making activities, the Bank transacts in debt and equity instruments, derivatives and commodities, including physical commodities inventories and financial instruments that reference commodities.

Principal transactions revenue also includes realized and unrealized gains and losses related to:

- derivatives designated in qualifying hedge accounting relationships, primarily fair value hedges of commodity and foreign exchange risk;
- derivatives used for specific risk management purposes, primarily to mitigate credit, foreign exchange and interest rate risks.

Refer to Note 6 for further information on the income statement classification of gains and losses from derivatives activities.

In the financial commodity markets, the Bank transacts in OTC derivatives (e.g., swaps, forwards, options) and ETD that reference a wide range of underlying commodities. In the physical commodity markets, the Bank primarily purchases and sells precious metals.

The following table presents all realized and unrealized gains and losses recorded in principal transactions revenue. This table excludes interest income and interest expense on trading assets and liabilities, which are an integral part of the overall performance of the Bank's client-driven market-making activities and fund deployment activities. Refer to Note 8 for further information on interest income and interest expense.

Trading revenue is presented primarily by instrument type. The Bank's client-driven market-making activities generally utilize a variety of instrument types in connection with their market-making and related risk-management activities; accordingly, the trading revenue presented in the table below is not representative of the total revenue of the Bank's client-driven market making activities.

Year ended December 31, (in millions)	2023	2022	2021
Trading revenue by instrument type			
Interest rate[(a)]	**$ 4,363**	$ 3,211	$ 1,977
Credit[(b)]	**790**	918 [(c)]	1,959
Foreign exchange	**4,885**	4,972	2,742
Equity	**8,909**	6,722	5,750
Commodity	**1,956**	2,071	1,248
Total trading revenue	**20,903**	17,894	13,676
Private equity gains	**—**	1	1
Principal transactions	**$ 20,903**	$ 17,895	$ 13,677

(a) Includes the impact of changes in funding valuation adjustments on derivatives.
(b) Includes the impact of changes in credit valuation adjustments on derivatives, net of the associated hedging activities.
(c) Includes net markdowns on held-for-sale positions, primarily unfunded commitments, in the bridge financing portfolio.

Lending- and deposit-related fees

Lending-related fees include fees earned from loan commitments, standby letters of credit, financial guarantees, and other loan-servicing activities. Deposit-related fees include fees earned from performing cash management activities, and providing overdraft and other deposit account services. Lending- and deposit-related fees are recognized over the period in which the related service is provided. Refer to Note 26 for further information on lending-related commitments.

The following table presents the components of lending- and deposit-related fees.

Year ended December 31, (in millions)	2023	2022	2021
Lending-related fees	**$ 2,362** [(a)]	$ 1,465	$ 1,471
Deposit-related fees	**5,048**	5,630	5,560
Total lending- and deposit-related fees	**$ 7,410**	$ 7,095	$ 7,031

(a) Includes the amortization of the purchase discount on certain acquired lending-related commitments associated with First Republic. The discount is deferred in other liabilities and recognized on a straight-line basis over the commitment period and was largely recognized in the current year as the commitments are generally short term. Refer to Note 29 for additional information.

Asset management fees

Investment management fees include fees associated with assets the Bank manages on behalf of its clients, including investors in Bank-sponsored funds and owners of separately managed investment accounts. Management fees are typically based on the value of assets under management and are collected and recognized at the end of each period over which the management services are provided and the value of the managed assets is known. The Bank also receives performance-based management fees, which are earned based on exceeding certain benchmarks or other performance targets and are accrued and recognized when the probability of reversal is remote, typically at the end of the related billing period.

All other asset management fees include commissions earned on the sales or distribution of mutual funds to clients. These fees are recorded as revenue at the time the service is rendered or, in the case of certain distribution fees, based on the underlying fund's asset value or investor redemption activity.

The following table presents the components of asset management fees.

Year ended December 31, (in millions)	2023	2022	2021
Asset management fees			
Investment management fees	**$ 2,540**	$ 2,427	$ 2,345
All other asset management fees	**51**	52	44
Total asset management fees	**$ 2,591**	$ 2,479	$ 2,389

Commissions and other fees

This revenue category includes commissions and fees from brokerage and custody services, and other products.

Brokerage commissions represents commissions earned when the Bank acts as a broker, by facilitating its clients' purchases and sales of securities and other financial instruments. Brokerage commissions are collected and recognized as revenue upon occurrence of the client transaction. The Bank reports certain costs paid to third-party clearing houses and exchanges net against commission revenue.

Administration fees predominantly include fees for custody, funds services, securities lending and securities clearance. These fees are recorded as revenue over the period in which the related service is provided.

The following table presents the components of commissions and other fees.

Year ended December 31, (in millions)	2023	2022	2021
Commissions and other fees			
Brokerage commissions	**$ 1,240**	$ 1,241	$ 1,409
Administration fees	**2,285**	2,337	2,543
All other commissions and fees[(a)]	**8,893**	7,878	7,680
Total commissions and other fees	**$ 12,418**	$ 11,456	$ 11,632

(a) Includes fees earned for operational support and services provided to JPMorgan Chase affiliates. Refer to Note 21 for additional information.

Mortgage fees and related income

This revenue category reflects production and net mortgage servicing revenue.

Production revenue includes fees and income recognized as earned on mortgage loans originated with the intent to sell, and the impact of risk management activities associated with the mortgage pipeline and warehouse loans. Production revenue also includes gains and losses on sales and lower of cost or fair value adjustments on mortgage loans held-for-sale (excluding certain repurchased loans insured by U.S. government agencies), and changes in the fair value of financial instruments measured under the fair value option.

Net mortgage servicing revenue includes operating revenue earned from servicing third-party mortgage loans, which is recognized over the period in which the service is provided; changes in the fair value of MSRs; the impact of risk management activities associated with MSRs; and gains and losses on securitization of excess mortgage servicing. Net mortgage servicing revenue also includes gains and losses on sales and lower of cost or fair value adjustments of certain repurchased loans insured by U.S. government agencies.

Refer to Note 16 for further information on risk management activities and MSRs.

Net interest income from mortgage loans is recorded in interest income.

Card income

This revenue category includes interchange and other income from credit and debit card transactions; and fees earned from processing card transactions for merchants, both of which are recognized when purchases are made by a cardholder and presented net of certain transaction-related costs. Card income also includes account origination costs and annual fees, which are deferred and recognized on a straight-line basis over a 12-month period.

Certain credit card products offer the cardholder the ability to earn points based on account activity, which the cardholder can choose to redeem for cash and non-cash rewards. The cost to the Bank related to these proprietary rewards programs varies based on multiple factors including the terms and conditions of the rewards programs, cardholder activity, cardholder reward redemption rates and cardholder reward selections.
The Bank maintains a liability for its obligations under its rewards programs and reports the current-period cost as a reduction of card income.

Credit card revenue sharing agreements
The Bank has contractual agreements with numerous co-brand partners that grant the Bank exclusive rights to issue co-branded credit card products and market them to the customers of such partners. These partners endorse the co-brand credit card programs and provide their customer or member lists to the Bank. The partners may also conduct marketing activities and provide rewards redeemable under their own loyalty programs that the Bank will grant to co-brand credit cardholders based on account activity. The terms of these agreements generally range from five to ten years.

The Bank typically makes payments to the co-brand credit card partners based on the cost of partners' marketing activities and loyalty program rewards provided to credit cardholders, new account originations and sales volumes. Payments to partners based on marketing efforts undertaken by the partners are expensed by the Bank as incurred and reported as marketing expense. Payments for partner loyalty program rewards are reported as a reduction of card income when incurred. Payments to partners based on new credit card account originations are accounted for as direct loan origination costs and are deferred and recognized as a reduction of card income on a straight-line basis over a 12-month period. Payments to partners based on sales volumes are reported as a reduction of card income when the related interchange income is earned.

The following table presents the components of card income:

Year ended December 31, (in millions)	2023	2022	2021
Interchange and merchant processing income	**$ 31,021**	$ 28,085	$ 23,592
Reward costs and partner payments	**(24,601)**	(22,162)	(17,868)
All other[(a)]	**(1,636)**	(1,502)	(622)
Total card income	**$ 4,784**	$ 4,421	$ 5,102

(a) Predominantly represents the amortization of account origination costs and annual fees, which are deferred and recognized on a straight-line basis over a 12-month period.

Other income

The following table presents certain components of other income:

Year ended December 31, (in millions)	2023		2022	2021
Operating lease income	$ 2,841		$ 3,651	$ 4,906
Estimated bargain purchase gain associated with the First Republic acquisition	2,775	(a)	–	–
Gain on sale of Visa B shares	–		914	–

(a) Refer to Note 29 for additional information on the First Republic acquisition.

Refer to Note 3 and 19 for additional information on Visa B shares and operating leases, respectively.

Noninterest expense

Other expense

Other expense on the Bank's Consolidated statements of income included:

Year ended December 31, (in millions)	2023		2022	2021
Legal expense	$ 852		$ 54	$ 90
FDIC-related expense	4,203	(a)	860	730

(a) Included the $2.9 billion FDIC special assessment.

FDIC Special Assessment

In November 2023, the FDIC approved a final rule to implement a special assessment intended to recover losses to the Deposit Insurance Fund ("DIF") arising from the protection of uninsured depositors resulting from the systemic risk determination made on March 12, 2023. The final rule imposed a special assessment at a quarterly rate of 3.36 basis points on insured depository institutions whose estimated uninsured deposits were over $5.0 billion as of December 31, 2022. During the second half of 2023, the Bank recognized the estimated special assessment expense of $2.9 billion (pre-tax).

Note 8 – Interest income and Interest expense

Interest income and interest expense are recorded in the Consolidated statements of income and classified based on the nature of the underlying asset or liability.

Interest income and interest expense includes the current-period interest accruals for financial instruments measured at fair value, except for derivatives and financial instruments containing embedded derivatives that would be separately accounted for in accordance with U.S. GAAP, absent the fair value option election; for those instruments, all changes in fair value including any interest elements, are primarily reported in principal transactions revenue. For financial instruments that are not measured at fair value, the related interest is included within interest income or interest expense, as applicable.

Interest income on loans and securities include the amortization and accretion of purchase premiums and discounts, as well as net deferred fees and costs on loans. These amounts are deferred in loans and investment securities, respectively, and recognized on a level-yield basis.

Refer to Notes 11, 12, 13 and 20 for further information on accounting for interest income and interest expense related to investment securities, securities financing activities (i.e., securities purchased or sold under resale or repurchase agreements; securities borrowed; and securities loaned), loans and long-term debt, respectively.

The following table presents the components of interest income and interest expense:

Year ended December 31, (in millions)	2023		2022	2021
Interest income				
Loans	**$83,232**	(c)	$52,657	$41,497
Taxable securities	**17,384**		10,361	6,452
Non-taxable securities[a]	**1,335**		973	1,040
Total investment securities	**18,719**	(c)	11,334	7,492
Trading assets-debt instruments	**8,014**		4,735	3,697
Federal funds sold and securities purchased under resale agreements	**12,119**		4,081	757
Securities borrowed[b]	**2,071**		478	(144)
Deposits with banks	**21,702**		9,040	514
All other interest-earning assets	**5,558**		1,772	57
Total interest income	**151,415**		84,097	53,870
Interest expense				
Interest-bearing deposits	**43,566**		11,210	624
Federal funds purchased and securities loaned or sold under repurchase agreements	**5,029**		1,411	132
Trading liabilities - debt, short-term and all other interest-bearing liabilities	**3,835**		1,693	764
Long-term debt	**5,039**		1,131	464
Beneficial interest issued by consolidated VIEs	**962**		230	80
Total interest expense	**58,431**		15,675	2,064
Net interest income	**92,984**		68,422	51,806
Provision for credit losses	**8,996**		6,347	(9,296)
Net interest income after provision for credit losses	**$83,988**		$62,075	$61,102

(a) Represents securities that are tax-exempt for U.S. federal income tax purposes.
(b) Negative interest and rates reflect the net impact of interest earned offset by fees paid on client-driven securities borrowed transactions.
(c) Includes the accretion of the purchase discount on certain acquired loans and investment securities associated with First Republic. Refer to Note 29 for additional information.

Note 9 – Pension and other postretirement employee benefit plans

The Bank has various defined benefit pension plans and other postretirement employee benefit ("OPEB") plans that provide benefits to its employees in the U.S. and certain non-U.S. locations. Substantially all the defined benefit pension plans are closed to new participants. The principal defined benefit pension plan in the U.S., which covered substantially all U.S. employees, was closed to new participants and frozen for existing participants on January 1, 2020, (and January 1, 2019 for new hires on or after December 2, 2017). Interest credits continue to accrue to participants' accounts based on their accumulated balances.

The Bank maintains unfunded postretirement benefit plans that provide medical and life insurance for certain eligible employees and retirees as well as their dependents covered under these programs. None of these plans have a material impact on the Bank's Consolidated Financial Statements.

The Bank also provides a qualified defined contribution plan in the U.S. and maintains other similar arrangements in certain non-U.S. locations. The most significant of these plans is the JPMorgan Chase 401(k) Savings Plan ("the 401(k) Savings Plan"), which covers substantially all U.S. employees. Employees can contribute to the 401(k) Savings Plan on a pretax and/or Roth 401(k) after-tax basis. The Bank makes annual matching and pay credit contributions to the 401(k) Savings Plan on behalf of eligible participants.

The following table presents the pretax benefit obligations, plan assets, the net funded status, and the amounts recorded in AOCI on the Consolidated balance sheets for the Bank's significant defined benefit pension and OPEB plans.

As of or for the year ended December 31, (in millions)	Defined benefit pension and OPEB plans	
	2023	2022
Projected benefit obligations	**$ (13,471)**	$ (13,080)
Fair value of plan assets	**18,016**	17,004
Net funded status	**4,545**	3,924
Accumulated other comprehensive income/(loss)	**(2,115)**	(2,361)

The weighted-average discount rate used to value the benefit obligations as of December 31, 2023 and 2022, was 5.02% and 5.13%, respectively.

Gains and losses

Gains or losses resulting from changes in the benefit obligation and the fair value of plan assets are recorded in OCI. Amortization of net gains or losses are recognized as part of the net periodic benefit cost over subsequent periods, if, as of the beginning of the year, the net gain or loss exceeds 10% of the greater of the projected benefit obligation or the fair value of the plan assets. Amortization is generally over the average expected remaining lifetime of plan participants, given the frozen status of most plans. For the year ended December 31, 2023, the net gain was attributable to market-driven increases in the fair value of plan assets, partially offset by changes in the discount rate and interest crediting rate. During the year ended December 31, 2022, a remeasurement of the Bank's U.S. principal defined benefit plan during the second half of 2022, was required as a result of a pension settlement. The remeasurement resulted in a reduction in the fair value of the Bank's U.S. principal defined benefit plan assets, reflecting market conditions at the time of remeasurement, and a reduction in the plan's projected benefit obligation totaling $4.0 billion and $2.6 billion, respectively, resulting in a net decrease of $1.4 billion in pre-tax AOCI.

The following table presents the net periodic benefit costs reported in the Consolidated statements of income for the Bank's defined benefit pension, defined contribution and OPEB plans, and in other comprehensive income for the defined benefit pension and OPEB plans.

Year ended December 31, (in millions)	Pension and OPEB plans		
	2023	2022	2021
Total net periodic defined benefit plan cost/(credit)[(a)(b)]	$ **(220)**	$ (106) [(c)]	$ (136) [(c)]
Total defined contribution plans	**1,410**	1,257	1,204
Total pension and OPEB cost included in noninterest expense	$ **1,190**	$ 1,151	$ 1,068
Total recognized in other comprehensive (income)/loss	$ **(248)**	$ 973	$ (895)

(a) The service cost component of net periodic defined benefit cost is reported in compensation expense; all other components of net periodic defined benefit costs are reported in other expense in the Consolidated statements of income.
(b) Includes $(30) million, $(12) million and $(16) million, for the years ended December 31, 2023, 2022 and 2021, respectively, that was charged by the Bank to JPMorgan Chase and its non-bank subsidiaries for their share of the U.S. qualified defined benefit pension plan expense.
(c) Includes pension settlement losses of $92 million and $33 million, respectively, for the years ended December 31, 2022 and 2021.

The following table presents the weighted-average actuarial assumptions used to determine the net periodic benefit costs for the defined benefit pension and OPEB plans.

	Defined benefit pension and OPEB plans		
Year ended December 31,	**2023**	2022	2021
Discount rate	**5.13 %**	2.53 %	2.17 %
Expected long-term rate of return on plan assets	**5.76**	3.78	2.94

Plan assumptions

The Bank's expected long-term rate of return is a blended weighted average, by asset allocation of the projected long-term returns for the various asset classes, taking into consideration local market conditions and the specific allocation of plan assets. Returns on asset classes are developed using a forward-looking approach and are not strictly based on historical returns, with consideration given to current market conditions and the portfolio mix of each plan.

The discount rates used in determining the benefit obligations are generally provided by the Bank's actuaries, with the Bank's principal defined benefit pension plan using a rate that was selected by reference to the yields on portfolios of bonds with maturity dates and coupons that closely match each of the plan's projected cash flows.

Investment strategy and asset allocation

The assets of the Bank's defined benefit pension plans are held in various trusts and are invested in well-diversified portfolios of equity and fixed income securities, cash and cash equivalents, and alternative investments. The Bank regularly reviews the asset allocations and asset managers, as well as other factors that could impact the portfolios, which are rebalanced when deemed necessary. As of December 31, 2023, the approved asset allocation ranges by asset class for the Bank's principal defined benefit plan are 42-100% debt securities, 0-40% equity securities, 0-2% real estate, and 0-10% alternatives.

Assets held by the Bank's defined benefit pension plans do not include securities issued by JPMorgan Chase or its affiliates, except through indirect exposures through investments in exchange traded funds, mutual funds and collective investment funds managed by third-parties. The defined benefit pension plans hold investments that are sponsored or managed by affiliates of JPMorgan Chase in the amount of $1.8 billion and $1.7 billion, as of December 31, 2023 and 2022, respectively.

Fair value measurement of the plans' assets and liabilities

Refer to Note 3 for information on fair value measurements, including descriptions of level 1, 2, and 3 of the fair value hierarchy and the valuation methods employed by the Bank.

Pension plan assets and liabilities measured at fair value

	Defined benefit pension plans							
	2023				2022			
December 31, (in millions)	Level 1[(a)]	Level 2[(b)]	Level 3[(c)]	Total fair value	Level 1[(a)]	Level 2[(b)]	Level 3[(c)]	Total fair value
Assets measured at fair value classified in the fair value hierarchy	**$ 6,190**	**$ 9,839**	**$ 336**	**$ 16,365**	$ 5,269	$ 9,247	$ 140	$ 14,656
Assets measured at fair value using NAV as a practical expedient	**—**	**—**	**—**	**2,097**	—	—	—	2,593
Net defined benefit pension plan payables	**—**	**—**	**—**	**(446)**	—	—	—	(245)
Total fair value of plan assets	**—**	**—**	**—**	**$ 18,016**	—	—	—	$ 17,004

(a) Consists predominantly of equity securities, U.S. federal, state, and local and non-U.S. government debt securities, and cash equivalents.
(b) Consists predominantly of corporate debt securities and mortgage-backed securities.
(c) Consists predominantly of fund investments and participating annuity contracts in 2023, and participating annuity contracts in 2022.

Estimated future benefit payments

The following table presents benefit payments expected to be paid for the defined benefit pension and OPEB plans for the years indicated.

Year ended December 31, (in millions)	Defined benefit pension and OPEB plans
2024	$ 1,081
2025	1,066
2026	1,055
2027	1,020
2028	1,006
Years 2029-2033	4,888

Note 10 – Employee share-based incentives

Employee share-based awards

The Bank's employees receive annual incentive compensation based on their performance, the performance of their business and JPMorgan Chase's consolidated operating results. The Bank's employees participate, to the extent they meet minimum eligibility requirements, in various share-based incentive plans sponsored by JPMorgan Chase.

In 2023, 2022 and 2021, JPMorgan Chase granted long-term share-based awards to certain employees under its Long-Term Incentive Plan ("LTIP"), as amended and restated effective May 15, 2018, and subsequently amended effective May 18, 2021. Under the terms of the LTIP, as of December 31, 2023, 54 million shares of JPMorgan Chase's common stock were available for issuance through May 2025. The LTIP is the only active plan under which JPMorgan Chase is currently granting share-based incentive awards. In the following discussion, the LTIP, plus prior JPMorgan Chase plans and plans assumed as the result of acquisitions, are referred to collectively as the "LTI Plans," and such plans constitute JPMorgan Chase's share-based incentive plans.

Restricted stock units ("RSUs") are awarded at no cost to the recipient upon their grant. Generally, RSUs are granted annually and vest at a rate of 50% after two years and 50% after three years and are converted into shares of common stock as of the vesting date. In addition, RSUs typically include full-career eligibility provisions, which allow employees to continue to vest upon voluntary termination based on age and/or service-related requirements, subject to post-employment and other restrictions. All RSU awards are subject to forfeiture until vested and contain clawback provisions that may result in cancellation under certain specified circumstances. Predominantly all RSUs entitle the recipient to receive cash payments equivalent to any dividends paid on the underlying common stock during the period the RSUs are outstanding.

Performance share units ("PSUs") are granted annually, and approved by JPMorgan Chase's Board of Directors, to members of JPMorgan Chase's Operating Committee under the variable compensation program. PSUs are subject to JPMorgan Chase's achievement of specified performance criteria over a three-year period. The number of awards that vest can range from zero to 150% of the grant amount. In addition, dividends that accrue during the vesting period are reinvested in dividend equivalent share units. PSUs and the related dividend equivalent share units are converted into shares of common stock after vesting.

Once the PSUs and dividend equivalent share units have vested, the shares of common stock that are delivered, after applicable tax withholding, must be retained for an additional holding period, for a total combined vesting and holding period of approximately five to eight years from the grant date depending on regulations in certain countries.

Under the LTI Plans, stock appreciation rights ("SARs") were generally granted with an exercise price equal to the fair value of JPMorgan Chase's common stock on the grant date. SARs generally expire ten years after the grant date. In 2021, JPMorgan Chase awarded its Chairman and Chief Executive Officer and its President and Chief Operating Officer 1.5 million and 750,000 SARs, respectively. There were no grants of SARs in 2023 or 2022.

The Bank separately recognizes compensation expense for each tranche of each award, net of estimated forfeitures, as if it were a separate award with its own vesting date. Generally, for each tranche granted, compensation expense is recognized on a straight-line basis from the grant date until the vesting date of the respective tranche, provided that the employees will not become full-career eligible during the vesting period. For awards with full-career eligibility provisions and awards granted with no future substantive service requirement, the Bank accrues the estimated value of awards expected to be awarded to employees as of the grant date without giving consideration to the impact of post-employment restrictions. For each tranche granted to employees who will become full-career eligible during the vesting period, compensation expense is recognized on a straight-line basis from the grant date until the earlier of the employee's full-career eligibility date or the vesting date of the respective tranche.

RSUs, PSUs and SARs activity

Generally, compensation expense for RSUs and PSUs is measured based on the number of units granted multiplied by the stock price at the grant date, and for SARs, is measured at the grant date using the Black-Scholes valuation model. Compensation expense for these awards is recognized in net income as described previously. The following table summarizes the Bank's RSUs, PSUs and SARs activity for 2023.

Year ended December 31, 2023 (in thousands, except weighted-average data, and where otherwise stated)	RSUs/PSUs Number of units	RSUs/PSUs Weighted-average grant date fair value	SARs Number of awards	SARs Weighted-average exercise price	SARs Weighted-average remaining contractual life (in years)	SARs Aggregate intrinsic value
Outstanding, January 1	**33,844**	**$ 138.12**	**2,467**	**$ 142.90**		
Granted	**17,610**	**138.92**	**–**	**–**		
Exercised or vested	**(12,730)**	**133.55**	**(217)**	**46.58**		
Forfeited	**(993)**	**140.82**	**–**	**–**		
Canceled	**NA**	**NA**	**–**	–		
Transferred	**(94)**	**138.12**	**–**	**–**		
Outstanding, December 31	**37,637**	**$ 139.93**	**2,250**	**$ 152.19**	**7.7**	**$ 40,444**
Exercisable, December 31	**NA**	**NA**	**–**	**–**	**–**	**–**

The total fair value of RSUs and PSUs that vested during the years ended December 31, 2023, 2022 and 2021, was $1.8 billion, $2.3 billion and $2.1 billion, respectively. The total intrinsic value of options exercised during the years ended December 31, 2023, 2022 and 2021, was $20 million, $71 million and $200 million, respectively.

Compensation expense

The Bank recognized the following compensation expense related to its participation in various employee share-based incentive plans in its Consolidated statements of income.

Year ended December 31, (in millions)	2023	2022	2021
Cost of prior grants of RSUs, PSUs and SARs that are amortized over their applicable vesting periods	**$ 1,121**	$ 893	$ 842
Accrual of estimated costs of share-based awards to be granted in future periods, predominantly those to full-career eligible employees	**1,162**	1,126	1,234
Total compensation expense related to employee share-based incentive plans	**$ 2,283**	$ 2,019	$ 2,076

There are no separate plans solely for the employees of the Bank and, therefore, the share-based compensation expense for the Bank is determined based upon employee participation in the JPMorgan Chase plans and effected through a charge from JPMorgan Chase, which is cash settled.

At December 31, 2023, approximately $794 million (pretax) of compensation expense related to unvested awards had not yet been charged to net income. That cost is expected to be amortized into compensation expense over a weighted-average period of 1.7 years. The Bank does not capitalize any compensation expense related to share-based compensation awards to employees.

Tax benefits

Income tax benefits (including tax benefits from dividends or dividend equivalents) related to share-based incentive arrangements recognized in the Bank's Consolidated statements of income for the years ended December 31, 2023, 2022 and 2021, were $620 million, $642 million and $691 million, respectively.

Note 11 – Investment securities

Investment securities consist of debt securities that are classified as AFS or HTM. Debt securities classified as trading assets are discussed in Note 3. Predominantly all of the Bank's AFS and HTM securities are held in connection with its asset-liability management activities.

AFS securities are carried at fair value on the Consolidated balance sheets. Unrealized gains and losses, after any applicable hedge accounting adjustments or allowance for credit losses, are reported in AOCI. The specific identification method is used to determine realized gains and losses on AFS securities, which are included in investment securities gains/(losses) on the Consolidated statements of income. HTM securities, which the Bank has the intent and ability to hold until maturity, are carried at amortized cost, net of allowance for credit losses, on the Consolidated balance sheets.

For both AFS and HTM securities, purchase discounts or premiums are generally amortized into interest income on a level-yield basis over the contractual life of the security. However, premiums on certain callable debt securities are amortized to the earliest call date.

Effective January 1, 2023, the Bank adopted the portfolio layer method hedge accounting guidance which permitted a transfer of HTM securities to AFS upon adoption. The Bank transferred obligations of U.S. states and municipalities with a carrying value of $7.1 billion resulting in the recognition of $38 million net pre-tax unrealized losses in AOCI. Refer to Note 1 and Note 22 for additional information.

During 2022, the Bank transferred investment securities with a fair value of $78.3 billion from AFS to HTM for capital management purposes. AOCI included pretax unrealized losses of $4.8 billion on the securities at the date of transfer.

Unrealized gains or losses at the date of transfer of these securities continue to be reported in AOCI and are amortized into interest income on a level-yield basis over the remaining life of the securities. This amortization will offset the effect on interest income of the amortization of the premium or discount resulting from the transfer recorded at fair value.

Transfers of securities between AFS and HTM are non-cash transactions.

The amortized costs and estimated fair values of the investment securities portfolio were as follows for the dates indicated.

	2023				2022			
December 31, (in millions)	Amortized cost[c][d]	Gross unrealized gains	Gross unrealized losses	Fair value	Amortized cost[c][d]	Gross unrealized gains	Gross unrealized losses	Fair value
Available-for-sale securities								
Mortgage-backed securities:								
U.S. GSEs and government agencies	**$ 88,377**	**$ 870**	**$ 4,077**	**$ 85,170**	$ 77,194	$ 479	$ 6,170	$ 71,503
Residential:								
U.S.	**2,086**	**10**	**68**	**2,028**	1,576	1	111	1,466
Non-U.S.	**1,608**	**4**	**1**	**1,611**	3,176	5	27	3,154
Commercial	**2,930**	**12**	**139**	**2,803**	2,113	–	155	1,958
Total mortgage-backed securities	**95,001**	**896**	**4,285**	**91,612**	84,059	485	6,463	78,081
U.S. Treasury and government agencies	**58,051**	**276**	**522**	**57,805**	95,217	302	3,459	92,060
Obligations of U.S. states and municipalities	**21,243**	**390**	**266**	**21,367**	7,075	86	403	6,758
Non-U.S. government debt securities	**21,387**	**254**	**359**	**21,282**	20,360	14	678	19,696
Corporate debt securities	**88**	**–**	**1**	**87**	342	–	6	336
Asset-backed securities:								
Collateralized loan obligations	**6,769**	**11**	**28**	**6,752**	5,916	1	125	5,792
Other	**2,789**	**8**	**26**	**2,771**	3,134	2	69	3,067
Unallocated portfolio layer fair value basis adjustments[a]	**73**	**(73)**	**–**	**NA**	NA	NA	NA	NA
Total available-for-sale securities	**205,401**	**1,762**	**5,487**	**201,676** [e]	216,103	890	11,203	205,790
Held-to-maturity securities[b]								
Mortgage-backed securities:								
U.S. GSEs and government agencies	**105,614**	**39**	**11,643**	**94,010**	113,492	35	13,709	99,818
U.S. Residential	**9,709**	**4**	**970**	**8,743**	10,503	3	1,244	9,262
Commercial	**10,534**	**13**	**581**	**9,966**	10,361	10	734	9,637
Total mortgage-backed securities	**125,857**	**56**	**13,194**	**112,719**	134,356	48	15,687	118,717
U.S. Treasury and government agencies	**173,666**	**–**	**13,074**	**160,592**	207,463	–	18,363	189,100
Obligations of U.S. states and municipalities	**9,945**	**74**	**591**	**9,428**	19,747	53	1,080	18,720
Asset-backed securities:								
Collateralized loan obligations	**58,565**	**47**	**352**	**58,260**	61,414	4	1,522	59,896
Other	**1,815**	**1**	**61**	**1,755**	2,325	–	110	2,215
Total held-to-maturity securities	**369,848**	**178**	**27,272**	**342,754**	425,305	105	36,762	388,648
Total investment securities, net of allowance for credit losses	**$ 575,249**	**$ 1,940**	**$ 32,759**	**$ 544,430**	$ 641,408	$ 995	$47,965	$ 594,438

(a) Represents the amount of portfolio layer method basis adjustments related to AFS securities hedged in a closed portfolio. Under U.S. GAAP portfolio layer method basis adjustments are not allocated to individual securities, however the amounts impact the unrealized gains or losses in the table for the types of securities being hedged. Refer to Note 1 and Note 6 for additional information.

(b) The Bank purchased $4.1 billion, $33.7 billion and $111.8 billion of HTM securities for the years ended December 31, 2023, 2022 and 2021, respectively.

(c) The amortized cost of investment securities is reported net of allowance for credit losses of $94 million and $67 million at December 31, 2023 and 2022, respectively.

(d) Excludes $2.8 billion and $2.5 billion of accrued interest receivable at December 31, 2023 and 2022, respectively, included in accrued interest and accounts receivable on the Consolidated balance sheets. The Bank generally does not recognize an allowance for credit losses on accrued interest receivable, consistent with its policy to write them off no later than 90 days past due by reversing interest income. The Bank did not reverse through interest income any accrued interest receivable for the years ended December 31, 2023 and 2022.

(e) As of December 31, 2023, included $24.2 billion of AFS securities associated with First Republic. Refer to Note 29 for additional information.

At December 31, 2023, the investment securities portfolio consisted of debt securities with an average credit rating of AA+ (based upon external ratings where available, and where not available, based primarily upon internal risk ratings). Risk ratings are used to identify the credit quality of securities and differentiate risk within the portfolio. The Bank's internal risk ratings generally align with the qualitative characteristics (e.g., borrower capacity to meet financial commitments and vulnerability to changes in the economic environment) defined by S&P and Moody's, however the quantitative characteristics (e.g., probability of default ("PD") and loss given default ("LGD")) may differ as they reflect internal historical experiences and assumptions. Risk ratings are assigned at acquisition, reviewed on a regular and ongoing basis by Credit Risk Management and adjusted as necessary over the life of the investment for updated information affecting the issuer's ability to fulfill its obligations.

AFS securities impairment

The following tables present the fair value and gross unrealized losses by aging category for AFS securities at December 31, 2023 and 2022. The tables exclude U.S. Treasury and government agency securities and U.S. GSE and government agency MBS with unrealized losses of $4.6 billion and $9.6 billion, at December 31, 2023 and 2022, respectively; changes in the value of these securities are generally driven by changes in interest rates rather than changes in their credit profile given the explicit or implicit guarantees provided by the U.S. government.

	Available-for-sale securities with gross unrealized losses					
	Less than 12 months		12 months or more			
Year ended December 31, 2023 (in millions)	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale securities						
Mortgage-backed securities:						
Residential:						
U.S.	$ 81	$ —	$ 1,160	$ 68	$ 1,241	$ 68
Non-U.S.	—	—	722	1	722	1
Commercial	228	3	1,775	136	2,003	139
Total mortgage-backed securities	309	3	3,657	205	3,966	208
Obligations of U.S. states and municipalities	2,134	20	2,278	246	4,412	266
Non-U.S. government debt securities	7,145	24	4,987	335	12,132	359
Corporate debt securities	9	—	66	1	75	1
Asset-backed securities:						
Collateralized loan obligations	932	2	3,744	26	4,676	28
Other	208	1	1,288	25	1,496	26
Total available-for-sale securities with gross unrealized losses	$ 10,737 [(a)]	$ 50	$ 16,020	$ 838	$ 26,757	$ 888

	Available-for-sale securities with gross unrealized losses					
	Less than 12 months		12 months or more			
Year ended December 31, 2022 (in millions)	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale securities						
Mortgage-backed securities:						
Residential:						
U.S.	$ 1,187	$ 71	$ 260	$ 40	$ 1,447	$ 111
Non-U.S.	2,848	26	70	1	2,918	27
Commercial	1,131	74	813	81	1,944	155
Total mortgage-backed securities	5,166	171	1,143	122	6,309	293
Obligations of U.S. states and municipalities	3,023	240	364	163	3,387	403
Non-U.S. government debt securities	6,941	321	3,848	357	10,789	678
Corporate debt securities	150	2	186	4	336	6
Asset-backed securities:						
Collateralized loan obligations	3,010	61	2,701	64	5,711	125
Other	2,586	51	256	18	2,842	69
Total available-for-sale securities with gross unrealized losses	$ 20,876	$ 846	$ 8,498	$ 728	$ 29,374	$ 1,574

(a) Includes the impact of First Republic, primarily obligations of U.S. states and municipalities. Refer to Note 29 for additional information.

AFS securities are considered impaired if the fair value is less than the amortized cost.

The Bank recognizes impairment losses in earnings if the Bank has the intent to sell the debt security, or if it is more likely than not that the Bank will be required to sell the debt security before recovery of its amortized cost. In these circumstances the impairment loss is recognized in investment securities gains/(losses) in the Consolidated Statements of Income and is equal to the full difference between the amortized cost (net of allowance if applicable) and the fair value of the security.

For impaired debt securities that the Bank has the intent and ability to hold, the securities are evaluated to determine if a credit loss exists. If it is determined that a credit loss exists, that loss is recognized as an allowance for credit losses through the provision for credit losses in the Consolidated Statements of Income, limited by the amount of impairment. Any impairment on debt securities that the Bank has the intent and ability to hold not due to credit losses is recorded in OCI.

Factors considered in evaluating credit losses include adverse conditions specifically related to the industry, geographic area or financial condition of the issuer or underlying collateral of a security; and payment structure of the security.

When assessing securities issued in a securitization for credit losses, the Bank estimates cash flows considering relevant market and economic data, underlying loan-level data, and structural features of the securitization, such as subordination, excess spread, overcollateralization or other forms of credit enhancement, and compares the losses projected for the underlying collateral ("pool losses") against the level of credit enhancement in the securitization structure to determine whether these features are sufficient to absorb the pool losses, or whether a credit loss exists.

For beneficial interests in securitizations that are rated below "AA" at their acquisition, or that can be contractually prepaid or otherwise settled in such a way that the Bank would not recover substantially all of its recorded investment, the Bank evaluates impairment for credit losses when there is an adverse change in expected cash flows.

HTM securities – credit risk

Allowance for credit losses

The allowance for credit losses on HTM securities represents expected credit losses over the remaining expected life of the securities.

The allowance for credit losses on HTM obligations of U.S. states and municipalities and commercial mortgage-backed securities is calculated by applying statistical credit loss factors (estimated PD and LGD) to the amortized cost. The credit loss factors are derived using a weighted average of five internally developed eight-quarter macroeconomic scenarios, followed by a single year straight-line interpolation to revert to long run historical information for periods beyond the forecast period. Refer to Note 14 for further information on the eight-quarter macroeconomic forecast.

The allowance for credit losses on HTM collateralized loan obligations and U.S. residential mortgage-backed securities is calculated as the difference between the amortized cost and the present value of the cash flows expected to be collected, discounted at the security's effective interest rate. These cash flow estimates are developed based on expectations of underlying collateral performance derived using the eight-quarter macroeconomic forecast and the single year straight-line interpolation, as well as considering the structural features of the security.

The application of different inputs and assumptions into the calculation of the allowance for credit losses is subject to significant management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for credit losses on HTM securities.

Credit quality indicator

The primary credit quality indicator for HTM securities is the risk rating assigned to each security. At December 31, 2023 and 2022, all HTM securities were rated investment grade and were current and accruing, with approximately 99% and 98% rated at least AA+, respectively.

Allowance for credit losses on investment securities

The allowance for credit losses on investment securities was $94 million, $67 million and $42 million as of December 31, 2023, 2022 and 2021, respectively, which included a cumulative-effect adjustment to retained earnings related to the transfer of HTM securities to AFS for the year ended December 31, 2023.

Selected impacts of investment securities on the Consolidated statements of income

Year ended December 31, (in millions)	**2023**	2022	2021
Realized gains	**$ 622**	$ 198	$ 595
Realized losses	**(3,802)**	(2,578)	(940)
Investment securities losses	**$(3,180)**	$(2,380)	$ (345)
Provision for credit losses	**$ 33**	$ 25	$ (36)

Contractual maturities and yields

The following table presents the amortized cost and estimated fair value at December 31, 2023, of the Bank's investment securities portfolio by contractual maturity.

By remaining maturity December 31, 2023 (in millions)	Due in one year or less	Due after one year through five years	Due after five years through 10 years	Due after 10 years[c]	Total
Available-for-sale securities					
Mortgage-backed securities					
Amortized cost	$ –	$ 5,166	$ 5,660	$ 84,175	$ 95,001
Fair value	–	5,072	5,662	80,878	91,612 [d]
Average yield[a]	– %	5.27 %	6.15 %	4.96 %	5.05 %
U.S. Treasury and government agencies					
Amortized cost	$ 1	$ 27,430	$ 23,884	$ 6,736	$ 58,051
Fair value	1	27,212	23,933	6,659	57,805
Average yield[a]	5.44 %	5.84 %	6.15 %	6.60 %	6.06 %
Obligations of U.S. states and municipalities					
Amortized cost	$ 10	$ 55	$ 531	$ 20,647	$ 21,243
Fair value	10	54	533	20,770	21,367 [d]
Average yield[a]	3.70 %	3.03 %	4.51 %	5.93 %	5.89 %
Non-U.S. government debt securities					
Amortized cost	$ 8,841	$ 4,553	$ 3,658	$ 4,335	$ 21,387
Fair value	8,814	4,537	3,470	4,461	21,282
Average yield[a]	3.68 %	4.35 %	2.00 %	3.79 %	3.55 %
Corporate debt securities					
Amortized cost	$ 7	$ 67	$ 14	$ –	$ 88
Fair value	7	66	14	–	87
Average yield[a]	14.09 %	6.25 %	4.10 %	– %	6.56 %
Asset-backed securities					
Amortized cost	$ 23	$ 869	$ 3,490	$ 5,176	$ 9,558
Fair value	23	861	3,487	5,152	9,523 [d]
Average yield[a]	6.13 %	3.72 %	6.47 %	6.82 %	6.41 %
Total available-for-sale securities					
Amortized cost[b]	$ 8,882	$ 38,140	$ 37,237	$ 121,069	$ 205,328
Fair value	8,855	37,802	37,099	117,920	201,676 [d]
Average yield[a]	3.69 %	5.53 %	5.75 %	5.25 %	5.33 %
Held-to-maturity securities					
Mortgage-backed securities					
Amortized cost	$ –	$ 5,868	$ 8,382	$ 111,649	$ 125,899
Fair value	–	5,480	7,448	99,791	112,719
Average yield[a]	– %	2.56 %	2.58 %	3.02 %	2.97 %
U.S. Treasury and government agencies					
Amortized cost	$ 63,974	$ 60,763	$ 48,929	$ –	$ 173,666
Fair value	63,012	56,064	41,516	–	160,592
Average yield[a]	0.63 %	0.97 %	1.26 %	– %	0.93 %
Obligations of U.S. states and municipalities					
Amortized cost	$ –	$ –	$ 283	$ 9,714	$ 9,997
Fair value	–	–	254	9,174	9,428
Average yield[a]	– %	– %	3.21 %	3.94 %	3.92 %
Asset-backed securities					
Amortized cost	$ –	$ 16	$ 20,345	$ 40,019	$ 60,380
Fair value	–	16	20,262	39,737	60,015
Average yield[a]	– %	6.86 %	6.36 %	6.58 %	6.50 %
Total held-to-maturity securities					
Amortized cost[b]	$ 63,974	$ 66,647	$ 77,939	$ 161,382	$ 369,942
Fair value	63,012	61,560	69,480	148,702	342,754
Average yield[a]	0.63 %	1.11 %	2.74 %	3.96 %	2.61 %

(a) Average yield is computed using the effective yield of each security owned at the end of the period, weighted based on the amortized cost of each security. The effective yield considers the contractual coupon, amortization of premiums and accretion of discounts, and the effect of related hedging derivatives, including closed portfolio hedges. Taxable-equivalent amounts are used where applicable. The effective yield excludes unscheduled principal prepayments; and accordingly, actual maturities of securities may differ from their contractual or expected maturities as certain securities may be prepaid. However, for certain callable debt securities, the average yield is calculated to the earliest call date.

(b) For purposes of this table, the amortized cost of available-for-sale securities excludes the portfolio layer fair value hedge basis adjustments of $73 million at December 31, 2023. The amortized cost of held-to-maturity securities also excludes the allowance for credit losses of $94 million at December 31, 2023.

(c) Substantially all of the Bank's U.S. residential MBS and collateralized mortgage obligations are due in 10 years or more, based on contractual maturity. The estimated weighted-average life, which reflects anticipated future prepayments, is approximately seven years for agency residential MBS, seven years for agency residential collateralized mortgage obligations, and six years for nonagency residential collateralized mortgage obligations.

(d) Includes AFS securities associated with First Republic, primarily due after 10 years. Refer to Note 29 for additional information.

Note 12 – Securities financing activities

The Bank enters into resale, repurchase, securities borrowed and securities loaned agreements (collectively, "securities financing agreements") primarily to finance the Bank's inventory positions, acquire securities to cover short sales, accommodate customers' financing needs, settle other securities obligations and to deploy the Bank's excess cash.

Securities financing agreements are treated as collateralized financings on the Bank's Consolidated balance sheets. Where appropriate under applicable accounting guidance, securities financing agreements with the same counterparty are reported on a net basis. Refer to Note 1 for further discussion of the offsetting of assets and liabilities. Fees received and paid in connection with securities financing agreements are recorded over the life of the agreement in interest income and interest expense on the Consolidated statements of income.

The Bank has elected the fair value option for certain securities financing agreements. Refer to Note 4 for further information regarding the fair value option. The securities financing agreements for which the fair value option has been elected are reported within securities purchased under resale agreements, securities loaned or sold under repurchase agreements, and securities borrowed on the Consolidated balance sheets. Generally, for agreements carried at fair value, current-period interest accruals are recorded within interest income and interest expense, with changes in fair value reported in principal transactions revenue. However, for financial instruments containing embedded derivatives that would be separately accounted for in accordance with accounting guidance for hybrid instruments, all changes in fair value, including any interest elements, are reported in principal transactions revenue.

Securities financing agreements not elected under the fair value option are measured at amortized cost. As a result of the Bank's credit risk mitigation practices described below, the Bank did not hold any allowance for credit losses with respect to resale and securities borrowed arrangements as of December 31, 2023 and 2022.

Credit risk mitigation practices

Securities financing agreements expose the Bank primarily to credit and liquidity risk. To manage these risks, the Bank monitors the value of the underlying securities (predominantly high-quality securities collateral, including government-issued debt and U.S. GSEs and government agencies MBS) that it has received from or provided to its counterparties compared to the value of cash proceeds and exchanged collateral, and either requests additional collateral or returns securities or collateral when appropriate. Margin levels are initially established based upon the counterparty, the type of underlying securities, and the permissible collateral, and are monitored on an ongoing basis.

In resale and securities borrowed agreements, the Bank is exposed to credit risk to the extent that the value of the securities received is less than initial cash principal advanced and any collateral amounts exchanged. In repurchase and securities loaned agreements, credit risk exposure arises to the extent that the value of underlying securities advanced exceeds the value of the initial cash principal received, and any collateral amounts exchanged.

Additionally, the Bank typically enters into master netting agreements and other similar arrangements with its counterparties, which provide for the right to liquidate the underlying securities and any collateral amounts exchanged in the event of a counterparty default. It is also the Bank's policy to take possession, where possible, of the securities underlying resale and securities borrowed agreements. Refer to Note 27 for further information regarding assets pledged and collateral received in securities financing agreements.

The table below summarizes the gross and net amounts of the Bank's securities financing agreements, as of December 31, 2023 and 2022. When the Bank has obtained an appropriate legal opinion with respect to a master netting agreement with a counterparty and where other relevant netting criteria under U.S. GAAP are met, the Bank nets, on the Consolidated balance sheets, the balances outstanding under its securities financing agreements with the same counterparty. In addition, the Bank exchanges securities and/or cash collateral with its counterparty to reduce the economic exposure with the counterparty, but such collateral is not eligible for net Consolidated balance sheet presentation. Where the Bank has obtained an appropriate legal opinion with respect to the counterparty master netting agreement, such collateral, along with securities financing balances that do not meet all these relevant netting criteria under U.S. GAAP, is presented in the table below as "Amounts not nettable on the Consolidated balance sheets," and reduces the "Net amounts" presented. Where a legal opinion has not been either sought or obtained, the securities financing balances are presented gross in the "Net amounts" below. In transactions where the Bank is acting as the lender in a securities-for-securities lending agreement and receives securities that can be pledged or sold as collateral, the Bank recognizes the securities received at fair value within other assets and the obligation to return those securities within accounts payable and other liabilities on the Consolidated balance sheets.

	December 31, 2023				
(in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets[(b)]	Net amounts[(c)]
Assets					
Securities purchased under resale agreements	**$ 358,661**	**$ (132,002)**	**$ 226,659**	**$ (218,289)**	**$ 8,370**
Securities borrowed	**62,345**	**(1,146)**	**61,199**	**(50,818)**	**10,381**
Liabilities					
Securities sold under repurchase agreements	**$ 200,976**	**$ (132,002)**	**$ 68,974**	**$ (67,652)**	**$ 1,322**
Securities loaned and other[(a)]	**14,200**	**(1,146)**	**13,054**	**(12,753)**	**301**

	December 31, 2022				
(in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets[(b)]	Net amounts[(c)]
Assets					
Securities purchased under resale agreements	$ 441,264	$ (181,895)	$ 259,369	$ (249,268)	$ 10,101
Securities borrowed	54,693	(1,051)	53,642	(43,817)	9,825
Liabilities					
Securities sold under repurchase agreements	$ 259,011	$ (181,895)	$ 77,116	$ (75,048)	$ 2,068
Securities loaned and other[(a)]	15,860	(1,051)	14,809	(14,590)	219

(a) Includes securities-for-securities lending agreements of $8.2 billion and $7.7 billion at December 31, 2023 and 2022, respectively, accounted for at fair value, where the Bank is acting as lender.
(b) In some cases, collateral exchanged with a counterparty exceeds the net asset or liability balance with that counterparty. In such cases, the amounts reported in this column are limited to the related net asset or liability with that counterparty.
(c) Includes securities financing agreements that provide collateral rights, but where an appropriate legal opinion with respect to the master netting agreement has not been either sought or obtained. At December 31, 2023 and 2022, included $7.0 billion and $5.9 billion, respectively, of securities purchased under resale agreements; $8.9 billion and $8.4 billion, respectively, of securities borrowed; $806 million and $495 million, respectively, of securities sold under repurchase agreements. There were no securities loaned and other agreements where the Bank has not received an appropriate legal opinion at December 31, 2023 and 2022.

The tables below present as of December 31, 2023 and 2022 the types of financial assets pledged in securities financing agreements and the remaining contractual maturity of the securities financing agreements.

	Gross liability balance			
	2023		2022	
December 31, (in millions)	Securities sold under repurchase agreements	Securities loaned and other	Securities sold under repurchase agreements	Securities loaned and other
Mortgage-backed securities:				
U.S. GSEs and government agencies	**$ 4,841**	**$ —**	$ 512	$ —
Commercial - nonagency	**3**	**—**	—	—
U.S. Treasury, GSEs and government agencies	**92,188**	**610**	93,398	7,704
Obligations of U.S. states and municipalities	**—**	**—**	5	72
Non-U.S. government debt	**96,684**	**2,837**	155,393	1,710
Corporate debt securities	**7,259**	**865**	9,665	614
Asset-backed securities	**1**	**—**	38	—
Equity securities	**—**	**9,888**	—	5,760
Total	**$ 200,976**	**$ 14,200**	$ 259,011	$ 15,860

	Remaining contractual maturity of the agreements				
December 31, 2023 (in millions)	Overnight and continuous	Up to 30 days	30 – 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	**$ 85,789**	**$ 91,983**	**$ 7,810**	**$ 15,394**	**$ 200,976**
Total securities loaned and other	**12,507**	**1,397**	**—**	**296**	**14,200**

	Remaining contractual maturity of the agreements				
December 31, 2022 (in millions)	Overnight and continuous	Up to 30 days	30 – 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	$ 77,679	$ 133,093	$ 31,212	$ 17,027	$ 259,011
Total securities loaned and other	14,412	1,147	3	298	15,860

Transfers not qualifying for sale accounting

At December 31, 2023 and 2022, the Bank held $505 million and $692 million, respectively, of financial assets for which the rights have been transferred to third parties; however, the transfers did not qualify as a sale in accordance with U.S. GAAP. These transfers have been recognized as collateralized financing transactions. The transferred assets are recorded in trading assets and loans, and the corresponding liabilities are recorded primarily in short-term borrowings and long-term debt on the Consolidated balance sheets.

Note 13 – Loans

Loan accounting framework

The accounting for a loan depends on management's strategy for the loan. The Bank accounts for loans based on the following categories:

- Originated or purchased loans held-for-investment (i.e., "retained")
- Loans held-for-sale
- Loans at fair value

The following provides a detailed accounting discussion of the Bank's loans by category:

Loans held-for-investment

Originated or purchased loans held-for-investment, including PCD, are recorded at amortized cost, reflecting the principal amount outstanding, net of the following: unamortized deferred loan fees, costs, premiums or discounts; charge-offs; collection of cash; and foreign exchange. Credit card loans also include billed finance charges and fees.

Interest income

Interest income on performing loans held-for-investment is accrued and recognized as interest income at the contractual rate of interest. Purchase price discounts or premiums, as well as net deferred loan fees or costs, are recognized in interest income over the contractual life of the loan as an adjustment of yield.

The Bank classifies accrued interest on loans, including accrued but unbilled interest on credit card loans, in accrued interest and accounts receivables on the Consolidated balance sheets. For credit card loans, accrued interest once billed is then recognized in the loan balances, with the related allowance recorded in the allowance for credit losses. Changes in the allowance for credit losses on accrued interest on credit card loans are recognized in the provision for credit losses and charge-offs are recognized by reversing interest income. For other loans, the Bank generally does not recognize an allowance for credit losses on accrued interest receivables, consistent with its policy to write them off no later than 90 days past due by reversing interest income.

Nonaccrual loans

Nonaccrual loans are those on which the accrual of interest has been suspended. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status and considered nonperforming when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest has been in default for a period of 90 days or more, unless the loan is both well-secured and in the process of collection. A loan is determined to be past due when the minimum payment is not received from the borrower by the contractually specified due date or for certain loans (e.g., residential real estate loans), when a monthly payment is due and unpaid for 30 days or more. Finally, collateral-dependent loans are typically maintained on nonaccrual status.

On the date a loan is placed on nonaccrual status, all interest accrued but not collected is reversed against interest income. In addition, the amortization of deferred amounts is suspended. Interest income on nonaccrual loans may be recognized as cash interest payments are received (i.e., on a cash basis) if the recorded loan balance is deemed fully collectible; however, if there is doubt regarding the ultimate collectibility of the recorded loan balance, all interest cash receipts are applied to reduce the carrying value of the loan (the cost recovery method). For consumer loans, application of this policy typically results in the Bank recognizing interest income on nonaccrual consumer loans on a cash basis.

A loan may be returned to accrual status when repayment is reasonably assured and there has been demonstrated performance under the terms of the loan or, if applicable, the terms of the restructured loan.

As permitted by regulatory guidance, credit card loans are generally exempt from being placed on nonaccrual status; accordingly, interest and fees related to credit card loans continue to accrue until the loan is charged off or paid in full.

Allowance for loan losses

The allowance for loan losses represents the estimated expected credit losses in the held-for-investment loan portfolio at the balance sheet date and is recognized on the balance sheet as a contra asset, which brings the amortized cost to the net carrying value. Changes in the allowance for loan losses are recorded in the provision for credit losses on the Bank's Consolidated statements of income. Refer to Note 14 for further information on the Bank's accounting policies for the allowance for loan losses.

Charge-offs

Consumer loans are generally charged off or charged down to the lower of the amortized cost or the net realizable value of the underlying collateral (i.e., fair value less estimated costs to sell), with an offset to the allowance for loan losses, upon reaching specified stages of delinquency in accordance with standards established by the Federal Financial Institutions Examination Council ("FFIEC"). Residential real estate loans, unmodified credit card loans and scored business banking loans are generally charged off no later than 180 days past due. Scored auto and closed-end consumer loans, including modified credit card accounts placed on a fixed payment plan, are charged off no later than 120 days past due.

Certain consumer loans are charged off or charged down to their net realizable value earlier than the FFIEC charge-off standards in the following circumstances:

- Loans modified to borrowers experiencing financial difficulty that are determined to be collateral-dependent.
- Loans to borrowers who have experienced an event that suggests a loss is either known or highly certain are subject to accelerated charge-off standards (e.g., residential real estate and auto loans are charged off or charged down within 60 days of receiving notification of a bankruptcy filing).
- Auto loans upon repossession of the automobile.

Other than in certain limited circumstances, the Bank typically does not recognize charge-offs on the government-guaranteed portion of loans.

Wholesale loans are charged off when it is highly certain that a loss has been realized. The determination of whether to recognize a charge-off includes many factors, including the prioritization of the Bank's claim in bankruptcy, expectations of the workout/restructuring of the loan and valuation of the borrower's equity or the loan collateral.

When a loan is charged down to the lower of its amortized cost or the estimated net realizable value of the underlying collateral, the determination of the fair value of the collateral depends on the type of collateral (e.g., securities, real estate). In cases where the collateral is in the form of liquid securities, the fair value is based on quoted market prices or broker quotes. For illiquid securities or other financial assets, the fair value of the collateral is generally estimated using a discounted cash flow model.

For residential real estate loans, collateral values are based upon external valuation sources. When it becomes likely that a borrower is either unable or unwilling to pay, the Bank utilizes a broker's price opinion, appraisal and/or an automated valuation model of the home based on an exterior-only valuation ("exterior opinions"), which is then updated at least every 12 months, or more frequently depending on various market factors. As soon as practicable after the Bank receives the property in satisfaction of a debt (e.g., by taking legal title or physical possession), the Bank generally obtains an appraisal based on an inspection that includes the interior of the home ("interior appraisals"). Exterior opinions and interior appraisals are discounted based upon the Bank's experience with actual liquidation values as compared with the estimated values provided by exterior opinions and interior appraisals, considering state-specific factors.

For commercial real estate loans, collateral values are generally based on appraisals from internal and external valuation sources. Collateral values are typically updated every six to twelve months, either by obtaining a new appraisal or by performing an internal analysis, in accordance with the Bank's policies. The Bank also considers both borrower- and market-specific factors, which may result in obtaining appraisal updates or broker price opinions at more frequent intervals.

Loans held-for-sale

Loans held-for-sale are measured at the lower of cost or fair value, with valuation changes recorded in noninterest revenue. For consumer loans, the valuation is performed on a portfolio basis. For wholesale loans, the valuation is performed on an individual loan basis.

Interest income on loans held-for-sale is accrued and recognized based on the contractual rate of interest.

Loan origination fees or costs and purchase price discounts or premiums are deferred in a contra loan account until the related loan is sold. The deferred fees or costs and discounts or premiums are an adjustment to the basis of the loan and therefore are included in the periodic determination of the lower of cost or fair value adjustments and/or the gain or loss recognized at the time of sale.

Because these loans are recognized at the lower of cost or fair value, the Bank's allowance for loan losses and charge-off policies do not apply to these loans. However, loans held-for-sale are subject to the Bank's nonaccrual policies.

Loans at fair value

Loans for which the fair value option has been elected are measured at fair value, with changes in fair value recorded in noninterest revenue.

Interest income on these loans is accrued and recognized based on the contractual rate of interest. Changes in fair value are recognized in noninterest revenue. Loan origination fees are recognized upfront in noninterest revenue. Loan origination costs are recognized in the associated expense category as incurred.

Because these loans are recognized at fair value, the Bank's allowance for loan losses and charge-off policies do not apply to these loans. However, loans at fair value are subject to the Bank's nonaccrual policies.

Refer to Note 4 for further information on the Bank's elections of fair value accounting under the fair value option. Refer to Note 3 and Note 4 for further information on loans carried at fair value and classified as trading assets.

Loan classification changes

Loans in the held-for-investment portfolio that management decides to sell are transferred to the held-for-sale portfolio at the lower of cost or fair value on the date of transfer. Credit-related losses are charged against the allowance for loan losses; non-credit related losses such as those due to changes in interest rates or foreign currency exchange rates are recognized in noninterest revenue.

In the event that management decides to retain a loan in the held-for-sale portfolio, the loan is transferred to the held-for-investment portfolio at amortized cost on the date of transfer. These loans are subsequently assessed for impairment based on the Bank's allowance methodology. Refer to Note 14 for a further discussion of the methodologies used in establishing the Bank's allowance for loan losses.

Loan modifications

The Bank seeks to modify certain loans in conjunction with its loss mitigation activities. Through the modification, the Bank grants one or more concessions to a borrower who is experiencing financial difficulty in order to minimize the Bank's economic loss and avoid foreclosure or repossession of the collateral, and to ultimately maximize payments received by the Bank from the borrower. The concessions granted vary by program and by borrower-specific characteristics, and may include interest rate reductions, term extensions, other-than-insignificant payment delays or principal forgiveness. Effective January 1, 2023 the Bank adopted the Financial Instruments - Credit Losses: Troubled Debt Restructurings and Vintage Disclosure accounting guidance, which changed the accounting for loan modifications from TDRs to FDMs. Refer to Note 1 for further information

Loans, except for credit card loans, reported as FDMs are generally placed on nonaccrual status, although in many cases such loans were already on nonaccrual status prior to modification. These loans may be returned to performing status (the accrual of interest is resumed) if the following criteria are met: (i) the borrower has performed under the modified terms for a minimum of six months and/or six payments, and (ii) the Bank has an expectation that repayment of the modified loan is reasonably assured based on, for example, the borrower's debt capacity and level of future earnings, collateral values, LTV ratios, and other current market considerations. In certain limited and well-defined circumstances in which the loan is current at the modification date, such loans are not placed on nonaccrual status at the time of modification.

The allowance for credit losses associated with FDMs is measured using the Bank's established allowance methodology, which considers the expected re-default rates for the modified loans. Refer to Note 14 for further discussion.

For periods ending prior to January 1, 2023, modifications of loans where the Bank granted concessions to a borrower experiencing financial difficulty were accounted for and reported as TDRs. The concessions granted varied by program and by borrower-specific characteristics, and included interest rate reductions, term extensions, payment delays, principal forgiveness, or the acceptance of equity or other assets in lieu of payments. Loans with short-term and other insignificant modifications that were not considered concessions were not TDRs.

Loans modified in TDRs were generally measured for impairment using the Bank's established asset-specific allowance methodology, which considers the expected redefault rates for the modified loans. A loan modified in a TDR generally remained subject to the asset-specific component of the allowance throughout its remaining life, regardless of whether the loan was performing and had been returned to accrual status. Refer to Note 14 for further discussion.

Foreclosed property

The Bank acquires property from borrowers through loan restructurings, workouts, and foreclosures. Property acquired may include real property (e.g., residential real estate, land, and buildings) and other commercial and personal property (e.g., automobiles, aircraft, railcars, and ships).

The Bank recognizes foreclosed property upon receiving assets in satisfaction of a loan (e.g., by taking legal title or physical possession). For loans collateralized by real property, the Bank generally recognizes the asset received at foreclosure sale or upon the execution of a deed in lieu of foreclosure transaction with the borrower. Foreclosed assets are reported in other assets on the Consolidated balance sheets and initially recognized at fair value less estimated costs to sell. Each quarter the fair value of the acquired property is reviewed and adjusted, if necessary, to the lower of cost or fair value. Subsequent adjustments to fair value are charged/credited to noninterest revenue. Operating expense, such as real estate taxes and maintenance, are charged to other expense.

Loan portfolio

The Bank's loan portfolio is divided into three portfolio segments, which are the same segments used by the Bank to determine the allowance for loan losses: Consumer, excluding credit card; Credit card; and Wholesale. Within each portfolio segment the Bank monitors and assesses the credit risk in the following classes of loans, based on the risk characteristics of each loan class.

Consumer, excluding credit card	Credit card	Wholesale[(c)(d)]
• Residential real estate[(a)] • Auto and other[(b)]	• Credit card loans	• Secured by real estate • Commercial and industrial • Other[(e)]

(a) Includes scored mortgage and home equity loans.
(b) Includes scored auto, business banking and consumer unsecured loans as well as overdrafts.
(c) Includes loans for which the wholesale methodology is applied when determining the allowance for loan losses.
(d) The wholesale portfolio segment's classes align with loan classifications as defined by the bank regulatory agencies, based on the loan's collateral, purpose, and type of borrower.
(e) Includes loans to SPEs, financial institutions, personal investment companies and trusts, individuals and individual entities (predominantly global private bank clients), states and political subdivisions, as well as loans to nonprofits. Refer to Note 15 for more information on SPEs.

The following tables summarize the Bank's loan balances by portfolio segment.

December 31, 2023 (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total[(b)(c)]
Retained	**$ 397,268** [(a)]	**$ 211,123**	**$ 669,753**	**$ 1,278,144**
Held-for-sale	**487**	**–**	**2,898**	**3,385**
At fair value	**12,317** [(a)]	**–**	**26,274**	**38,591**
Total	**$ 410,072**	**$ 211,123**	**$ 698,925**	**$ 1,320,120**

December 31, 2022 (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total[(b)(c)]
Retained	$ 300,746	$ 185,175	$ 601,393	$ 1,087,314
Held-for-sale	617	–	3,259	3,876
At fair value	9,980	–	31,815	41,795
Total	$ 311,343	$ 185,175	$ 636,467	$ 1,132,985

(a) Includes loans associated with First Republic consisting of $90.7 billion of retained loans and $1.9 billion of loans at fair value in consumer, excluding credit card and $52.8 billion of retained loans in wholesale.
(b) Excludes $6.8 billion and $5.2 billion of accrued interest receivable at December 31, 2023 and 2022, respectively. The Bank wrote off accrued interest receivable of $49 million and $39 million for the years ended December 31, 2023 and 2022, respectively.
(c) Loans (other than those for which the fair value option has been elected) are presented net of unamortized discounts and premiums and net deferred loan fees or costs. These amounts were not material as of December 31, 2023 and 2022.

The following tables provide information about the carrying value of retained loans purchased, sold and reclassified to held-for-sale during the periods indicated. Loans that were reclassified to held-for-sale and sold in a subsequent period are excluded from the sales line of this table.

	2023			
Year ended December 31, (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	**$ 92,205** [(b)(c)(d)]	**$ –**	**$ 60,300** [(d)]	**$ 152,505**
Sales	**2,202**	**–**	**44,916**	**47,118**
Retained loans reclassified to held-for-sale[(a)]	**274**	**–**	**1,486**	**1,760**

	2022			
Year ended December 31, (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	$ 1,625 [(b)(c)]	$ –	$ 1,088	$ 2,713
Sales	2,884	–	41,934	44,818
Retained loans reclassified to held-for-sale[(a)]	229	–	1,055	1,284

	2021			
Year ended December 31, (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	$ 515 [(b)(c)]	$ –	$ 1,204	$ 1,719
Sales	799	–	31,104	31,903
Retained loans reclassified to held-for-sale[(a)]	1,225	–	2,178	3,403

(a) Reclassifications of loans to held-for-sale are non-cash transactions.
(b) Includes purchases of residential real estate loans, including the Bank's voluntary repurchases of certain delinquent loans from loan pools as permitted by Government National Mortgage Association ("Ginnie Mae") guidelines for the years ended December 31, 2023, 2022 and 2021. The Bank typically elects to repurchase these delinquent loans as it continues to service them and/or manage the foreclosure process in accordance with applicable requirements of Ginnie Mae, the Federal Housing Administration ("FHA"), Rural Housing Services ("RHS"), and/or the U.S. Department of Veterans Affairs ("VA").
(c) Excludes purchases of retained loans of $5.1 billion, $12.4 billion and $25.8 billion for the years ended December 31, 2023, 2022 and 2021, respectively, which are predominantly sourced through the correspondent origination channel and underwritten in accordance with the Bank's standards.
(d) Includes loans acquired in the First Republic acquisition consisting of $91.9 billion in consumer, excluding credit card and $59.2 billion in wholesale. Refer to Note 29 for additional information.

Gains and losses on sales of loans

Net gains/(losses) on sales of loans and lending-related commitments (including adjustments to record loans and lending-related commitments held-for-sale at the lower of cost or fair value) recognized in noninterest revenue was $57 million for the year ended December 31, 2023 of which $63 million was related to loans. Net gains/(losses) on sales of loans and lending-related commitments was $(232) million for the year ended December 31, 2022 of which $(100) million was related to loans. Net gains/(losses) on sales of loans and lending-related commitments was $258 million for the year ended December 31, 2021 of which $250 million was related to loans. In addition, the sale of loans may also result in write downs, recoveries or changes in the allowance recognized in the provision for credit losses.

Consumer, excluding credit card loan portfolio

Consumer loans, excluding credit card loans, consist primarily of scored residential mortgages, home equity loans and lines of credit, auto and business banking loans, with a focus on serving the prime consumer credit market. These loans include home equity loans secured by junior liens, prime mortgage loans with an interest-only payment period, and certain payment-option loans that may result in negative amortization.

The following table provides information about retained consumer loans, excluding credit card, by class.

December 31, (in millions)	2023	2022
Residential real estate	**$ 326,402** [(a)]	$ 237,554
Auto and other	**70,866**	63,192
Total retained loans	**$ 397,268**	$ 300,746

(a) Included $90.7 billion of loans associated with First Republic.

Delinquency rates are the primary credit quality indicator for consumer loans. Loans that are more than 30 days past due provide an early warning of borrowers who may be experiencing financial difficulties and/or who may be unable or unwilling to repay the loan. As the loan continues to age, it becomes more clear whether the borrower is likely to be unable or unwilling to pay. In the case of residential real estate loans, late-stage delinquencies (greater than 150 days past due) are a strong indicator of loans that will ultimately result in a foreclosure or similar liquidation transaction. In addition to delinquency rates, other credit quality indicators for consumer loans vary based on the class of loan, as follows:

- For residential real estate loans, the current estimated LTV ratio, or the combined LTV ratio in the case of junior lien loans, is an indicator of the potential loss severity in the event of default. Additionally, LTV or combined LTV ratios can provide insight into a borrower's continued willingness to pay, as the delinquency rate of high-LTV loans tends to be greater than that for loans where the borrower has equity in the collateral. The geographic distribution of the loan collateral also provides insight as to the credit quality of the portfolio, as factors such as the regional economy, home price changes and specific events such as natural disasters, will affect credit quality. The borrower's current or "refreshed" FICO score is a secondary credit quality indicator for certain loans, as FICO scores are an indication of the borrower's credit payment history. Thus, a loan to a borrower with a low FICO score (less than 660) is considered to be of higher risk than a loan to a borrower with a higher FICO score. Further, a loan to a borrower with a high LTV ratio and a low FICO score is at greater risk of default than a loan to a borrower that has both a high LTV ratio and a high FICO score.
- For scored auto and business banking loans, geographic distribution is an indicator of the credit performance of the portfolio. Similar to residential real estate loans, geographic distribution provides insights into the portfolio performance based on regional economic activity and events.

Residential real estate

Delinquency is the primary credit quality indicator for retained residential real estate loans. The following tables provide information on delinquency and gross charge-offs for the year ended December 31, 2023.

	December 31, 2023								
	Term loans by origination year[f]						Revolving loans		
(in millions, except ratios)	2023	2022	2021	2020	2019	Prior to 2019	Within the revolving period	Converted to term loans	Total
Loan delinquency[a][b]									
Current[c]	**$ 23,216**	**$ 64,366**	**$ 84,496**	**$ 55,546**	**$ 21,530**	**$ 59,558**	**$ 7,479**	**$ 8,151**	**$ 324,342**
30–149 days past due	**33**	**74**	**89**	**70**	**41**	**800**	**49**	**223**	**1,379**
150 or more days past due	**1**	**10**	**17**	**7**	**21**	**456**	**5**	**164**	**681**
Total retained loans	**$ 23,250**	**$ 64,450**	**$ 84,602**	**$ 55,623**	**$ 21,592**	**$ 60,814**	**$ 7,533**	**$ 8,538**	**$ 326,402**
% of 30+ days past due to total retained loans[d][e]	**0.15 %**	**0.13 %**	**0.13 %**	**0.14 %**	**0.29 %**	**2.04 %**	**0.72 %**	**4.53 %**	**0.63 %**
Gross charge-offs	$ –	$ –	$ –	$ –	$ 4	$ 167	$ 26	$ 7	$ 204

	December 31, 2022								
	Term loans by origination year[f]						Revolving loans		
(in millions, except ratios)	2022	2021	2020	2019	2018	Prior to 2018	Within the revolving period	Converted to term loans	Total
Loan delinquency[a][b]									
Current	$ 39,934	$ 66,072	$ 43,315	$ 15,397	$ 6,339	$ 49,626	$ 5,589	$ 9,685	$ 235,957
30–149 days past due	29	11	14	20	20	597	15	208	914
150 or more days past due	1	1	6	10	7	479	4	175	683
Total retained loans	$ 39,964	$ 66,084	$ 43,335	$ 15,427	$ 6,366	$ 50,702	$ 5,608	$ 10,068	$ 237,554
% of 30+ days past due to total retained loans[d]	0.08 %	0.02 %	0.05 %	0.19 %	0.42 %	2.07 %	0.34 %	3.80 %	0.66 %

(a) Individual delinquency classifications include mortgage loans insured by U.S. government agencies which were not material at December 31, 2023 and 2022.
(b) At December 31, 2023 and 2022, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.
(c) Included $6.4 billion, $26.3 billion, $21.9 billion, $14.8 billion, $7.4 billion, and $10.9 billion of term loans originated in 2023, 2022, 2021, 2020, 2019 and prior to 2019, respectively, and $2.5 billion of revolving loans within the revolving period associated with First Republic.
(d) Excludes mortgage loans that are 30 or more days past due insured by U.S. government agencies which were not material at December 31, 2023 and 2022. These amounts have been excluded based upon the government guarantee.
(e) Included $343 million of 30 or more days past due loans associated with First Republic.
(f) Purchased loans are included in the year in which they were originated.

Approximately 37% of the total revolving loans are senior lien loans; the remaining balance are junior lien loans. The lien position the Bank holds is considered in the Bank's allowance for credit losses. Revolving loans that have been converted to term loans have higher delinquency rates than those that are still within the revolving period. That is primarily because the fully-amortizing payment that is generally required for those products is higher than the minimum payment options available for revolving loans within the revolving period.

Nonaccrual loans and other credit quality indicators

The following table provides information on nonaccrual and other credit quality indicators for retained residential real estate loans.

(in millions, except weighted-average data)	December 31, 2023	December 31, 2022
Nonaccrual loans[(a)(b)(c)(d)(e)]	$ 3,463	$ 3,742
Current estimated LTV ratios[(f)(g)(h)]		
Greater than 125% and refreshed FICO scores:		
Equal to or greater than 660	$ 72	$ 2
Less than 660	–	–
101% to 125% and refreshed FICO scores:		
Equal to or greater than 660	223	174
Less than 660	4	6
80% to 100% and refreshed FICO scores:		
Equal to or greater than 660	6,491 (l)	12,034
Less than 660	102	184
Less than 80% and refreshed FICO scores:		
Equal to or greater than 660	309,246 (l)	215,093
Less than 660	9,275 (l)	8,656
No FICO/LTV available[(i)]	989	1,405
Total retained loans	$ 326,402 (m)	$ 237,554
Weighted average LTV ratio[(f)(j)]	49 %	51 %
Weighted average FICO[(g)(j)]	770	769
Geographic region[(i)(k)]		
California	$ 127,071 (n)	$ 73,112
New York	48,814 (n)	34,471
Florida	22,777 (n)	18,870
Texas	15,504	14,968
Massachusetts	14,213 (n)	6,380
Illinois	10,856	11,296
Colorado	10,800	9,968
Washington	9,923	9,060
New Jersey	8,050	7,108
Connecticut	7,163	5,432
All other	51,231	46,889
Total retained loans	$ 326,402	$ 237,554

(a) Includes collateral-dependent residential real estate loans that are charged down to the fair value of the underlying collateral less costs to sell. The Bank reports, in accordance with regulatory guidance, residential real estate loans that have been discharged under Chapter 7 bankruptcy and not reaffirmed by the borrower ("Chapter 7 loans") as collateral-dependent nonaccrual loans, regardless of their delinquency status. At December 31, 2023, approximately 9% of Chapter 7 residential real estate loans were 30 days or more past due.

(b) Mortgage loans insured by U.S. government agencies excluded from nonaccrual loans were not material at December 31, 2023 and 2022.

(c) Generally, all consumer nonaccrual loans have an allowance. In accordance with regulatory guidance, certain nonaccrual loans that are considered collateral-dependent have been charged down to the lower of amortized cost or the fair value of their underlying collateral less costs to sell. If the value of the underlying collateral improves subsequent to charge down, the related allowance may be negative.

(d) Interest income on nonaccrual loans recognized on a cash basis was $180 million and $175 million for the years ended December 31, 2023 and 2022, respectively.

(e) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic.

(f) Represents the aggregate unpaid principal balance of loans divided by the estimated current property value. Current property values are estimated, at a minimum, quarterly, based on home valuation models using nationally recognized home price index valuation estimates incorporating actual data to the extent available and forecasted data where actual data is not available. Current estimated combined LTV for junior lien home equity loans considers all available lien positions, as well as unused lines, related to the property.

(g) Refreshed FICO scores represent each borrower's most recent credit score, which is obtained by the Bank on at least a quarterly basis.

(h) Includes residential real estate loans, primarily held in LLCs, that did not have a refreshed FICO score. These loans have been included in a FICO band based on management's estimation of the borrower's credit quality.

(i) Included U.S. government-guaranteed loans as of December 31, 2023 and 2022.

(j) Excludes loans with no FICO and/or LTV data available.

(k) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2023.

(l) Included $1.1 billion in equal to or greater than 660 FICO scores within 80% to 100% LTV ratio, and $87.9 billion and $1.1 billion in equal to or greater than 660 and less than 660 FICO scores, respectively, within less than 80% LTV ratio associated with First Republic.

(m) Included $90.7 billion of loans associated with First Republic.

(n) Included $54.9 billion, $14.9 billion, $3.5 billion and $7.8 billion in California, New York, Florida and Massachusetts, respectively, associated with First Republic.

Loan modifications

The Bank grants certain modifications of residential real estate loans to borrowers experiencing financial difficulty, which effective January 1, 2023, are reported as FDMs. The Bank's proprietary modification programs as well as government programs, including U.S. GSE programs, that generally provide various modifications to borrowers experiencing financial difficulty including, but not limited to, interest rate reductions, term extensions, other-than-insignificant payment delay and principal forgiveness that would otherwise have been required under the terms of the original agreement, are considered FDMs.

Financial effects of FDMs

For the year ended December 31, 2023, residential real estate FDMs were $136 million. The financial effects of the FDMs, which were predominantly in the form of term extensions and interest rate reductions, included extending the weighted-average life of the loans by 20 years, and reducing the weighted-average contractual interest rate from 7.21% to 4.44% for the year ended December 31, 2023. There were no additional commitments to lend to borrowers experiencing financial difficulty whose loans have been modified as FDMs.

In addition to FDMs, the Bank also had $69 million of loans subject to a trial modification, and $9 million of Chapter 7 loans for the year ended December 31, 2023. The changes to the TDR accounting guidance eliminated the TDR reasonably expected and concession assessment criteria. Accordingly, trial modifications and Chapter 7 loans were considered TDRs, but not FDMs. Refer to Note 1 for further information.

Payment status of FDMs and redefaults

For the year ended December 31, 2023, residential real estate FDMs of $29 million were 30 or more days past due, and FDMs that re-defaulted were $17 million.

Nature and extent of TDRs

For periods ending prior to January 1, 2023, modifications of residential real estate loans where the Bank granted concessions to borrowers who were experiencing financial difficulty were generally accounted for and reported as TDRs. Loans with short-term or other insignificant modifications that were not considered concessions were not TDRs. For the years ended December 31, 2022 and 2021, new TDRs were $362 million and $866 million, and there were no additional commitments to lend to borrowers whose residential real estate loans were modified in TDRs.

The Bank's proprietary modification programs as well as government programs, including U.S. GSE programs, generally provide various concessions to financially troubled borrowers including, but not limited to, interest rate reductions, term or payment extensions and delays of principal and/or interest payments that would otherwise have been required under the terms of the original agreement.

The following table provides information about how residential real estate loans were modified in TDRs during the period presented. This table excludes loans with short-term or other insignificant modifications that are not considered concessions.

Year ended December 31,	2022	2021
Number of loans approved for a trial modification	3,898	6,243
Number of loans permanently modified	4,182	4,588
Concession granted:[a]		
Interest rate reduction	54 %	74 %
Term or payment extension	67	53
Principal and/or interest deferred	10	23
Principal forgiveness	1	2
Other[b]	37	36

(a) Represents concessions granted in permanent modifications as a percentage of the number of loans permanently modified. The sum of the percentages exceeds 100% because predominantly all of the modifications include more than one type of concession. Concessions offered on trial modifications are generally consistent with those granted on permanent modifications.

(b) Includes variable interest rate to fixed interest rate modifications and payment delays that meet the definition of a TDR.

Financial effects of TDRs and redefaults

The following table provides information about the financial effects of the various concessions granted in modifications of residential real estate loans and about redefaults of certain loans modified in TDRs for the periods presented. The following table presents only the financial effects of permanent modifications and does not include temporary concessions offered through trial modifications. This table also excludes loans with short-term or other insignificant modifications that were not considered concessions.

Year ended December 31, (in millions, except weighted-average data)	2022	2021
Weighted-average interest rate of loans with interest rate reductions – before TDR	4.75 %	4.52 %
Weighted-average interest rate of loans with interest rate reductions – after TDR	3.35	2.89
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – before TDR	22	23
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – after TDR	38	38
Charge-offs recognized upon permanent modification	$ 1	$ –
Principal deferred	16	28
Principal forgiven	2	1
Balance of loans that redefaulted within one year of permanent modification[a]	$ 147	$ 160

(a) Represents loans permanently modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The dollar amounts presented represent the balance of such loans at the end of the reporting period in which such loans defaulted.

Active and suspended foreclosure

At December 31, 2023 and 2022, the Bank had residential real estate loans, excluding those insured by U.S. government agencies, with a carrying value of $565 million and $564 million, respectively, that were not included in REO, but were in the process of active or suspended foreclosure.

Auto and other

Delinquency is the primary credit quality indicator for retained auto and other loans. The following tables provide information on delinquency and gross charge-offs for the year ended December 31, 2023.

	December 31, 2023								
	Term loans by origination year						Revolving loans		
(in millions, except ratios)	2023	2022	2021	2020	2019	Prior to 2019	Within the revolving period	Converted to term loans	Total
Loan delinquency									
Current	**$ 30,328**	**$ 14,797**	**$ 12,825**	**$ 6,538**	**$ 1,777**	**$ 511**	**$ 2,984**	**$ 102**	**$ 69,862**
30–119 days past due	**276**	**279**	**231**	**78**	**43**	**17**	**19**	**24**	**967**
120 or more days past due	**1**	**1**	**7**	**8**	**—**	**—**	**3**	**17**	**37**
Total retained loans	**$ 30,605**	**$ 15,077**	**$ 13,063**	**$ 6,624**	**$ 1,820**	**$ 528**	**$ 3,006**	**$ 143**	**$ 70,866**
% of 30+ days past due to total retained loans[(a)]	**0.91 %**	**1.86 %**	**1.75 %**	**1.15 %**	**2.36 %**	**3.22 %**	**0.73 %**	**28.67 %**	**1.39 %**
Gross charge-offs	**$ 333**	**$ 297**	**$ 161**	**$ 53**	**$ 35**	**$ 64**	**$ —**	**$ 4**	**$ 947**

	December 31, 2022								
	Term loans by origination year						Revolving loans		
(in millions, except ratios)	2022	2021	2020	2019	2018	Prior to 2018	Within the revolving period	Converted to term loans	Total
Loan delinquency									
Current	$ 22,187	$ 20,212	$ 11,401	$ 3,991	$ 1,467	$ 578	$ 2,342	$ 118	$ 62,296
30–119 days past due	263	308	100	68	33	17	12	10	811
120 or more days past due	—	53	24	—	—	1	2	5	85
Total retained loans	$ 22,450	$ 20,573	$ 11,525	$ 4,059	$ 1,500	$ 596	$ 2,356	$ 133	$ 63,192
% of 30+ days past due to total retained loans[(a)]	1.17 %	1.15 %	0.83 %	1.68 %	2.20 %	3.02 %	0.59 %	11.28 %	1.18 %

(a) At December 31, 2023 and 2022, auto and other loans excluded $20 million and $153 million, respectively, of PPP loans guaranteed by the SBA that are 30 or more days past due. These amounts have been excluded based upon the SBA guarantee.

Nonaccrual and other credit quality indicators

The following table provides information on nonaccrual and other credit quality indicators for retained auto and other consumer loans.

	Total Auto and other	
(in millions)	**December 31, 2023**	December 31, 2022
Nonaccrual loans[(a)(b)(c)]	**$ 177**	$ 129
Geographic region[(d)]		
California	**$ 10,959**	$ 9,689
Texas	**8,502**	7,216
Florida	**5,684**	4,847
New York	**4,938**	4,345
Illinois	**3,147**	2,839
New Jersey	**2,609**	2,219
Georgia	**1,912**	1,708
Pennsylvania	**1,900**	1,822
Arizona	**1,779**	1,551
North Carolina	**1,714**	1,481
All other	**27,722**	25,475
Total retained loans	**$ 70,866**	$ 63,192

(a) At December 31, 2023 and 2022, nonaccrual loans excluded $15 million and $101 million, respectively, of PPP loans 90 or more days past due and guaranteed by the SBA, of which $15 million and $76 million, respectively, were no longer accruing interest based on the guidelines set by the SBA. Typically the principal balance of the loans is insured and interest is guaranteed at a specified reimbursement rate subject to meeting the guidelines set by the SBA. There were no loans that were not guaranteed by the SBA that are 90 or more days past due and still accruing interest at December 31, 2023 and 2022.
(b) Generally, all consumer nonaccrual loans have an allowance. In accordance with regulatory guidance, certain nonaccrual loans that are considered collateral-dependent have been charged down to the lower of amortized cost or the fair value of their underlying collateral less costs to sell. If the value of the underlying collateral improves subsequent to charge down, the related allowance may be negative.
(c) Interest income on nonaccrual loans recognized on a cash basis was not material for the years ended December 31, 2023 and 2022.
(d) The geographic regions presented in this table are ordered based on the magnitude of the corresponding loan balances at December 31, 2023.

Loan modifications

The Bank grants certain modifications of auto and other loans to borrowers experiencing financial difficulty, which effective January 1, 2023, are reported as FDMs. For the year ended December 31, 2023, auto and other FDMs were not material and there were no additional commitments to lend to borrowers modified as FDMs.

For periods ending prior to January 1, 2023, modifications of auto and other loans where the Bank granted concessions to borrowers who were experiencing financial difficulty were generally accounted for and reported as TDRs. Loans with short-term or other insignificant modifications that were not considered concessions were not TDRs. For the years ended December 31, 2022 and 2021, auto and other TDRs were not material.

Credit card loan portfolio

The credit card portfolio segment includes credit card loans originated and purchased by the Bank. Delinquency rates are the primary credit quality indicator for credit card loans as they provide an early warning that borrowers may be experiencing difficulties (30 days past due); information on those borrowers that have been delinquent for a longer period of time (90 days past due) is also considered. In addition to delinquency rates, the geographic distribution of the loans provides insight as to the credit quality of the portfolio based on the regional economy.

While the borrower's credit score is another general indicator of credit quality, the Bank does not view credit scores as a primary indicator of credit quality because the borrower's credit score tends to be a lagging indicator. The distribution of such scores provides a general indicator of credit quality trends within the portfolio; however, the score does not capture all factors that would be predictive of future credit performance. Refreshed FICO score information, which is obtained at least quarterly, for a statistically significant random sample of the credit card portfolio is indicated in other credit quality indicators. FICO is considered to be the industry benchmark for credit scores.

The Bank generally originates new credit card accounts to prime consumer borrowers. However, certain cardholders' FICO scores may decrease over time, depending on the performance of the cardholder and changes in the credit score calculation.

The following tables provide information on delinquency and gross charge-offs for the year ended December 31, 2023.

	December 31, 2023		
(in millions, except ratios)	Within the revolving period	Converted to term loans	Total
Loan delinquency			
Current and less than 30 days past due and still accruing	$ **205,731**	$ **882**	$ **206,613**
30–89 days past due and still accruing	**2,217**	**84**	**2,301**
90 or more days past due and still accruing	**2,169**	**40**	**2,209**
Total retained loans	$ **210,117**	$ **1,006**	$ **211,123**
Loan delinquency ratios			
% of 30+ days past due to total retained loans	**2.09** %	**12.33** %	**2.14** %
% of 90+ days past due to total retained loans	**1.03**	**3.98**	**1.05**
Gross charge-offs	$ **5,325**	$ **166**	$ **5,491**

	December 31, 2022		
(in millions, except ratios)	Within the revolving period	Converted to term loans	Total
Loan delinquency			
Current and less than 30 days past due and still accruing	$ 181,793	$ 696	$ 182,489
30–89 days past due and still accruing	1,356	64	1,420
90 or more days past due and still accruing	1,230	36	1,266
Total retained loans	$ 184,379	$ 796	$ 185,175
Loan delinquency ratios			
% of 30+ days past due to total retained loans	1.40 %	12.56 %	1.45 %
% of 90+ days past due to total retained loans	0.67	4.52	0.68

Other credit quality indicators

The following table provides information on other credit quality indicators for retained credit card loans.

(in millions, except ratios)	**December 31, 2023**	December 31, 2022
Geographic region[(a)]		
California	**$ 32,652**	$ 28,154
Texas	**22,086**	19,171
New York	**16,915**	15,046
Florida	**15,103**	12,905
Illinois	**11,364**	10,089
New Jersey	**8,688**	7,643
Ohio	**6,424**	5,792
Colorado	**6,307**	5,493
Pennsylvania	**6,088**	5,517
Arizona	**5,209**	4,487
All other	**80,287**	70,878
Total retained loans	**$ 211,123**	$ 185,175
Percentage of portfolio based on carrying value with estimated refreshed FICO scores		
Equal to or greater than 660	**85.8 %**	86.8 %
Less than 660	**14.0**	13.0
No FICO available	**0.2**	0.2

(a) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2023.

Loan modifications

The Bank grants certain modifications of credit card loans to borrowers experiencing financial difficulty, which effective January 1, 2023, are reported as FDMs. These modifications may involve placing the customer's credit card account on a fixed payment plan, generally for 60 months, which typically includes reducing the interest rate on the credit card account. If the borrower does not make the contractual payments when due under the modified payment terms, the credit card loan continues to age and will be charged-off in accordance with the Bank's standard charge-off policy. In most cases, the Bank does not reinstate the borrower's line of credit.

Financial effects of FDMs

The following table provides information on credit card loan modifications considered FDMs.

Year ended December 31, 2023 (in millions)	Amortized cost basis	% of loan modifications to total retained credit card loans	Financial effect of loan modification
Loan modification			
Term extension and interest rate reduction[(a)(b)]	**$ 648**	**0.31 %**	Term extension with a reduction in the weighted average contractual interest rate from 23.19% to 3.64%
Total	**$ 648**		

(a) Term extension includes credit card loans whose terms have been modified under long-term programs by placing the customer's credit card account on a fixed payment plan.
(b) The interest rates represent weighted average at enrollment.

For the year ended December 31, 2023, the Bank also had $27 million of credit card loans subject to trial modifications. The changes to the TDR accounting guidance eliminated the TDR reasonably expected and concession assessment criteria. Accordingly, trial modifications are not considered FDMs.

Payment status of FDMs and redefaults

The following table provides information on the payment status of FDMs during the year ended December 31, 2023.

Year ended December 31, 2023 (in millions)	Amortized cost basis
Current and less than 30 days past due and still accruing	**$ 558**
30-89 days past due and still accruing	**59**
90 or more days past due and still accruing	**31**
Total	**$ 648**

There were $50 million FDMs that re-defaulted during the year ended December 31, 2023 which were a combination of term extension and interest rate reduction.

For credit card loans modified as FDMs, payment default is deemed to have occurred when the borrower misses two consecutive contractual payments. Defaulted modified credit card loans remain in the modification program and continue to be charged off in accordance with the Bank's standard charge-off policy.

Financial effects of TDRs and redefaults

For periods ending prior to January 1, 2023, modifications of credit card loans where the Bank granted concessions to borrowers who were experiencing financial difficulty were generally accounted for and reported as TDRs. The Bank granted concessions for most of the credit card loans under long-term programs. These concessions involved placing the customer's credit card account on a fixed payment plan, generally for 60 months, and typically included reducing the interest rate on the credit card account. Substantially all modifications under the Bank's long-term programs were considered to be TDRs. Loans with short-term or other insignificant modifications that were not considered concessions were not reported as TDRs.

The following table provides information about the financial effects of the concessions granted on credit card loans modified in TDRs and redefaults for the periods presented. For all periods disclosed, new enrollments were less than 1% of total retained credit card loans.

Year ended December 31, (in millions, except weighted-average data)	2022	2021
Balance of new TDRs[(a)]	$ 418	$ 393
Weighted-average interest rate of loans – before TDR	19.86 %	17.75 %
Weighted-average interest rate of loans – after TDR	4.13	5.14
Balance of loans that redefaulted within one year of modification[(b)]	$ 34	$ 57

(a) Represents the outstanding balance prior to modification.

(b) Represents loans modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The amounts presented represent the balance of such loans as of the end of the quarter in which they defaulted.

For credit card loans modified in TDRs, payment default was deemed to have occurred when the borrower missed two consecutive contractual payments. Defaulted modified credit card loans remained in the modification program and continued to be charged of in accordance with the Bank's standard charge-off policy.

Wholesale loan portfolio

Wholesale loans include loans made to a variety of clients, ranging from large corporate and institutional clients to high-net-worth individuals.

The primary credit quality indicator for wholesale loans is the internal risk rating assigned to each loan. Risk ratings are used to identify the credit quality of loans and differentiate risk within the portfolio. Risk ratings on loans consider the PD and the LGD. The PD is the likelihood that a loan will default. The LGD is the estimated loss on the loan that would be realized upon the default of the borrower and takes into consideration collateral and structural support for each credit facility.

Management considers several factors to determine an appropriate internal risk rating, including the obligor's debt capacity and financial flexibility, the level of the obligor's earnings, the amount and sources for repayment, the level and nature of contingencies, management strength, and the industry and geography in which the obligor operates. The Bank's internal risk ratings generally align with the qualitative characteristics (e.g., borrower capacity to meet financial commitments and vulnerability to changes in the economic environment) defined by S&P and Moody's, however the quantitative characteristics (e.g., PD and LGD) may differ as they reflect internal historical experiences and assumptions. The Bank generally considers internal ratings with qualitative characteristics equivalent to BBB-/Baa3 or higher as investment grade, and these ratings have a lower PD and/or lower LGD than non-investment grade ratings.

Noninvestment-grade ratings are further classified as noncriticized and criticized, and the criticized portion is further subdivided into performing and nonaccrual loans, representing management's assessment of the collectibility of principal and interest. Criticized loans have a higher PD than noncriticized loans. The Bank's definition of criticized aligns with the U.S. banking regulatory definition of criticized exposures, which consist of special mention, substandard and doubtful categories. Refer to Note 1 for additional information.

Risk ratings are reviewed on a regular and ongoing basis by Credit Risk Management and are adjusted as necessary for updated information affecting the obligor's ability to fulfill its obligations.

As noted above, the risk rating of a loan considers the industry in which the obligor conducts its operations. As part of the overall credit risk management framework, the Bank focuses on the management and diversification of its industry and client exposures, with particular attention paid to industries with an actual or potential credit concern. Refer to Note 5 for further detail on industry concentrations.

Internal risk rating is the primary credit quality indicator for retained wholesale loans. The following tables provide information on internal risk rating and gross charge-offs for the year ended December 31, 2023.

December 31, (in millions, except ratios)	Secured by real estate		Commercial and industrial		Other[b]		Total retained loans	
	2023	2022	**2023**	2022	**2023**	2022	**2023**	2022
Loans by risk ratings								
Investment- grade	**$ 120,402**	$ 99,514	**$ 72,618**	$ 76,207	**$ 265,086**	$ 248,155	**$ 458,106**	$ 423,876
Noninvestment- grade:								
Noncriticized	**34,186**	23,307	**80,516**	81,359	**73,784**	57,547	**188,486**	162,213
Criticized performing	**7,291**	3,652	**12,402**	8,965	**1,257**	728	**20,950**	13,345
Criticized nonaccrual	**401**	246	**1,221**	1,018	**589**	695	**2,211**	1,959
Total noninvestment-grade	**41,878**	27,205	**94,139**	91,342	**75,630**	58,970	**211,647**	177,517
Total retained loans[a]	**$ 162,280**	$ 126,719	**$ 166,757**	$ 167,549	**$ 340,716**	$ 307,125	**$ 669,753**	$ 601,393
% of investment-grade to total retained loans	**74.19 %**	78.53 %	**43.55 %**	45.48 %	**77.80 %**	80.80 %	**68.40 %**	70.48 %
% of total criticized to total retained loans	**4.74**	3.08	**8.17**	5.96	**0.54**	0.46	**3.46**	2.54
% of criticized nonaccrual to total retained loans	**0.25**	0.19	**0.73**	0.61	**0.17**	0.23	**0.33**	0.33

(a) As of December 31, 2023 included $33.8 billion of Secured by real estate loans, $3.0 billion of Commercial and industrial loans, and $16.0 billion of Other loans associated with First Republic.

(b) Includes loans to SPEs, financial institutions, personal investment companies and trusts, individuals and individual entities (predominantly global private bank clients), states and political subdivisions, as well as loans to nonprofits. As of December 31, 2023, predominantly consisted of $105.8 billion to individuals and individual entities, $90.8 billion to SPEs and $87.3 billion to financial institutions. Refer to Note 15 for more information on SPEs.

	Secured by real estate								
	December 31, 2023								
	Term loans by origination year						Revolving loans		
(in millions)	2023	2022	2021	2020	2019	Prior to 2019	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	**$ 10,684**	**$ 28,874**	**$ 25,784**	**$ 16,820**	**$ 15,677**	**$ 21,108**	**$ 1,455**	**$ –**	**$ 120,402**
Noninvestment-grade	**4,438**	**12,563**	**7,839**	**3,840**	**3,987**	**7,918**	**1,291**	**2**	**41,878**
Total retained loans[a]	**$ 15,122**	**$ 41,437**	**$ 33,623**	**$ 20,660**	**$ 19,664**	**$ 29,026**	**$ 2,746**	**$ 2**	**$ 162,280**
Gross charge-offs	**$ 20**	**$ 48**	**$ 22**	**$ –**	**$ 23**	**$ 78**	**$ –**	**$ –**	**$ 191**

	Secured by real estate								
	December 31, 2022								
	Term loans by origination year						Revolving loans		
(in millions)	2022	2021	2020	2019	2018	Prior to 2018	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	$ 24,096	$ 22,407	$ 14,773	$ 14,666	$ 5,277	$ 17,289	$ 1,006	$ –	$ 99,514
Noninvestment-grade	6,097	5,602	3,032	3,498	2,395	5,659	920	2	27,205
Total retained loans	$ 30,193	$ 28,009	$ 17,805	$ 18,164	$ 7,672	$ 22,948	$ 1,926	$ 2	$ 126,719

(a) As of December 31, 2023 included $3.3 billion, $11.2 billion, $6.2 billion, $4.3 billion, $2.9 billion, and $5.1 billion of retained loans originated in 2023, 2022, 2021, 2020, 2019 and prior to 2019, respectively, and $838 million of revolving loans within the revolving period associated with First Republic.

Commercial and industrial									
	December 31, 2023								
	Term loans by origination year						Revolving loans		
(in millions)	2023	2022	2021	2020	2019	Prior to 2019	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	**$ 14,869**	**$ 10,642**	**$ 4,276**	**$ 2,291**	**$ 1,030**	**$ 1,115**	**$ 38,394**	**$ 1**	**$ 72,618**
Noninvestment-grade	**18,763**	**16,444**	**9,299**	**1,813**	**1,144**	**1,006**	**45,596**	**74**	**94,139**
Total retained loans[(a)]	**$ 33,632**	**$ 27,086**	**$ 13,575**	**$ 4,104**	**$ 2,174**	**$ 2,121**	**$ 83,990**	**$ 75**	**$ 166,757**
Gross charge-offs	**$ 25**	**$ 8**	**$ 110**	**$ 55**	**$ 2**	**$ 12**	**$ 224**	**$ 9**	**$ 445**

Commercial and industrial									
	December 31, 2022								
	Term loans by origination year						Revolving loans		
(in millions)	2022	2021	2020	2019	2018	Prior to 2018	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	$ 21,051	$ 8,338	$ 3,045	$ 1,995	$ 766	$ 989	$ 40,022	$ 1	$ 76,207
Noninvestment-grade	24,080	12,444	3,459	2,506	525	1,014	47,232	82	91,342
Total retained loans	$ 45,131	$ 20,782	$ 6,504	$ 4,501	$ 1,291	$ 2,003	$ 87,254	$ 83	$ 167,549

(a) As of December 31, 2023 included $364 million, $568 million, $471 million, $212 million, $53 million, and $121 million of retained loans originated in 2023, 2022, 2021, 2020, 2019 and prior to 2019, respectively, and $1.2 billion of revolving loans within the revolving period and $12 million converted to term loans associated with First Republic.

Other[(a)]									
	December 31, 2023								
	Term loans by origination year						Revolving loans		
(in millions)	2023	2022	2021	2020	2019	Prior to 2019	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	**$ 38,301**	**$ 17,983**	**$ 9,679**	**$ 10,099**	**$ 3,721**	**$ 6,528**	**$ 176,581**	**$ 2,194**	**$ 265,086**
Noninvestment-grade	**13,664**	**7,874**	**6,041**	**2,051**	**745**	**1,915**	**43,281**	**59**	**75,630**
Total retained loans[(b)]	**$ 51,965**	**$ 25,857**	**$ 15,720**	**$ 12,150**	**$ 4,466**	**$ 8,443**	**$ 219,862**	**$ 2,253**	**$ 340,716**
Gross charge-offs	**$ 5**	**$ 296**	**$ 8**	**$ 8**	**$ –**	**$ 8**	**$ 13**	**$ –**	**$ 338**

Other[(a)]									
	December 31, 2022								
	Term loans by origination year						Revolving loans		
(in millions)	2022	2021	2020	2019	2018	Prior to 2018	Within the revolving period	Converted to term loans	Total
Loans by risk ratings									
Investment-grade	$ 31,401	$ 15,505	$ 13,015	$ 4,529	$ 2,160	$ 7,055	$ 170,893	$ 3,597	$ 248,155
Noninvestment-grade	16,971	7,096	1,821	699	451	454	31,396	82	58,970
Total retained loans	$ 48,372	$ 22,601	$ 14,836	$ 5,228	$ 2,611	$ 7,509	$ 202,289	$ 3,679	$ 307,125

(a) Includes loans to SPEs, financial institutions, personal investment companies and trusts, individuals and individual entities (predominantly global private bank clients), states and political subdivisions, as well as loans to nonprofits. Refer to Note 15 for more information on SPEs.
(b) As of December 31, 2023, included $180 million, $828 million, $692 million, $1.0 billion, $178 million, and $1.4 billion of retained loans originated in 2023, 2022, 2021, 2020, 2019 and prior to 2019, respectively, and $11.8 billion of revolving loans within the revolving period and $56 million converted to term loans associated with First Republic.

The following table presents additional information on retained loans secured by real estate within the Wholesale portfolio, which consists of loans secured wholly or substantially by a lien or liens on real property at origination. Multifamily lending includes financing for acquisition, leasing and construction of apartment buildings. Other commercial lending largely includes financing for acquisition, leasing and construction, largely for office, retail and industrial real estate. Included in secured by real estate loans is $10.2 billion and $6.4 billion as of December 31, 2023 and 2022, respectively, of construction and development loans made to finance land development and on-site construction of commercial, industrial, residential, or farm buildings.

December 31, (in millions, except ratios)	Multifamily		Other Commercial		Total retained loans secured by real estate	
	2023	2022	**2023**	2022	**2023**	2022
Retained loans secured by real estate	**$ 100,725**	$ 79,139	**$ 61,555**	$ 47,580	**$ 162,280** (a)	$ 126,719
Criticized	**3,596**	1,916	**4,096**	1,982	**7,692**	3,898
% of criticized to total retained loans secured by real estate	**3.57 %**	2.42 %	**6.65 %**	4.17 %	**4.74 %**	3.08 %
Criticized nonaccrual	**$ 76**	$ 51	**$ 325**	$ 195	**$ 401**	$ 246
% of criticized nonaccrual loans to total retained loans secured by real estate	**0.08 %**	0.06 %	**0.53 %**	0.41 %	**0.25 %**	0.19 %

(a) Included $20.7 billion and $13.1 billion of Multifamily and Other commercial loans, respectively, associated with First Republic.

Geographic distribution and delinquency

The following table provides information on the geographic distribution and delinquency for retained wholesale loans.

December 31, (in millions)	Secured by real estate		Commercial and industrial		Other		Total retained loans	
	2023	2022	**2023**	2022	**2023**	2022	**2023**	2022
Loans by geographic distribution[(a)(b)]								
Total U.S.	**$159,459**	$123,753	**$127,245**	$125,273	**$260,769**	$229,293	**$547,473**	$478,319
Total non-U.S.	**2,821**	2,966	**39,512**	42,276	**79,947**	77,832	**122,280**	123,074
Total retained loans	**$162,280**	$126,719	**$166,757**	$167,549	**$340,716**	$307,125	**$669,753**	$601,393
Loan delinquency								
Current and less than 30 days past due and still accruing	**$161,256**	$126,072	**$164,490**	$165,303	**$339,013**	$305,363	**$664,759**	$596,738
30–89 days past due and still accruing	**473**	400	**884**	1,128	**1,090**	1,014	**2,447**	2,542
90 or more days past due and still accruing[(c)]	**150**	1	**162**	100	**24**	53	**336**	154
Criticized nonaccrual[(c)]	**401**	246	**1,221**	1,018	**589**	695	**2,211**	1,959
Total retained loans	**$162,280**	$126,719	**$166,757**	$167,549	**$340,716**	$307,125	**$669,753**	$601,393
Net charge-offs/(recoveries)	**$ 178**	$ 6	**$ 335**	$ 145	**$ 329**	$ 3	**$ 842**	$ 154
% of net charge-offs/(recoveries) to end-of-period retained loans	**0.11 %**	– %	**0.20 %**	0.09 %	**0.10 %**	– %	**0.13 %**	0.03 %

(a) The U.S. and non-U.S. distribution is determined based predominantly on the domicile of the borrower.
(b) Borrowers associated with First Republic are predominantly domiciled in the U.S.
(c) Represents loans that are considered well-collateralized and therefore still accruing interest.

Nonaccrual loans

The following table provides information on retained wholesale nonaccrual loans.

December 31, (in millions)	Secured by real estate 2023	Secured by real estate 2022	Commercial and industrial 2023	Commercial and industrial 2022	Other 2023	Other 2022	Total retained loans 2023	Total retained loans 2022
Nonaccrual loans								
With an allowance	**$ 129**	$ 172	**$ 776**	$ 686	**$ 386**	$ 483	**$ 1,291**	$ 1,341
Without an allowance[a]	**272**	74	**445**	332	**203**	212	**920**	618
Total nonaccrual loans[b]	**$ 401**	$ 246	**$ 1,221**	$ 1,018	**$ 589**	$ 695	**$ 2,211**	$ 1,959

(a) When the discounted cash flows or collateral value equals or exceeds the amortized cost of the loan, the loan does not require an allowance. This typically occurs when the loans have been partially charged off and/or there have been interest payments received and applied to the loan balance.
(b) Interest income on nonaccrual loans recognized on a cash basis were not material for the years ended December 31, 2023 and 2022.

Loan modifications

The Bank grants certain modifications of wholesale loans to borrowers experiencing financial difficulty, which effective January 1, 2023, are reported as FDMs.

Financial effects of FDMs

The following tables provide information by loan class about modifications considered FDMs.

	Secured by real estate		
	Year ended December 31, 2023		
(in millions)	Amortized cost basis	% of loan modifications to total retained Real Estate loans	Financial effect of loan modification
Loan modification			
Single modifications			
Term extension	**$ 149**	**0.09 %**	Extended loans by a weighted average of 14 months
Other-than-insignificant payment deferral	**3**	**– %**	Provided payment deferrals with delayed amounts primarily re-amortized over the remaining life of the loan
Multiple modifications			
Interest rate reduction and term extension	**3**	**– %**	Reduced weighted-average contractual interest by 350 bps and extended loans by a weighted average of 3 months
Other-than-insignificant payment deferral and interest rate reduction	**5**	**– %**	Provided payment deferrals with delayed amounts primarily recaptured at maturity and reduced weighted average contractual interest by 184 bps
Total	**$ 160**		

(in millions)	Commercial and industrial Year ended December 31, 2023 Amortized cost basis	% of loan modifications to total retained Commercial and industrial loans	Financial effect of loan modification
Loan modification			
Single modifications			
Term extension	$ 890	0.53 %	Extended loans by a weighted average of 16 months
Other-than-insignificant payment deferral	402	0.24 %	Provided payment deferrals with delayed amounts primarily recaptured at the end of the deferral period
Multiple modifications			
Other-than-insignificant payment deferral and term extension	$ 35	0.02 %	Provided payment deferrals with delayed amounts primarily re-amortized over the remaining life of the loan and extended loans by a weighted average of 7 months
Other-than-insignificant payment deferral and interest rate reduction and term extension	2	— %	Provided payment deferrals with delayed amounts primarily re-amortized over the remaining life of the loan, reduced weighted average contractual interest by 75 bps and extended loans by a weighted average of 29 months
Term extension and principal forgiveness	7	— %	Extended loans by a weighted average of 76 months and reduced amortized cost basis of the loans by $5 million
Interest rate reduction and term extension	1	— %	Reduced weighted average contractual interest rate over the life of the loan as a result of converting from variable to fixed rate and extended loans by a weighted average of 16 months
Total	$ 1,337		

(in millions)	Other Year ended December 31, 2023 Amortized cost basis	% of loan modifications to total retained Other loans	Financial effect of loan modification
Loan modification			
Single modifications			
Interest rate reduction	$ 9	— %	Reduced weighted average contractual interest by 654 bps
Term extension	355	0.10 %	Extended loans by a weighted average of 23 months
Multiple modifications			
Other-than-insignificant payment deferral and term extension	245	0.07 %	Provided payment deferrals with delayed amounts primarily recaptured at the end of the deferral period and extended loans by a weighted average of 137 months
Total[(a)]	$ 609		

(a) Includes loans to nonprofits, financial institutions, and personal investment companies and trusts.

Payment status of FDMs and redefaults

The following table provides information by loan class about the payment status of FDMs during the year ended December 31, 2023.

	Amortized cost basis		
	Secured by real estate	Commercial and industrial	Other
(in millions)	Year ended December 31, 2023	Year ended December 31, 2023	Year ended December 31, 2023
Current and less than 30 days past due and still accruing	$ 118	$ 921	$ 400
30-89 days past due and still accruing	2	42	–
Criticized nonaccrual	40	374	209
Total	$ 160	$ 1,337	$ 609

The following table provides information by loan class about FDMs that re-defaulted during the year ended December 31, 2023.

	Amortized cost basis		
	Secured by real estate	Commercial and industrial	Other
(in millions)	Year ended December 31, 2023	Year ended December 31, 2023	Year ended December 31, 2023
Loan modification			
Term extension	$ 1	$ 49	$ 31
Other-than-insignificant payment deferral	2	–	–
Interest rate reduction and term extension	3	1	–
Total[(a)]	$ 6	$ 50	$ 31

(a) Represents FDMs that were 30 days or more past due.

As of December 31, 2023, additional unfunded commitments to lend to borrowers experiencing financial difficulty for Commercial and industrial and Other loan FDMs were $1.8 billion and $4 million, respectively. There were no additional unfunded commitments to lend to borrowers experiencing financial difficulties for Secured by real estate loan FDMs.

Nature and extent of TDRs

Prior to January 1, 2023, certain loan modifications were considered TDRs. These loan modifications provided various concessions to borrower who were experiencing financial difficulty. Loans with short-term or other insignificant modifications that were not considered concessions were not TDRs nor were loans for which the Bank elected to suspend TDR accounting guidance under the option provided by the CARES Act.

For the year ended December 31, 2022 and 2021, new TDRs were $801 million and $881 million, respectively. New TDRs for the year ended December 31, 2022 and 2021 reflected extended maturity dates and covenant waivers primarily in the Commercial and Industrial loan class. For the year ended December 31, 2022 and 2021, the impact of these modifications resulting in new TDRs was not material to the Bank.

As a result of the elimination of the requirement to assess whether a modification is reasonably expected or involves a concession, the population of loans considered FDMs is greater than the population previously considered TDRs.

Note 14 – Allowance for credit losses

The Bank's allowance for credit losses represents management's estimate of expected credit losses over the remaining expected life of the Bank's financial assets measured at amortized cost and certain off-balance sheet lending-related commitments. The allowance for credit losses generally comprises:

- the allowance for loan losses, which covers the Bank's retained loan portfolios (scored and risk-rated),
- the allowance for lending-related commitments, which is presented on the Consolidated balance sheets in accounts payable and other liabilities, and
- the allowance for credit losses on investment securities, which is reflected in investment securities on the Consolidated balance sheets.

The income statement effect of all changes in the allowance for credit losses is recognized in the provision for credit losses.

Determining the appropriateness of the allowance for credit losses is complex and requires significant judgment by management about the effect of matters that are inherently uncertain. At least quarterly, the allowance for credit losses is reviewed by the CRO, the CFO and the Controller of JPMorgan Chase. Subsequent evaluations of credit exposures, considering the macroeconomic conditions, forecasts and other factors then prevailing, may result in significant changes in the allowance for credit losses in future periods.

The Bank's policies used to determine its allowance for loan losses and its allowance for lending-related commitments are described in the following paragraphs. Refer to Note 11 for a description of the policies used to determine the allowance for credit losses on investment securities.

Methodology for allowances for loan losses and lending-related commitments

The allowance for loan losses and allowance for lending-related commitments represents expected credit losses over the remaining expected life of retained loans and lending-related commitments that are not unconditionally cancellable. The Bank does not record an allowance for future draws on unconditionally cancellable lending-related commitments (e.g., credit cards). Expected losses related to accrued interest on credit card loans are considered in the Bank's allowance for loan losses. However, the Bank does not record an allowance on other accrued interest receivables, due to its policy to write these receivables off no later than 90 days past due by reversing interest income.

The expected life of each instrument is determined by considering its contractual term, expected prepayments, cancellation features, and certain extension and call options. The expected life of funded credit card loans is generally estimated by considering expected future payments on the credit card account, and determining how much of those amounts should be allocated to repayments of the funded loan balance (as of the balance sheet date) versus other account activity. This allocation is made using an approach that incorporates the payment application requirements of the Credit Card Accountability Responsibility and Disclosure Act of 2009, generally paying down the highest interest rate balances first.

The estimate of expected credit losses includes expected recoveries of amounts previously charged off or expected to be charged off, even if such recoveries result in a negative allowance.

Collective and Individual Assessments

When calculating the allowance for loan losses and the allowance for lending-related commitments, the Bank assesses whether exposures share similar risk characteristics. If similar risk characteristics exist, the Bank estimates expected credit losses collectively, considering the risk associated with a particular pool and the probability that the exposures within the pool will deteriorate or default. The assessment of risk characteristics is subject to significant management judgment. Emphasizing one characteristic over another or considering additional characteristics could affect the allowance.

- Relevant risk characteristics for the consumer portfolio include product type, delinquency status, current FICO scores, geographic distribution, and, for collateralized loans, current LTV ratios.
- Relevant risk characteristics for the wholesale portfolio include, risk rating, delinquency status, tenor, level and type of collateral, geography, industry, credit enhancement, product type, facility purpose, and payment terms.

The majority of the Bank's credit exposures share risk characteristics with other similar exposures, and as a result are collectively assessed for impairment ("portfolio-based component"). The portfolio-based component covers consumer loans, performing risk-rated loans and certain lending-related commitments.

If an exposure does not share risk characteristics with other exposures, the Bank generally estimates expected credit losses on an individual basis, considering expected repayment and conditions impacting that individual exposure ("asset-specific component"). The asset-specific component covers collateral-dependent loans and risk-rated loans that have been placed on nonaccrual status.

Portfolio-based component

The portfolio-based component begins with a quantitative calculation that considers the likelihood of the borrower changing delinquency status or moving from one risk rating to another. The quantitative calculation covers expected credit losses over an instrument's expected life and is estimated by applying credit loss factors to the Bank's estimated exposure at default. The credit loss factors incorporate the probability of borrower default as well as loss severity in the event of default. They are derived using a weighted average of five internally developed macroeconomic scenarios over an eight-quarter forecast period, followed by a single year straight-line interpolation to revert to long run historical information for periods beyond the eight-quarter forecast period. The five macroeconomic scenarios consist of a central, relative adverse, extreme adverse, relative upside and extreme upside scenario, and are updated by the Bank's central forecasting team. The scenarios take into consideration the Bank's macroeconomic outlook, internal perspectives from subject matter experts across the Bank, and market consensus and involve a governed process that incorporates feedback from senior management.

The eight-quarter forecast incorporates hundreds of macroeconomic variables ("MEVs") that are relevant for exposures across the Bank, with modeled credit losses being driven primarily by a subset of less than twenty variables, including U.S. unemployment, U.S. real GDP, U.S. equity prices, U.S. interest rates, U.S. corporate credit spreads, oil prices, U.S. commercial real estate prices and HPI. The specific variables that have the greatest effect on the modeled losses of each portfolio vary by portfolio and geography.

The quantitative calculation is adjusted to take into consideration model imprecision, emerging risk assessments, trends and other subjective factors that are not yet reflected in the calculation. These adjustments are accomplished in part by analyzing the historical loss experience, including during stressed periods, for each major product or model. Management applies judgment in making this adjustment, including taking into account uncertainties associated with the economic and political conditions, quality of underwriting standards, borrower behavior, credit concentrations or deterioration within an industry, product or portfolio, as well as other relevant internal and external factors affecting the credit quality of the portfolio. In certain instances, the interrelationships between these factors create further uncertainties.

The application of different inputs into the quantitative calculation, and the assumptions used by management to adjust the quantitative calculation, are subject to significant management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for loan losses and the allowance for lending-related commitments.

Asset-specific component
To determine the asset-specific component of the allowance, collateral-dependent loans (including those loans for which foreclosure is probable) and nonaccrual risk-rated loans in the wholesale portfolio segment are generally evaluated individually.

On January 1, 2023 the Bank adopted the Financial Instruments - Credit Losses: Troubled Debt Restructurings accounting guidance as described in Note 1.

The adoption of this guidance eliminated the requirement to measure the allowance for TDRs using a discounted cash flow (DCF) methodology and allowed the option of a non-DCF portfolio-based approach for modified loans to borrowers experiencing financial difficulty. If a DCF methodology is still applied for these modified loans, the discount rate must be the post-modification effective interest rate, instead of the pre-modification effective interest rate.

The Bank elected to change from an asset-specific allowance approach to its non-DCF, portfolio-based allowance approach for modified loans to troubled borrowers for all portfolios except collateral-dependent loans and nonaccrual risk-rated loans, for which the asset-specific allowance approach will continue to apply. The adoption did not impact the collateral-dependent allowance approach or scope.

This guidance was adopted under the modified retrospective method which resulted in a net decrease to the allowance for credit losses of $587 million and an increase to retained earnings of $446 million, after-tax predominantly driven by residential real estate and credit card.

For collateral-dependent loans, the fair value of collateral less estimated costs to sell, as applicable, is used to determine the charge-off amount for declines in value (to reduce the amortized cost of the loan to the fair value of collateral) or the amount of negative allowance that should be recognized (for recoveries of prior charge-offs associated with improvements in the fair value of the collateral).

For non-collateral dependent loans, the Bank generally measures the asset-specific allowance as the difference between the amortized cost of the loan and the present value of the cash flows expected to be collected, discounted at the loan's effective interest rate. Subsequent changes in impairment are generally recognized as an adjustment to the allowance for loan losses. The asset-specific component of the allowance for non-collateral dependent loans incorporates the effect of the modification on the loan's expected cash flows including changes in interest rates, principal forgiveness, and other concessions, as well as management's expectation of the borrower's ability to repay under the modified terms.

Estimating the timing and amounts of future cash flows is highly judgmental as these cash flow projections rely upon estimates such as loss severities, asset valuations, the amounts and timing of interest or principal payments (including any expected prepayments) or other factors that are reflective of current and expected market conditions. These estimates are, in turn, dependent on factors such as the duration of current overall economic conditions, industry, portfolio, or borrower-specific factors, the expected outcome of insolvency proceedings as well as, in certain circumstances, other economic factors. All of these estimates and assumptions require significant management judgment and certain assumptions are highly subjective.

Other financial assets

In addition to loans and investment securities, the Bank holds other financial assets that are measured at amortized cost on the Consolidated balance sheets, including credit exposures arising from lending activities subject to collateral maintenance requirements. Management estimates the allowance for other financial assets using various techniques considering historical losses and current economic conditions.

Credit risk arising from lending activities subject to collateral maintenance requirements is generally mitigated by factors such as the short-term nature of the activity, the fair value of collateral held and the Bank's right to call for, and the borrower's obligation to provide additional margin when the fair value of the collateral declines. Because of these mitigating factors, these exposures generally do not require an allowance for credit losses. However, management may also consider other factors such as the borrower's ongoing ability to provide collateral to satisfy margin requirements, or whether collateral is significantly concentrated in an individual issuer or in securities with similar risk characteristics.If in management's judgment, an allowance for credit losses for these exposures is required, the Bank estimates expected credit losses based on the value of the collateral and probability of borrower default.

Allowance for credit losses and related information

The table below summarizes information about the allowances for credit losses, and includes a breakdown of loans and lending-related commitments by impairment methodology. Refer to Note 11 for further information on the allowance for credit losses on investment securities.

(Table continued on next page)

Year ended December 31, (in millions)	2023			
	Consumer, excluding credit card	Credit card	Wholesale	Total
Allowance for loan losses				
Beginning balance at January 1,	$ 2,040	$ 11,200	$ 6,474	$ 19,714
Cumulative effect of a change in accounting principle[(a)]	(489)	(100)	2	(587)
Gross charge-offs	1,151	5,491	974	7,616
Gross recoveries collected	(519)	(793)	(132)	(1,444)
Net charge-offs	632	4,698	842	6,172
Provision for loan losses	937	6,048	2,349	9,334
Other	1	–	21	22
Ending balance at December 31,	$ 1,857	$ 12,450	$ 8,004	$ 22,311
Allowance for lending-related commitments				
Beginning balance at January 1,	$ 76	$ –	$ 2,276	$ 2,352
Provision for lending-related commitments	(1)	–	(392)	(393)
Other	–	–	1	1
Ending balance at December 31,	$ 75	$ –	$ 1,885	$ 1,960
Total allowance for investment securities	NA	NA	NA	$ 94
Total allowance for credit losses[(b)(c)]	$ 1,932	$ 12,450	$ 9,889	$ 24,365
Allowance for loan losses by impairment methodology				
Asset-specific[(d)]	$ (876)	$ –	$ 379	$ (497)
Portfolio-based	2,733	12,450	7,625	22,808
Total allowance for loan losses	$ 1,857	$ 12,450	$ 8,004	$ 22,311
Loans by impairment methodology				
Asset-specific[(d)]	$ 3,284	$ –	$ 2,207	$ 5,491
Portfolio-based	393,984	211,123	667,546	1,272,653
Total retained loans	$ 397,268	$ 211,123	$ 669,753	$ 1,278,144
Collateral-dependent loans				
Net charge-offs	$ 6	$ –	$ 180	$ 186
Loans measured at fair value of collateral less cost to sell	3,213	–	1,008	4,221
Allowance for lending-related commitments by impairment methodology				
Asset-specific	$ –	$ –	$ 89	$ 89
Portfolio-based	75	–	1,796	1,871
Total allowance for lending-related commitments[(e)]	$ 75	$ –	$ 1,885	$ 1,960
Lending-related commitments by impairment methodology				
Asset-specific	$ –	$ –	$ 464	$ 464
Portfolio-based[(f)]	28,248	–	513,215	541,463
Total lending-related commitments	$ 28,248	$ –	$ 513,679	$ 541,927

(a) Represents the impact to the allowance for loan losses upon the adoption of the Financial Instruments - Credit Losses: Troubled Debt Restructurings accounting guidance. Refer to Note 1 for further information.
(b) At December 31, 2023 and 2022, in addition to the allowance for credit losses in the table above, the Bank also had an allowance for credit losses of $42 million and $21 million, respectively, associated with certain accounts receivable.
(c) As of December 31, 2023, included the allowance for credit losses associated with First Republic.
(d) Includes collateral-dependent loans, including those for which foreclosure is deemed probable, and nonaccrual risk-rated loans for all periods presented. Prior periods also include non collateral-dependent TDRs or reasonably expected TDRs and modified PCD loans.
(e) The allowance for lending-related commitments is reported in accounts payable and other liabilities on the Consolidated balance sheets.
(f) At December 31, 2023, 2022 and 2021, lending-related commitments excluded $17.2 billion, $13.1 billion and $15.7 billion, respectively, for the consumer, excluding credit card portfolio segment; $915.7 billion, $821.3 billion and $730.5 billion, respectively, for the credit card portfolio segment; and $19.7 billion, $9.8 billion and $31.3 billion, respectively, for the wholesale portfolio segment, which were not subject to the allowance for lending-related commitments.

(table continued from previous page)

2022				2021			
Consumer, excluding credit card	Credit card	Wholesale	Total	Consumer, excluding credit card	Credit card	Wholesale	Total
$ 1,765	$ 10,250	$ 4,363	$ 16,378	$ 3,634	$ 17,800	$ 6,884	$ 28,318
NA	NA	NA	NA	NA	NA	NA	NA
812	3,192	288	4,292	630	3,651	283	4,564
(543)	(789)	(134)	(1,466)	(619)	(939)	(141)	(1,699)
269	2,403	154	2,826	11	2,712	142	2,865
543	3,353	2,263	6,159	(1,858)	(4,838)	(2,373)	(9,069)
1	–	2	3	–	–	(6)	(6)
$ 2,040	$ 11,200	$ 6,474	$ 19,714	$ 1,765	$ 10,250	$ 4,363	$ 16,378
$ 113	$ –	$ 2,102	$ 2,215	$ 187	$ –	$ 2,218	$ 2,405
(37)	–	174	137	(75)	–	(116)	(191)
–	–	–	–	1	–	–	1
$ 76	$ –	$ 2,276	$ 2,352	$ 113	$ –	$ 2,102	$ 2,215
NA	NA	NA	67	NA	NA	NA	42
$ 2,116	$ 11,200	$ 8,750	$ 22,133	$ 1,878	$ 10,250	$ 6,465	$ 18,635
$ (624)	$ 223	$ 466	$ 65	$ (665)	$ 313	$ 262	$ (90)
2,664	10,977	6,008	19,649	2,430	9,937	4,101	16,468
$ 2,040	$ 11,200	$ 6,474	$ 19,714	$ 1,765	$ 10,250	$ 4,363	$ 16,378
$ 11,973	$ 796	$ 2,185	$ 14,954	$ 13,913	$ 987	$ 2,251	$ 17,151
288,773	184,379	599,208	1,072,360	281,634	153,309	555,855	990,798
$ 300,746	$ 185,175	$ 601,393	$ 1,087,314	$ 295,547	$ 154,296	$ 558,106	$ 1,007,949
$ (33)	$ –	$ 16	$ (17)	$ 33	$ –	$ 38	$ 71
3,582	–	460	4,042	4,469	–	613	5,082
$ –	$ –	$ 70	$ 70	$ –	$ –	$ 122	$ 122
76	–	2,206	2,282	113	–	1,980	2,093
$ 76	$ –	$ 2,276	$ 2,352	$ 113	$ –	$ 2,102	$ 2,215
$ –	$ –	$ 419	$ 419	$ –	$ –	$ 664	$ 664
20,423	–	458,569	478,992	29,588	–	451,080	480,668
$ 20,423	$ –	$ 458,988	$ 479,411	$ 29,588	$ –	$ 451,744	$ 481,332

Discussion of changes in the allowance

The allowance for credit losses as of December 31, 2023 was $24.4 billion, reflecting a net addition of $2.8 billion from December 31, 2022.

The net addition to the allowance for credit losses included $1.6 billion, consisting of:

- $1.3 billion in **consumer**, predominantly driven by a net addition of $1.4 billion in credit card, partially offset by a net reduction of $199 million in residential real estate. The net addition in credit card was driven by loan growth, including an increase in revolving balances, partially offset by reduced borrower uncertainty. The net reduction in residential real estate was driven by improvements in the outlook for home prices, and
- $373 million in **wholesale**, driven by net downgrade activity, the net effect of changes in the Bank's weighted average macroeconomic outlook, including deterioration in the outlook for commercial real estate, partially offset by the impact of changes in the loan and lending-related commitment portfolios.

The net addition also included $1.2 billion to establish the allowance for the First Republic loans and lending-related commitments in the second quarter of 2023.

The changes in the Bank's weighted average macroeconomic outlook also included updates to the central scenario in the third quarter of 2023 to reflect a lower forecasted unemployment rate consistent with a higher growth rate in GDP, and the impact of the additional weight placed on the adverse scenarios in the first quarter of 2023, reflecting elevated recession risks due to high inflation and tightening financial conditions.

The allowance for credit losses also reflected a reduction of $587 million as a result of the adoption of changes to the TDR accounting guidance on January 1, 2023. Refer to Note 1 for further information.

The Bank's allowance for credit losses is estimated using a weighted average of five internally developed macroeconomic scenarios. The adverse scenarios incorporate more punitive macroeconomic factors than the central case assumptions provided in the table below, resulting in a weighted average U.S. unemployment rate peaking at 5.5% in the fourth quarter of 2024, and a weighted average U.S. real GDP level that is 1.5% lower than the central case at the end of the second quarter of 2025.

The following table presents the Bank's central case assumptions for the periods presented:

	Central case assumptions at December 31, 2023		
	2Q24	4Q24	2Q25
U.S. unemployment rate[(a)]	**4.1 %**	**4.4 %**	**4.1 %**
YoY growth in U.S. real GDP[(b)]	**1.8 %**	**0.7 %**	**1.0 %**

	Central case assumptions at December 31, 2022		
	2Q23	4Q23	2Q24
U.S. unemployment rate[(a)]	3.8 %	4.3 %	5.0 %
YoY growth in U.S. real GDP[(b)]	1.5 %	0.4 %	– %

(a) Reflects quarterly average of forecasted U.S. unemployment rate.
(b) The year over year growth in U.S. real GDP in the forecast horizon of the central scenario is calculated as the percentage change in U.S. real GDP levels from the prior year.

Subsequent changes to this forecast and related estimates will be reflected in the provision for credit losses in future periods.

Note 15 – Variable interest entities

Refer to Note 1 for a further description of the the Bank's accounting policies regarding consolidation of and involvement with VIEs.

The following table summarizes the most significant types of Bank-sponsored VIEs. The Bank considers a "Bank-sponsored" VIE to include any entity where: (1) The Bank is the primary beneficiary of the structure; (2) the VIE is used by the Bank to securitize Bank assets; (3) the VIE issues financial instruments with the JPMorgan Chase Bank, N.A. name; or (4) the entity is a JPMorgan Chase Bank, N.A.–administered asset-backed commercial paper conduit.

Transaction Type	*Activity*	*Consolidated Financial Statements page reference*
Credit card securitization trusts	Securitization of originated credit card receivables	97-98
Mortgage securitization trusts	Servicing and securitization of both originated and purchased residential mortgages	98-99
Mortgage and other securitization trusts	Securitization of both originated and purchased residential and commercial mortgages, and other consumer loans	98-99
Multi-seller conduits	Assisting clients in accessing the financial markets in a cost-efficient manner and structuring transactions to meet investor needs	99-100
Municipal bond vehicles	Financing of municipal bond investments	100

The Bank is also involved with VIEs (both third-party and Bank-sponsored), but to a lesser extent, as follows:

- The Bank provides financing and lending-related services to a wide spectrum of clients, including certain third-party-sponsored entities that may meet the definition of a VIE. The Bank does not control the activities of these entities and does not consolidate these entities. The Bank's maximum loss exposure, regardless of whether the entity is a VIE, is generally limited to loans and lending-related commitments which are reported and disclosed in the same manner as any other third-party transaction.
- The Bank is involved with entities that may meet the definition of VIEs; however these entities are generally subject to specialized investment company accounting, which does not require the consolidation of investments, including VIEs.
- The Bank invests in securities generally issued by third parties which may meet the definition of VIEs (e.g., issuers of asset-backed securities). In general, the Bank does not have the power to direct the significant activities of these entities and therefore does not consolidate these entities. Refer to Note 11 for further information on the Bank's investment securities portfolio.
- The Bank also invests in and provides financing and other services to VIEs sponsored by third parties. Refer to page 102 of this Note for more information on the VIEs sponsored by third parties.

Significant Bank-sponsored VIEs

Credit card securitizations

The Bank may securitize originated credit card loans, primarily through the Chase Issuance Trust (the "Trust"). The Bank's continuing involvement in credit card securitizations includes servicing the receivables, retaining an undivided seller's interest in the receivables, retaining certain senior and subordinated securities and maintaining escrow accounts.

The Bank consolidates the assets and liabilities of its sponsored credit card trusts as it is considered to be the primary beneficiary of these securitization trusts based on the Bank's ability to direct the activities of these VIEs through its servicing responsibilities and other duties, including making decisions as to the receivables that are transferred into those trusts and as to any related modifications and workouts. Additionally, the nature and extent of the Bank's other continuing involvement with the trusts, as indicated above, obligates the Bank to absorb losses and gives the Bank the right to receive certain benefits from these VIEs that could potentially be significant.

The underlying securitized credit card receivables and other assets of the securitization trusts are available only for payment of the beneficial interests issued by the securitization trusts; they are not available to pay the Bank's other obligations or the claims of the Bank's creditors.

The agreements with the credit card securitization trusts require the Bank to maintain a minimum undivided interest in the credit card trusts (generally 5%). As of December 31, 2023 and 2022, the Bank held undivided interests in Bank-sponsored credit card securitization trusts of $4.9 billion and $6.1 billion, respectively. The Bank maintained an average undivided interest in principal receivables owned by those trusts of approximately 65%

and 62% for the years ended December 31, 2023 and 2022, respectively. The Bank did not retain any senior securities and retained $1.5 billion of subordinated securities in certain of its credit card securitization trusts at both December 31, 2023 and 2022. The Bank's undivided interests in the credit card trusts and securities retained are eliminated in consolidation.

Bank-sponsored mortgage and other securitization trusts
The Bank securitizes (or has securitized) originated and purchased residential mortgages, commercial mortgages and other consumer loans. Depending on the particular transaction, as well as the respective business involved, the Bank may act as the servicer of the loans and/or retain certain beneficial interests in the securitization trusts.

The following tables present the total unpaid principal amount of assets held in Bank-sponsored private-label securitization entities, including those in which the Bank has continuing involvement, and those that are consolidated by the Bank. Continuing involvement includes servicing the loans, holding senior interests or subordinated interests (including amounts required to be held pursuant to credit risk retention rules), recourse or guarantee arrangements, and derivative contracts. In certain instances, the Bank's only continuing involvement is servicing the loans. The Bank's maximum loss exposure from retained and purchased interests is the carrying value of these interests.

	Principal amount outstanding			The Bank interest in securitized assets in nonconsolidated VIEs[(c)(d)]			
December 31, 2023 (in millions)	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Investment securities	Other financial assets	Total interests held by the Bank
Securitization-related[(a)]							
Residential mortgage:							
Prime/Alt-A and option ARMs	**$ 51,659**	**$ 675**	**$ 30,152**	**$ 421**	**$ 1,981**	**$ 61**	**$ 2,463**
Subprime	**6,203**	**—**	**659**	**—**	**—**	**—**	**—**
Commercial and other[(b)]	**167,852**	**—**	**85,466**	**239**	**5,638**	**1,353**	**7,230**
Total	**$ 225,714**	**$ 675**	**$ 116,277**	**$ 660**	**$ 7,619**	**$ 1,414**	**$ 9,693**

	Principal amount outstanding			The Bank interest in securitized assets in nonconsolidated VIEs[(c)(d)]			
December 31, 2022 (in millions)	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Investment securities	Other financial assets	Total interests held by the Bank
Securitization-related[(a)]							
Residential mortgage:							
Prime/Alt-A and option ARMs	$ 47,662	$ 754	$ 26,597	$ 382	$ 1,918	$ —	$ 2,300
Subprime	6,753	—	726	—	—	—	—
Commercial and other[(b)]	164,661	—	78,746	268	5,373	670	6,311
Total	$ 219,076	$ 754	$ 106,069	$ 650	$ 7,291	$ 670	$ 8,611

(a) Excludes U.S. GSEs and government agency securitizations, which are not Bank-sponsored.
(b) Consists of securities backed by commercial real estate loans and non-mortgage-related consumer receivables.
(c) Excludes the following: retained servicing; securities retained from loan sales and securitization activity related to U.S. GSEs and government agencies; interest rate and foreign exchange derivatives primarily used to manage interest rate and foreign exchange risks of securitization entities. There were no senior and subordinated securities purchased in connection with the Bank's secondary market-making activities at December 31, 2023 and 2022, respectively.
(d) As of December 31, 2023 and 2022, 77% and 85%, respectively, of the Bank's retained securitization interests, which are predominantly carried at fair value and include amounts required to be held pursuant to credit risk retention rules, were risk-rated "A" or better, on an S&P-equivalent basis. The retained interests in prime residential mortgages consisted of $2.4 billion and $2.3 billion of investment-grade retained interests at December 31, 2023 and 2022, respectively, and $80 million and $15 million of noninvestment-grade retained interests at December 31, 2023 and 2022, respectively. The retained interests in commercial and other securitization trusts consisted of $5.7 billion and $5.4 billion of investment-grade retained interests and $1.6 billion and $899 million of noninvestment-grade retained interests at December 31, 2023 and 2022, respectively.

Residential mortgage
The Bank securitizes originated residential mortgage loans, as well as residential mortgage loans purchased from third parties. The Bank generally retains servicing for all residential mortgage loans originated and may retain servicing for certain mortgage loans purchased. For securitizations of loans serviced by the Bank, it has the power to direct the significant activities of the VIE because it is responsible for decisions related to loan modifications and workouts. The Bank may also retain an interest upon securitization.

In addition, the Bank may engage in trading activities involving securities issued by Bank-sponsored securitization trusts. As a result, the Bank at times retains senior and/or subordinated interests (including residual interests and amounts required to be held pursuant to credit risk retention rules) in residential mortgage securitizations at the time of securitization, and/or reacquires positions in the secondary market in the normal course of business. In certain instances, as a result of the positions retained or reacquired by the Bank, when considered together with the servicing arrangements entered into, the Bank, is deemed to be the primary beneficiary of certain securitization trusts.

The Bank does not consolidate residential mortgage securitizations (Bank-sponsored or third-party-sponsored) when it is not the servicer (and therefore does not have the power to direct the most significant activities of the trust) or does not hold a beneficial interest in the trust that could potentially be significant to the trust.

Commercial mortgages and other consumer securitizations
The Bank originates and securitizes commercial mortgage loans, and engages in underwriting and trading activities involving the securities issued by securitization trusts. The Bank may retain unsold senior and/or subordinated interests (including amounts required to be held pursuant to credit risk retention rules) in commercial mortgage securitizations at the time of securitization but, generally, the Bank does not service commercial loan securitizations. Treasury and CIO may choose to invest in these securitizations as well. For commercial mortgage securitizations the power to direct the significant activities of the VIE generally is held by the servicer or investors in a specified class of securities ("controlling class"). The Bank generally does not retain an interest in the controlling class in its sponsored commercial mortgage securitization transactions.

Multi-seller conduits
Multi-seller conduit entities are separate bankruptcy remote entities that provide secured financing, collateralized by pools of receivables and other financial assets, to customers of the Bank. The conduits fund their financing facilities through the issuance of highly rated commercial paper. The primary source of repayment of the commercial paper is the cash flows from the pools of assets. In most instances, the assets are structured with deal-specific credit enhancements provided to the conduits by the customers (i.e., sellers) or other third parties. Deal-specific credit enhancements are generally structured to cover a multiple of historical losses expected on the pool of assets, and are typically in the form of overcollateralization provided by the seller. The deal-specific credit enhancements mitigate the Bank's potential losses on its agreements with the conduits.

To ensure timely repayment of the commercial paper, and to provide the conduits with funding to provide financing to customers in the event that the conduits do not obtain funding in the commercial paper market, each asset pool financed by the conduits has a minimum 100% deal-specific liquidity facility associated with it provided by the Bank. The Bank also provides the multi-seller conduit vehicles with uncommitted program-wide liquidity facilities and program-wide credit enhancement in the form of standby letters of credit. The amount of program-wide credit enhancement required is based upon commercial paper issuance and approximates 10% of the outstanding balance of commercial paper.

The Bank consolidates its Bank-administered multi-seller conduits, as the Bank has both the power to direct the significant activities of the conduits and a potentially significant economic interest in the conduits. As administrative agent and in its role in structuring transactions, the Bank makes decisions regarding asset types and credit quality, and manages the commercial paper funding needs of the conduits. The Bank's interests that could potentially be significant to the VIEs include the fees received as administrative agent and liquidity and program-wide credit enhancement provider, as well as the potential exposure created by the liquidity and credit enhancement facilities provided to the conduits.

In the normal course of business, the Bank makes markets in and invests in commercial paper issued by the Bank-administered multi-seller conduits. The Bank held $9.8 billion and $13.8 billion of the commercial paper issued by the Bank-administered multi-seller conduits at December 31, 2023 and 2022, respectively, which have been eliminated in consolidation. The Bank's investments reflect its funding needs and capacity and were not driven by market illiquidity. Other than the amounts required to be held pursuant to credit risk retention rules, the Bank is not obligated under any agreement to purchase the commercial paper issued by the Bank-administered multi-seller conduits.

The Bank provides deal-specific liquidity as well as program-wide liquidity and credit enhancement to its administered multi-seller conduits, which have been eliminated in consolidation. The administered multi-seller conduits then provide certain of their clients with lending-related commitments. The unfunded commitments were $10.8 billion and $10.6 billion at December 31, 2023 and 2022, respectively, and are reported as off-balance sheet lending-related commitments in other unfunded commitments to extend credit. Refer to Note 26 for more information on off-balance sheet lending-related commitments.

Municipal bond vehicles

Municipal bond vehicles or tender option bond ("TOB") trusts allow institutions to finance their municipal bond investments at short-term rates. In a typical TOB transaction, the trust purchases highly rated municipal bond(s) of a single issuer and funds the purchase by issuing two types of securities: (1) puttable floating-rate certificates ("floaters") and (2) inverse floating-rate residual interests ("residuals"). The floaters are typically purchased by money market funds or other short-term investors and may be tendered, with requisite notice, to the TOB trust. The residuals are retained by the investor seeking to finance its municipal bond investment. TOB transactions where the residual is held by a third-party investor are typically known as customer TOB trusts, and non-customer TOB trusts are transactions where the Residual is retained by the Bank. Customer TOB trusts are sponsored by a third party. The Bank serves as sponsor for all non-customer TOB transactions. The Bank may provide various services to a TOB trust, including liquidity or tender option provider, and/or sponsor.

The Bank often serves as the sole liquidity or tender option provider for the TOB trusts. The liquidity provider's obligation to perform is conditional and is limited by certain events ("Termination Events"), which include bankruptcy or failure to pay by the municipal bond issuer or credit enhancement provider, an event of taxability on the municipal bonds or the immediate downgrade of the municipal bond to below investment grade. In addition, the liquidity provider's exposure is typically further limited by the high credit quality of the underlying municipal bonds, the excess collateralization in the vehicle, or, in certain transactions, the reimbursement agreements with the Residual holders.

Holders of the floaters may "put," or tender, their floaters to the TOB trust. If the remarketing agent cannot successfully remarket the floaters to another investor, the liquidity provider either provides a loan to the TOB trust for the TOB trust's purchase of the floaters, or it directly purchases the tendered floaters.

TOB trusts are considered to be variable interest entities. The Bank consolidates non-customer TOB trusts because as the Residual holder, the Bank has the right to make decisions that significantly impact the economic performance of the municipal bond vehicle, and it has the right to receive benefits and bear losses that could potentially be significant to the municipal bond vehicle.

Consolidated VIE assets and liabilities

The following table presents information on assets and liabilities related to VIEs consolidated by the Bank as of December 31, 2023 and 2022.

December 31, 2023 (in millions)	Assets				Liabilities		
	Trading assets	Loans	Other[(b)]	Total assets[(c)]	Beneficial interests in VIE assets[(d)]	Other[(e)]	Total liabilities
VIE program type							
Bank-sponsored credit card trusts	**$ —**	**$ 9,460**	**$ 117**	**$ 9,577**	**$ 2,998**	**$ 6**	**$ 3,004**
Bank-administered multi-seller conduits	**1**	**27,372**	**194**	**27,567**	**17,781**	**47**	**17,828**
Municipal bond vehicles	**2,056**	**—**	**22**	**2,078**	**2,259**	**9**	**2,268**
Mortgage securitization entities[(a)]	**—**	**685**	**7**	**692**	**124**	**57**	**181**
Other	**—**	**85**	**—**	**85**	**—**	**—**	**—**
Total	**$ 2,057**	**$ 37,602**	**$ 340**	**$ 39,999**	**$ 23,162**	**$ 119**	**$ 23,281**

December 31, 2022 (in millions)	Assets				Liabilities		
	Trading assets	Loans	Other[(b)]	Total assets[(c)]	Beneficial interests in VIE assets[(d)]	Other[(e)]	Total liabilities
VIE program type							
Bank-sponsored credit card trusts	$ —	$ 9,699	$ 100	$ 9,799	$ 1,999	$ 2	$ 2,001
Bank-administered multi-seller conduits	—	22,819	169	22,988	9,236	52	9,288
Municipal bond vehicles	2,089	—	7	2,096	2,052	10	2,062
Mortgage securitization entities[(a)]	—	763	10	773	137	68	205
Other	—	1,113 [(f)]	4	1,117	—	—	—
Total	$ 2,089	$ 34,394	$ 290	$ 36,773	$ 13,424	$ 132	$ 13,556

(a) Includes residential mortgage securitizations.
(b) Includes assets classified as cash and other assets on the Consolidated balance sheets.
(c) The assets of the consolidated VIEs included in the program types above are used to settle the liabilities of those entities. The assets and liabilities include third-party assets and liabilities of consolidated VIEs (including balances with related parties) and exclude intercompany balances that eliminate in consolidation.
(d) The interest-bearing beneficial interest liabilities issued by consolidated VIEs are classified in the line item on the Consolidated balance sheets titled, "Beneficial interests issued by consolidated VIEs". The holders of these beneficial interests generally do not have recourse to the general credit of the Bank. Included in beneficial interests in VIE assets are long-term beneficial interests of $3.1 billion and $2.1 billion at December 31, 2023 and 2022, respectively.
(e) Includes liabilities classified as accounts payable and other liabilities on the Consolidated balance sheets.
(f) Primarily includes purchased supply chain finance receivables and purchased auto loan securitizations.

VIEs sponsored by third parties

The Bank enters into transactions with VIEs structured by other parties. These include, for example, acting as a derivative counterparty, liquidity provider, investor, underwriter, placement agent, remarketing agent, trustee or custodian. These transactions are conducted at arm's-length, and individual credit decisions are based on the analysis of the specific VIE, taking into consideration the quality of the underlying assets. Where the Bank does not have the power to direct the activities of the VIE that most significantly impact the VIE's economic performance, or a variable interest that could potentially be significant, the Bank generally does not consolidate the VIE, but it records and reports these positions on its Consolidated balance sheets in the same manner it would record and report positions in respect of any other third-party transaction.

Tax credit vehicles

The Bank holds investments in unconsolidated tax credit vehicles, which are limited partnerships and similar entities that own and operate affordable housing, energy, and other projects. These entities are primarily considered VIEs. A third party is typically the general partner or managing member and has control over the significant activities of the tax credit vehicles, and accordingly the Bank does not consolidate tax credit vehicles. The Bank generally invests in these partnerships as a limited partner and earns a return primarily through the receipt of tax credits allocated to the projects. The maximum loss exposure, represented by equity investments and funding commitments, was $30.9 billion and $25.0 billion, of which $13.5 billion and $9.1 billion was unfunded at December 31, 2023 and 2022, respectively. The Bank assesses each project and to reduce the risk of loss, may withhold varying amounts of its capital investment until the project qualifies for tax credits. Refer to Note 23 for further information on affordable housing tax credits and Note 26 for more information on off-balance sheet lending-related commitments.

Customer municipal bond vehicles (TOB trusts)

The Bank may provide various services to customer TOB trusts, including liquidity or tender option provider. In certain customer TOB transactions, the Bank as liquidity provider, has entered into a reimbursement agreement with the Residual holder. In those transactions, upon the termination of the vehicle, the Bank has recourse to the third-party Residual holders for any shortfall. The Bank does not have any intent to protect Residual holders from potential losses on any of the underlying municipal bonds. The Bank does not consolidate customer TOB trusts, since the Bank does not have the power to make decisions that significantly impact the economic performance of the municipal bond vehicle.

The Bank's maximum exposure as a liquidity provider to customer TOB trusts at December 31, 2023 and 2022, was $5.1 billion and $5.8 billion, respectively. The fair value of assets held by such VIEs at December 31, 2023 and 2022 was $7.3 billion and $8.2 billion, respectively.

Loan securitizations

The Bank has securitized and sold a variety of loans, including residential mortgages, credit card receivables, commercial mortgages and other consumer loans. The purposes of these securitization transactions were to satisfy investor demand and to generate liquidity for the Bank.

For loan securitizations in which the Bank is not required to consolidate the trust, the Bank records the transfer of the loan receivable to the trust as a sale when all of the following accounting criteria for a sale are met: (1) the transferred financial assets are legally isolated from the Bank's creditors; (2) the transferee or beneficial interest holder can pledge or exchange the transferred financial assets; and (3) The Bank does not maintain effective control over the transferred financial assets (e.g., the Bank cannot repurchase the transferred assets before their maturity and it does not have the ability to unilaterally cause the holder to return the transferred assets).

For loan securitizations accounted for as a sale, the Bank recognizes a gain or loss based on the difference between the value of proceeds received (including cash, beneficial interests, or servicing assets received) and the carrying value of the assets sold. Gains and losses on securitizations are reported in noninterest revenue.

Securitization activity

The following table provides information related to the Bank's securitization activities for the years ended December 31, 2023, 2022 and 2021, related to assets held in Bank-sponsored securitization entities that were not consolidated by the Bank, and where sale accounting was achieved at the time of the securitization.

Year ended December 31, (in millions)	2023 Residential mortgage[(b)]	2023 Commercial and other[(c)]	2022 Residential mortgage[(b)]	2022 Commercial and other[(c)]	2021 Residential mortgage[(b)]	2021 Commercial and other[(c)]
Principal securitized	**$ 7,678**	**$ 3,901**	$ 10,218	$ 9,036	$ 23,876	$ 14,917
All cash flows during the period:						
Proceeds received from loan sales as cash or financial instruments[(a)]	**$ 7,251**	**$ 3,896**	$ 9,783	$ 8,921	$ 24,450	$ 15,044
Servicing fees collected	**24**	**5**	62	2	152	1
Cash flows received on interests	**296**	**367**	432	225	486	207

(a) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale. The proceeds received were primarily cash.
(b) Represents prime mortgages. Excludes loan securitization activity related to U.S. GSEs and government agencies.
(c) Includes commercial mortgage and other consumer loans.

Key assumptions used to value retained interests originated during the year are shown in the table below.

Year ended December 31,	2023	2022	2021
Residential mortgage retained interest:			
Weighted-average life (in years)	**14.3**	10.8	3.5
Weighted-average discount rate	**5.3 %**	3.7 %	1.9 %
Commercial mortgage retained interest:			
Weighted-average life (in years)	**3.0**	5.7	6.0
Weighted-average discount rate	**4.5 %**	2.9 %	1.2 %

Loans and excess MSRs sold to U.S. government-sponsored enterprises and loans in securitization transactions pursuant to Ginnie Mae guidelines

In addition to the amounts reported in the securitization activity tables above, the Bank, in the normal course of business, sells originated and purchased mortgage loans and certain originated excess MSRs on a nonrecourse basis, predominantly to U.S. GSEs. These loans and excess MSRs are sold primarily for the purpose of securitization by the U.S. GSEs, who provide certain guarantee provisions (e.g., credit enhancement of the loans). The Bank also sells loans into securitization transactions pursuant to Ginnie Mae guidelines; these loans are typically insured or guaranteed by another U.S. government agency. The Bank does not consolidate the securitization vehicles underlying these transactions as it is not the primary beneficiary. For a limited number of loan sales, the Bank is obligated to share a portion of the credit risk associated with the sold loans with the purchaser. Refer to Note 26 for additional information about the Bank's loan sales- and securitization-related indemnifications and Note 16 for additional information about the impact of the Bank's sale of certain excess MSRs.

The following table summarizes the activities related to loans sold to the U.S. GSEs, and loans in securitization transactions pursuant to Ginnie Mae guidelines.

Year ended December 31, (in millions)	2023	2022	2021
Carrying value of loans sold	$ 19,906	$ 48,891	$ 105,035
Proceeds received from loan sales as cash	$ 300	$ 22	$ 161
Proceeds from loan sales as securities[(a)(b)]	19,389	48,096	103,286
Total proceeds received from loan sales[(c)]	$ 19,689	$ 48,118	$ 103,447
Gains/(losses) on loan sales[(d)(e)]	$ —	$ (25)	$ 9

(a) Includes securities from U.S. GSEs and Ginnie Mae that are generally sold shortly after receipt or retained as part of the Bank's investment securities portfolio.
(b) Included in level 2 assets.
(c) Excludes the value of MSRs retained upon the sale of loans.
(d) Gains/(losses) on loan sales include the value of MSRs.
(e) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale.

Options to repurchase delinquent loans

In addition to the Bank's obligation to repurchase certain loans due to material breaches of representations and warranties as discussed in Note 26. The Bank also has the option to repurchase delinquent loans that it services for Ginnie Mae loan pools, as well as for other U.S. government agencies under certain arrangements. The Bank typically elects to repurchase delinquent loans from Ginnie Mae loan pools as it continues to service them and/or manage the foreclosure process in accordance with the applicable requirements, and such loans continue to be insured or guaranteed. When the Bank's repurchase option becomes exercisable, such loans must be reported on the Consolidated balance sheets as a loan with a corresponding liability. Refer to Note 13 for additional information.

The following table presents loans the Bank repurchased or had an option to repurchase, real estate owned, and foreclosed government-guaranteed residential mortgage loans recognized on the Bank's Consolidated balance sheets as of December 31, 2023 and 2022. Substantially all of the loans and real estate owned are insured or guaranteed by U.S. government agencies.

December 31, (in millions)	2023	2022
Loans repurchased or option to repurchase[(a)]	$ 596	$ 837
Real estate owned	8	10
Foreclosed government-guaranteed residential mortgage loans[(b)]	22	26

(a) Predominantly all of these amounts relate to loans that have been repurchased from Ginnie Mae loan pools.
(b) Relates to voluntary repurchases of loans, which are included in accrued interest and accounts receivable.

Loan delinquencies and liquidation losses

The table below includes information about components of and delinquencies related to nonconsolidated securitized financial assets held in Bank-sponsored private-label securitization entities, in which the Bank has continuing involvement as of December 31, 2023 and 2022.

As of or for the year ended December 31, (in millions)	Securitized assets		90 days past due		Net liquidation losses/ (recoveries)	
	2023	2022	2023	2022	2023	2022
Securitized loans						
Residential mortgage:						
Prime/ Alt-A & option ARMs	$ 30,152	$ 26,597	$ 266	$ 287	$ 10	$ (21)
Subprime	659	726	62	80	1	(3)
Commercial and other	85,466	78,746	1,410	426	40	15
Total loans securitized	$ 116,277	$ 106,069	$ 1,738	$ 793	$ 51	$ (9)

Note 16 – Goodwill, mortgage servicing rights, and other intangible assets

Goodwill

Goodwill is recorded upon completion of a business combination as the difference between the purchase price and the fair value of the net assets acquired, and can be adjusted up to one year from the acquisition date as additional information pertaining to facts and circumstances that existed as of the acquisition date is obtained about the fair value of assets acquired and liabilities assumed. Subsequent to initial recognition, goodwill is not amortized but is tested for impairment during the fourth quarter of each fiscal year, or more often if events or circumstances, such as adverse changes in the business climate, indicate that there may be an impairment.

The following table presents changes in the carrying amount of goodwill.

Year ended December 31, (in millions)	**2023**	2022	2021
Balance at beginning of period[(a)]	**$ 40,520**	$ 40,202	$ 40,075
Changes during the period from:			
Business combinations[(b)]	**9**	337	134
Other[(c)]	**8**	(19)	(7)
Balance at December 31,[(a)]	**$ 40,537**	$ 40,520	$ 40,202

(a) Reflects gross goodwill balances as the Bank has not recognized any impairment losses to date.
(b) For 2022, represents estimated goodwill associated with the acquisitions of Figg, Inc., Renovite Technologies, Inc. and Volkswagen Payments S.A. For 2021, represents goodwill associated with the acquisition of Frank, a college financial planning platform for students.
(c) Predominantly foreign currency adjustments.

Goodwill impairment testing

The Bank's goodwill was not impaired at December 31, 2023, 2022 and 2021.

The goodwill impairment test is generally performed by comparing the current fair value of the Bank with its carrying value. If the fair value is in excess of the carrying value, then the Bank's goodwill is considered not to be impaired. If the fair value is less than the carrying value, then an impairment is recognized for the amount by which the Bank's carrying value exceeds its fair value, up to the amount of the Bank's goodwill.

The primary method the Bank uses to estimate its fair value is the income approach. This approach projects cash flows for the forecast period and uses the perpetuity growth method to calculate terminal values. These cash flows and terminal values are then discounted using an appropriate discount rate.

Unanticipated declines in business performance, increases in credit losses, increases in capital requirements, as well as deterioration in economic or market conditions, adverse regulatory or legislative changes or increases in the estimated market cost of equity, could cause the estimated fair value of the Bank to decline in the future, which could result in a material impairment loss to earnings in a future period related to some portion of the associated goodwill.

Mortgage servicing rights

MSRs represent the fair value of expected future cash flows for performing servicing activities for others. The fair value considers estimated future servicing fees and ancillary revenue, offset by estimated costs to service the loans, and generally declines over time as net servicing cash flows are received, effectively amortizing the MSR asset against contractual servicing and ancillary fee income. MSRs are either purchased from third parties or recognized upon sale or securitization of mortgage loans if servicing is retained.

As permitted by U.S. GAAP, the Bank has elected to account for its MSRs at fair value. The Bank treats its MSRs as a single class of servicing assets based on the availability of market inputs used to measure the fair value of its MSR asset and its treatment of MSRs as one aggregate pool for risk management purposes. The Bank estimates the fair value of MSRs using an option-adjusted spread ("OAS") model, which projects MSR cash flows over multiple interest rate scenarios in conjunction with the Bank's prepayment model, and then discounts these cash flows at risk-adjusted rates. The model considers portfolio characteristics, contractually specified servicing fees, prepayment assumptions, delinquency rates, costs to service, late charges and other ancillary revenue, and other economic factors. The Bank compares fair value estimates and assumptions to observable market data where available, and also considers recent market activity and actual portfolio experience.

The fair value of MSRs is sensitive to changes in interest rates, including their effect on prepayment speeds. MSRs typically decrease in value when interest rates decline because declining interest rates tend to increase prepayments and therefore reduce the expected life of the net servicing cash flows that comprise the MSR asset. Conversely, securities (e.g., mortgage-backed securities), and certain derivatives (e.g., those for which the Bank receives fixed-rate interest payments) increase in value when interest rates decline. The Bank uses combinations of derivatives and securities to manage the risk of changes in the fair value of MSRs. The intent is to offset any interest-rate related changes in the fair value of MSRs with changes in the fair value of the related risk management instruments.

The following table summarizes MSR activity for the years ended December 31, 2023, 2022 and 2021.

As of or for the year ended December 31, (in millions, except where otherwise noted)	2023	2022	2021
Fair value at beginning of period	**$ 7,973**	$ 5,494	$ 3,276
MSR activity:			
Originations of MSRs	**253**	798	1,659
Purchase of MSRs[a]	**1,028**	1,400	1,363
Disposition of MSRs[b]	**(188)**	(822)	(114)
Net additions/(dispositions)	**1,093**	1,376	2,908
Changes due to collection/realization of expected cash flows	**(1,011)**	(936)	(788)
Changes in valuation due to inputs and assumptions:			
Changes due to market interest rates and other[c]	**424**	2,022	404
Changes in valuation due to other inputs and assumptions:			
Projected cash flows (e.g., cost to service)	**(22)**	14	109
Discount rates	**14**	–	–
Prepayment model changes and other[d]	**51**	3	(415)
Total changes in valuation due to other inputs and assumptions	**43**	17	(306)
Total changes in valuation due to inputs and assumptions	**467**	2,039	98
Fair value at December 31,	**$ 8,522**	$ 7,973	$ 5,494
Change in unrealized gains/(losses) included in income related to MSRs held at December 31,	**$ 467**	$ 2,039	$ 98
Contractual service fees, late fees and other ancillary fees included in income	**1,590**	1,535	1,298
Third-party mortgage loans serviced at December 31, (in billions)	**632**	584	520
Servicer advances, net of an allowance for uncollectible amounts, at December 31[e]	**659**	758	1,611

(a) Includes purchase price adjustments associated with MSRs purchased, primarily as a result of loans that prepaid within 90 days of settlement, allowing the Bank to recover the purchase price.
(b) Includes excess MSRs transferred to agency-sponsored trusts in exchange for stripped mortgage backed securities ("SMBS"). In each transaction, a portion of the SMBS was acquired by third parties at the transaction date; the Bank acquired the remaining balance of those SMBS as trading securities.
(c) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
(d) Represents changes in prepayments other than those attributable to changes in market interest rates.
(e) Represents amounts the Bank pays as the servicer (e.g., scheduled principal and interest, taxes and insurance), which will generally be reimbursed within a short period of time after the advance from future cash flows from the trust or the underlying loans. The Bank's credit risk associated with these servicer advances is minimal because reimbursement of the advances is typically senior to all cash payments to investors. In addition, the Bank maintains the right to stop payment to investors if the collateral is insufficient to cover the advance. However, certain of these servicer advances may not be recoverable if they were not made in accordance with applicable rules and agreements.

The following table presents the components of mortgage fees and related income (including the impact of MSR risk management activities) for the years ended December 31, 2023, 2022 and 2021.

Year ended December 31, (in millions)	2023	2022	2021
Mortgage fees and related income			
Production revenue	**$ 421**	$ 497	$ 2,215
Net mortgage servicing revenue:			
Operating revenue:			
Loan servicing revenue	**1,634**	1,582	1,257
Changes in MSR asset fair value due to collection/realization of expected cash flows	**(1,011)**	(936)	(788)
Total operating revenue	**623**	646	469
Risk management:			
Changes in MSR asset fair value due to market interest rates and other[(a)]	**424**	2,022	404
Other changes in MSR asset fair value due to other inputs and assumptions in model[(b)]	**43**	17	(306)
Change in derivative fair value and other	**(336)**	(1,946)	(623)
Total risk management	**131**	93	(525)
Total net mortgage servicing revenue	**754**	739	(56)
All other	**1**	14	11
Mortgage fees and related income	**$ 1,176**	$ 1,250	$ 2,170

(a) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
(b) Represents the aggregate impact of changes in model inputs and assumptions such as projected cash flows (e.g., cost to service), discount rates and changes in prepayments other than those attributable to changes in market interest rates (e.g., changes in prepayments due to changes in home prices).

Changes in fair value based on variations in assumptions generally cannot be easily extrapolated, because the relationship of the change in the assumptions to the change in fair value are often highly interrelated and may not be linear. In the following table, the effect that a change in a particular assumption may have on the fair value is calculated without changing any other assumption. In reality, changes in one factor may result in changes in another, which would either magnify or counteract the impact of the initial change.

The table below outlines the key economic assumptions used to determine the fair value of the Bank's MSRs at December 31, 2023 and 2022, and outlines the sensitivities of those fair values to immediate adverse changes in those assumptions, as defined below.

December 31, (in millions, except rates)	2023	2022
Weighted-average prepayment speed assumption (constant prepayment rate)	**6.29 %**	6.12 %
Impact on fair value of 10% adverse change	**$ (206)**	$ (183)
Impact on fair value of 20% adverse change	**(401)**	(356)
Weighted-average option adjusted spread[(a)]	**6.10 %**	5.77 %
Impact on fair value of 100 basis points adverse change	**$ (369)**	$ (341)
Impact on fair value of 200 basis points adverse change	**(709)**	(655)

(a) Includes the impact of operational risk and regulatory capital.

Other intangible assets

The Bank's finite-lived and indefinite-lived other intangible assets are initially recorded at their fair value primarily upon completion of a business combination. Subsequently, the Bank's finite lived intangible assets, including core deposit intangibles, customer relationship intangibles, and certain other intangible assets, are amortized over their useful lives, estimated based on the expected future economic benefits to the Bank of the intangible asset. The Bank's intangible assets with indefinite lives are not subject to amortization and are assessed periodically for impairment.

As of December 31, 2023 and 2022, the gross carrying values of other intangible assets were $1.6 billion and $334 million, respectively, and the accumulated amortization was $406 million and $228 million, respectively. Other intangible assets primarily consists of finite-lived intangible assets.

As of December 31, 2023, other intangible assets reflected core deposit and certain wealth management customer relationship intangibles related to the First Republic acquisition. Refer to Note 29 for additional information on the First Republic acquisition.

As of December 31, 2023 and 2022, amortization expense was $177 million and $52 million, respectively.

The following table presents estimated future amortization expense.

December 31, (millions)	Finite-lived intangible assets
2024	$ 199
2025	187
2026	185
2027	185
2028	185

Impairment testing

The Bank's finite-lived and indefinite-lived other intangible assets are assessed for impairment annually or more often if events or changes in circumstances indicate that the asset might be impaired. Once the Bank determines that an impairment exists for an intangible asset, the impairment is recognized in other expense.

Note 17 – Premises and equipment

Premises and equipment includes land carried at cost, as well as buildings, leasehold improvements, internal-use software and furniture and equipment carried at cost less accumulated depreciation and amortization. The Bank's operating lease right-of-use assets are also included in Premises and equipment. Refer to Note 19 for a further discussion of the Bank's right-of-use assets.

The following table presents certain components of Premises and equipment.

December 31, (in millions)	2023	2022
Land, buildings and leasehold improvements	$ **14,643**	$ 13,293
Right-of-use assets[(a)]	**7,340**	6,804
Other premises and equipment[(b)]	**6,845**	6,250
Total premises and equipment	**$ 28,828**	$ 26,347

(a) Excluded $366 million and $202 million of right-of-use assets that were recorded in Other assets at December 31, 2023 and 2022, respectively.
(b) Other premises and equipment is comprised of internal-use software and furniture and equipment.

The Bank computes depreciation using the straight-line method over the estimated useful life for buildings and furniture and equipment. The Bank depreciates leasehold improvements over the lesser of the remainder of the lease term or the estimated useful life. The Bank also capitalizes certain costs associated with the acquisition or development of internal-use software. Once the software is ready for its intended use, these costs are amortized on a straight-line basis over the software's expected useful life. The estimated useful lives range from 10 to 50 years for buildings and leasehold improvements, and 3 to 10 years for internal-use software and furniture and equipment.

Impairment is assessed when events or changes in circumstances indicate that the carrying value of an asset may not be fully recoverable.

Note 18 – Deposits

As of December 31, 2023 and 2022, noninterest-bearing and interest-bearing deposits were as follows.

December 31, (in millions)	2023	2022
U.S. offices		
Noninterest-bearing (included **$75,533** and $26,483 at fair value)[(a)]	$ **645,872**	$ 648,852
Interest-bearing (included **$573** and $586 at fair value)[(a)]	**1,392,043**	1,365,661
Total deposits in U.S. offices	**2,037,915**	2,014,513
Non-U.S. offices		
Noninterest-bearing (included **$1,737** and $1,400 at fair value)[(a)]	**24,492**	28,394
Interest-bearing (included **$681** and $273 at fair value)[(a)]	**435,824**	397,815
Total deposits in non-U.S. offices	**460,316**	426,209
Total deposits	**$ 2,498,231**	$ 2,440,722

(a) Includes structured notes classified as deposits for which the fair value option has been elected. Refer to Note 4 for further discussion.

As of December 31, 2023 and 2022, time deposits in denominations that met or exceeded the insured limit were as follows.

December 31, (in millions)	2023	2022
U.S. offices	$ **152,894**	$ 76,698
Non-U.S. offices[(a)]	**90,744**	78,241
Total	**$ 243,638**	$ 154,939

(a) Represents all time deposits in non-U.S. offices as these deposits typically exceed the insured limit.

As of December 31, 2023, the remaining maturities of interest-bearing time deposits were as follows.

December 31, (in millions)	U.S.	Non-U.S.	Total
2024	$195,074	$ 87,490	$ 282,564
2025	20,803	209	21,012
2026	243	30	273
2027	140	35	175
2028	136	992	1,128
After 5 years	475	251	726
Total	$216,871	$ 89,007	$ 305,878

Note 19 – Leases

The Bank as lessee

At December 31, 2023, the Bank and its subsidiaries were obligated under a number of noncancellable leases, predominantly operating leases for premises and equipment used primarily for business purposes. These leases generally have terms of 20 years or less, determined based on the contractual maturity of the lease, and include periods covered by options to extend or terminate the lease when the Bank is reasonably certain that it will exercise those options. All leases with lease terms greater than twelve months are reported as a lease liability with a corresponding right-of-use ("ROU") asset. None of these lease agreements impose restrictions on the Bank's ability to pay dividends, engage in debt or equity financing transactions or enter into further lease agreements. Certain of these leases contain escalation clauses that will increase rental payments based on maintenance, utility and tax increases, which are non-lease components. The Bank elected not to separate lease and non-lease components of a contract for its real estate leases. As such, real estate lease payments represent payments on both lease and non-lease components.

Operating lease liabilities and ROU assets are recognized at the lease commencement date based on the present value of the future minimum lease payments over the lease term. The future lease payments are discounted at a rate that estimates the Bank's collateralized borrowing rate for financing instruments of a similar term and are included in accounts payable and other liabilities. The operating lease ROU assets, predominantly included in premises and equipment, also include any lease prepayments made, plus initial direct costs incurred, less any lease incentives received. Rental expense associated with operating leases is recognized on a straight-line basis over the lease term, and generally included in occupancy expense in the Consolidated statements of income.

The carrying values of the Bank's operating leases were as follows:

December 31, (in millions, except where otherwise noted)	2023	2022
Right-of-use assets	$ 7,706 [(a)]	$ 7,006
Lease liabilities	8,191 [(b)]	7,495
Weighted average remaining lease term (in years)	8.5	8.5
Weighted average discount rate	3.88 %	3.35 %
Supplemental cash flow information		
Cash paid for amounts included in the measurement of lease liabilities - operating cash flows	$ 1,511	$ 1,492
Supplemental non-cash information		
Right-of-use assets obtained in exchange for operating lease obligations	$ 2,025	$ 936

(a) Included $647 million of right-of-use assets associated with First Republic.
(b) Included $712 million of lease liabilities associated with First Republic.

Year ended December 31, (in millions)	2023	2022
Rental expense		
Gross rental expense	$ 1,882	$ 1,890
Sublease rental income	(49)	(91)
Net rental expense	$ 1,833	$ 1,799

The following table presents future payments under operating leases as of December 31, 2023:

Year ended December 31, (in millions)	
2024	$ 1,548
2025	1,447
2026	1,216
2027	1,072
2028	923
After 2028	3,548
Total future minimum lease payments	9,754
Less: Imputed interest	(1,563)
Total	$ 8,191

In addition to the table above, as of December 31, 2023, the Bank had additional future operating lease commitments of $419 million that were signed but had not yet commenced. These operating leases will commence between 2024 and 2026 with lease terms up to 21 years.

The Bank as lessor

The Bank provides auto and equipment lease financing to its customers through lease arrangements with lease terms that may contain renewal, termination and/or purchase options. The Bank's lease financings are predominantly auto operating leases. These assets subject to operating leases are recognized in other assets on the Bank's Consolidated balance sheets and are depreciated on a straight-line basis over the lease term to reduce the asset to its estimated residual value. Depreciation expense is included in technology, communications and equipment expense in the Consolidated statements of income. The Bank's lease income is generally recognized on a straight-line basis over the lease term and is included in other income in the Consolidated statements of income.

On a periodic basis, the Bank assesses leased assets for impairment, and if the carrying amount of the leased asset exceeds the undiscounted cash flows from the lease payments and the estimated residual value upon disposition of the leased asset, an impairment is recognized.

The risk of loss on auto and equipment leased assets relating to the residual value of the leased assets is monitored through projections of the asset residual values at lease origination and periodic review of residual values, and is mitigated through arrangements with certain manufacturers or lessees.

The following table presents the carrying value of assets subject to leases reported on the Consolidated balance sheets:

December 31, (in millions)	**2023**	2022
Carrying value of assets subject to operating leases, net of accumulated depreciation	**$ 10,663**	$ 12,298
Accumulated depreciation	**3,288**	4,281

The following table presents the Bank's operating lease income and the related depreciation expense on the Consolidated statements of income:

Year ended December 31, (in millions)	**2023**	2022	2021
Operating lease income	**$ 2,841**	$ 3,651	$ 4,906
Depreciation expense	**1,777**	2,472	3,379

The following table presents future receipts under operating leases as of December 31, 2023:

Year ended December 31, (in millions)	
2024	$ 1,868
2025	1,158
2026	451
2027	32
2028	9
After 2028	8
Total future minimum lease receipts	$ 3,526

Note 20 – Long-term debt

The Bank issues long-term debt denominated in various currencies, predominantly U.S. dollars, with both fixed and variable interest rates. Included in senior and subordinated debt below are various equity-linked or other indexed instruments, which the Bank has elected to measure at fair value. Changes in fair value are recorded in principal transactions revenue in the Consolidated statements of income, except for unrealized gains/(losses) due to DVA which are recorded in OCI. The following table is a summary of long-term debt carrying values (including unamortized premiums and discounts, issuance costs, valuation adjustments and fair value adjustments, where applicable) by remaining contractual maturity as of December 31, 2023.

By remaining maturity at December 31, (in millions, except rates)		2023				2022
		Under 1 year	1-5 years	After 5 years	**Total**	Total
Long-term debt payable to JPMorgan Chase & Co. and affiliates						
Senior debt:	Fixed rate	$ –	$ 24	$ 44	$ 68	$ 52
	Variable rate	2,364	82,307	90	84,761	35,080
	Interest rates[f]	– %	6.07 %	– %	6.07 %	4.69 %
	Subtotal	$ 2,364	$ 82,331	$ 134	$ 84,829	$ 35,132
Long-term debt issued to unrelated parties						
Federal Home Loan Banks ("FHLB") advances:	Fixed rate	$ 13,941	$ 9,269	$ 37	$ 23,247 [g]	$ 93
	Variable rate	4,000	14,000	–	18,000	11,000
	Interest rates[f]	4.59 %	5.12 %	6.06 %	4.89 %	4.32%
Purchase Money Note[a]:	Fixed rate	$ –	$ 48,988	$ –	$ 48,988	NA
	Interest rates[f]	– %	3.40 %	– %	3.40 %	NA
Senior debt:	Fixed rate	$ 867	$ 8,491	$ 5,031	$ 14,389	$ 10,882
	Variable rate	7,175	6,409	3,653	17,237	17,770
	Interest rates[f]	4.28 %	5.41 %	1.49%	3.92 %	2.01%
Subordinated debt:	Fixed rate	$ 255	$ –	$ –	$ 255	$ 261
	Interest rates[f]	8.25 %	– %	– %	8.25 %	8.25 %
	Subtotal	$ 26,238	$ 87,157	$ 8,721	$ 122,116	$ 40,006
Total long-term debt[b][c][d]		$ 28,602	$ 169,488	$ 8,855	$ 206,945 [h][i]	$ 75,138
Long-term beneficial interests:						
	Fixed rate	$ –	$ 2,998	$ –	$ 2,998	$ 1,999
	Variable rate	–	–	124	124	138
	Interest rates[f]	– %	4.74 %	3.44 %	4.69 %	2.80 %
Total long-term beneficial interests[e]		$ –	$ 2,998	$ 124	$ 3,122	$ 2,137

(a) Reflects the Purchase Money Note associated with the First Republic acquisition. Refer to Note 29 for additional information.
(b) Included long-term debt of $93.0 billion and $13.8 billion secured by assets totaling $218.5 billion and $208.3 billion at December 31, 2023 and 2022, respectively. The amount of long-term debt secured by assets does not include amounts related to hybrid instruments.
(c) Included $29.0 billion and $27.1 billion of long-term debt accounted for at fair value at December 31, 2023 and 2022, respectively.
(d) Included $2.9 billion and $2.4 billion of outstanding zero-coupon notes at December 31, 2023 and 2022, respectively. The aggregate principal amount of these notes at their respective maturities is $5.4 billion and $4.4 billion, respectively. The aggregate principal amount reflects the contractual principal payment at maturity, which may exceed the contractual principal payment at the Bank's next call date, if applicable.
(e) Included on the Consolidated balance sheets in beneficial interests issued by consolidated VIEs. Excluded short-term commercial paper and other short-term beneficial interests of $20.0 billion and $11.3 billion at December 31, 2023 and 2022, respectively.
(f) The interest rates shown are the weighted average of contractual rates in effect at December 31, 2023 and 2022, respectively, including non-U.S. dollar fixed- and variable-rate issuances, which excludes the effects of the associated derivative instruments used in hedge accounting relationships, if applicable. The interest rates shown exclude structured notes accounted for at fair value.
(g) As of December 31, 2023, included $23.2 billion of FHLB advances associated with First Republic. Refer to Note 29 for additional information.
(h) As of December 31, 2023, long-term debt in the aggregate of $9.0 billion was redeemable at the option of the Bank in whole or in part, prior to maturity, based on the terms specified in the respective instruments.
(i) The aggregate carrying values of debt that matures in each of the five years subsequent to 2023 is $28.6 billion in 2024, $97.0 billion in 2025, $15.1 billion in 2026, $2.9 billion in 2027 and $54.5 billion in 2028.

The weighted-average contractual interest rates for total long-term debt excluding structured notes accounted for at fair value were 4.98% and 4.47% as of December 31, 2023 and 2022, respectively. In order to modify exposure to interest rate movements, the Bank utilizes derivative instruments, primarily interest rate swaps, in conjunction with some of its debt issuances. The use of these instruments modifies the Bank's interest expense on the associated debt. The modified weighted-average interest rates for total long-term debt, including the effects of related derivative instruments, were 4.99% and 4.46% as of December 31, 2023 and 2022, respectively.

The Bank's unsecured debt does not contain requirements that would call for an acceleration of payments, maturities or changes in the structure of the existing debt, provide any limitations on future borrowings or require additional collateral, based on unfavorable changes in the Bank's credit ratings, financial ratios or earnings.

Note 21 – Related party transactions

JPMorgan Chase Bank, N.A. regularly enters into transactions with JPMorgan Chase and its various subsidiaries collectively, JPMorgan Chase affiliates. The following discussion summarizes the more significant types of transactions.

Securities financing activities
Securities financing activities include resale, repurchase, securities borrowed and securities loaned agreements entered into with JPMorgan Chase affiliates. Interest accrued in connection with securities financing agreements is recorded in interest income and interest expense. Refer to Note 12 for further discussion of securities financing activities.

Deposits
JPMorgan Chase affiliates may deposit excess funds into noninterest-bearing, interest-bearing demand or time deposit accounts with the Bank. Interest accrued on interest bearing deposits is recorded in interest expense by the Bank. Refer to Note 18 for further discussion of deposits.

Long-term debt
The Bank issues long-term debt to JPMorgan Chase affiliates as part of JPMorgan Chase's liquidity management strategy. Interest accrued on long-term debt is recorded in interest expense. Refer to Note 20 for further discussion of long-term debt.

Derivative transactions
The Bank executes derivative transactions with JPMorgan Chase affiliates as part of its client driven market-making activities and to facilitate hedging certain risks for its affiliates. To accomplish this, the Bank predominantly enters into offsetting derivative transactions with third-parties and records both the third-party and related party gains and losses in principal transactions revenue. Refer to Note 6 for further discussion of derivatives activities.

Servicing agreements and fee arrangements
Through servicing agreements, the Bank provides and receives operational support and services to and from JPMorgan Chase affiliates. These servicing agreements cover certain occupancy, marketing, communication and technology services, other shared corporate service costs, and employee related costs associated with risk management expertise and trading services. The Bank is allocated or allocates a share of the cost of the services over the relevant service period based on the agreed methodology. Fees earned by the Bank for services provided to affiliates are recorded in all other income, and fees incurred by the Bank for services from affiliates are recorded in noninterest expense.

Revenue and expense-related transactions with related parties are listed below.

Year ended December 31, (in millions)	2023	2022	2021
Interest income and Interest expense			
Interest income	**$ 6,367**	$ 1,952	$ (9)
Interest expense	**8,013**	2,606	390
Net interest income	**(1,646)**	(654)	(399)
Noninterest revenue			
Principal transactions	**(3,444)**	20,105	8,691
All other income[(a)]	**8,684**	7,637	7,391
Total noninterest revenue	**5,240**	27,742	16,082
Noninterest expense[(a)]	**6,818**	6,046	6,619

Balances with related parties are listed below.

December 31, (in millions)	2023	2022
Assets		
Federal funds sold and securities purchased under resale agreements	**$ 99,714**	$ 107,038
Accrued interest and accounts receivable	**9,309**	28,989
All other assets	**24,021**	6,487
Liabilities		
Deposits[(b)]	**97,543**	100,548
Federal funds purchased and securities loaned or sold under repurchase agreements	**44,268**	40,821
Accounts payable and all other liabilities	**13,168**	13,749
Long-term debt	**84,829**	35,132

(a) All other income includes fees earned by the Bank for services provided to JPMorgan Chase affiliates. Noninterest expense includes fees incurred by the Bank for services provided from JPMorgan Chase affiliates.
(b) At December 31, 2023 and 2022, includes $25.0 billion that was pledged to support extensions of credit and other transactions requiring collateral with JPMorgan Chase as defined by Section 23A under the Federal Reserve Act, which defines the constraints that apply to U.S. banks in certain of their interactions with affiliates.

The following table summarizes information on derivative receivables and payables with JPMorgan Chase affiliates before and after netting adjustments for legally enforceable master netting agreements as of December 31, 2023 and 2022.

	2023		2022	
December 31, (in millions)	Gross derivative receivable/payable	Net derivative receivable/payable	Gross derivative receivable/payable	Net derivative receivable/payable
Derivative receivables from affiliates	**$ 88,355**	**$ 354**	$ 89,480	$ 322
Derivative payables to affiliates	**82,810**	**102**	77,784	56

Note 22 – Accumulated other comprehensive income/(loss)

AOCI includes the after-tax change in unrealized gains and losses on investment securities, foreign currency translation adjustments (including the impact of related derivatives), fair value changes of excluded components on fair value hedges, cash flow hedging activities, net gain/(loss) related to the Bank's defined benefit pension and OPEB plans, and fair value option-elected liabilities arising from changes in the Bank's own credit risk (DVA).

Year ended December 31, (in millions)	Unrealized gains/(losses) on investment securities	Translation adjustments, net of hedges	Cash flow hedges	Defined benefit pension and OPEB plans	DVA on fair value option elected liabilities	Accumulated other comprehensive income/(loss)
Balance at December 31, 2020	$ 8,162	$ (243)	$ 2,383	$ (1,725)	$ (159)	$ 8,418
Net change	(5,516)	(442)	(2,679)	688	(291)	(8,240)
Balance at December 31, 2021	$ 2,646 (a)	$ (685)	$ (296)	$ (1,037)	$ (450)	$ 178
Net change	(11,751)	(555)	(5,359)	(742)	265	(18,142)
Balance at December 31, 2022	$ (9,105) (a)	$ (1,240)	$(5,655)	$ (1,779)	$ (185)	$ (17,964)
Net change	5,387	339	1,723	188	133	7,770
Balance at December 31, 2023	**$ (3,718)** (a)	**$ (901)**	**$(3,932)**	**$ (1,591)**	**$ (52)**	**$ (10,194)**

(a) As of December 31, 2023 includes after-tax net unamortized unrealized gains/(losses) of $(29) million related to HTM securities that have been transferred to AFS as permitted by the new hedge accounting guidance adopted on January 1, 2023. Includes after-tax net unamortized unrealized gains/(losses) of $(895) million, $(1.3) billion and $2.4 billion related to AFS securities that have been transferred to HTM for the years ended 2023, 2022 and 2021, respectively. Refer to Note 11 for further information.

The following table presents the pre-tax and after-tax changes in the components of OCI.

	2023			2022			2021		
Year ended December 31, (in millions)	Pre-tax	Tax effect	After-tax	Pre-tax	Tax effect	After-tax	Pre-tax	Tax effect	After-tax
Unrealized gains/(losses) on investment securities									
Net unrealized gains/(losses) arising during the period	**$ 3,900**	**$ (925)**	**$ 2,975**	$ (17,844)	$ 4,285	$(13,559)	$ (7,604)	$ 1,826	$(5,778)
Reclassification adjustment for realized (gains)/losses included in net income[(a)]	**3,180**	**(768)**	**2,412**	2,380	(572)	1,808	345	(83)	262
Net change	**7,080**	**(1,693)**	**5,387**	(15,464)	3,713	(11,751)	(7,259)	1,743	(5,516)
Translation adjustments[(b)]:									
Translation	**1,539**	**(29)**	**1,510**	(2,859)	142	(2,717)	(2,297)	107	(2,190)
Hedges	**(1,543)**	**372**	**(1,171)**	2,842	(680)	2,162	2,302	(554)	1,748
Net change	**(4)**	**343**	**339**	(17)	(538)	(555)	5	(447)	(442)
Cash flow hedges:									
Net unrealized gains/(losses) arising during the period	**483**	**(114)**	**369**	(7,471)	1,794	(5,677)	(2,303)	553	(1,750)
Reclassification adjustment for realized (gains)/losses included in net income[(c)]	**1,774**	**(420)**	**1,354**	419	(101)	318	(1,222)	293	(929)
Net change	**2,257**	**(534)**	**1,723**	(7,052)	1,693	(5,359)	(3,525)	846	(2,679)
Defined benefit pension and OPEB plans, net change[(d)]:	**248**	**(60)**	**188**	(973)	231	(742)	895	(207)	688
DVA on fair value option elected liabilities, net change:	**$ 173**	**$ (40)**	**$ 133**	$ 355	$ (90)	$ 265	$ (389)	$ 98	$ (291)
Total other comprehensive income/(loss)	**$ 9,754**	**$(1,984)**	**$ 7,770**	$ (23,151)	$ 5,009	$(18,142)	$(10,273)	$ 2,033	$(8,240)

(a) The pre-tax amount is reported in Investment securities gains/(losses) in the Consolidated statements of income.

(b) Reclassifications of pre-tax realized gains/(losses) on translation adjustments and related hedges are reported in other income/expense in the Consolidated statements of income. There were no sales or liquidations of legal entities that resulted in reclassification for the year ended December 31, 2023. The amount reclassified for the year ended December 31, 2022 was not material. During the year ended December 31, 2021, the Bank reclassified a net pre-tax loss of $7 million.

(c) The pre-tax amounts are primarily recorded in noninterest revenue, net interest income and compensation expense in the Consolidated statements of income.

(d) During the year ended December 31, 2022, a remeasurement of the Bank's U.S. principal defined benefit plan during the second half of 2022 was required as a result of a pension settlement. The remeasurement resulted in a net decrease of $1.4 billion in pre-tax AOCI. Refer to Note 9 for further information.

Note 23 – Income taxes

The results of operations of the Bank are included in the consolidated federal, New York State, New York City and other state income tax returns filed by JPMorgan Chase. Pursuant to a tax sharing agreement, JPMorgan Chase allocates to the Bank its share of the consolidated income tax expense or benefit based upon statutory rates applied to the Bank's earnings as if it were filing separate income tax returns. Furthermore, JPMorgan Chase will reimburse the Bank for losses irrespective of whether the Bank would utilize losses on a separate return basis. The Bank uses the separate return adjusted for benefits-for-loss allocation methodology to provide income taxes on all transactions recorded in the Consolidated Financial Statements. The Bank's expense for income taxes includes the current and deferred portions of that expense. Valuation allowances are established when necessary to reduce deferred tax assets to an amount that in the opinion of management, is more likely than not to be realized. State and local income taxes are provided on the Bank's taxable income at the effective income tax rate applicable to the consolidated JPMorgan Chase entity.
The tax sharing arrangement between JPMorgan Chase and the Bank allows for intercompany payments to or from JPMorgan Chase for outstanding current tax assets or liabilities.

Due to the inherent complexities arising from the nature of the Bank's businesses, and from conducting business and being taxed in a substantial number of jurisdictions, significant judgments and estimates are required to be made. Agreement of tax liabilities between the Bank and the many tax jurisdictions in which the Bank files tax returns may not be finalized for several years. Thus, the Bank's final tax-related assets and liabilities may ultimately be different from those currently reported.

Effective tax rate and expense

The following table presents a reconciliation of the applicable statutory U.S. federal income tax rate to the effective tax rate.

Effective tax rate

Year ended December 31,	**2023**	2022	2021
Statutory U.S. federal tax rate	**21.0 %**	21.0 %	21.0 %
Increase/(decrease) in tax rate resulting from:			
U.S. state and local income taxes, net of U.S. federal income tax benefit	**2.2**	2.9	3.0
Tax-exempt income	**(0.7)**	(0.8)	(0.8)
Non-U.S. earnings	**1.6**	0.5	0.7
Business tax credits	**(3.6)**	(2.2)	(1.5)
Other, net	**(0.2)**	0.4	–
Effective tax rate	**20.3 %** [(a)]	21.8 %	22.4 %

(a) Income tax expense associated with the First Republic acquisition was reflected in the estimated bargain purchase gain, which resulted in a reduction in the Bank's effective tax rate.

The following table reflects the components of income tax expense/(benefit) included in the Consolidated statements of income.

Income tax expense/(benefit)

Year ended December 31, (in millions)	**2023**	2022	2021
Current income tax expense/(benefit)			
U.S. federal	**$ 9,653**	$ 8,222	$ 4,910
Non-U.S.	**3,865**	2,716	2,384
U.S. state and local	**2,745**	2,156	1,560
Total current income tax expense/(benefit)	**16,263**	13,094	8,854
Deferred income tax expense/(benefit)			
U.S. federal	**(3,339)**	(2,849)	1,938
Non-U.S.	**95**	(161)	(97)
U.S. state and local	**(950)**	(532)	306
Total deferred income tax expense/(benefit)	**(4,194)**	(3,542)	2,147
Total income tax expense	**$12,069**	$ 9,552	$11,001

Total income tax expense includes $47 million of tax benefits in 2023, $213 million of tax benefits in 2022, and $72 million of tax expenses in 2021, resulting from the resolution of tax audits.

Tax effect of items recorded in stockholder's equity
The preceding table does not reflect the tax effect of certain items that are recorded each period directly in stockholder's equity, which are predominantly reflected in OCI. The tax effect of items recorded directly to OCI is reflected in Note 22. For the year ended December 31, 2023, stockholder's equity also reflected the tax effect associated with the Bank's adoption of the TDR accounting guidance recognized in retained earnings. Refer to Note 1 for further information.

Results from U.S. and non-U.S. earnings

The following table presents the U.S. and non-U.S. components of income before income tax expense.

Year ended December 31, (in millions)	2023	2022	2021
U.S.	$ 46,511	$ 33,376	$ 40,737
Non-U.S.[(a)]	13,054	10,518	8,319
Income before income tax expense	$ 59,565	$ 43,894	$ 49,056

(a) For purposes of this table, non-U.S. income is defined as income generated from operations located outside the U.S.

The Bank will recognize any U.S. income tax expense it may incur on global intangible low tax income as income tax expense in the period in which the tax is incurred.

Affordable housing tax credits

The Bank recognized $2.0 billion of tax credits and other tax benefits associated with investments in affordable housing projects within income tax expense for the year ended 2023, and $1.8 billion and $1.7 billion for the years ended 2022 and 2021, respectively. The amount of amortization of such investments reported in income tax expense was $1.6 billion, $1.3 billion and $1.3 billion, respectively. The carrying value of these investments, which are reported in other assets on the Bank's Consolidated balance sheets, was $14.6 billion and $12.0 billion at December 31, 2023 and 2022, respectively. The amount of commitments related to these investments, which are reported in accounts payable and other liabilities on the Bank's Consolidated balance sheets, was $6.8 billion and $5.4 billion at December 31, 2023 and 2022, respectively.

Deferred taxes

Deferred income tax expense/(benefit) reflects the differences between assets and liabilities measured for financial reporting purposes versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. If a deferred tax asset is determined to be unrealizable, a valuation allowance is established. The significant components of deferred tax assets and liabilities are reflected in the following table, the net deferred tax assets are reflected in other assets on the Bank's Consolidated balance sheets.

December 31, (in millions)	2023	2022
Deferred tax assets		
Allowance for loan losses	$ 5,776	$ 5,179
Employee benefits	–	47
Accrued expenses and other	8,691 [(a)]	7,843
Non-U.S. operations	979	1,007
Tax attribute carryforwards	53	73
Gross deferred tax assets	15,499	14,149
Valuation allowance	(68)	(71)
Deferred tax assets, net of valuation allowance	$ 15,431	$ 14,078
Deferred tax liabilities		
Depreciation and amortization	$ 64	$ 1,169
Mortgage servicing rights, net of hedges	1,794	1,864
Leasing transactions	2,266	2,852
Other, net	1,716	1,591
Gross deferred tax liabilities	5,840	7,476
Net deferred tax assets	$ 9,591	$ 6,602

(a) Includes the estimated net deferred tax asset associated with the First Republic acquisition. The allocation of the tax basis to individual assets may be refined during the measurement period, which could result in an impact to the gross deferred tax assets and liabilities.

The Bank has recorded deferred tax assets of $53 million at December 31, 2023 in connection with tax attribute carryforwards. U.S. federal NOL carryforwards were $3 million and non-U.S. NOL carryforwards were $177 million. U.S. federal NOL carryforwards have an unlimited carryforward period. Similarly, certain non-U.S. NOL carryforwards will expire between 2026 and 2040 whereas others have an unlimited carryforward period.

The valuation allowance at December 31, 2023, was due to certain non-U.S. deferred tax assets, including NOL carryforwards.

Unrecognized tax benefits

At December 31, 2023, 2022 and 2021, the Bank's unrecognized tax benefits, excluding related interest expense and penalties, were $3.5 billion, $3.4 billion and $3.2 billion, respectively, of which $2.5 billion, $2.6 billion and $2.4 billion, respectively, if recognized, would reduce the annual effective tax rate. Included in the amount of unrecognized tax benefits are certain items that would not affect the effective tax rate if they were recognized in the Consolidated statements of income. These unrecognized items include the tax effect of certain temporary differences, the portion of gross state and local unrecognized tax benefits that would be offset by the benefit from associated U.S. federal income tax deductions, and the portion of gross non-U.S. unrecognized tax benefits that would have offsets in other jurisdictions. JPMorgan Chase evaluates the need for changes in unrecognized tax benefits based on its anticipated tax return filing positions as part of its U.S. federal and state and local tax returns. In addition, JPMorgan Chase is presently under audit by a number of taxing authorities, most notably by the Internal Revenue Service, as summarized in the Tax examination status table below. The evaluation of unrecognized tax benefits as well as the potential for audit settlements make it reasonably possible that over the next 12 months the gross balance of unrecognized tax benefits may increase or decrease by as much as approximately $1.0 billion. The change in the unrecognized tax benefit would result in a payment or income statement recognition.

The following table presents a reconciliation of the beginning and ending amount of unrecognized tax benefits.

Year ended December 31, (in millions)	**2023**	2022	2021
Balance at January 1,	**$ 3,427**	$ 3,235	$ 3,005
Increases based on tax positions related to the current period	**938**	822	481
Increases based on tax positions related to prior periods	**30**	36	357
Decreases based on tax positions related to prior periods	**(899)**	(543)	(467)
Decreases related to cash settlements with taxing authorities	**(4)**	(123)	(142)
Balance at December 31,	**$ 3,492**	$ 3,427	$ 3,235

After-tax interest expense/(benefit) and penalties related to income tax liabilities recognized in income tax expense were $115 million, $99 million and $128 million in 2023, 2022 and 2021, respectively.

At December 31, 2023 and 2022, in addition to the liability for unrecognized tax benefits, the Bank had accrued $1.0 billion and $868 million, respectively, for income tax-related interest and penalties.

Tax examination status

JPMorgan Chase is continually under examination by the Internal Revenue Service, by taxing authorities throughout the world, and by many state and local jurisdictions throughout the U.S. The following table summarizes the status of tax years that remain subject to income tax examination of JPMorgan Chase and its consolidated subsidiaries by significant jurisdictions as of December 31, 2023.

	Periods under examination	Status
JPMorgan Chase – U.S.	2011 - 2013	Field examination of amended returns; certain matters at Appellate level
JPMorgan Chase – U.S.	2014 - 2020	Field examination of original and amended returns; certain matters at Appellate level
JPMorgan Chase – New York State	2012 - 2014	Field Examination
JPMorgan Chase – New York City	2015 - 2017	Field Examination
JPMorgan Chase – U.K.	2011 - 2020	Field examination of certain select entities

Note 24 – Restricted cash, other restricted assets and intercompany funds transfers

Restricted cash and other restricted assets

Certain of the Bank's cash and other assets are restricted as to withdrawal or usage. These restrictions are imposed by various regulatory authorities based on the particular activities of the Bank.

The business of the Bank is subject to examination and regulation by the OCC. The Bank is a member of the U.S. Federal Reserve System, and its deposits in the U.S. are insured by the FDIC, subject to applicable limits.

The Bank is required to maintain cash reserves at certain non-US central banks.

The Bank is also subject to rules and regulations established by other U.S. and non U.S. regulators. As part of its compliance with the respective regulatory requirements, the Bank's broker-dealer activities are subject to certain restrictions on cash and other assets.

The following table presents the components of the Bank's restricted cash:

December 31, (in billions)	2023	2022
Segregated for the benefit of securities and cleared derivative customers	**$ 8.7**	$ 8.5
Cash reserves at non-U.S. central banks and held for other general purposes	**9.1**	8.1
Total restricted cash[(a)]	**$ 17.8**	$ 16.6

(a) Comprises $16.4 billion and $15.2 billion in deposits with banks and $1.4 billion and $1.4 billion in cash and due from banks on the Consolidated balance sheets as of December 31, 2023 and 2022, respectively.

Also, as of December 31, 2023 and 2022, the Bank had cash pledged with clearing organizations for the benefit of customers of $6.2 billion and $7.0 billion, respectively.

Intercompany funds transfers

Restrictions imposed by U.S. federal law prohibit the Bank from lending to JPMorgan Chase & Co. and certain of its affiliates unless the loans are secured in specified amounts. Such secured loans provided by the Bank to any particular affiliate, together with certain other transactions with such affiliate (collectively referred to as "covered transactions"), must be made on terms and conditions that are consistent with safe and sound banking practices. In addition, unless collateralized with cash or US Government debt obligations, covered transactions are generally limited to 10% of the Bank's total capital, as determined by the risk-based capital guidelines; the aggregate amount of covered transactions between the Bank and all affiliates is limited to 20% of the Bank's total capital.

In addition to dividend restrictions set forth in statutes and regulations, the OCC, and under certain circumstances the FDIC, have authority under the Financial Institutions Supervisory Act to prohibit or to limit the payment of dividends by the banking organizations they supervise, including the Bank if, in the banking regulator's opinion, payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the banking organization.

At January 1, 2024, the Bank could pay, in the aggregate, approximately $20 billion in dividends to JPMorgan Chase without the prior approval of its relevant banking regulators. The capacity to pay dividends in 2024 will be supplemented by the Bank's earnings during the year.

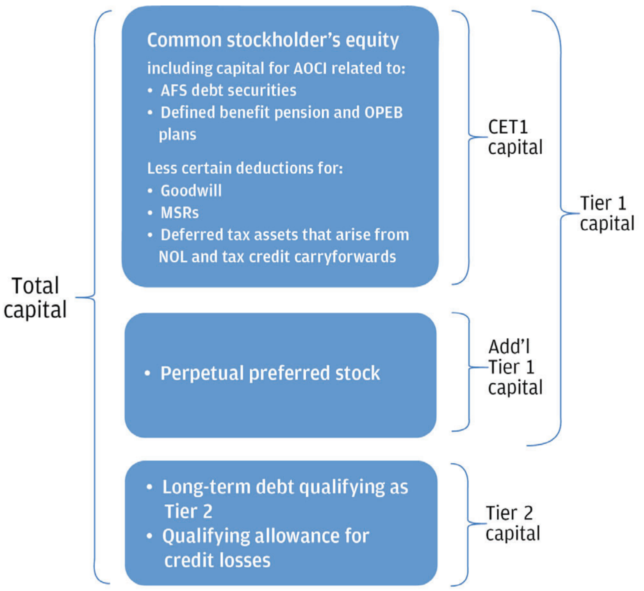
Note 25 – Regulatory capital

The Bank's banking regulator, the OCC, establishes capital requirements, including well-capitalized standards, for national banks.

Basel III overview

The capital rules under Basel III establish minimum capital ratios and overall capital adequacy standards for banks, including JPMorgan Chase Bank, N.A. The minimum amount of regulatory capital that must be held by banks is determined by calculating RWA, which are on-balance sheet assets and off-balance sheet exposures, weighted according to risk. Two comprehensive approaches are prescribed for calculating RWA: a standardized approach ("Basel III Standardized"), and an advanced approach ("Basel III Advanced"). For each of the risk-based capital ratios, the capital adequacy of the Bank is evaluated against the lower of the Standardized or Advanced approaches compared to their respective regulatory capital ratio requirements.

The three components of regulatory capital under the Basel III rules are as illustrated below:



Risk-weighted assets

Basel III rules establish capital requirements for calculating credit risk RWA and market risk RWA, and in the case of Basel III Advanced, operational risk RWA. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is generally calculated consistently between Basel III Standardized and Basel III Advanced. In addition to the RWA calculated under these approaches, the Bank may supplement such amounts to incorporate management judgment and feedback from its regulators.

Supplementary leverage ratio ("SLR")

Basel III also includes a requirement for Advanced Approach banking organizations to calculate the SLR. The SLR is defined as Tier 1 capital under Basel III divided by the Bank's total leverage exposure. Total leverage exposure is calculated by taking the Bank's total average on-balance sheet assets, less amounts permitted to be deducted for Tier 1 capital, and adding certain off-balance sheet exposures, as defined in regulatory capital rules.

Risk-based capital regulatory requirements

All banking institutions are currently required to have a minimum CET1 capital ratio of 4.5% of risk-weighted assets.

Certain banking organizations, including JPMorgan Chase Bank, N.A. are required to hold additional levels of capital to serve as a "capital conservation buffer". The capital conservation buffer is intended to be used to absorb losses in times of financial or economic stress. The capital conservation buffer incorporates a fixed capital conservation buffer of 2.5% and a discretionary countercyclical capital buffer.

The U.S. federal regulatory capital standards include a framework for setting a discretionary countercyclical capital buffer taking into account the macro financial environment in which large, internationally active banks function. As of December 31, 2023, the U.S. countercyclical capital buffer remained at 0%. The Federal Reserve will continue to review the buffer at least annually. The buffer can be increased if the Federal Reserve, FDIC and OCC determine that systemic risks are meaningfully above normal and can be calibrated up to an additional 2.5% of RWA subject to a 12-month implementation period.

Failure to maintain regulatory capital equal to or in excess of the risk-based regulatory capital minimum plus the capital conservation buffer and any countercyclical buffer will result in limitations to the amount of capital that the Bank may distribute, as well as on discretionary bonus payments for certain executive officers.

Under the risk-based capital and leverage-based guidelines of the OCC, the Bank is required to maintain minimum ratios for CET1 capital, Tier 1 capital, Total capital, Tier 1 leverage and the SLR. Failure to meet these minimum requirements could cause the OCC to take action.

The following table presents the risk-based and leverage-based regulatory capital ratio requirements and well-capitalized ratios to which the Bank was subject as of December 31, 2023 and 2022.

	Capital ratio requirements[(a)(b)]	Well-capitalized ratios[(c)]
Risk-based capital ratios		
CET1 capital	7.0 %	6.5 %
Tier 1 capital	8.5	8.0
Total capital	10.5	10.0
Tier 1 leverage	4.0	5.0
SLR	6.0	6.0

Note: The table above is as defined by the regulations issued by the OCC and FDIC and to which the Bank is subject.

(a) Represents minimum SLR requirement of 3.0%, as well as, supplementary leverage buffer requirement of 3.0% for the Bank.
(b) Represents the regulatory capital ratio requirements applicable to the Bank under Basel III. The CET1, Tier 1 and Total capital ratio requirements include a fixed capital conservation buffer requirement of 2.5%.
(c) Represents requirements for the Bank pursuant to regulations issued under the FDIC Improvement Act.

Current Expected Credit Losses ("CECL") Regulatory Capital Transition

Beginning January 1, 2022, the $2.9 billion CECL capital benefit, provided by the Federal Reserve in response to the COVID-19 pandemic, is being phased out at 25% per year over a three-year period. As of December 31, 2023, the Bank's CET1 capital reflected the remaining $1.5 billion benefit associated with the CECL capital transition provisions.

Similarly, as of January 1, 2023, the Bank has phased out 50% of the other CECL capital transition provisions which impacted Tier 2 capital, adjusted average assets, total leverage exposure and RWA, as applicable.

The following tables present risk-based capital metrics under both the Basel III Standardized and Basel III Advanced approaches and leverage-based capital metrics for the Bank. As of December 31, 2023 and 2022, the Bank was well-capitalized and met all capital requirements to which it was subject.

	Basel III Standardized		Basel III Advanced	
(in millions, except ratios)	**Dec 31, 2023**	Dec 31, 2022	**Dec 31, 2023**	Dec 31, 2022
Risk-based capital metrics[(a)]:				
CET1 capital	**$ 262,030**	$ 269,668	**$ 262,030**	$269,668
Tier 1 capital	**262,032**	269,672	**262,032**	269,672
Total capital	**281,308**	288,433	**268,392** [(b)]	275,255
Risk-weighted assets	**1,621,789**	1,597,072	**1,526,952** [(b)(c)]	1,475,602
CET1 capital ratio	**16.2 %**	16.9 %	**17.2 %**	18.3 %
Tier 1 capital ratio	**16.2**	16.9	**17.2**	18.3
Total capital ratio	**17.3**	18.1	**17.6**	18.7

(a) The capital metrics reflect the CECL capital transition provisions.
(b) Includes the impacts of certain assets associated with First Republic to which the Standardized approach has been applied as permitted by the transition provisions in the U.S. capital rules.
(c) RWA results include the benefit of the shared-loss agreements with the FDIC for certain assets associated with the First Republic acquisition.

Three months ended (in millions, except ratios)	**Dec 31, 2023**	Dec 31, 2022
Leverage-based capital metrics[(a)]:		
Adjusted average assets[(b)]	**$ 3,337,842**	$ 3,249,912
Tier 1 leverage ratio	**7.9 %**	8.3 %
Total leverage exposure	**$ 4,038,739**	$ 3,925,502
SLR	**6.5 %**	6.9 %

(a) The capital metrics reflect the CECL capital transition provisions.
(b) Adjusted average assets, for purposes of calculating the leverage ratios, includes quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill, inclusive of estimated equity method goodwill, and other intangible assets.

Note 26 – Off-balance sheet lending-related financial instruments, guarantees, and other commitments

The Bank provides lending-related financial instruments (e.g., commitments and guarantees) to address the financing needs of its customers and clients. The contractual amount of these financial instruments represents the maximum possible credit risk to the Bank should the customer or client draw upon the commitment or the Bank be required to fulfill its obligation under the guarantee, and should the customer or client subsequently fail to perform according to the terms of the contract. Most of these commitments and guarantees have historically been refinanced, extended, cancelled, or expired without being drawn or a default occurring. As a result, the total contractual amount of these instruments is not, in the Bank's view, representative of its expected future credit exposure or funding requirements.

To provide for expected credit losses in wholesale and certain consumer lending-related commitments, an allowance for credit losses on lending-related commitments is maintained. Refer to Note 14 for further information regarding the allowance for credit losses on lending-related commitments.

The following table summarizes the contractual amounts and carrying values of off-balance sheet lending-related financial instruments, guarantees and other commitments at December 31, 2023 and 2022. The amounts in the table below for credit card and home equity lending-related commitments represent the total available credit for these products. The Bank has not experienced, and does not anticipate, that all available lines of credit for these products will be utilized at the same time. The Bank can reduce or cancel credit card lines of credit by providing the borrower notice or, in some cases as permitted by law, without notice. In addition, the Bank typically closes credit card lines when the borrower is 60 days or more past due. The Bank may reduce or close HELOCs when there are significant decreases in the value of the underlying property, or when there has been a demonstrable decline in the creditworthiness of the borrower.

Off-balance sheet lending-related financial instruments, guarantees and other commitments

	Contractual amount						Carrying value[l]	
	2023					2022	2023	2022
By remaining maturity as of December 31, (in millions)	Expires in 1 year or less	Expires after 1 year through 3 years	Expires after 3 years through 5 years	Expires after 5 years	Total	Total		
Lending-related								
Consumer, excluding credit card:								
Residential real estate[a]	$ 6,917	$ 7,175	$ 6,493	$ 9,540	$ 30,125	$ 21,287	$ 678 [m]	$ 75
Auto and other	12,247	159	–	2,872	15,278	12,231	148 [m]	–
Total consumer, excluding credit card	19,164	7,334	6,493	12,412	45,403	33,518	826	75
Credit card[b]	915,670	–	–	–	915,670	821,284	–	–
Total consumer[c]	934,834	7,334	6,493	12,412	961,073	854,802	826	75
Wholesale:								
Other unfunded commitments to extend credit[d]	122,712	175,030	178,617	23,774	500,133	437,211	2,783 [k][m]	2,298 [k]
Standby letters of credit and other financial guarantees[d][e]	13,794	10,478	3,623	991	28,886	27,455	479	408
Other letters of credit[d]	4,084	222	79	–	4,385	4,134	37	6
Total wholesale[c]	140,590	185,730	182,319	24,765	533,404	468,800	3,299	2,712
Total lending-related	$1,075,424	$ 193,064	$ 188,812	$ 37,177	$1,494,477	$1,323,602	$ 4,125	$2,787
Other guarantees and commitments								
Securities lending indemnification agreements and guarantees[f]	$ 306,769	$ –	$ –	$ –	$ 306,769	$ 312,261	$ –	$ –
Derivatives qualifying as guarantees	1,788	364	11,657	40,848	54,657	59,262	92	652
Unsettled resale and securities borrowed agreements[g]	61,561	186	–	–	61,747	82,694	–	(3)
Unsettled repurchase and securities loaned agreements[h]	47,306	554	–	–	47,860	53,321	–	(3)
Loan sale and securitization-related indemnifications:								
Mortgage repurchase liability	NA	NA	NA	NA	NA	NA	76	76
Loans sold with recourse	NA	NA	NA	NA	637	631	8	11
Exchange & clearing house guarantees and commitments[i]	19,897	–	–		19,897	43,641	–	–
Other guarantees and commitments[j]	8,286	1,281	229	3,468	13,264	6,272	38	53

(a) Includes certain commitments to purchase loans from correspondents.
(b) Also includes commercial card lending-related commitments.
(c) Predominantly all consumer and wholesale lending-related commitments are in the U.S.
(d) As of December 31, 2023 and 2022, reflected the contractual amount net of risk participations totaling $88 million and $71 million, respectively, for other unfunded commitments to extend credit; $8.2 billion at both periods for standby letters of credit and other financial guarantees; and $589 million and $512 million, respectively, for other letters of credit. In regulatory filings with the Federal Reserve these commitments are shown gross of risk participations.
(e) As of both December 31, 2023 and 2022, includes commitments to JPMorgan Chase affiliates of $19 million.
(f) As of December 31, 2023 and 2022, collateral held by the Bank in support of securities lending indemnification agreements was $324.1 billion and $328.2 billion, respectively. Total securities lending indemnification agreements and guarantees included balances with JPMorgan Chase affiliates of $23.1 billion and $28.9 billion at December 31, 2023 and 2022, respectively. Collateral held by the Bank in support of securities lending indemnification agreements with JPMorgan Chase affiliates was $29.0 billion and $29.6 billion at December 31, 2023 and 2022, respectively. Securities lending collateral primarily consists of cash, G7 government securities, and securities issued by U.S. GSEs and government agencies.
(g) As of December 31, 2023 and 2022, includes $4.2 billion and $35 million of unsettled resale and securities borrowed agreements with JPMorgan Chase affiliates.
(h) As of December 31, 2023 and 2022, includes $471 million and $128 million of unsettled repurchase and securities loaned agreements with JPMorgan Chase affiliates.
(i) As of December 31, 2023 and 2022, includes guarantees to the Fixed Income Clearing Corporation under the sponsored member repo program and commitments and guarantees associated with the Bank's membership in certain clearing houses.
(j) As of December 31, 2023 and 2022, primarily includes, unfunded commitments related to certain tax-oriented equity investments, other equity investment commitments and unfunded commitments to purchase secondary market loans.
(k) For lending-related products, the carrying value includes the allowance for lending-related commitments and the guarantee liability; for derivative-related products and lending-related commitments for which the fair value option was elected, the carrying value represents the fair value.
(l) For lending-related commitments, the carrying value also includes fees and any purchase discounts or premiums that are deferred and recognized in accounts payable and other liabilities on the Consolidated balance sheets. Deferred amounts for revolving commitments and commitments not expected to fund, are amortized to lending- and deposit-related fees on a straight line basis over the commitment period. For all other commitments the deferred amounts remain deferred until the commitment funds or is sold.

(m) As of December 31, 2023, includes fair value adjustments associated with First Republic for residential real estate lending-related commitments totaling $630 million, for auto and other lending-related commitments totaling $148 million and for other unfunded commitments to extend credit totaling $1.1 billion. Refer to Note 29 for additional information.
(n) As of December 31, 2022, included net markdowns on held-for-sale positions related to unfunded commitments in the bridge financing portfolio.

Other unfunded commitments to extend credit

Other unfunded commitments to extend credit generally consist of commitments for working capital and general corporate purposes, extensions of credit to support commercial paper facilities and bond financings in the event that those obligations cannot be remarketed to new investors, as well as committed liquidity facilities to clearing organizations. The Bank also issues commitments under multipurpose facilities which could be drawn upon in several forms, including the issuance of a standby letter of credit.

Guarantees

U.S. GAAP requires that a guarantor recognize, at the inception of a guarantee, a liability in an amount equal to the fair value of the obligation undertaken in issuing the guarantee. U.S. GAAP defines a guarantee as a contract that contingently requires the guarantor to pay the guaranteed party based upon: (a) changes in an underlying asset, liability or equity security of the guaranteed party; or (b) a third party's failure to perform under a specified agreement. The Bank considers the following off-balance sheet arrangements to be guarantees under U.S. GAAP: standby letters of credit and other financial guarantees, securities lending indemnifications, certain indemnification agreements included within third-party contractual arrangements, certain derivative contracts and the guarantees under the sponsored member repo program.

As required by U.S. GAAP, the Bank initially records guarantees at the inception date fair value of the non-contingent obligation assumed (e.g., the amount of consideration received or the net present value of the premium receivable). For these obligations, the Bank records this fair value amount in other liabilities with an offsetting entry recorded in cash (for premiums received), or other assets (for premiums receivable). Any premium receivable recorded in other assets is reduced as cash is received under the contract, and the fair value of the liability recorded at inception is amortized into income as lending and deposit-related fees over the life of the guarantee contract. The lending-related contingent obligation is recognized based on expected credit losses in addition to, and separate from, any non-contingent obligation.

Non-lending-related contingent obligations are recognized when the liability becomes probable and reasonably estimable. These obligations are not recognized if the estimated amount is less than the carrying amount of any non-contingent liability recognized at inception (adjusted for any amortization). Examples of non-lending-related contingent obligations include indemnifications provided in sales agreements, where a portion of the sale proceeds is allocated to the guarantee, which adjusts the gain or loss that would otherwise result from the transaction. For these indemnifications, the initial liability is amortized to income as the Bank's risk is reduced (i.e., over time or when the indemnification expires).

The contractual amount and carrying value of guarantees and indemnifications are included in the table on page 124.

For additional information on the guarantees, see below.

Standby letters of credit and other financial guarantees

Standby letters of credit and other financial guarantees are conditional lending commitments issued by the Bank to guarantee the performance of a client or customer to a third party under certain arrangements, such as commercial paper facilities, bond financings, acquisition financings, trade financings and similar transactions.

The following table summarizes the contractual amount and carrying value of standby letters of credit and other financial guarantees and other letters of credit arrangements as of December 31, 2023 and 2022.

Standby letters of credit, other financial guarantees and other letters of credit

	2023		2022	
December 31, (in millions)	Standby letters of credit and other financial guarantees	Other letters of credit	Standby letters of credit and other financial guarantees	Other letters of credit
Investment-grade[a]	**$ 19,712**	**$ 3,552**	$ 19,224	$ 3,040
Noninvestment-grade[a]	**9,174**	**833**	8,231	1,094
Total contractual amount	**$ 28,886**	**$ 4,385**	$ 27,455	$ 4,134
Allowance for lending-related commitments	**$ 110**	**$ 37**	$ 82	$ 6
Guarantee liability	**369**	**–**	326	–
Total carrying value	**$ 479**	**$ 37**	$ 408	$ 6
Commitments with collateral	**$ 16,857**	**$ 539**	$ 15,293	$ 795

(a) The ratings scale is based on the Bank's internal risk ratings. Refer to Note 13 for further information on internal risk ratings.

Securities lending indemnifications

Through the Bank's securities lending program, counterparties' securities, via custodial and non-custodial arrangements, may be lent to third parties. As part of this program, the Bank provides an indemnification in the lending agreements which protects the lender against the failure of the borrower to return the lent securities. To minimize its liability under these indemnification agreements, the Bank obtains cash or other highly liquid collateral with a market value exceeding 100% of the value of the securities on loan from the borrower. Collateral is marked to market daily to help assure that collateralization is adequate. Additional collateral is called from the borrower if a shortfall exists, or collateral may be released to the borrower in the event of overcollateralization. If a borrower defaults, the Bank would use the collateral held to purchase replacement securities in the market or to credit the lending client or counterparty with the cash equivalent thereof.

The cash collateral held by the Bank may be invested on behalf of the client in indemnified resale agreements, whereby the Bank indemnifies the client against the loss of principal invested. To minimize its liability under these agreements, the Bank obtains collateral with a market value exceeding 100% of the principal invested.

Derivatives qualifying as guarantees

The Bank transacts in certain derivative contracts that have the characteristics of a guarantee under U.S. GAAP. These contracts include written put options that require the Bank to purchase assets upon exercise by the option holder at a specified price by a specified date in the future. The Bank may enter into written put option contracts in order to meet client needs, or for other trading purposes. The terms of written put options are typically five years or less.

Derivatives deemed to be guarantees also includes stable value contracts, commonly referred to as "stable value products", that require the Bank to make a payment of the difference between the market value and the book value of a counterparty's reference portfolio of assets in the event that market value is less than book value and certain other conditions have been met. Stable value products are transacted in order to allow investors to realize investment returns with less volatility than an unprotected portfolio. These contracts are typically longer-term or may have no stated maturity, but allow the Bank to elect to terminate the contract under certain conditions.

The notional value of derivative guarantees generally represents the Bank's maximum exposure. However, exposure to certain stable value products is contractually limited to a substantially lower percentage of the notional amount.

The fair value of derivative guarantees reflects the probability, in the Bank's view, of whether the Bank will be required to perform under the contract. The Bank reduces exposures to these contracts by entering into offsetting transactions, or by entering into contracts that hedge the market risk related to the derivative guarantees.

The following table summarizes the derivatives qualifying as guarantees as of December 31, 2023 and 2022.

(in millions)	**December 31, 2023**	December 31, 2022
Notional amounts		
Derivative guarantees	**$ 54,657**	$ 59,262
Stable value contracts with contractually limited exposure	**32,488**	31,820
Maximum exposure of stable value contracts with contractually limited exposure	**1,652**	2,063
Fair value		
Derivative payables	**92**	652

In addition to derivative contracts that meet the characteristics of a guarantee, the Bank is both a purchaser and seller of credit protection in the credit derivatives market. Refer to Note 6 for a further discussion of credit derivatives.

Unsettled securities financing agreements

In the normal course of business, the Bank enters into resale and securities borrowed agreements. At settlement, these commitments result in the Bank advancing cash to and receiving securities collateral from the counterparty. The Bank also enters into repurchase and securities loaned agreements. At settlement, these commitments result in the Bank receiving cash from and providing securities collateral to the counterparty. Such agreements settle at a future date. These agreements generally do not meet the definition of a derivative, and therefore, are not recorded on the Consolidated balance sheets until settlement date. These agreements predominantly have regular-way settlement terms. Refer to Note 12 for a further discussion of securities financing agreements.

Loan sales- and securitization-related indemnifications

Mortgage repurchase liability

In connection with the Bank's mortgage loan sale and securitization activities with U.S. GSEs the Bank has made representations and warranties that the loans sold meet certain requirements, and that may require the Bank to repurchase mortgage loans and/or indemnify the loan purchaser if such representations and warranties are breached by the Bank.

Private label securitizations

The liability related to repurchase demands associated with private label securitizations is separately evaluated by the Bank in establishing its litigation reserves.

Refer to Note 28 for additional information regarding litigation.

Loans sold with recourse

The Bank provides servicing for mortgages and certain commercial lending products on both a recourse and nonrecourse basis. In nonrecourse servicing, the principal credit risk to the Bank is the cost of temporary servicing advances of funds (i.e., normal servicing advances). In recourse servicing, the servicer agrees to share credit risk with the owner of the mortgage loans, such as Fannie Mae or Freddie Mac or a private investor, insurer or guarantor. Losses on recourse servicing predominantly occur when foreclosure sales proceeds of the property underlying a defaulted loan are less than the sum of the outstanding principal balance, plus accrued interest on the loan and the cost of holding and disposing of the underlying property. The Bank's securitizations are predominantly nonrecourse, thereby effectively transferring the risk of future credit losses to the purchaser of the mortgage-backed securities issued by the trust. The unpaid principal balance of loans sold with recourse as well as the carrying value of the related liability that the Bank has recorded in accounts payable and other liabilities on the Consolidated balance sheets, which is representative of the Bank's view of the likelihood it will have to perform under its recourse obligations, are disclosed in the table on page 124.

Other off-balance sheet arrangements

Indemnification agreements – general

In connection with issuing securities to investors outside the U.S., the Bank may agree to pay additional amounts to the holders of the securities in the event that, due to a change in tax law, certain types of withholding taxes are imposed on payments on the securities. The terms of the securities may also give the Bank the right to redeem the securities if such additional amounts are payable. The Bank may also enter into indemnification clauses in connection with the licensing of software to clients ("software licensees") or when it sells a business or assets to a third party ("third-party purchasers"), pursuant to which it indemnifies software licensees for claims of liability or damages that may occur subsequent to the licensing of the software, or third-party purchasers for losses they may incur due to actions taken by the Bank prior to the sale of the business or assets. It is difficult to estimate the Bank's maximum exposure under these indemnification arrangements, since this would require an assessment of future changes in tax law and future claims that may be made against the Bank that have not yet occurred. However, based on historical experience, management expects the risk of loss to be remote.

Merchant charge-backs

Under the rules of payment networks, in its role as a merchant acquirer, the Bank's Merchant Services business in Payments retains a contingent liability for disputed processed credit and debit card transactions that result in a charge-back to the merchant. If a dispute is resolved in the cardholder's favor, the Bank will (through the cardholder's issuing bank) credit or refund the amount to the cardholder and will charge back the transaction to the merchant. If the Bank is unable to collect the amount from the merchant, the Bank will bear the loss for the amount credited or refunded to the cardholder. The Bank mitigates this risk by withholding future settlements, retaining cash reserve accounts or obtaining other collateral. In addition, the Bank recognizes a valuation allowance that covers the payment or performance risk the Bank related to charge-backs.

For the years ended December 31, 2023, 2022 and 2021, the Bank processed an aggregate volume of $2,411.0 billion, $2,158.4 billion, and $1,886.7 billion, respectively.

Clearing Services – Client Credit Risk

The Bank provides clearing services for clients by entering into securities purchases and sales and derivative contracts with CCPs, including ETDs such as futures and options, as well as OTC-cleared derivative contracts. As a clearing member, the Bank stands behind the performance of its clients, collects cash and securities collateral (margin) as well as any settlement amounts due from or to clients, and remits them to the relevant CCP or client in whole or part. There are two types of margin: variation margin is posted on a daily basis based on the value of clients' derivative contracts and initial margin is posted at inception of a derivative contract, generally on the basis of the potential changes in the variation margin requirement for the contract.

As a clearing member, the Bank is exposed to the risk of nonperformance by its clients, but is not liable to clients for the performance of the CCPs. Where possible, the Bank seeks to mitigate its risk to the client through the collection of appropriate amounts of margin at inception and throughout the life of the transactions. The Bank can also cease providing clearing services if clients do not adhere to their obligations under the clearing agreement. In the event of nonperformance by a client, the Bank would close out the client's positions and access available margin. The CCP would utilize any margin it holds to make itself whole, with any remaining shortfalls required to be paid by the Bank as a clearing member.

The Bank reflects its exposure to nonperformance risk of the client through the recognition of margin receivables from clients and margin payables to CCPs; the clients' underlying securities or derivative contracts are not reflected in the Bank's Consolidated Financial Statements.

It is difficult to estimate the Bank's maximum possible exposure through its role as a clearing member, as this would require an assessment of transactions that clients may execute in the future. However, based upon historical experience, and the credit risk mitigants available to the Bank, management believes it is unlikely that the Bank will have to make any material payments under these arrangements and the risk of loss is expected to be remote.

Refer to Note 6 for information on the derivatives that the Bank executes for its own account and records in its Consolidated Financial Statements.

Exchange & Clearing House Memberships
The Bank is a member of several securities and derivative exchanges and clearing houses, both in the U.S. and other countries, and it provides clearing services to its clients. Membership in some of these organizations requires the Bank to pay a pro rata share of the losses incurred by the organization as a result of the default of another member. Such obligations vary with different organizations. These obligations may be limited to the amount (or a multiple of the amount) of the Bank's contribution to the guarantee fund maintained by a clearing house or exchange as part of the resources available to cover any losses in the event of a member default. Alternatively, these obligations may also include a pro rata share of the residual losses after applying the guarantee fund. Additionally, certain clearing houses require the Bank as a member to pay a pro rata share of losses that may result from the clearing house's investment of guarantee fund contributions and initial margin, unrelated to and independent of the default of another member. Generally a payment would only be required should such losses exceed the resources of the clearing house or exchange that are contractually required to absorb the losses in the first instance. In certain cases, it is difficult to estimate the Bank's maximum possible exposure under these membership agreements, since this would require an assessment of future claims that may be made against the Bank that have not yet occurred. However, based on historical experience, management expects the risk of loss to the Bank to be remote. Where the Bank's maximum possible exposure can be estimated, the amount is disclosed in the table on page 124, in the Exchange & clearing house guarantees and commitments line.

Sponsored member repo program
The Bank acts as a sponsoring member to clear eligible overnight and term resale and repurchase agreements through the Government Securities Division of the Fixed Income Clearing Corporation ("FICC") on behalf of clients that become sponsored members under the FICC's rules. The Bank also guarantees to the FICC the prompt and full payment and performance of its sponsored member clients' respective obligations under the FICC's rules. The Bank minimizes its liability under these guarantees by obtaining a security interest in the cash or high-quality securities collateral that the clients place with the clearing house; therefore, the Bank expects the risk of loss to be remote. The Bank's maximum possible exposure, without taking into consideration the associated collateral, is included in the Exchange & clearing house guarantees and commitments line on page 124. Refer to Note 12 for additional information on credit risk mitigation practices on resale agreements and the types of collateral pledged under repurchase agreements.

Guarantees of subsidiaries and affiliates
In the normal course of business, the Bank may provide counterparties with guarantees of certain of the trading and other obligations of its subsidiaries and affiliates on a contract-by-contract basis, as negotiated with the Bank's counterparties. The obligations of the subsidiaries are included on the Bank's Consolidated balance sheets or are reflected as off-balance sheet commitments; therefore, the Bank has not recognized a separate liability for these guarantees. As at December 31, 2023 and 2022, guarantees of obligations of affiliates provided by the Bank were not material. The Bank believes that the occurrence of any event that would trigger payments under these guarantees is remote.

Note 27 – Pledged assets and collateral

Pledged assets

The Bank pledges financial assets that it owns to maintain potential borrowing capacity at discount windows with Federal Reserve banks, various other central banks and FHLBs. Additionally, the Bank pledges assets for other purposes, including to collateralize repurchase and other securities financing agreements, to cover short sales and to collateralize derivative contracts and deposits and borrowings from affiliates. Certain of these pledged assets may be sold or repledged or otherwise used by the secured parties and are parenthetically identified on the Consolidated balance sheets as assets pledged.

The following table presents the Bank's pledged assets.

December 31, (in billions)		2023		2022
Assets that may be sold or repledged or otherwise used by secured parties	**$**	**90.5**	$	57.2
Assets that may not be sold or repledged or otherwise used by secured parties[(a)]		**145.0**		43.3
Assets pledged at Federal Reserve banks and FHLBs		**675.6**		567.6
Total pledged assets	**$**	**911.1**	$	668.1

(a) As of December 31, 2023, included $88.4 billion of assets pledged to the FDIC associated with the First Republic acquisition. Refer to Note 29 for additional information.

Total pledged assets do not include assets of consolidated VIEs; these assets are used to settle the liabilities of those entities. Refer to Note 15 for additional information on assets and liabilities of consolidated VIEs. Refer to Note 12 for additional information on the Bank's securities financing activities. Refer to Note 20 for additional information on the Bank's long-term debt. The significant components of the Bank's pledged assets were as follows.

December 31, (in billions)		2023		2022
Investment securities	**$**	**111.2**	$	110.5
Loans		**681.8**		485.9
Trading assets and other		**118.1**		71.7
Total pledged assets	**$**	**911.1**	$	668.1

Collateral

The Bank accepts financial assets as collateral that it is permitted to sell or repledge, deliver or otherwise use. This collateral is generally obtained under resale and other securities financing agreements, prime brokerage-related held-for-investment customer receivables and derivative contracts. Collateral is generally used under repurchase and other securities financing agreements, to cover short sales, and to collateralize derivative contracts and deposits.

The following table presents the fair value of collateral accepted.

December 31, (in billions)		2023		2022
Collateral permitted to be sold or repledged, delivered, or otherwise used	**$**	**617.3**	$	710.6
Collateral sold, repledged, delivered or otherwise used		**447.6**		522.7

Note 28 - Litigation

Contingencies

As of December 31, 2023, JPMorgan Chase and its subsidiaries, including but not limited to JPMorgan Chase Bank, N.A., are defendants or respondents in numerous evolving legal proceedings, including private proceedings, public proceedings, government investigations, regulatory enforcement matters, and the matters described below. The litigations range from individual actions involving a single plaintiff to class action lawsuits with potentially millions of class members. Investigations and regulatory enforcement matters involve both formal and informal proceedings, by both governmental agencies and self-regulatory organizations. These legal proceedings are at varying stages of adjudication, arbitration or investigation, and involve each of JPMorgan Chase's lines of business and several geographies and a wide variety of claims (including common law tort and contract claims and statutory antitrust, securities and consumer protection claims), some of which present novel legal theories.

JPMorgan Chase believes the estimate of the aggregate range of reasonably possible losses, in excess of reserves established, for its legal proceedings is from $0 to approximately $1.3 billion at December 31, 2023. This estimated aggregate range of reasonably possible losses was based upon information available as of that date for those proceedings in which JPMorgan Chase believes that an estimate of reasonably possible loss can be made. For certain matters, JPMorgan Chase does not believe that such an estimate can be made, as of that date. JPMorgan Chase's estimate of the aggregate range of reasonably possible losses involves significant judgment, given:

- the number, variety and varying stages of the proceedings, including the fact that many are in preliminary stages,
- the existence in many such proceedings of multiple defendants, including JPMorgan Chase and JPMorgan Chase Bank, N.A., whose share of liability (if any) has yet to be determined,
- the numerous yet-unresolved issues in many of the proceedings, including issues regarding class certification and the scope of many of the claims, and
- the uncertainty of the various potential outcomes of such proceedings, including where JPMorgan Chase has made assumptions concerning future rulings by the court or other adjudicator, or about the behavior or incentives of adverse parties or regulatory authorities, and those assumptions prove to be incorrect.

In addition, the outcome of a particular proceeding may be a result which JPMorgan Chase did not take into account in its estimate because JPMorgan Chase had deemed the likelihood of that outcome to be remote. Accordingly, JPMorgan Chase's estimate of the aggregate range of reasonably possible losses will change from time to time, and actual losses may vary significantly.

Set forth below are descriptions of JPMorgan Chase's material legal proceedings in which JPMorgan Chase and its subsidiaries (which in certain instances include JPMorgan Chase Bank, N.A.) are involved or have been named as parties.

1MDB Litigation. J.P. Morgan (Suisse) SA was named as a defendant in a civil litigation filed in May 2021 in Malaysia by 1Malaysia Development Berhad ("1MDB"), a Malaysian state-owned and controlled investment fund. The claim alleges "dishonest assistance" against J.P. Morgan (Suisse) SA in relation to payments of $300 million and $500 million, from 2009 and 2010, respectively, received from 1MDB and paid into an account at J.P. Morgan (Suisse) SA held by 1MDB PetroSaudi Limited, a joint venture company between 1MDB and PetroSaudi Holdings (Cayman) Limited. JPMorgan Chase is challenging the validity of service and the Malaysian Court's jurisdiction to hear the claim. In August 2023 the Court denied an application by 1MDB to discontinue its claim with permission to re-file a new claim in the future. An appeals court is scheduled in August 2024 to hear separate appeals filed by 1MDB and JPMorgan Chase against that August 2023 decision. In its appeal, JPMorgan Chase seeks to prevent any claim from continuing.

In addition, in November 2023, the Federal Office of the Attorney General (OAG) in Switzerland notified J.P. Morgan (Suisse) SA that it is conducting an investigation into possible criminal liability in connection with transactions arising from J.P. Morgan (Suisse) SA's relationship with the 1MDB PetroSaudi joint venture and its related persons for the period September 2009 through August 2015. The OAG investigation is ongoing.

Amrapali. India's Enforcement Directorate ("ED") is investigating J.P. Morgan India Private Limited in connection with investments made in 2010 and 2012 by two offshore funds formerly managed by JPMorgan Chase entities into residential housing projects developed by the Amrapali Group ("Amrapali") relating to delays in delivering or failure to deliver residential units. In August 2021, the ED issued an order fining J.P. Morgan India Private Limited approximately $31.5 million, and JPMorgan Chase is appealing that order. Relatedly, in July 2019, the Supreme Court of India issued an order making preliminary findings that Amrapali and other parties, including unspecified JPMorgan Chase entities and the offshore funds that had invested in the projects, violated certain criminal currency control and money laundering provisions, and ordered the ED to conduct a further inquiry. JPMorgan Chase is responding to and cooperating with the inquiry.

Foreign Exchange Investigations and Litigation. JPMorgan Chase previously reported settlements with certain government authorities relating to its foreign exchange ("FX") sales and trading activities and controls related to those activities. Among those resolutions, in May 2015, JPMorgan Chase pleaded guilty to a single violation of federal antitrust law. The Department of Labor ("DOL") granted JPMorgan Chase exemptions that permit JPMorgan Chase and its affiliates to continue to rely on the Qualified Professional Asset Manager exemption under the Employee Retirement Income Security Act ("ERISA") through the ten-year disqualification period following the antitrust plea. The only remaining FX-related governmental inquiry is a South Africa Competition Commission matter which is currently pending before the South Africa Competition Tribunal.

With respect to civil litigation matters, in a putative class action filed against JPMorgan Chase and other foreign exchange dealers on behalf of certain parties who purchased foreign currencies at allegedly inflated rates, the District Court denied certification of a class and granted summary judgment against the named plaintiffs in March 2023. An appeal by those plaintiffs of the District Court's decision is pending. In addition, some FX-related individual and putative class actions based on similar alleged underlying conduct have been filed outside the U.S., including in the U.K., Israel, the Netherlands, Brazil and Australia. An agreement to resolve one of the U.K. actions was reached in December 2022. In July 2023, the U.K. Court of Appeal overturned the Competition Appeal Tribunal's earlier denial of a request for class certification on an opt-out basis. In Israel, a settlement in principle has been reached on the putative class action, which remains subject to court approval.

Government Inquiries Related to the Zelle Network. JPMorgan Chase is responding to inquiries from civil government authorities regarding the handling of disputes related to transfers of funds through the Zelle Network. JPMorgan Chase is cooperating with these inquiries and responding to requests for information.

Interchange Litigation. Groups of merchants and retail associations filed a series of class action complaints alleging that Visa and Mastercard, as well as certain banks, conspired to set the price of credit and debit card interchange fees and enacted related rules in violation of antitrust laws.

In September 2018, the parties settled the class action seeking monetary relief, with the defendants collectively contributing approximately $6.2 billion. The settlement has been approved by the District Court and affirmed on appeal. Based on the percentage of merchants that opted out of the settlement, $700 million has been returned to the defendants from the settlement escrow. A separate class action seeking injunctive relief continues, and in September 2021, the District Court granted plaintiffs' motion for class certification in part, and denied the motion in part.

Of the merchants who opted out of the damages class settlement, certain merchants filed individual actions raising similar allegations against Visa and Mastercard, as well as against JPMorgan Chase and other banks. While some of those actions remain pending, the defendants have reached settlements with the merchants who opted out representing approximately 70% of the combined Mastercard-branded and Visa-branded payment card sales volume.

Jeffrey Epstein Litigation. JPMorgan Chase Bank, N.A. was named as a defendant in lawsuits filed in the United States District Court for the Southern District of New York alleging that JPMorgan Chase Bank, N.A. knowingly facilitated Jeffrey Epstein's sex trafficking and other unlawful conduct by providing banking services to Epstein until 2013. In June 2023, the Court granted preliminary approval of a settlement between the victim class and JPMorgan Chase Bank, N.A., pursuant to which JPMorgan Chase Bank, N.A. paid $290 million to a fund for Epstein survivors. In November 2023, the Court granted final approval of the settlement, rejecting objections, including those of certain state Attorneys General, regarding the victims' releases.

LIBOR and Other Benchmark Rate Investigations and Litigation. JPMorgan Chase has responded to inquiries from various governmental agencies and entities around the world relating primarily to the British Bankers Association's ("BBA") London Interbank Offered Rate ("LIBOR") for various currencies and the European Banking Federation's Euro Interbank Offered Rate ("EURIBOR"). The Swiss Competition Commission's investigation relating to EURIBOR, to which JPMorgan Chase and one other bank remain subject, continues. JPMorgan Chase appealed a December 2016 decision by the European Commission against JPMorgan Chase and other banks finding an infringement of European antitrust rules relating to EURIBOR. In December 2023, the European General Court annulled the fine imposed by the European Commission, but exercised its discretion to re-impose a fine in an identical amount. JPMorgan Chase is considering its options.

In addition, JPMorgan Chase has been named as a defendant along with other banks in various individual and putative class actions related to benchmark rates, including U.S. dollar LIBOR. In actions related to U.S. dollar LIBOR during the period that it was administered by the BBA, JPMorgan Chase has obtained dismissal of certain actions and resolved certain other actions, and others are in various stages of litigation. The United States District Court for the Southern District of New York has granted class certification of antitrust claims related to bonds and interest rate swaps sold directly by the defendants, including JPMorgan Chase. In addition, a lawsuit filed by a group of individual plaintiffs asserting antitrust claims, alleging that JPMorgan Chase and other defendants were engaged in an unlawful agreement to set U.S. dollar LIBOR and conspired to monopolize the market for LIBOR-based consumer loans and credit cards was dismissed in October 2023. Plaintiff filed an appeal of the dismissal to the United States Court of Appeals for the Ninth Circuit in November 2023. JPMorgan Chase has resolved all non-U.S. dollar LIBOR actions.

Russian Litigation. JPMorgan Chase is obligated to comply with international sanctions laws, which mandate the freezing or restriction of certain assets. These laws apply when assets associated with individuals, companies, products or services are within the scope of the sanctions. JPMorgan Chase has faced actual and threatened litigation in Russia seeking payments on transactions that JPMorgan Chase cannot make, and is contractually excused from paying, under relevant sanctions laws, with judgment entered against JPMorgan Chase in one claim in February 2024. The Russian court may disregard the parties' contractual agreement on forum selection, and may not recognize foreign sanctions laws as a basis for not making payment. JPMorgan Chase holds assets in Russia, which could be seized if the claims are granted and enforced.

SEC Inquiries. JPMorgan Chase is responding to requests from the SEC regarding aspects of certain advisory programs within J.P. Morgan Securities LLC, including aggregation of accounts for billing, discounting advisory fees, and selecting portfolio managers. Separately, JPMorgan Chase is responding to requests from the SEC in connection with the timing of JPMorgan Chase's liquidation of shares distributed in-kind to certain investment vehicles that invest in third-party managed private funds. JPMorgan Chase is cooperating with the SEC in regard to both inquires.

Securities Lending Antitrust Litigation. JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC, J.P. Morgan Prime, Inc., and J.P. Morgan Strategic Securities Lending Corp. are named as defendants in a putative class action filed in the United States District Court for the Southern District of New York. The complaint asserts violations of federal antitrust law and New York State common law in connection with an alleged conspiracy to prevent the emergence of anonymous exchange trading for securities lending transactions. The settlement of this action by the parties has been preliminarily approved, and is subject to final court approval.

Shareholder Litigation. Several shareholder putative class actions, as well as shareholder derivative actions purporting to act on behalf of JPMorgan Chase, have been filed against JPMorgan Chase, its Board of Directors and certain of its current and former officers.

Certain of these shareholder suits relate to historical trading practices by former employees in the precious metals and U.S. treasuries markets and related conduct which were the subject of JPMorgan Chase's resolutions with the DOJ, CFTC and SEC in September 2020, and fiduciary activities that were separately the subject of a resolution between JPMorgan Chase Bank, N.A. and the OCC in November 2020. One of these shareholder derivative suits was filed in the Supreme Court of the State of New York in May 2022, asserting breach of fiduciary duty and unjust enrichment claims relating to the historical trading practices and related conduct and fiduciary activities which were the subject of the resolutions described above. In December 2022, the court granted defendants' motion to dismiss this action in full, and in July 2023, the plaintiff filed an appeal, which remains pending. A second shareholder derivative action was filed in the United States District Court for the Eastern District of New York in December 2022 relating to the historical trading practices and related conduct, which asserts breach of fiduciary duty and contribution claims and alleges that the shareholder is excused from making a demand to commence litigation because such a demand would have been futile. Defendants have moved to dismiss the complaint. In addition, a consolidated putative class action is pending in the United States District Court for the Eastern District of New York on behalf of shareholders who acquired shares of JPMorgan Chase common stock during the putative class period, alleging that certain SEC filings of JPMorgan Chase were materially false or misleading because they did not disclose certain information relating to the historical trading practices and conduct. In December 2023, the court granted Defendants' motion to dismiss the amended complaint.

A shareholder derivative suit was filed in May 2023 in the United States District Court for the Southern District of New York against various officers and directors of JPMorgan Chase asserting breaches of fiduciary duty and unjust enrichment based upon allegations that the defendants caused JPMorgan Chase to retain Jeffrey Epstein as a client of the bank after defendants knew, or should have known, that Epstein was using JPMorgan Chase's financial services to facilitate his alleged sex trafficking activities. In December 2023, the Court dismissed the derivative action.

A separate shareholder derivative suit was filed in March 2022 in the United States District Court for the Eastern District of New York asserting breaches of fiduciary duty and violations of federal securities laws based on the alleged failure of the Board of Directors to exercise adequate oversight over JPMorgan Chase's compliance with records preservation requirements which were the subject of resolutions between certain of JPMorgan Chase's subsidiaries and the SEC and the CFTC. Defendants' motion to dismiss the amended complaint is pending.

Trading Venues Investigations. JPMorgan Chase has been responding to government inquiries regarding its processes to inventory trading venues and confirm the completeness of certain data fed to trade surveillance platforms. JPMorgan Chase self-identified that certain trading and order data through the CIB was not feeding into its trade surveillance platforms. JPMorgan Chase has completed enhancements to the CIB's venue inventory and data completeness controls, and other remediation is underway. JPMorgan Chase has also performed a review of the data not originally surveilled, which is nearly complete, and has not identified any employee misconduct, harm to clients or the market. While the identified gaps represent a fraction of the overall activity across the CIB, the data gap on one venue, which largely consisted of sponsored client access activity, was significant. JPMorgan Chase is dedicated to maintaining rigorous controls and continuously enhancing the reliability of its trade infrastructure. JPMorgan Chase expects to enter into resolutions with two U.S. regulators that will require JPMorgan Chase to, among other things, complete its remediation, engage an independent consultant, and pay aggregate civil penalties of approximately $350 million. JPMorgan Chase is also in advanced negotiations with a third U.S. regulator, but there is no assurance that such discussions will result in a resolution. JPMorgan Chase does not expect any disruption of service to clients as a result of these resolutions.

* * *

In addition to the various legal proceedings discussed above, JPMorgan Chase and its subsidiaries, including in certain cases, JPMorgan Chase Bank, N.A., are named as defendants or are otherwise involved in a substantial number of other legal proceedings. JPMorgan Chase and JPMorgan Chase Bank, N.A., each believe it has meritorious defenses to the claims asserted against it in its currently outstanding legal proceedings and it intends to defend itself vigorously. Additional legal proceedings may be initiated from time to time in the future.

JPMorgan Chase Bank, N.A., has established reserves for several hundred of its currently outstanding legal proceedings. In accordance with the provisions of U.S. GAAP for contingencies, JPMorgan Chase Bank, N.A., accrues for a litigation-related liability when it is probable that such a liability has been incurred and the amount of the loss can be reasonably estimated. JPMorgan Chase Bank, N.A., evaluates its outstanding legal proceedings each quarter to assess its litigation reserves, and makes adjustments in such reserves, upward or downward, as appropriate, based on management's best judgment after consultation with counsel. JPMorgan Chase Bank, N.A.,'s legal expense was $852 million, $54 million and $90 million for the years ended December 31, 2023, 2022 and 2021, respectively. Where a particular litigation matter involves one or more subsidiaries or affiliates of JPMorgan Chase, JPMorgan Chase determines the appropriate allocation of legal expense among those subsidiaries or affiliates (including, where applicable, JPMorgan Chase Bank, N.A.). There is no assurance that JPMorgan Chase Bank N.A.'s litigation reserves will not need to be adjusted in the future.

In view of the inherent difficulty of predicting the outcome of legal proceedings, particularly where the claimants seek very large or indeterminate damages, or where the matters present novel legal theories, involve a large number of parties or are in early stages of discovery, JPMorgan Chase Bank, N.A. cannot state with confidence what will be the eventual outcomes of the currently pending matters, the timing of their ultimate resolution or the eventual losses, fines, penalties or consequences related to those matters. JPMorgan Chase Bank, N.A. believes, based upon its current knowledge and after consultation with counsel, consideration of the material legal proceedings described above and after taking into account its current litigation reserves and its estimated aggregate range of possible losses, that the other legal proceedings currently pending against it should not have a material adverse effect on JPMorgan Chase Bank, N.A.'s consolidated financial condition. JPMorgan Chase Bank, N.A. notes, however, that in light of the uncertainties involved in such proceedings, there is no assurance that the ultimate resolution of these matters will not significantly exceed the reserves it has currently accrued or that a matter will not have material reputational consequences. As a result, the outcome of a particular matter may be material to JPMorgan Chase Bank, N.A.'s operating results for a particular period, depending on, among other factors, the size of the loss or liability imposed and the level of JPMorgan Chase Bank, N.A.'s income for that period.

Note 29 – Business combinations

On May 1, 2023, JPMorgan Chase Bank, National Association acquired certain assets and assumed certain liabilities of First Republic Bank (the "First Republic acquisition") from the Federal Deposit Insurance Corporation (“FDIC”), as receiver. The Bank believes that the First Republic acquisition is complementary to the Bank’s existing franchises. The acquisition resulted in an estimated bargain purchase gain, which represents the excess of the estimated fair value of the net assets acquired above the purchase price.

The Bank has determined that this acquisition constitutes a business combination under U.S. GAAP. Accordingly, the initial recognition of the assets acquired and liabilities assumed were generally measured at their estimated fair values as of May 1, 2023. The determination of those fair values required management to make certain market-based assumptions about expected future cash flows, discount rates and other valuation inputs at the time of the acquisition. The Bank believes that the fair value estimates of the assets acquired and liabilities assumed provide a reasonable basis for determining the estimated bargain purchase gain.

The Bank and the FDIC have not yet completed the settlement process under which the purchase price, and the identification of the assets acquired and liabilities assumed, will be finalized. The finalization of this settlement process may impact the amount of the estimated bargain purchase gain. The purchase and assumption agreement entered into with the FDIC allows for final settlement to occur up to a year after the acquisition date.

In addition, the purchase price and the estimated bargain purchase gain could change pending management's finalization of its acquisition date fair value estimates for certain of the assets acquired and liabilities assumed, which may take place up to one year from the acquisition date, as permitted by U.S. GAAP.

The First Republic acquisition resulted in a preliminary estimated bargain purchase gain of $2.7 billion. The Bank has continued to progress in the settlement process with the FDIC and refine its acquisition-date fair value estimates. As a result, during the year ended December 31, 2023, adjustments totaling $63 million were made increasing the estimated bargain purchase gain to $2.8 billion.

In connection with the First Republic acquisition, the Bank and the FDIC entered into two shared-loss agreements with respect to certain loans and lending-related commitments (the "shared-loss assets"): the Commercial Shared-Loss Agreement ("CSLA") and the Single-Family Shared-Loss Agreement (“SFSLA”). The CSLA covers 80% of credit losses, on a pari passu basis, over 5 years with a subsequent 3-year recovery period for certain acquired commercial loans and other real estate exposure. The SFSLA covers 80% of credit losses, on a pari passu basis, for 7 years for certain acquired loans secured by mortgages on real property or shares in cooperative property constituting a primary residence. The indemnification assets, which represent the fair value of the CSLA and SFSLA on the acquisition date, are reflected in the total assets acquired.

As part of the consideration paid, JPMorgan Chase Bank, N.A. issued a five-year, $50.0 billion secured note to the FDIC (the "Purchase Money Note"). The Purchase Money Note bears interest at a fixed rate of 3.4% and is secured by certain of the acquired loans. The Purchase Money Note is prepayable upon notice to the holder.

The Bank had placed a $5.0 billion deposit with First Republic Bank on March 16, 2023, as part of $30.0 billion of deposits provided by a consortium of large U.S. banks. The Bank’s $5.0 billion deposit was effectively settled as part of the acquisition and the associated allowance for credit losses was released upon closing. The Bank subsequently repaid the remaining $25.0 billion of deposits to the consortium of banks, including accrued interest through the payment date on May 9, 2023.

The computation of the purchase price, the estimated fair values of the assets acquired and liabilities assumed as part of the First Republic acquisition and the related estimated bargain purchase gain are presented below, and reflect the adjustments made through December 31, 2023 to the acquisition-date fair value of the net assets acquired.

(in millions)	Fair value purchase price allocation as of May 1, 2023
Purchase price consideration	
Amounts paid/due to the FDIC, net of cash acquired[a]	$ 13,524
Purchase Money Note (at fair value)	48,848
Settlement of First Republic deposit and other related party transactions[b]	5,447
Contingent consideration - Shared-loss agreements	15
Purchase price consideration	$ 67,834
Assets	
Securities	$ 30,285
Loans[c]	153,242
Core deposit and customer relationship intangibles	1,455
Indemnification assets - Shared-loss agreements	675
Accounts receivable and other assets[c][d]	6,574
Total assets acquired	$ 192,231
Liabilities	
Deposits	$ 87,572
FHLB advances	27,919
Lending-related commitments	2,614
Accounts payable and other liabilities[c][d]	2,793
Deferred tax liabilities	724
Total liabilities assumed	$ 121,622
Fair value of net assets acquired	$ 70,609
Estimated gain on acquisition, after-tax	$ 2,775

(a) Includes $10.6 billion of cash paid to the FDIC at acquisition and $3.6 billion payable to the FDIC, less cash acquired of $680 million.
(b) Includes $447 million of securities financing transactions with First Republic Bank that were effectively settled on the acquisition date.
(c) In the six months ended December 31, 2023, certain assets and liabilities were reclassified resulting in a $762 million increase to loans, an $870 million decrease to accounts receivable and other assets and a $30 million increase to accounts payable and other liabilities.
(d) Other assets include $1.2 billion in tax-oriented investments and $683 million of lease right-of-use assets. Other liabilities include the related tax-oriented investment liabilities of $669 million and lease liabilities of $748 million. Refer to Note 15 and Note 19 for additional information.

The issuance of the $50 billion Purchase Money Note, the effective settlement of the Bank's $5 billion deposit and $447 million of securities financing with First Republic Bank, and the $3.6 billion payable to the FDIC as part of the purchase price consideration are considered non-cash transactions.

The following describes the accounting policies and fair value methodologies generally used by the Bank for the following assets acquired and liabilities assumed: core deposit and customer relationship intangibles, shared-loss agreements and the related indemnification assets, Purchase Money Note, and FHLB advances.

For further discussion of the Bank's accounting policies and valuation methodologies, refer to Note 3 and Note 4 for fair value measurement, Note 11 for investment securities, Note 13 for loans, Note 18 for deposits, and Note 26 for lending-related commitments.

Core deposit and customer relationship intangibles

Core deposit and certain wealth management customer relationship intangibles were acquired as part of the First Republic acquisition. The core deposit intangible of $1.3 billion was valued by discounting estimated after-tax cost savings over the remaining useful life of the deposits using the favorable source of funds method. The after-tax cost savings were estimated based on the difference between the cost of maintaining the core deposit base relative to the cost of next best alternative funding sources available to market participants. The customer relationship intangibles of $180 million were valued by discounting estimated after-tax earnings over their remaining useful lives using the multi-period excess earnings method. Both intangible asset valuations utilized assumptions that the Bank believes a market participant would use to estimate fair values, such as growth and attrition rates, projected fee income as well as related costs to service the relationships, and discount rates. The core deposit and customer relationship intangibles will be amortized over a projected period of future cash flows of approximately 7 years. Refer to Note 16 for further discussion on other intangible assets.

Indemnification assets - Shared-loss agreements

The indemnification assets represent forecasted recoveries from the FDIC associated with the shared-loss assets over the respective shared-loss recovery periods. The indemnification assets were recorded at fair value in other assets on the Consolidated balance sheets on the acquisition date. The fair values of the indemnification assets were estimated based on the timing of the forecasted losses underlying the related allowance for credit losses. The subsequent quarterly remeasurement of the indemnification assets is based on changes in the amount and timing of forecasted losses in the allowance for credit losses associated with the shared-loss assets and is recorded in other income. Under certain circumstances, the Bank may be required to make a payment to the FDIC upon termination of the shared-loss agreements based on the level of actual losses and recoveries on the shared-loss assets. The estimated potential future payment is reflected as contingent consideration as part of the purchase price consideration.

Purchase Money Note and FHLB advances

The Purchase Money Note is recorded in long-term debt on the Consolidated balance sheets. The fair value of the Purchase Money Note was estimated based on a discounted cash flow methodology and incorporated estimated market discount rates.

The FHLB advances assumed in the acquisition are recorded in short-term borrowings and in long-term debt. The fair values of the FHLB advances were based on a discounted cash flow methodology and considered the observed FHLB advance issuance rates.

Loans

The following table presents the unpaid principal balance ("UPB") and estimated fair values of the loans acquired as of May 1, 2023, and reflects adjustments to the acquisition-date fair value of the loans acquired through December 31, 2023.

	May 1, 2023	
(in millions)	UPB	Fair value
Residential real estate	$ 106,240	$ 92,053
Auto and other	3,093	2,030
Total consumer	109,333	94,083
Secured by real estate	37,117	33,602
Commercial & industrial	4,332	3,932
Other[(a)]	23,499	21,625
Total wholesale	64,948	59,159
Total loans	$ 174,281	$ 153,242

(a) In the six months ended December 31, 2023, certain assets and liabilities were reclassified resulting in a $900 million increase to the UPB and $762 million increase to the fair value of Other wholesale loans.

Unaudited pro forma condensed combined financial information

Included in the Bank's Consolidated statements of income are noninterest revenue, net interest income and net income contributed by First Republic of $4.4 billion, $3.7 billion and $4.1 billion, respectively, for the year ended December 31, 2023.

The following table presents certain unaudited pro forma financial information for the year ended December 31, 2023 and 2022 as if the First Republic acquisition had occurred on January 1, 2022, including recognition of the estimated bargain purchase gain of $2.8 billion and the provision for credit losses of $1.2 billion. Additional adjustments include the interest on the Purchase Money Note and the impact of amortizing and accreting certain estimated fair value adjustments related to intangible assets, loans and lending-related commitments.

The Bank expects to achieve operating cost savings and other business synergies resulting from the acquisition that are not reflected in the pro forma amounts. The pro forma information is not necessarily indicative of the historical results of operations had the acquisition occurred on January 1, 2022, nor is it indicative of the results of operations in future periods, particularly in light of recent changes in market and economic conditions.

	Year ended December 31,	
(in millions)	2023	2022
Noninterest revenue	$ 51,016	$ 55,080
Net interest income	94,573	72,717
Net income	46,609	37,755

Note 30 – Business changes and developments

Internal transfers of legal entities under common control

From time to time there may be transfers of legal entities under common control between the Bank and JPMorgan Chase. Such transfers are accounted for at historical cost in accordance with U.S. GAAP and are reflected in the Consolidated Financial Statements prospectively when the impact of the transfers are not material to the Bank's Consolidated Financial Statements. There were internal transfers of legal entities between the Bank and JPMorgan Chase for the years ended December 31, 2023, 2022 and 2021, and the impact of these transfers were not material to the Bank's Consolidated Financial Statements.

Subsequent events

The Bank has performed an evaluation of events that have occurred subsequent to December 31, 2023, and through February 16, 2024 (the date the financial statements were available to be issued). Other than the event indicated below, [there have been no material subsequent events] that occurred during such period that would require disclosure or recognition in the Bank's Consolidated Financial Statements as of December 31, 2023.

Dividend payment

On January 10, 2024, the Bank paid a $5.0 billion dividend to its parent JPMorgan Chase & Co.

ABS: Asset-backed securities

AFS: Available-for-sale

Amortized cost: Amount at which a financing receivable or investment is originated or acquired, adjusted for accretion or amortization of premium, discount, and net deferred fees or costs, collection of cash, charge-offs, foreign exchange, and fair value hedge accounting adjustments. For AFS securities, amortized cost is also reduced by any impairment losses recognized in earnings. Amortized cost is not reduced by the allowance for credit losses, except where explicitly presented net.

AOCI: Accumulated other comprehensive income/(loss)

ARM: Adjustable rate mortgage(s)

Bank: JPMorgan Chase Bank N.A.

BBL: Barrel

Beneficial interests issued by consolidated VIEs: Represents the interest of third-party holders of debt, equity securities, or other obligations, issued by VIEs that the Bank consolidates.

Benefit obligation: Refers to the projected benefit obligation for pension plans and the accumulated postretirement benefit obligation for OPEB plans.

Bridge Financing Portfolio: A portfolio of held-for-sale unfunded loan commitments and funded loans. The unfunded commitments include both short-term bridge loan commitments that will ultimately be replaced by longer term financing as well as term loan commitments. The funded loans include term loans and funded revolver facilities.

CCP: "Central counterparty" is a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts. A CCP becomes a counterparty to trades with market participants through novation, an open offer system, or another legally binding arrangement.

CDS: Credit default swaps

CECL: Current Expected Credit Losses

CET1 Capital: Common equity Tier 1 capital

CFO: Chief Financial Officer

CLO: Collateralized loan obligations

Collateral-dependent: A loan is considered to be collateral-dependent when repayment of the loan is expected to be provided substantially through the operation or sale of the collateral when the borrower is experiencing financial difficulty, including when foreclosure is deemed probable based on borrower delinquency.

Credit derivatives: Financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Upon the occurrence of a credit event by the reference entity, which may include, among other events, the bankruptcy or failure to pay its obligations, or certain restructurings of the debt of the reference entity, neither party has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value at the time of settling the credit derivative contract. The determination as to whether a credit event has occurred is generally made by the relevant International Swaps and Derivatives Association ("ISDA") Determinations Committee.

Criticized: Criticized loans, lending-related commitments and derivative receivables that are classified as special mention, substandard and doubtful categories for regulatory purposes and are generally consistent with a rating of CCC+/Caa1 and below, as defined by S&P and Moody's.

CRO: Chief Risk Officer

CVA: Credit valuation adjustment

DVA: Debit valuation adjustment

Embedded derivatives: are implicit or explicit terms or features of a financial instrument that affect some or all of the cash flows or the value of the instrument in a manner similar to a derivative. An instrument containing such terms or features is referred to as a "hybrid." The component of the hybrid that is the non-derivative instrument is referred to as the "host." For example, callable debt is a hybrid instrument that contains a plain vanilla debt instrument (i.e., the host) and an embedded option that allows the issuer to redeem the debt issue at a specified date for a specified amount (i.e., the embedded derivative). However, a floating rate instrument is not a hybrid composed of a fixed-rate instrument and an interest rate swap.

ETD: "Exchange-traded derivatives": Derivative contracts that are executed on an exchange and settled via a central clearing house.

EU: European Union

Fannie Mae: Federal National Mortgage Association

FASB: Financial Accounting Standards Board

FCA: Financial Conduct Authority

FDIC: Federal Deposit Insurance Corporation

FDM: "Financial difficulty modification" applies to loan modifications effective January 1, 2023, and is deemed to occur when the Bank modifies specific terms of the original loan agreement. The following types of modifications are considered FDMs: principal forgiveness, interest rate reduction, other-than-insignificant payment delay, term extension or a combination of these modifications.

Federal Reserve: The Board of the Governors of the Federal Reserve System

FFIEC: Federal Financial Institutions Examination Council

FHA: Federal Housing Administration

FHLB: Federal Home Loan Bank

FICC: The Fixed Income Clearing Corporation

FICO score: A measure of consumer credit risk provided by credit bureaus, typically produced from statistical models by Fair Isaac Corporation utilizing data collected by the credit bureaus.

Freddie Mac: Federal Home Loan Mortgage Corporation

Free standing derivatives: A derivative contract entered into either separate and apart from any of the Bank's other financial instruments or equity transactions. Or, in conjunction with some other transaction and is legally detachable and separately exercisable.

FTC: Foreign tax credit

FVA: Funding valuation adjustment

FX: Foreign exchange

G7: Group of Seven nations: Countries in the G7 are Canada, France, Germany, Italy, Japan, the U.K. and the U.S.

G7 government securities: Securities issued by the government of one of the G7 nations.

Ginnie Mae: Government National Mortgage Association

HELOC: Home equity line of credit

Home equity – senior lien: Represents loans and commitments where the Bank holds the first security interest on the property.

Home equity – junior lien: Represents loans and commitments where the Bank holds a security interest that is subordinate in rank to other liens.

HTM: Held-to-maturity

Investment-grade: An indication of credit quality based on the Bank's internal risk assessment. The Bank considers ratings of BBB-/Baa3 or higher as investment-grade.

JPMorgan Chase: JPMorgan Chase & Co.

LGD: Loss given default

LIBOR: London Interbank Offered Rate

LLC: Limited Liability Company

LTIP: Long-term incentive plan

LTV: "Loan-to-value": For residential real estate loans, the relationship, expressed as a percentage, between the principal amount of a loan and the appraised value of the collateral (i.e., residential real estate) securing the loan.

Origination date LTV ratio
The LTV ratio at the origination date of the loan. Origination date LTV ratios are calculated based on the actual appraised values of collateral (i.e., loan-level data) at the origination date.

Current estimated LTV ratio
An estimate of the LTV as of a certain date. The current estimated LTV ratios are calculated using estimated collateral values derived from a nationally recognized home price index measured at the metropolitan statistical area ("MSA") level. These MSA-level home price indices consist of actual data to the extent available and forecasted data where actual data is not available. As a result, the estimated collateral values used to calculate these ratios do not represent actual appraised loan-level collateral values; as such, the resulting LTV ratios are necessarily imprecise and should therefore be viewed as estimates.

Combined LTV ratio
The LTV ratio considering all available lien positions, as well as unused lines, related to the property. Combined Loan-To-Value ratios are used for junior lien home equity products.

Master netting agreement: A single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due).

MBS: Mortgage-backed securities

Measurement alternative: Measures equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer.

Merchant Services: offers merchants payment processing capabilities, fraud and risk management, data and analytics, and other payments services. Through Merchant Services, merchants of all sizes can accept payments via credit and debit cards and payments in multiple currencies.

MEV: Macroeconomic variable

MMBTU: One million British thermal units

Moody's: Moody's Investor Services

Mortgage product types:
Alt-A
Alt-A loans are generally higher in credit quality than subprime loans but have characteristics that would disqualify the borrower from a traditional prime loan. Alt-A lending characteristics may include one or more of the following: (i) limited documentation; (ii) a high CLTV ratio; (iii) loans secured by non-owner occupied properties; or (iv)

a debt-to-income ratio above normal limits. A substantial proportion of the Bank's Alt-A loans are those where a borrower does not provide complete documentation of his or her assets or the amount or source of his or her income.

Option ARMs
The option ARM real estate loan product is an adjustable-rate mortgage loan that provides the borrower with the option each month to make a fully amortizing, interest-only or minimum payment. The minimum payment on an option ARM loan is based on the interest rate charged during the introductory period. This introductory rate is usually significantly below the fully indexed rate. The fully indexed rate is calculated using an index rate plus a margin. Once the introductory period ends, the contractual interest rate charged on the loan increases to the fully indexed rate and adjusts monthly to reflect movements in the index. The minimum payment is typically insufficient to cover interest accrued in the prior month, and any unpaid interest is deferred and added to the principal balance of the loan. Option ARM loans are subject to payment recast, which converts the loan to a variable-rate fully amortizing loan upon meeting specified loan balance and anniversary date triggers.

Prime
Prime mortgage loans are made to borrowers with good credit records who meet specific underwriting requirements, including prescriptive requirements related to income and overall debt levels. New prime mortgage borrowers provide full documentation and generally have reliable payment histories.

Subprime
Subprime loans are loans that, prior to mid-2008, were offered to certain customers with one or more high risk characteristics, including but not limited to: (i) unreliable or poor payment histories; (ii) a high LTV ratio of greater than 80% (without borrower-paid mortgage insurance); (iii) a high debt-to-income ratio; (iv) an occupancy type for the loan is other than the borrower's primary residence; or (v) a history of delinquencies or late payments on the loan.

MSA: Metropolitan statistical areas

MSR: Mortgage servicing rights

NA: Data is not applicable or available for the period presented.

NAV: Net Asset Value

Net charge-off/(recovery) rate: Represents net charge-offs/(recoveries) (annualized) divided by average retained loans for the reporting period.

Net interchange income includes the following components:

- **Interchange income**: Fees earned by credit and debit card issuers on sales transactions.
- **Rewards costs**: The cost to the Bank for points earned by cardholders enrolled in credit card rewards programs generally tied to sales transactions.
- **Partner payments**: Payments to co-brand credit card partners based on the cost of loyalty program rewards earned by cardholders on credit card transactions.

Net mortgage servicing revenue: Includes operating revenue earned from servicing third-party mortgage loans, which is recognized over the period in which the service is provided; changes in the fair value of MSRs; the impact of risk management activities associated with MSRs; and gains and losses on securitization of excess mortgage servicing. Net mortgage servicing revenue also includes gains and losses on sales and lower of cost or fair value adjustments of certain repurchased loans insured by U.S. government agencies.

NOL: Net operating loss

Nonaccrual loans: Loans for which interest income is not recognized on an accrual basis. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest have been in default for a period of 90 days or more unless the loan is both well-secured and in the process of collection. Collateral-dependent loans are typically maintained on nonaccrual status.

OAS: Option-adjusted spread

OCC: Office of the Comptroller of the Currency

OCI: Other comprehensive income/(loss)

OPEB: Other postretirement employee benefit

Over-the-counter ("OTC") derivatives: Derivative contracts that are negotiated, executed and settled bilaterally between two derivative counterparties, where one or both counterparties is a derivatives dealer.

Over-the-counter cleared ("OTC-cleared") derivatives: Derivative contracts that are negotiated and executed bilaterally, but subsequently settled via a central clearing house, such that each derivative counterparty is only exposed to the default of that clearing house.

PCD: **"Purchased credit deteriorated"** assets represent acquired financial assets that as of the date of acquisition have experienced a more-than-insignificant deterioration in credit quality since origination, as determined by the Bank.

PD: Probability of default

PPP: Paycheck Protection Program under the Small Business Association ("SBA")

PRA: Prudential Regulation Authority

Principal transactions revenue: Principal transactions revenue is driven by many factors, including:

- the bid-offer spread, which is the difference between the price at which a market participant is willing and able to sell an instrument to the Bank and the price at which another market participant is willing and able to buy it from the Bank, and vice versa; and
- realized and unrealized gains and losses on financial instruments and commodities transactions, including those accounted for under the fair value option, primarily used in client-driven market-making activities.
  - Realized gains and losses result from the sale of instruments, closing out or termination of transactions, or interim cash payments.
  - Unrealized gains and losses result from changes in valuation.

In connection with its client-driven market-making activities, the Bank transacts in debt and equity instruments, derivatives and commodities, including physical commodities inventories and financial instruments that reference commodities.

Principal transactions revenue also includes realized and unrealized gains and losses related to:

- derivatives designated in qualifying hedge accounting relationships, primarily fair value hedges of commodity and foreign exchange risk;
- derivatives used for specific risk management purposes, primarily to mitigate credit, foreign exchange and interest rate risks.

Production revenue: Includes fees and income recognized as earned on mortgage loans originated with the intent to sell, and the impact of risk management activities associated with the mortgage pipeline and warehouse loans. Production revenue also includes gains and losses on sales and lower of cost or fair value adjustments on mortgage loans held-for-sale (excluding certain repurchased loans insured by U.S. government agencies), and changes in the fair value of financial instruments measured under the fair value option.

PSUs: Performance share units

REO: Real estate owned

Retained loans: Loans that are held-for-investment (i.e., excludes loans held-for-sale and loans at fair value).

RHS: Rural Housing Service of the U.S. Department of Agriculture

ROU assets: Right-of-use assets

RSU(s): Restricted stock units

RWA: "Risk-weighted assets": Basel III establishes two comprehensive approaches for calculating RWA (a Standardized approach and an Advanced approach) which include capital requirements for credit risk, market risk, and in the case of Basel III Advanced, also operational risk. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced.

Scored portfolios: Consumer loan portfolios that predominantly include residential real estate loans, credit card loans, auto loans to individuals and certain small business loans.

S&P: Standard and Poor's

SAR(s) as it pertains to employee stock awards: Stock appreciation rights

SEC: U.S. Securities and Exchange Commission

Securities financing agreements: Include resale, repurchase, securities borrowed and securities loaned agreements

SLR: Supplementary leverage ratio

SMBS: Stripped mortgage-backed securities

SOFR: Secured Overnight Financing Rate

SPEs: Special purpose entities

Structured notes: Structured notes are financial instruments whose cash flows are linked to the movement in one or more indexes, interest rates, foreign exchange rates, commodities prices, prepayment rates, underlying reference pool of loans or other market variables. The notes typically contain embedded (but not separable or detachable) derivatives. Contractual cash flows for principal, interest, or both can vary in amount and timing throughout the life of the note based on non-traditional indexes or non-traditional uses of traditional interest rates or indexes.

TDR: "Troubled debt restructuring" applies to loan modifications granted prior to January 1, 2023 and is deemed to occur when the Bank modifies the original terms of a loan agreement by granting a concession to a borrower that is experiencing financial difficulty. Loans with short-term and other insignificant modifications that are not considered concessions are not TDRs.

U.K.: United Kingdom

Unaudited: Financial statements and/or information that have not been subject to auditing procedures by an independent registered public accounting firm.

U.S.: United States of America

U.S. GAAP: Accounting principles generally accepted in the U.S.

U.S. government agencies: U.S. government agencies include, but are not limited to, agencies such as Ginnie Mae and FHA, and do not include Fannie Mae and Freddie Mac which are U.S. government-sponsored enterprises ("U.S. GSEs"). In general, obligations of U.S. government agencies are fully and explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government in the event of a default.

U.S. GSE(s): "U.S. government-sponsored enterprises" are quasi-governmental, privately-held entities established or chartered by the U.S. government to serve public purposes as specified by the U.S. Congress to improve the flow of credit to specific sectors of the economy and provide certain essential services to the public. U.S. GSEs include Fannie Mae and Freddie Mac, but do not include Ginnie Mae or FHA. U.S. GSE obligations are not explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government.

U.S. Treasury: U.S. Department of the Treasury

VA: U.S. Department of Veterans Affairs

VCG: Valuation Control Group

VGF: Valuation Governance Forum

VIEs: Variable interest entities

Warehouse loans: Consist of prime mortgages originated with the intent to sell that are accounted for at fair value and classified as loans.

STATUTORY CONSENTS

As a national banking association organised under the federal laws of the United States of America, the guarantor is empowered to give guarantees. Each issue of structured products will have the benefit of the guarantee.

NO MATERIAL ADVERSE CHANGE AND LITIGATION

Save as disclosed in the section headed "General Information about Us" and the section headed "Information Relating to the Guarantor" in this base listing document, there has been no material adverse change in our or the guarantor's financial position since the date of the most recently published audited financial statements of us or the guarantor on a consolidated basis respectively, as the case may be, that would have a material adverse effect on our ability to perform our obligations, or the guarantor's ability to perform its obligations respectively in the context of any issue of structured products.

Save as disclosed in this base listing document (including the financial statements included herein), we and the guarantor are not aware, to the best of our and the guarantor's knowledge and belief, of any litigation or claims of material importance pending or threatened against us or the guarantor.

FINANCIAL INFORMATION ABOUT THE GUARANTOR

As at the date of this base listing document, PricewaterhouseCoopers LLP, auditor of the guarantor, has given and has not withdrawn its written consent to the inclusion in this base listing document of its audit report dated 16 February 2024 (which relates to the guarantor's financial statements for the year ended 31 December 2023 comprising consolidated balance sheets at 31 December 2023 and 2022 and the related consolidated statements of income, changes in stockholder's equity, comprehensive income and cash flows for each of the three years ended 31 December 2023) in the form and context in which it is included. Its report was not prepared for incorporation in this base listing document.

PricewaterhouseCoopers LLP does not have any shareholding in the guarantor or any of the guarantor's subsidiaries, nor does it have the right (whether legally enforceable or not) to subscribe for or to nominate persons to subscribe for securities of the guarantor or any of the guarantor's subsidiaries.

OUR SERVICE OF PROCESS AGENT

We have authorised J.P. Morgan Securities (Asia Pacific) Limited, 23-29/F, Chater House, 8 Connaught Road Central, Hong Kong to accept on our behalf and on behalf of the guarantor service of process and any other notices required to be served on either us or the guarantor in Hong Kong.

OUR AUTHORISED REPRESENTATIVES

Our authorised representatives are Elaine Hue Mei Chan, Executive Director (who can be contacted at 23-29/F, Chater House, 8 Connaught Road Central, Hong Kong) and Yao Khoon, Shuy, Executive Director (who can be contacted at the Quayside, 12/F Tower 2, 77 Hoi Bun Road, Kwun Tong, Hong Kong).

ANNEX 1

TERMS AND CONDITIONS OF THE CASH-SETTLED STOCK WARRANTS

The relevant Conditions will, together with the supplemental provisions contained in the relevant launch announcement and supplemental listing document and subject to completion and amendment, be endorsed on the back of the global warrant certificate. The applicable launch announcement and supplemental listing document in relation to the issue of any series of Warrants may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with the relevant Conditions, replace or modify the relevant Conditions for the purpose of such series of Warrants. Capitalised terms used in the relevant Conditions and not otherwise defined therein shall have the meanings given to them in the relevant launch announcement and supplemental listing document.

1 Form; Status; Guarantee; Transfer and Title

(A) The Warrants (which expression shall, unless the context otherwise requires, include any further warrants issued pursuant to Condition 13) relating to the Shares of the Company are issued in registered form subject to and with the benefit of the amended and restated instrument dated 3 May 2010 (the "**Instrument**") made by J.P. Morgan Structured Products B.V. (the "**Issuer**") and JPMorgan Chase Bank, National Association (the "**Guarantor**") and the guarantee dated 11 March 2024 (the "**Guarantee**") made by the Guarantor.

Copies of the Instrument and the Guarantee are available for inspection at the office of J.P. Morgan Securities (Asia Pacific) Limited as specified below. The Warrantholders (as hereinafter defined) are entitled to the benefit of, are bound by and are deemed to have notice of, all the provisions of the Instrument and the Guarantee.

(B) The settlement obligation of the Issuer in respect of the Warrants represent general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

Warrants represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of warrants deposit liabilities of the Issuer or a debt obligation of any kind.

In the Guarantee, the Guarantor has, subject to the terms of the Guarantee, unconditionally and irrevocably guaranteed to the Warrantholders the due and punctual settlement in full of all obligations due and owing by the Issuer arising under the issuance of the Warrants after taking account of any set off, combination of accounts, netting or similar arrangement from time to time exercisable by the Issuer against any person to whom obligations are from time to time being owed, when and as due (whether at maturity, by acceleration or otherwise).

(C) Transfers of Warrants may be effected only in Board Lots or integral multiples thereof in the Central Clearing and Settlement System ("**CCASS**") in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time ("**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by or on behalf of the Issuer outside of Hong Kong as the holder shall be treated by the Issuer, the Guarantor and the Agent as the absolute owner and holder of the Warrants. The expression "**Warrantholder**" shall be construed accordingly.

(E) Trading in Warrants on The Stock Exchange of Hong Kong Limited (the "**Stock Exchange**") shall be suspended prior to the Expiry Date in accordance with the requirements of the Stock Exchange.

2 Warrant Rights and Exercise Expenses

(A) Every Board Lot entitles the Warrantholder, upon compliance with Condition 4, to payment of the Cash Settlement Amount (as defined in Condition 4(C)).

(B) The Warrantholder will be required to pay any charges or expenses including any taxes or duties which are incurred or withheld in respect of the exercise of the Warrants (the "**Exercise Expenses**"). To effect such payment, an amount equivalent to the Exercise Expenses will be deducted by the Issuer from the Cash Settlement Amount in accordance with Condition 4(C).

3 Automatic Exercise

(A) Any Warrant in respect of which the Cash Settlement Amount which would be payable by the Issuer if exercised on the Expiry Date shall be deemed to be automatically exercised on the Expiry Date ("**Automatic Exercise**").

(B) Any Warrant which has not been automatically exercised in accordance with Condition 3(A) shall expire immediately without value thereafter and all rights of the Warrantholder and obligations of the Issuer with respect to such Warrant shall cease.

(C) In these Conditions, "**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong.

4 Exercise of Warrants

(A) Warrants may only be exercised in Board Lots or integral multiples thereof.

(B) Following the Expiry Date the Issuer will, with effect from the first Business Day following the Expiry Date cancel the Global Warrant Certificate.

(C) Subject to an Automatic Exercise in accordance with Condition 3(A), the Issuer will as soon as practicable and not later than the third CCASS Settlement Day after the later of: (i) the Expiry Date; and (ii) the day on which the Average Price is determined in accordance with these Conditions (the "**Settlement Date**") in accordance with these Conditions procure payment of the aggregate Cash Settlement Amount (following deduction of determined Exercise Expenses) for all Warrants exercised or deemed exercised, electronically through CCASS by crediting the relevant bank account of the Warrantholder as appearing in the register kept by or on behalf of the Issuer.

Subject to adjustment as provided in Condition 6, "**Cash Settlement Amount**" means:

In the case of a series of call Warrants:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{\text{Entitlement} \times (\text{Average Price} - \text{Exercise Price}) \times \text{one Board Lot}}{\text{Number of Warrant(s) per Entitlement}}$$

In the case of a series of put Warrants:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{\text{Entitlement} \times (\text{Exercise Price} - \text{Average Price}) \times \text{one Board Lot}}{\text{Number of Warrant(s) per Entitlement}}$$

"**Average Price**" shall be the arithmetic mean of the closing prices of one Share (as derived from the Daily Quotation Sheet of the Stock Exchange, subject to any adjustment to such closing prices as may be necessary to reflect any event as contemplated in Condition 6 such as capitalisation, rights issue, distribution or the like) in respect of each Valuation Date.

"**CCASS Settlement Day**" has the meaning ascribed to the term "**Settlement Day**" in the CCASS Rules, subject to such modification and amendment prescribed by Hong Kong Securities Clearing Company Limited from time to time.

"**Entitlement**" means the number of Shares to which the Warrants relate, as specified in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6.

"**Market Disruption Event**" means:

(i) the occurrence or existence on any Valuation Date during the one-half hour period that ends at the close of trading of any suspension of, or limitation imposed on, trading (by reason of movements in price exceeding limits permitted by the Stock Exchange or otherwise) on the Stock Exchange in (1) the Shares; or (2) any options or futures contracts relating to the Shares if, in any such case, such suspension or limitation is, in the determination of the Issuer and/or Agent, material;

(ii) the occurrence of any severe weather condition or other event on any day which either (1) results in the Stock Exchange being closed for trading for the entire day; or (2) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of such severe weather condition or other event; or

(iii) a limitation or closure of the Stock Exchange due to unforeseen circumstances.

"**Valuation Date**" means, subject as provided above in relation to a Market Disruption Event, each of the five Business Days immediately preceding the Expiry Date.

If the Issuer and/or the Agent determine, in its sole discretion, that a Market Disruption Event has occurred on any Valuation Date, then that Valuation Date shall be postponed until the first succeeding Business Day on which there is no Market Disruption Event irrespective of whether that postponed Valuation Date would fall on a Business Day that already is or is deemed to be a Valuation Date. For the avoidance of doubt, in the event that a Market Disruption Event has occurred and a Valuation Date is postponed as aforesaid, the closing price of the Shares on the first succeeding Business Day will be used more than once in determining the Average Price, so that in no event shall there be less than five closing prices used to determine the Average Price.

If the postponement of a Valuation Date as aforesaid would result in the Valuation Date falling on or after the Expiry Date, then:

(i) the Business Day immediately preceding the Expiry Date (the "**Last Valuation Date**") shall be deemed to be the Valuation Date notwithstanding the Market Disruption Event; and

(ii) the Issuer and/or the Agent shall determine the closing price of the Shares on the basis of its good faith estimate of the price that would have prevailed on the Last Valuation Date but for the Market Disruption Event.

Any payment made pursuant to this Condition 4(C) shall be delivered at the risk and expense of the Warrantholder to the Warrantholder, or such bank, broker or agent in Hong Kong (if any) as recorded on the register.

(D) If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Warrantholder for any interest in respect of the amount due or any loss or damage that such Warrantholder may suffer as a result of the existence of a Settlement Disruption Event.

(E) These Conditions shall not be construed so as to give rise to any relationship of agency or trust between the Guarantor, the Issuer or its agent or nominee and the Warrantholder and neither the Guarantor, the Issuer nor its agent or nominee shall owe any duty of a fiduciary nature to the Warrantholder.

None of the Issuer, the Guarantor or the Agent shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these terms and conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 4(C) above.

5 Agent

(A) The Agent will be acting as agent of the Issuer in respect of the Warrants and will not assume any obligation or duty to or any relationship or agency or trust for the Warrantholder.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Agent and to appoint another agent provided that it will at all times maintain an agent in Hong Kong for so long as the Warrants are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Warrantholder in accordance with Condition 10.

6 Adjustments

Adjustments may be made by the Issuer and/or the Agent to the terms of the Warrants (including, but not limited to, the Exercise Price and the Entitlement) on the basis of the following provisions:

(A) (i) If and whenever the Company shall, by way of Rights (as defined below), offer new Shares for subscription at a fixed subscription price to the holders of existing Shares pro rata to existing holdings (a "**Rights Offer**"), the Entitlement shall be adjusted on the Business Day on which the trading in the Shares of the Company becomes ex-entitlement in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = \frac{1 + M}{1 + (R/S) \times M}$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

S: Cum-Rights Share price, being the closing price of an existing Share, as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Shares are traded on a cum-Rights basis

R: Subscription price per new Share specified in the Rights Offer plus an amount equal to any dividends or other benefits foregone to exercise the Rights

M: Number of new Shares (whether a whole or a fraction) per existing Share each holder of an existing Share is entitled to subscribe

For the purposes of these Conditions, "**Rights**" means the right(s) attached to each existing Share or needed to acquire one new Share (as the case may be) which are given to a holder of existing Shares to subscribe at a fixed subscription price for new Shares pursuant to the Rights Offer (whether by the exercise of one Right, a part of a Right or an aggregate number of Rights).

(ii) The Exercise Price (which shall be rounded to the nearest 0.001) shall be adjusted by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Exercise Price shall take effect on the same day that the Entitlement is adjusted.

(iii) For the purposes of Conditions 6(A) and 6(B), no adjustment will be made if the adjustment to the Entitlement is one per cent. or less of the Entitlement immediately prior to the adjustment.

(B) If and whenever the Company shall make an issue of Shares credited as fully paid to holders of Shares generally by way of capitalisation of profits or reserves (other than pursuant to a scrip dividend or similar scheme for the time being operated by the Company or otherwise in lieu of a cash dividend) (and without any payment or other consideration being made or given by such holders) (a "**Bonus Issue**"), the Entitlement will be adjusted, subject to Condition 6(A)(iii), on the Business Day on which the trading in the Shares of the Company becomes ex-entitlement in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = 1 + N$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

N: Number of additional Shares (whether a whole or a fraction) per existing Share each holder of an existing Share is entitled to receive

In addition, the Issuer and/or the Agent shall adjust the Exercise Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Exercise Price shall take effect on the same day that the Entitlement is adjusted.

(C) If and whenever the Company shall subdivide its outstanding share capital into a greater number of shares (a "**Subdivision**") or consolidate its outstanding share capital into a smaller number of shares (a "**Consolidation**"), then:

(i) in the case of a Subdivision, the Entitlement shall be increased whereas the Exercise Price (which shall be rounded to the nearest 0.001) shall be decreased in the same ratio as the Subdivision; and

(ii) in the case of a Consolidation, the Entitlement shall be decreased whereas the Exercise Price (which shall be rounded to the nearest 0.001) shall be increased in the same ratio as the Consolidation,

in each case on the day on which the relevant Subdivision or Consolidation (as the case may be) shall have taken effect.

(D) If it is announced that the Company is to or may merge or consolidate with or into any other corporation (including becoming, by agreement or otherwise, a subsidiary of or controlled by any person or corporation) (except where the Company is the surviving corporation in a merger) or that it is to or may sell or transfer all or substantially all of its assets, the rights attaching to the Warrants may in the absolute discretion of the Issuer and/or the Agent be amended no later than the Business Day preceding the consummation of such merger, consolidation, sale or transfer (each a "**Restructuring Event**") (as determined by the Issuer and/or the Agent in its absolute discretion).

The rights attaching to the Warrants after the adjustment shall, after such Restructuring Event, relate to the number of shares of the corporation(s) resulting from or surviving such Restructuring Event or other securities (the "**Substituted Securities**") and/or cash offered in substitution for the affected Shares, as the case may be, to which the holder of such number of Shares to which the Warrants related immediately before such Restructuring Event would have been entitled upon such Restructuring Event. Thereafter the provisions hereof shall apply to such Substituted Securities, provided that any Substituted Securities may, in the absolute discretion of the Issuer and/or the Agent, be deemed to be replaced by an amount in the relevant currency equal to the market value or, if no market value is available, fair value, of such Substituted Securities in each case as determined by the Issuer and/or the Agent as soon as practicable after such Restructuring Event is effected.

For the avoidance of doubt, any remaining Shares shall not be affected by this paragraph (D) and, where cash is offered in substitution for Shares or is deemed to replace Substituted Securities as described above, references in these Conditions to the Shares shall include any such cash.

(E) No adjustment will be made for an ordinary cash dividend (whether or not it is offered with a scrip alternative) ("**Ordinary Dividend**"). For any other forms of cash distribution ("**Cash Distribution**") announced by the Company, such as a cash bonus, special dividend or extraordinary dividend, no adjustment will be made unless the value of the Cash Distribution accounts for 2 per cent. or more of the Share's closing price on the day of announcement by the Company.

If and whenever the Company shall make a Cash Distribution credited as fully paid to the holders of Shares generally, the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Shares becomes ex-entitlement in respect of the relevant Cash Distribution in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = \frac{S - OD}{S - OD - CD}$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

S: Cum-Cash Distribution Share price, being the closing price of an existing Share, as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Shares are traded on a cum-Cash Distribution basis

CD: The Cash Distribution per Share

OD: The Ordinary Dividend per Share, provided that the Ordinary Dividend and the Cash Distribution have the same ex-entitlement date. For the avoidance of doubt, the OD shall be zero if the Ordinary Dividend and the Cash Distribution have different ex-entitlement dates

In addition, the Issuer shall adjust the Exercise Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Exercise Price shall take effect on the same date that the Entitlement is adjusted.

(F) Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer and/or the Agent may (but shall not be obliged to) make such other adjustments to the terms and conditions of the Warrants as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is: (i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such adjustment in any particular jurisdiction); or (ii) determined by the Issuer and/or the Agent in good faith to be appropriate and commercially reasonable.

(G) The Issuer and/or the Agent shall determine any adjustment or amendment and its determination shall be conclusive and binding on the Warrantholder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholder in accordance with Condition 10 as soon as practicable after the determination thereof.

7 Purchase by the Issuer

The Issuer and any of its affiliates may purchase Warrants at any time on or after the date of their issue and any Warrants which are so purchased may be surrendered for cancellation or offered from time to time in one or more transactions in the over-the-counter market or otherwise at prevailing market prices or in negotiated transactions, at the discretion of the Issuer or any such affiliate, as the case may be.

8 Global Warrant Certificate

A global warrant certificate (the "**Global Warrant Certificate**") representing the Warrants will be deposited within CCASS and registered in the name of HKSCC Nominees Limited (or its successors). The Global Warrant Certificate will not be exchangeable for definitive warrant certificates.

9 Meeting of Warrantholder and Modification

(A) *Meetings of Warrantholder.* Notices for convening meetings to consider any matter affecting the Warrantholder's interests will be given to the Warrantholder in accordance with the provisions of Condition 10.

Every question submitted to a meeting of the Warrantholder shall be decided by poll. A meeting may be convened by the Issuer or by the Warrantholder holding not less than 10 per cent. of the Warrants for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons (including any nominee appointed by the Warrantholder) holding or representing not less than 25 per cent. of the Warrants for the time being remaining unexercised, or at any adjourned meeting two or more persons (including any nominee appointed by the Warrantholder) being or representing Warrantholder whatever the number of Warrants so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Warrantholder as, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Warrantholder shall be binding on all the holders of the Warrants, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Warrantholder being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Warrantholders, effect any modification of the terms and conditions of the Warrants or the Instrument which, in the opinion of the Issuer and/or the Agent, is:

(i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such modification in any particular jurisdiction);

(ii) of a formal, minor or technical nature;

(iii) made to correct a manifest error; or

(iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Any such modification shall be binding on the Warrantholders and shall be notified to them by the Issuer and/or the Agent as soon as practicable thereafter in accordance with Condition 10.

10 Notices

All notices in English and Chinese to the Warrantholder will be validly given if published on the website of the Hong Kong Exchanges and Clearing Limited. In such circumstances, the Issuer shall not be required to dispatch copies of the notice to the Warrantholders.

11 Liquidation

In the event of a liquidation, winding up or dissolution of the Company or the appointment of a liquidator, receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the undertaking, property or assets of the Company (each an "**Insolvency Event**"), all unexercised Warrants shall terminate automatically upon the occurrence of any Insolvency Event and the Issuer shall have no further obligation under the Warrants, except that in the case of a series of put Warrants:

(A) if the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner that there is any residual value in the put Warrants upon the occurrence of such Insolvency Event:

(i) the Issuer shall pay to each Warrantholder the residual value of the put Warrants in cash representing the fair market value in respect of each put Warrant held by such Warrantholder on or about the occurrence of such Insolvency Event less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion, acting in good faith and in a commercially reasonable manner. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholders in accordance with Condition 10; and

(ii) the Issuer and/or the Agent may, but shall not be obliged to, determine such cash amount by having regard to the manner in which the options contracts or futures contracts of the Shares traded on the Stock Exchange are calculated;

(B) otherwise, if the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner that there is no residual value in the put Warrants upon the occurrence of such Insolvency Event, the put Warrants shall lapse and cease to be valid for any purpose upon the occurrence of the Insolvency Event.

For the purpose of this Condition 11, an Insolvency Event occurs:

(i) in the case of a voluntary liquidation or winding up of the Company, on the effective date of the relevant resolution; or

(ii) in the case of an involuntary liquidation, winding up or dissolution of the Company, on the date of the relevant court order; or

(iii) in the case of the appointment of a liquidator or receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the undertaking, property or assets of the Company, on the date when such appointment is effective but subject (in any such case) to any contrary mandatory requirement of the applicable law.

12 Delisting of Company

(A) If at any time the Shares cease to be listed on the Stock Exchange, the Issuer shall give effect to these Conditions in such manner and make such adjustments to the rights attaching to the Warrants as it shall, in its absolute discretion, consider appropriate to ensure, so far as it is reasonably able to do so, that the interests of the Warrantholder generally are not materially prejudiced as a consequence of such delisting (without considering the individual circumstances of the Warrantholder or the tax or other consequences that may result in any particular jurisdiction).

(B) Without prejudice to the generality of Condition 12(A), where the Shares are or, upon the delisting, become, listed on any other stock exchange, these Conditions may, in the absolute discretion of the Issuer, be amended to the extent necessary to allow for the substitution of that other stock exchange in place of the Stock Exchange and the Issuer may, without the consent of the Warrantholder, make such adjustments to the entitlements of the Warrantholder on exercise (including, if appropriate, by converting foreign currency amounts at prevailing market rates into the relevant currency) as it shall consider appropriate in the circumstances.

(C) Any adjustment, amendment or determination made by the Issuer pursuant to this Condition 12 shall be conclusive and binding on the Warrantholder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholder in accordance with Condition 10 as soon as practicable after they are determined.

13 Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Warrantholder, to create and issue further warrants so as to form a single series with the Warrants.

14 Illegality or Impracticability

The Issuer is entitled to terminate the Warrants if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(A) for it to perform its obligations under the Warrants, or for the Guarantor to perform its obligations under the Guarantee, in whole or in part as a result of:

(i) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(ii) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (i) and (ii), a "**Change in Law Event**"); or

(B) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the Warrants due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Warrantholder a cash amount that the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner to be the fair market value in respect of each Warrant held by such Warrantholder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholders in accordance with Condition 10.

15 Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer and/or the Agent under these Conditions will be made in good faith and in a commercially reasonable manner.

16 Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the Warrants.

17 Governing Law

The Warrants, the Guarantee and the Instrument will be governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer, the Guarantor and the Warrantholder (by its acquisition of the Warrants) shall be deemed to have submitted for all purposes in connection with the Warrants, the Guarantee and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

18 Language

A Chinese translation of these Conditions is available upon request during usual business hours on any weekday (Saturdays, Sundays and holidays excepted) at the offices of the Agent. In the event of any inconsistency between the English version and Chinese translation of these Conditions, the English version shall prevail and be governing.

Agent
J.P. Morgan Securities (Asia Pacific) Limited
23-29/F, Chater House
8 Connaught Road Central
Hong Kong

TERMS AND CONDITIONS OF THE CASH-SETTLED FOREIGN STOCK WARRANTS

The relevant Conditions will, together with the supplemental provisions contained in the relevant launch announcement and supplemental listing document and subject to completion and amendment, be endorsed on the back of the global warrant certificate. The applicable launch announcement and supplemental listing document in relation to the issue of any series of Warrants may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with the relevant Conditions, replace or modify the relevant Conditions for the purpose of such series of Warrants. Capitalised terms used in the relevant Conditions and not otherwise defined therein shall have the meanings given to them in the relevant launch announcement and supplemental listing document.

1 Form; Status; Guarantee; Transfer and Title

(A) The Warrants (which expression shall, unless the context otherwise requires, include any further warrants issued pursuant to Condition 13) relating to the Shares of the Company are issued in registered form subject to and with the benefit of the amended and restated instrument dated 3 May 2010 (the "**Instrument**") made by J.P. Morgan Structured Products B.V. (the "**Issuer**") and JPMorgan Chase Bank, National Association (the "**Guarantor**") and the guarantee dated 11 March 2024 (the "**Guarantee**") made by the Guarantor.

Copies of the Instrument and the Guarantee are available for inspection at the office of J.P. Morgan Securities (Asia Pacific) Limited as specified below. The Warrantholders (as hereinafter defined) are entitled to the benefit of, are bound by and are deemed to have notice of, all the provisions of the Instrument and the Guarantee.

(B) The settlement obligation of the Issuer in respect of the Warrants represent general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

Warrants represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of warrants deposit liabilities of the Issuer or a debt obligation of any kind.

In the Guarantee, the Guarantor has, subject to the terms of the Guarantee, unconditionally and irrevocably guaranteed to the Warrantholders the due and punctual settlement in full of all obligations due and owing by the Issuer arising under the issuance of the Warrants after taking account of any set off, combination of accounts, netting or similar arrangement from time to time exercisable by the Issuer against any person to whom obligations are from time to time being owed, when and as due (whether at maturity, by acceleration or otherwise).

(C) Transfers of Warrants may be effected only in Board Lots or integral multiples thereof in the Central Clearing and Settlement System ("**CCASS**") in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time ("**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by or on behalf of the Issuer outside of Hong Kong as the holder shall be treated by the Issuer, the Guarantor and the Agent as the absolute owner and holder of the Warrants. The expression "**Warrantholder**" shall be construed accordingly.

(E) Trading in Warrants on The Stock Exchange of Hong Kong Limited (the "**Stock Exchange**") shall be suspended prior to the Expiry Date in accordance with the requirements of the Stock Exchange.

2 Warrant Rights and Exercise Expenses

(A) Every Board Lot entitles the Warrantholder, upon compliance with Condition 4, to payment of the Cash Settlement Amount (as defined in Condition 4(C)).

(B) The Warrantholder will be required to pay any charges or expenses including any taxes or duties which are incurred or withheld in respect of the exercise of the Warrants (the "**Exercise Expenses**"). To effect such payment, an amount equivalent to the Exercise Expenses will be deducted by the Issuer from the Cash Settlement Amount in accordance with Condition 4(C).

3 Automatic Exercise

(A) Any Warrant in respect of which the Cash Settlement Amount which would be payable by the Issuer if exercised on the Expiry Date shall be deemed to be automatically exercised on the Expiry Date ("**Automatic Exercise**").

(B) Any Warrant which has not been automatically exercised in accordance with Condition 3(A) shall expire immediately without value thereafter and all rights of the Warrantholder and obligations of the Issuer with respect to such Warrant shall cease.

(C) In these Conditions, "**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong.

4 Exercise of Warrants

(A) Warrants may only be exercised in Board Lots or integral multiples thereof.

(B) Following the Expiry Date the Issuer will, with effect from the first Business Day following the Expiry Date cancel the Global Warrant Certificate.

(C) Subject to an Automatic Exercise in accordance with Condition 3(A), the Issuer will as soon as practicable and not later than the third CCASS Settlement Day after the later of: (i) the Expiry Date; and (ii) the day on which the Average Price is determined in accordance with these Conditions (the "**Settlement Date**") in accordance with these Conditions procure payment of the aggregate Cash Settlement Amount (following deduction of determined Exercise Expenses) for all Warrants exercised or deemed exercised, electronically through CCASS by crediting the relevant bank account of the Warrantholder as appearing in the register kept by or on behalf of the Issuer.

Subject to adjustment as provided in Condition 6, "**Cash Settlement Amount**" means:

In the case of a series of call Warrants:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{\text{Entitlement} \times (\text{Average Price} - \text{Exercise Price}) \times \text{one Board Lot}}{\text{Number of Warrant(s) per Entitlement}}$$

(if applicable) either (i) converted from the Underlying Currency into the Settlement Currency at the Exchange Rate or, as the case may be, (ii) converted from the Underlying Currency into the Interim Currency at the First Exchange Rate and then converted from the Interim Currency into the Settlement Currency at the Second Exchange Rate.

In the case of a series of put Warrants:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{\text{Entitlement} \times (\text{Exercise Price} - \text{Average Price}) \times \text{one Board Lot}}{\text{Number of Warrant(s) per Entitlement}}$$

(if applicable) either (i) converted from the Underlying Currency into the Settlement Currency at the Exchange Rate or, as the case may be, (ii) converted from the Underlying Currency into the Interim Currency at the First Exchange Rate and then converted from the Interim Currency into the Settlement Currency at the Second Exchange Rate.

"**Average Price**" shall be the arithmetic mean of the official closing prices of one Share (as published by the Underlying Exchange, subject to any adjustment to such closing prices as may be necessary to reflect any event as contemplated in Condition 6 such as capitalisation, rights issue, distribution or the like) in respect of each Valuation Date.

"**CCASS Settlement Day**" has the meaning ascribed to the term "**Settlement Day**" in the CCASS Rules, subject to such modification and amendment prescribed by Hong Kong Securities Clearing Company Limited from time to time.

"**Entitlement**" means the number of Shares to which the Warrants relate, as specified in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6.

"**Exchange Rate**", if applicable, has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**First Exchange Rate**", if applicable, has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**Interim Currency**", if applicable, has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**Market Disruption Event**" means:

(i) the occurrence or existence on any Valuation Date during the one-half hour period that ends at the close of trading of any suspension of, or limitation imposed on, trading (by reason of movements in price exceeding limits permitted by the Underlying Exchange or otherwise) on the Underlying Exchange in (1) the Shares; or (2) any options or futures contracts relating to the Shares if, in any such case, such suspension or limitation is, in the determination of the Issuer and/or Agent, material; or

(ii) a closure of the Underlying Exchange or a disruption or limitation in trading on the Underlying Exchange due to any other unforeseen circumstances;

"**Second Exchange Rate**", if applicable, has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**Underlying Currency**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**Underlying Exchange**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document;

"**Underlying Exchange Business Day**" means a day (excluding Saturdays, Sundays or public holidays) on which the Underlying Exchange is scheduled to open for dealings during its regular trading sessions;

"**Valuation Date**" means, subject as provided above in relation to a Market Disruption Event, each of the five Underlying Exchange Business Days immediately preceding the Expiry Date.

If the Issuer and/or the Agent determine, in its sole discretion, that a Market Disruption Event has occurred on any Valuation Date, then that Valuation Date shall be postponed until the first succeeding Underlying Exchange Business Day on which there is no Market Disruption Event irrespective of whether that postponed Valuation Date would fall on an Underlying Exchange Business Day that already is or is deemed to be a Valuation Date. For the avoidance of doubt, in the event that a Market Disruption Event has occurred and a Valuation Date is postponed as aforesaid, the official closing price of the Shares on the first succeeding Underlying Exchange Business Day will be used more than once in determining the Average Price, so that in no event shall there be less than five official closing prices used to determine the Average Price.

If the postponement of a Valuation Date as aforesaid would result in the Valuation Date falling on or after the Expiry Date, then:

(i) the Underlying Exchange Business Day immediately preceding the Expiry Date (the "**Last Valuation Date**") shall be deemed to be the Valuation Date notwithstanding the Market Disruption Event; and

(ii) the Issuer and/or the Agent shall determine the official closing price of the Shares on the basis of its good faith estimate of the price that would have prevailed on the Last Valuation Date but for the Market Disruption Event.

Any payment made pursuant to this Condition 4(C) shall be delivered at the risk and expense of the Warrantholder to the Warrantholder, or such bank, broker or agent in Hong Kong (if any) as recorded on the register.

(D) If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Warrantholder for any interest in respect of the amount due or any loss or damage that such Warrantholder may suffer as a result of the existence of a Settlement Disruption Event.

(E) These Conditions shall not be construed so as to give rise to any relationship of agency or trust between the Guarantor, the Issuer or its agent or nominee and the Warrantholder and neither the Guarantor, the Issuer nor its agent or nominee shall owe any duty of a fiduciary nature to the Warrantholder.

None of the Issuer, the Guarantor or the Agent shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these terms and conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 4(C) above.

5 Agent

(A) The Agent will be acting as agent of the Issuer in respect of the Warrants and will not assume any obligation or duty to or any relationship or agency or trust for the Warrantholder.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Agent and to appoint another agent provided that it will at all times maintain an agent in Hong Kong for so long as the Warrants are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Warrantholder in accordance with Condition 10.

6 Adjustments

Adjustments may be made by the Issuer and/or the Agent to the terms of the Warrants (including, but not limited to, the Exercise Price and the Entitlement) on the basis of the following provisions:

(A) (i) If and whenever the Company shall, by way of Rights (as defined below), offer new Shares for subscription at a fixed subscription price to the holders of existing Shares pro rata to existing holdings (a "**Rights Offer**"), the Entitlement shall be adjusted on the Underlying Exchange Business Day on which the trading in the Shares of the Company becomes ex-entitlement in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = \frac{1 + M}{1 + (R/S) \times M}$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

S: Cum-Rights Share price, being the official closing price of an existing Share as published by the Underlying Exchange on the last Underlying Exchange Business Day on which the Shares are traded on a cum-Rights basis

R: Subscription price per new Share specified in the Rights Offer plus an amount equal to any dividends or other benefits foregone to exercise the Rights

M: Number of new Share(s) (whether a whole or a fraction) per existing Share each holder of an existing Share is entitled to subscribe

For the purposes of these Conditions, "**Rights**" means the right(s) attached to each existing Share or needed to acquire one new Share (as the case may be) which are given to a holder of existing Shares to subscribe at a fixed subscription price for new Shares pursuant to the Rights Offer (whether by the exercise of one Right, a part of a Right or an aggregate number of Rights).

(ii) The Exercise Price shall be adjusted by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Exercise Price shall take effect on the same day that the Entitlement is adjusted.

(iii) For the purposes of Conditions 6(A) and 6(B), no adjustment will be made if the adjustment to the Entitlement is one per cent. or less of the Entitlement immediately prior to the adjustment.

(B) If and whenever the Company shall make an issue of Shares credited as fully paid to holders of Shares generally by way of capitalisation of profits or reserves (other than pursuant to a scrip dividend or similar scheme for the time being operated by the Company or otherwise in lieu of a cash dividend and without any payment or other consideration being made or given by such holders) (a "**Bonus Issue**"), the Entitlement will be adjusted, subject to Condition 6(A)(iii), on the Underlying Exchange Business Day on which the trading in the Shares of the Company becomes ex-entitlement in accordance with the following formula:

Adjusted Entitlement = Adjustment Factor x E

Where:

Adjustment Factor = 1 + N

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

N: Number of additional Share(s) (whether a whole or a fraction) per existing Share each holder of an existing Share is entitled to receive

In addition, the Issuer and/or the Agent shall adjust the Exercise Price by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Exercise Price shall take effect on the same day that the Entitlement is adjusted.

(C) If and whenever the Company shall subdivide its outstanding share capital into a greater number of shares (a "**Subdivision**") or consolidate its outstanding share capital into a smaller number of shares (a "**Consolidation**"), then:

(i) in the case of a Subdivision, the Entitlement shall be increased whereas the Exercise Price shall be decreased in the same ratio as the Subdivision; and

(ii) in the case of a Consolidation, the Entitlement shall be decreased whereas the Exercise Price shall be increased in the same ratio as the Consolidation,

in each case on the day on which the relevant Subdivision or Consolidation (as the case may be) shall have taken effect.

(D) If it is announced that the Company is to or may merge or consolidate with or into any other corporation (including becoming, by agreement or otherwise, a subsidiary of or controlled by any person or corporation) (except where the Company is the surviving corporation in a merger) or that it is to or may sell or transfer all or substantially all of its assets, the rights attaching to the Warrants may in the absolute discretion of the Issuer and/or the Agent be amended no later than the Underlying Exchange Business Day preceding the consummation of such merger, consolidation, sale or transfer (each a "**Restructuring Event**") (as determined by the Issuer and/or the Agent in its absolute discretion).

The rights attaching to the Warrants after the adjustment shall, after such Restructuring Event, relate to the number of shares of the corporation(s) resulting from or surviving such Restructuring Event or other securities (the "**Substituted Securities**") and/or cash offered in substitution for the affected Shares, as the case may be, to which the holder of such number of Shares to which the Warrants related immediately before such Restructuring Event would have been entitled upon such Restructuring Event. Thereafter the provisions hereof shall apply to such Substituted Securities, provided that any Substituted Securities may, in the absolute discretion of the Issuer and/or the Agent, be deemed to be replaced by an amount in the relevant currency equal to the market value or, if no market value is available, fair value, of such Substituted Securities in each case as determined by the Issuer and/or the Agent as soon as practicable after such Restructuring Event is effected.

For the avoidance of doubt, any remaining Shares shall not be affected by this paragraph (D) and, where cash is offered in substitution for Shares or is deemed to replace Substituted Securities as described above, references in these Conditions to the Shares shall include any such cash.

(E) No adjustment will be made for an ordinary cash dividend (whether or not it is offered with a scrip alternative) ("**Ordinary Dividend**"). For any other forms of cash distribution ("**Cash Distribution**") announced by the Company, such as a cash bonus, special dividend or extraordinary dividend, no adjustment will be made unless the value of the Cash Distribution accounts for 2 per cent. or more of the Share's official closing price on the day of announcement by the Company.

If and whenever the Company shall make a Cash Distribution credited as fully paid to the holders of Shares generally, the Entitlement shall be adjusted to take effect on the Underlying Exchange Business Day on which trading in the Shares becomes ex-entitlement in respect of the relevant Cash Distribution in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = \frac{S - OD}{S - OD - CD}$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

S: Cum-Cash Distribution Share price, being the official closing price of an existing Share as published by the Underlying Exchange on the last Underlying Exchange Business Day on which the Shares are traded on a cum-Cash Distribution basis

CD: The Cash Distribution per Share

OD: The Ordinary Dividend per Share, provided that the Ordinary Dividend and the Cash Distribution have the same ex-entitlement date. For the avoidance of doubt, the OD shall be zero if the Ordinary Dividend and the Cash Distribution have different ex-entitlement dates

In addition, the Issuer shall adjust the Exercise Price by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Exercise Price shall take effect on the same date that the Entitlement is adjusted.

(F) Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer and/or the Agent may (but shall not be obliged to) make such other adjustments to the terms and conditions of the Warrants as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is: (i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such adjustment in any particular jurisdiction); or (ii) determined by the Issuer and/or the Agent in good faith to be appropriate and commercially reasonable.

(G) The Issuer and/or the Agent shall determine any adjustment or amendment and its determination shall be conclusive and binding on the Warrantholder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholder in accordance with Condition 10 as soon as practicable after the determination thereof.

7 Purchase by the Issuer

The Issuer and any of its affiliates may purchase Warrants at any time on or after the date of their issue and any Warrants which are so purchased may be surrendered for cancellation or offered from time to time in one or more transactions in the over-the-counter market or otherwise at prevailing market prices or in negotiated transactions, at the discretion of the Issuer or any such affiliate, as the case may be.

8 Global Warrant Certificate

A global warrant certificate (the "**Global Warrant Certificate**") representing the Warrants will be deposited within CCASS and registered in the name of HKSCC Nominees Limited (or its successors). The Global Warrant Certificate will not be exchangeable for definitive warrant certificates.

9 Meeting of Warrantholder and Modification

(A) *Meetings of Warrantholder.* Notices for convening meetings to consider any matter affecting the Warrantholder's interests will be given to the Warrantholder in accordance with the provisions of Condition 10.

Every question submitted to a meeting of the Warrantholder shall be decided by poll. A meeting may be convened by the Issuer or by the Warrantholder holding not less than 10 per cent. of the Warrants for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons (including any nominee appointed by the Warrantholder) holding or representing not less than 25 per cent. of the Warrants for the time being remaining unexercised, or at any adjourned meeting two or more persons (including any nominee appointed by the Warrantholder) being or representing Warrantholder whatever the number of Warrants so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Warrantholder as, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Warrantholder shall be binding on all the holders of the Warrants, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Warrantholder being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Warrantholders, effect any modification of the terms and conditions of the Warrants or the Instrument which, in the opinion of the Issuer and/or the Agent, is:

(i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such modification in any particular jurisdiction);

(ii) of a formal, minor or technical nature;

(iii) made to correct a manifest error; or

(iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Any such modification shall be binding on the Warrantholders and shall be notified to them by the Issuer and/or the Agent as soon as practicable thereafter in accordance with Condition 10.

10 Notices

All notices in English and Chinese to the Warrantholder will be validly given if published on the website of the Hong Kong Exchanges and Clearing Limited. In such circumstances, the Issuer shall not be required to dispatch copies of the notice to the Warrantholders.

11 Liquidation

In the event of a liquidation, winding up or dissolution of the Company or the appointment of a liquidator, receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the undertaking, property or assets of the Company (each an "**Insolvency Event**"), all unexercised Warrants shall terminate automatically upon the occurrence of any Insolvency Event and the Issuer shall have no further obligation under the Warrants, except that in the case of a series of put Warrants:

(A) if the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner that there is any residual value in the put Warrants upon the occurrence of such Insolvency Event:

(i) the Issuer shall pay to each Warrantholder the residual value of the put Warrants in cash representing the fair market value in respect of each put Warrant held by such Warrantholder on or about the occurrence of such Insolvency Event less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion, acting in good faith and in a commercially reasonable manner. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholders in accordance with Condition 10; and

(ii) the Issuer and/or the Agent may, but shall not be obliged to, determine such cash amount by having regard to the manner in which the options contracts or futures contracts of the Shares traded on the Stock Exchange are calculated;

(B) otherwise, if the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner that there is no residual value in the put Warrants upon the occurrence of such Insolvency Event, the put Warrants shall lapse and cease to be valid for any purpose upon the occurrence of the Insolvency Event.

For the purpose of this Condition 11, an Insolvency Event occurs:

(i) in the case of a voluntary liquidation or winding up of the Company, on the effective date of the relevant resolution; or

(ii) in the case of an involuntary liquidation, winding up or dissolution of the Company, on the date of the relevant court order; or

(iii) in the case of the appointment of a liquidator or receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the undertaking, property or assets of the Company, on the date when such appointment is effective but subject (in any such case) to any contrary mandatory requirement of the applicable law.

12 Delisting of Company

(A) If at any time the Shares cease to be listed on the Underlying Exchange, the Issuer shall give effect to these Conditions in such manner and make such adjustments to the rights attaching to the Warrants as it shall, in its absolute discretion, consider appropriate to ensure, so far as it is reasonably able to do so, that the interests of the Warrantholder generally are not materially prejudiced as a consequence of such delisting (without considering the individual circumstances of the Warrantholder or the tax or other consequences that may result in any particular jurisdiction).

(B) Without prejudice to the generality of Condition 12(A), where the Shares are or, upon the delisting, become, listed on any other stock exchange, these Conditions may, in the absolute discretion of the Issuer, be amended to the extent necessary to allow for the substitution of that other stock exchange in place of the Underlying Exchange and the Issuer may, without the consent of the Warrantholder, make such adjustments to the entitlements of the Warrantholder on exercise (including, if appropriate, by converting foreign currency amounts at prevailing market rates into the relevant currency) as it shall consider appropriate in the circumstances.

(C) Any adjustment, amendment or determination made by the Issuer pursuant to this Condition 12 shall be conclusive and binding on the Warrantholder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholder in accordance with Condition 10 as soon as practicable after they are determined.

13 Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Warrantholder, to create and issue further warrants so as to form a single series with the Warrants.

14 Illegality or Impracticability

The Issuer is entitled to terminate the Warrants if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(A) for it to perform its obligations under the Warrants, or for the Guarantor to perform its obligations under the Guarantee, in whole or in part as a result of:

  (i) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

  (ii) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

  (each of (i) and (ii), a "**Change in Law Event**"); or

(B) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the Warrants due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Warrantholder a cash amount that the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner to be the fair market value in respect of each Warrant held by such Warrantholder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholders in accordance with Condition 10.

15 Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer and/or the Agent under these Conditions will be made in good faith and in a commercially reasonable manner.

16 Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the Warrants.

17 Governing Law

The Warrants, the Guarantee and the Instrument will be governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer, the Guarantor and the Warrantholder (by its acquisition of the Warrants) shall be deemed to have submitted for all purposes in connection with the Warrants, the Guarantee and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

18 Language

A Chinese translation of these Conditions is available upon request during usual business hours on any weekday (Saturdays, Sundays and holidays excepted) at the offices of the Agent. In the event of any inconsistency between the English version and Chinese translation of these Conditions, the English version shall prevail and be governing.

Agent
J.P. Morgan Securities (Asia Pacific) Limited
23-29/F, Chater House
8 Connaught Road Central
Hong Kong

TERMS AND CONDITIONS OF THE CASH-SETTLED WARRANTS OVER EXCHANGE TRADED FUND

The relevant Conditions will, together with the supplemental provisions contained in the relevant launch announcement and supplemental listing document and subject to completion and amendment, be endorsed on the back of the global warrant certificate. The applicable launch announcement and supplemental listing document in relation to the issue of any series of Warrants may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with the relevant Conditions, replace or modify the relevant Conditions for the purpose of such series of Warrants. Capitalised terms used in the relevant Conditions and not otherwise defined therein shall have the meanings given to them in the relevant launch announcement and supplemental listing document.

1 Form; Status; Guarantee; Transfer and Title

(A) The Warrants (which expression shall, unless the context otherwise requires, include any further warrants issued pursuant to Condition 13) relating to the Units of the Fund are issued in registered form subject to and with the benefit of the amended and restated instrument dated 3 May 2010 (the "**Instrument**") made by J.P. Morgan Structured Products B.V. (the "**Issuer**") and JPMorgan Chase Bank, National Association (the "**Guarantor**") and the guarantee dated 11 March 2024 (the "**Guarantee**") made by the Guarantor.

Copies of the Instrument and the Guarantee are available for inspection at the office of J.P. Morgan Securities (Asia Pacific) Limited as specified below. The Warrantholders (as hereinafter defined) are entitled to the benefit of, are bound by and are deemed to have notice of, all the provisions of the Instrument and the Guarantee.

(B) The settlement obligation of the Issuer in respect of the Warrants represent general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

Warrants represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of warrants deposit liabilities of the Issuer or a debt obligation of any kind.

In the Guarantee, the Guarantor has, subject to the terms of the Guarantee, unconditionally and irrevocably guaranteed to the Warrantholders the due and punctual settlement in full of all obligations due and owing by the Issuer arising under the issuance of the Warrants after taking account of any set off, combination of accounts, netting or similar arrangement from time to time exercisable by the Issuer against any person to whom obligations are from time to time being owed, when and as due (whether at maturity, by acceleration or otherwise).

(C) Transfers of Warrants may be effected only in Board Lots or integral multiples thereof in the Central Clearing and Settlement System ("**CCASS**") in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time ("**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by or on behalf of the Issuer outside of Hong Kong as the holder shall be treated by the Issuer, the Guarantor and the Agent as the absolute owner and holder of the Warrants. The expression "**Warrantholder**" shall be construed accordingly.

(E) Trading in Warrants on The Stock Exchange of Hong Kong Limited (the "**Stock Exchange**") shall be suspended prior to the Expiry Date in accordance with the requirements of the Stock Exchange.

2 Warrant Rights and Exercise Expenses

(A) Every Board Lot entitles the Warrantholder, upon compliance with Condition 4, to payment of the Cash Settlement Amount (as defined in Condition 4(C)).

(B) The Warrantholder will be required to pay any charges or expenses including any taxes or duties which are incurred or withheld in respect of the exercise of the Warrants (the "**Exercise Expenses**"). To effect such payment, an amount equivalent to the Exercise Expenses will be deducted by the Issuer from the Cash Settlement Amount in accordance with Condition 4(C).

3 Automatic Exercise

(A) Any Warrant in respect of which the Cash Settlement Amount which would be payable by the Issuer if exercised on the Expiry Date shall be deemed to be automatically exercised on the Expiry Date ("**Automatic Exercise**").

(B) Any Warrant which has not been automatically exercised in accordance with Condition 3(A) shall expire immediately without value thereafter and all rights of the Warrantholder and obligations of the Issuer with respect to such Warrant shall cease.

(C) In these Conditions, "**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong.

4 Exercise of Warrants

(A) Warrants may only be exercised in Board Lots or integral multiples thereof.

(B) Following the Expiry Date the Issuer will, with effect from the first Business Day following the Expiry Date cancel the Global Warrant Certificate.

(C) Subject to an Automatic Exercise in accordance with Condition 3(A), the Issuer will as soon as practicable and not later than the third CCASS Settlement Day after the later of: (i) the Expiry Date; and (ii) the day on which the Average Price is determined in accordance with these Conditions (the "**Settlement Date**") in accordance with these Conditions procure payment of the aggregate Cash Settlement Amount (following deduction of determined Exercise Expenses) for all Warrants exercised or deemed exercised, electronically through CCASS by crediting the relevant bank account of the Warrantholder as appearing in the register kept by or on behalf of the Issuer.

Subject to adjustment as provided in Condition 6, "**Cash Settlement Amount**" means:

In the case of a series of call Warrants:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{\text{Entitlement} \times (\text{Average Price} - \text{Exercise Price}) \times \text{one Board Lot}}{\text{Number of Warrant(s) per Entitlement}}$$

In the case of a series of put Warrants:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{\text{Entitlement} \times (\text{Exercise Price} - \text{Average Price}) \times \text{one Board Lot}}{\text{Number of Warrant(s) per Entitlement}}$$

"**Average Price**" shall be the arithmetic mean of the closing prices of one Unit (as derived from the Daily Quotation Sheet of the Stock Exchange, subject to any adjustment to such closing prices as may be necessary to reflect any event as contemplated in Condition 6 such as capitalisation, rights issue, distribution or the like) in respect of each Valuation Date.

"**CCASS Settlement Day**" has the meaning ascribed to the term "**Settlement Day**" in the CCASS Rules, subject to such modification and amendment prescribed by Hong Kong Securities Clearing Company Limited from time to time.

"**Entitlement**" means the number of Units to which the Warrants relate, as specified in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6.

"**Market Disruption Event**" means:

(i) the occurrence or existence on any Valuation Date during the one-half hour period that ends at the close of trading of any suspension of, or limitation imposed on, trading (by reason of movements in price exceeding limits permitted by the Stock Exchange or otherwise) on the Stock Exchange in (1) the Units; or (2) any options or futures contracts relating to the Units if, in any such case, such suspension or limitation is, in the determination of the Issuer and/or Agent, material;

(ii) the occurrence of any severe weather condition or other event on any day which either (1) results in the Stock Exchange being closed for trading for the entire day; or (2) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of such severe weather condition or other event; or

(iii) a limitation or closure of the Stock Exchange due to unforeseen circumstances.

"**Valuation Date**" means, subject as provided above in relation to a Market Disruption Event, each of the five Business Days immediately preceding the Expiry Date.

If the Issuer and/or the Agent determine, in its sole discretion, that a Market Disruption Event has occurred on any Valuation Date, then that Valuation Date shall be postponed until the first succeeding Business Day on which there is no Market Disruption Event irrespective of whether that postponed Valuation Date would fall on a Business Day that already is or is deemed to be a Valuation Date. For the avoidance of doubt, in the event that a Market Disruption Event has occurred and a Valuation Date is postponed as aforesaid, the closing price of the Units on the first succeeding Business Day will be used more than once in determining the Average Price, so that in no event shall there be less than five closing prices used to determine the Average Price.

If the postponement of a Valuation Date as aforesaid would result in the Valuation Date falling on or after the Expiry Date, then:

(i) the Business Day immediately preceding the Expiry Date (the "**Last Valuation Date**") shall be deemed to be the Valuation Date notwithstanding the Market Disruption Event; and

(ii) the Issuer and/or the Agent shall determine the closing price of the Units on the basis of its good faith estimate of the price that would have prevailed on the Last Valuation Date but for the Market Disruption Event.

Any payment made pursuant to this Condition 4(C) shall be delivered at the risk and expense of the Warrantholder to the Warrantholder, or such bank, broker or agent in Hong Kong (if any) as recorded on the register.

(D) If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Warrantholder for any interest in respect of the amount due or any loss or damage that such Warrantholder may suffer as a result of the existence of a Settlement Disruption Event.

(E) These Conditions shall not be construed so as to give rise to any relationship of agency or trust between the Guarantor, the Issuer or its agent or nominee and the Warrantholder and neither the Guarantor, the Issuer nor its agent or nominee shall owe any duty of a fiduciary nature to the Warrantholder.

None of the Issuer, the Guarantor or the Agent shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these terms and conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 4(C) above.

5 Agent

(A) The Agent will be acting as agent of the Issuer in respect of the Warrants and will not assume any obligation or duty to or any relationship or agency or trust for the Warrantholder.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Agent and to appoint another agent provided that it will at all times maintain an agent in Hong Kong for so long as the Warrants are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Warrantholder in accordance with Condition 10.

6 Adjustments

Adjustments may be made by the Issuer and/or the Agent to the terms of the Warrants (including, but not limited to, the Exercise Price and the Entitlement) on the basis of the following provisions:

(A) (i) If and whenever the Fund shall, by way of Rights (as defined below), offer new Units for subscription at a fixed subscription price to the holders of existing Units pro rata to existing holdings (a "**Rights Offer**"), the Entitlement shall be adjusted on the Business Day on which the trading in the Units of the Fund becomes ex-entitlement in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = \frac{1 + M}{1 + (R/S) \times M}$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

S: Cum-Rights Unit price, being the closing price of an existing Unit, as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Units are traded on a cum-rights basis

R: Subscription price per new Unit specified in the Rights Offer plus an amount equal to any distributions or other benefits foregone to exercise the Rights

M: Number of new Unit(s) (whether a whole or a fraction) per existing Unit each holder of an existing Unit is entitled to subscribe

For the purposes of these Conditions, "**Rights**" means the right(s) attached to each existing Unit or needed to acquire one new Unit (as the case may be) which are given to a holder of existing Units to subscribe at a fixed subscription price for new Units pursuant to the Rights Offer (whether by the exercise of one Right, a part of a Right or an aggregate number of Rights).

(ii) The Exercise Price (which shall be rounded to the nearest 0.001) shall be adjusted by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Exercise Price shall take effect on the same day that the Entitlement is adjusted.

(iii) For the purposes of Conditions 6(A) and 6(B), no adjustment will be made if the adjustment to the Entitlement is one per cent. or less of the Entitlement immediately prior to the adjustment.

(B) If and whenever the Fund shall make an issue of Units credited as fully paid to holders of Units generally by way of capitalisation of profits or reserves (other than pursuant to a scrip distribution or similar scheme for the time being operated by the Fund or otherwise in lieu of a cash distribution) (and without any payment or other consideration being made or given by such holders) (a "**Bonus Issue**"), the Entitlement will be adjusted, subject to Condition 6(A)(iii), on the Business Day on which the trading in the Units of the Fund becomes ex-entitlement in accordance with the following formula:

Adjusted Entitlement = Adjustment Factor x E

Where:

Adjustment Factor = 1 + N

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

N: Number of additional Units (whether a whole or a fraction) per existing Unit each holder of an existing Unit is entitled to receive

In addition, the Issuer and/or the Agent shall adjust the Exercise Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Exercise Price shall take effect on the same day that the Entitlement is adjusted.

(C) If and whenever the Fund shall subdivide its Units or any class of its outstanding Units into a greater number of units or shares (a "**Subdivision**") or consolidate the Units or any class of its outstanding Units into a smaller number of units or shares (a "**Consolidation**"), then:

(i) in the case of a Subdivision, the Entitlement shall be increased whereas the Exercise Price (which shall be rounded to the nearest 0.001) shall be decreased in the same ratio as the Subdivision; and

(ii) in the case of a Consolidation, the Entitlement shall be decreased whereas the Exercise Price (which shall be rounded to the nearest 0.001) shall be increased in the same ratio as the Consolidation,

in each case on the day on which the relevant Subdivision or Consolidation (as the case may be) shall have taken effect.

(D) If it is announced that the Fund is to or may merge or consolidate with or into any other trust or corporation (including becoming, by agreement or otherwise, a subsidiary of or controlled by any person or corporation) (except where the Fund is the surviving entity in a merger) or that it is to or may sell or transfer all or substantially all of its assets, the rights attaching to the Warrants may in the absolute discretion of the Issuer and/or the Agent be amended no later than the Business Day preceding the consummation of such merger, consolidation, sale or transfer (each a "**Restructuring Event**") (as determined by the Issuer and/or the Agent in its absolute discretion).

The rights attaching to the Warrants after the adjustment shall, after such Restructuring Event, relate to the number of units or shares of the trust(s) or corporation(s) resulting from or surviving such Restructuring Event or other securities (the "**Substituted Securities**") and/or cash offered in substitution for the affected Units, as the case may be, to which the holder of such number of Units to which the Warrants related immediately before such Restructuring Event would have been entitled upon such Restructuring Event. Thereafter the provisions hereof shall apply to such Substituted Securities, provided that any Substituted Securities may, in the absolute discretion of the Issuer and/or the Agent, be deemed to be replaced by an amount in the relevant currency equal to the market value or, if no market value is available, fair value, of such Substituted Securities in each case as determined by the Issuer and/or the Agent as soon as practicable after such Restructuring Event is effected.

For the avoidance of doubt, any remaining Units shall not be affected by this paragraph (D) and, where cash is offered in substitution for Units or is deemed to replace Substituted Securities as described above, references in these Conditions to the Units shall include any such cash.

(E) No adjustment will be made for an ordinary cash distribution (whether or not it is offered with a scrip alternative) ("**Ordinary Distribution**"). For any other forms of cash distribution ("**Cash Distribution**") announced by the Fund, such as a cash bonus, special distribution or extraordinary distribution, no adjustment will be made unless the value of the Cash Distribution accounts for 2 per cent. or more of the Unit's closing price on the day of announcement by the Fund.

If and whenever the Fund shall make a Cash Distribution credited as fully paid to the holders of Units generally, the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Units becomes ex-entitlement in respect of the relevant Cash Distribution in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = \frac{S - OD}{S - OD - CD}$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

S: Cum-Cash Distribution Unit price, being the closing price of an existing Unit, as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Units are traded on a cum-Cash Distribution basis

CD: The Cash Distribution per Unit

OD: The Ordinary Distribution per Unit, provided that the Ordinary Distribution and the Cash Distribution have the same ex-entitlement date. For the avoidance of doubt, the OD shall be zero if the Ordinary Distribution and the Cash Distribution have different ex-entitlement dates

In addition, the Issuer shall adjust the Exercise Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Exercise Price shall take effect on the same date that the Entitlement is adjusted.

(F) Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer and/or the Agent may (but shall not be obliged to) make such other adjustments to the terms and conditions of the Warrants as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is: (i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such adjustment in any particular jurisdiction); or (ii) determined by the Issuer and/or the Agent in good faith to be appropriate and commercially reasonable.

(G) The Issuer and/or the Agent shall determine any adjustment or amendment and its determination shall be conclusive and binding on the Warrantholder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholder in accordance with Condition 10 as soon as practicable after the determination thereof.

7 Purchase by the Issuer

The Issuer and any of its affiliates may purchase Warrants at any time on or after the date of their issue and any Warrants which are so purchased may be surrendered for cancellation or offered from time to time in one or more transactions in the over-the-counter market or otherwise at prevailing market prices or in negotiated transactions, at the discretion of the Issuer or any such affiliate, as the case may be.

8 Global Warrant Certificate

A global warrant certificate (the "**Global Warrant Certificate**") representing the Warrants will be deposited within CCASS and registered in the name of HKSCC Nominees Limited (or its successors). The Global Warrant Certificate will not be exchangeable for definitive warrant certificates.

9 Meeting of Warrantholder and Modification

(A) *Meetings of Warrantholder.* Notices for convening meetings to consider any matter affecting the Warrantholder's interests will be given to the Warrantholder in accordance with the provisions of Condition 10.

Every question submitted to a meeting of the Warrantholder shall be decided by poll. A meeting may be convened by the Issuer or by the Warrantholder holding not less than 10 per cent. of the Warrants for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons (including any nominee appointed by the Warrantholder) holding or representing not less than 25 per cent. of the Warrants for the time being remaining unexercised, or at any adjourned meeting two or more persons (including any nominee appointed by the Warrantholder) being or representing Warrantholder whatever the number of Warrants so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Warrantholder as, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Warrantholder shall be binding on all the holders of the Warrants, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Warrantholder being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Warrantholders, effect any modification of the terms and conditions of the Warrants or the Instrument which, in the opinion of the Issuer and/or the Agent, is:

(i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such modification in any particular jurisdiction);

(ii) of a formal, minor or technical nature;

(iii) made to correct a manifest error; or

(iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Any such modification shall be binding on the Warrantholders and shall be notified to them by the Issuer and/or the Agent as soon as practicable thereafter in accordance with Condition 10.

10 Notices

All notices in English and Chinese to the Warrantholder will be validly given if published on the website of the Hong Kong Exchanges and Clearing Limited. In such circumstances, the Issuer shall not be required to dispatch copies of the notice to the Warrantholders.

11 Termination or Liquidation

In the event of a Termination or the liquidation, winding up or dissolution of the Fund or, if applicable, trustee of the Fund (including any successor trustee appointed from time to time) ("**Trustee**") (in its capacity as trustee of the Fund) or the appointment of a liquidator, receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the Fund's or the Trustee's (as the case may be) undertaking, property or assets all unexercised Warrants shall lapse and cease to be valid for any purpose. In the case of a Termination the unexercised Warrants shall lapse and cease to be valid on the effective date of the Termination, in the case of a voluntary liquidation or winding up, on the effective date of the relevant resolution and, in the case of an involuntary liquidation, winding up or dissolution, on the date of the relevant court order or, in the case of the appointment of a liquidator or receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of such Fund's or Trustee's (as the case may be) undertaking, property or assets, on the date when such appointment is effective but subject (in any such case) to any contrary mandatory requirement of the applicable law.

For the purpose of this Condition 11, "**Termination**" means (i) the Fund is terminated or required to be terminated for whatever reason, or the termination of the Fund commences; (ii) where applicable, the Fund is held or is conceded by the Trustee or the manager of the Fund (including any successor manager appointed from time to time) not to have been constituted or to have been imperfectly constituted; (iii) where applicable, the Trustee ceases to be authorised under the Fund to hold the property of the Fund in its name and perform its obligations under the trust deed constituting the Fund; or (iv) the Fund ceases to be authorised as an authorised collective investment scheme under the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong).

12 Delisting of Fund

(A) If at any time the Units cease to be listed on the Stock Exchange, the Issuer shall give effect to these Conditions in such manner and make such adjustments to the rights attaching to the Warrants as it shall, in its absolute discretion, consider appropriate to ensure, so far as it is reasonably able to do so, that the interests of the Warrantholder generally are not materially prejudiced as a consequence of such delisting (without considering the individual circumstances of the Warrantholder or the tax or other consequences that may result in any particular jurisdiction).

(B) Without prejudice to the generality of Condition 12(A), where the Units are or, upon the delisting, become, listed on any other stock exchange, these Conditions may, in the absolute discretion of the Issuer, be amended to the extent necessary to allow for the substitution of that other stock exchange in place of the Stock Exchange and the Issuer may, without the consent of the Warrantholder, make such adjustments to the entitlements of the Warrantholder on exercise (including, if appropriate, by converting foreign currency amounts at prevailing market rates into the relevant currency) as it shall consider appropriate in the circumstances.

(C) Any adjustment, amendment or determination made by the Issuer pursuant to this Condition 12 shall be conclusive and binding on the Warrantholder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholder in accordance with Condition 10 as soon as practicable after they are determined.

13 Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Warrantholder, to create and issue further warrants so as to form a single series with the Warrants.

14 Illegality or Impracticability

The Issuer is entitled to terminate the Warrants if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(A) for it to perform its obligations under the Warrants, or for the Guarantor to perform its obligations under the Guarantee, in whole or in part as a result of:

(i) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(ii) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (i) and (ii), a "**Change in Law Event**"); or

(B) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the Warrants due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Warrantholder a cash amount that the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner to be the fair market value in respect of each Warrant held by such Warrantholder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholders in accordance with Condition 10.

15 Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer and/or the Agent under these Conditions will be made in good faith and in a commercially reasonable manner.

16 Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the Warrants.

17 Governing Law

The Warrants, the Guarantee and the Instrument will be governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer, the Guarantor and the Warrantholder (by its acquisition of the Warrants) shall be deemed to have submitted for all purposes in connection with the Warrants, the Guarantee and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

18 Language

A Chinese translation of these Conditions is available upon request during usual business hours on any weekday (Saturdays, Sundays and holidays excepted) at the offices of the Agent. In the event of any inconsistency between the English version and Chinese translation of these Conditions, the English version shall prevail and be governing.

Agent
J.P. Morgan Securities (Asia Pacific) Limited
23-29/F, Chater House
8 Connaught Road Central
Hong Kong

TERMS AND CONDITIONS OF THE CASH-SETTLED INDEX WARRANTS

The relevant Conditions will, together with the supplemental provisions contained in the relevant launch announcement and supplemental listing document and subject to completion and amendment, be endorsed on the back of the global warrant certificate. The applicable launch announcement and supplemental listing document in relation to the issue of any series of Warrants may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with the relevant Conditions, replace or modify the relevant Conditions for the purpose of such series of Warrants. Capitalised terms used in the relevant Conditions and not otherwise defined therein shall have the meanings given to them in the relevant launch announcement and supplemental listing document.

1 Form; Status; Guarantee; Transfer and Title

(A) The Warrants (which expression shall, unless the context otherwise requires, include any further warrants issued pursuant to Condition 11) relating to the Index as published by the Index Compiler are issued in registered form subject to and with the benefit of the amended and restated instrument dated 3 May 2010 (the "**Instrument**"), made by J.P. Morgan Structured Products B.V. (the "**Issuer**") and JPMorgan Chase Bank, National Association (the "**Guarantor**") and the guarantee dated 11 March 2024 (the "**Guarantee**") made by the Guarantor.

Copies of the Instrument and the Guarantee are available for inspection at the office of J.P. Morgan Securities (Asia Pacific) Limited as specified below. The Warrantholders (as hereinafter defined) are entitled to the benefit of, are bound by and are deemed to have notice of, all the provisions of the Instrument and the Guarantee.

(B) The settlement obligation of the Issuer in respect of the Warrants represent general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

Warrants represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of warrants deposit liabilities of the Issuer or a debt obligation of any kind.

In the Guarantee, the Guarantor has, subject to the terms of the Guarantee, unconditionally and irrevocably guaranteed to the Warrantholders the due and punctual settlement in full of all obligations due and owing by the Issuer arising under the issuance of the Warrants after taking account of any set off, combination of accounts, netting or similar arrangement from time to time exercisable by the Issuer against any person to whom obligations are from time to time being owed, when and as due (whether at maturity, by acceleration or otherwise).

(C) Transfers of Warrants may be effected only in Board Lots or integral multiples thereof in the Central Clearing and Settlement System ("**CCASS**") in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time ("**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by or on behalf of the Issuer outside of Hong Kong as the holder shall be treated by the Issuer, the Guarantor and the Agent as the absolute owner and holder of the Warrants. The expression "**Warrantholder**" shall be construed accordingly.

(E) Trading in Warrants on The Stock Exchange of Hong Kong Limited (the "**Stock Exchange**") shall be suspended prior to the Expiry Date in accordance with the requirements of the Stock Exchange.

2 Warrant Rights and Exercise Expenses

(A) Every Board Lot entitles the Warrantholder, upon compliance with Condition 4, to payment of the Cash Settlement Amount (as defined in Condition 4(C)).

(B) The Warrantholder will be required to pay any charges or expenses including any taxes or duties which are incurred or withheld in respect of the exercise of the Warrants (the "**Exercise Expenses**"). To effect such payments, an amount equivalent to the Exercise Expenses will be deducted by the Issuer from the Cash Settlement Amount in accordance with Condition 4(C).

3 Automatic Exercise

(A) Any Warrant in respect of which the Cash Settlement Amount which would be payable by the Issuer if exercised on the Expiry Date shall be deemed to be automatically exercised on the Expiry Date ("**Automatic Exercise**").

(B) Any Warrant which has not been automatically exercised in accordance with Condition 3(A) shall expire immediately without value thereafter and all rights of the Warrantholder and obligations of the Issuer with respect to such Warrant shall cease.

(C) In these Conditions, "**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong.

4 Exercise of Warrants

(A) Warrants may only be exercised in Board Lots or integral multiples thereof.

(B) Following the Expiry Date the Issuer will, with effect from the first Business Day following the Expiry Date cancel the Global Warrant Certificate.

(C) Subject to an Automatic Exercise in accordance with Condition 3(A), the Issuer will as soon as practicable and not later than the third CCASS Settlement Day after the later of: (i) the Expiry Date; and (ii) the day on which the Closing Level is determined in accordance with these Conditions (the "**Settlement Date**") in accordance with these Conditions procure payment of the aggregate Cash Settlement Amount (following deduction of determined Exercise Expenses) for all Warrants exercised or deemed exercised, electronically through CCASS by crediting the relevant bank account of the Warrantholder as appearing in the register kept by or on behalf of the Issuer.

Subject to adjustment as provided in Condition 6, "**Cash Settlement Amount**" means for every Board Lot, an amount calculated by the Issuer and/or the Agent in accordance with the following formula, either (i) converted (if applicable) into the Settlement Currency at the Exchange Rate or, as the case may be, (ii) converted into the Interim Currency at the First Exchange Rate and then (if applicable) converted into Settlement Currency at the Second Exchange Rate:

In the case of a series of call Warrants:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{(\text{Closing Level} - \text{Strike Level}) \times \text{one Board Lot} \times \text{Index Currency Amount}}{\text{Divisor}}$$

In the case of a series of put Warrants:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{(\text{Strike Level} - \text{Closing Level}) \times \text{one Board Lot} \times \text{Index Currency Amount}}{\text{Divisor}}$$

"**CCASS Settlement Day**" has the meaning ascribed to the term "**Settlement Day**" in the CCASS Rules, subject to such modification and amendment prescribed by Hong Kong Securities Clearing Company Limited from time to time.

"**Index Business Day**" means a day on which the Index Exchange is scheduled to open for trading for its regular trading sessions.

"**Index Exchange**" means the Stock Exchange or any other exchange as specified in the relevant Launch Announcement and Supplemental Listing Document.

"**Market Disruption Event**" means:

(1) the occurrence or existence, on the Valuation Date during the one-half hour period that ends at the close of trading on the Index Exchange, of any of:

(i) the suspension or material limitation of the trading of a material number of constituent securities that comprise the Index; or

(ii) the suspension or material limitation of the trading of options or futures contracts relating to the Index on any exchanges on which such contracts are traded; or

(iii) the imposition of any exchange controls in respect of any currencies involved in determining the Cash Settlement Amount;

for the purpose of paragraph (1), (x) the limitation of the number of hours or days of trading will not constitute a Market Disruption Event if it results from an announced change in the regular business hours of any relevant exchange, and (y) a limitation on trading imposed by reason of the movements in price exceeding the levels permitted by any relevant exchange will constitute a Market Disruption Event; or

(2) where the Index Exchange is the Stock Exchange, the occurrence of any severe weather condition or other event on any day which either (i) results in the Stock Exchange being closed for trading for the entire day; or (ii) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning

session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of such severe weather condition or other event; or

(3) the limitation or closure of the Index Exchange due to any unforeseen circumstances; or

(4) any circumstances beyond the control of the Issuer in which the Closing Level or, if applicable, the Exchange Rate, the First Exchange Rate or the Second Exchange Rate (as the case may be) cannot be determined by the Issuer and/or the Agent in the manner set out in these Conditions or in such other manner as the Issuer considers appropriate at such time after taking into account all the relevant circumstances.

"**Settlement Currency**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Valuation Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document. If the Issuer and/or the Agent determine, in its sole discretion, that a Marker Disruption Event has occurred on the Valuation Date, then the Issuer and/or the Agent shall determine the Closing Level on the basis of its good faith estimate of the Closing Level that would have prevailed on that day but for the occurrence of the Market Disruption Event provided that the Issuer, if applicable, may, but shall not be obliged to, determine such Closing Level by having regard to the manner in which futures contracts relating to the Index are calculated.

Any payment made pursuant to this Condition 4(C) shall be delivered at the risk and expense of the Warrantholder to the Warrantholder, or such bank, broker or other agent in Hong Kong (if any) as is recorded on the register.

(D) If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Warrantholder for any interest in respect of the amount due or any loss or damage that such Warrantholder may suffer as a result of the existence of a Settlement Disruption Event.

(E) These Conditions shall not be construed so as to give rise to any relationship of agency or trust between the Guarantor, the Issuer or its agent or nominee and the Warrantholder and neither the Guarantor, the Issuer nor its agent or nominee shall owe any duty of a fiduciary nature to the Warrantholder.

None of the Issuer, the Guarantor or the Agent shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these terms and conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 4(C) above.

5 Agent

(A) The Agent will be acting as agent of the Issuer in respect of the Warrants and will not assume any obligation or duty to or any relationship or agency or trust for the Warrantholder.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Agent and to appoint another agent provided that it will at all times maintain an agent in Hong Kong for so long as the Warrants are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Warrantholder in accordance with Condition 10.

6 Adjustments

(A) If the Index is (i) not calculated and announced by the Index Compiler but is calculated and published by a successor to the Index Compiler (the "**Successor Index Compiler**") acceptable to the Issuer and/or Agent or (ii) replaced by a successor index using, in the determination of the Issuer and/or Agent, the same or a substantially similar formula for and method of calculation as used in the calculation of the Index, then the Index will be deemed to be the index so calculated and announced by the Successor Index Compiler or that successor index, as the case may be.

(B) If (i) on or prior to the Valuation Date, the Index Compiler or (if applicable) the Successor Index Compiler makes a material change in the formula for or the method of calculating the Index or in any other way materially modifies the Index (other than a modification prescribed in that formula or method to maintain the Index in the event of changes in constituent securities, contracts or commodities and other routine events), or (ii) on the Valuation Date, the Index Compiler or (if applicable) the Successor Index Compiler fails to calculate and publish the Index (other than as a result of a Market Disruption Event), then the Issuer and/or the Agent shall determine the Closing Level using, in lieu of a published level for the Index, the level for the Index as at the Valuation Date as determined by the Issuer and/or the Agent in accordance with the formula for and method of calculating the Index last in effect prior to the change or failure, but using only those securities, contracts or commodities that comprised the Index immediately prior to that change or failure (other than those securities that have since ceased to be listed on the relevant exchange).

(C) Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer and/or the Agent may (but shall not be obliged to) make such other adjustments to the terms and conditions of the Warrants as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is: (i) not materially prejudicial to the interests of Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such adjustment in any particular jurisdiction); or (ii) determined by the Issuer and/or Agent in good faith to be appropriate and commercially reasonable.

(D) The Issuer and/or the Agent shall determine any adjustment or amendment and its determination shall be conclusive and binding on the Warrantholder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholder in accordance with Condition 10 as soon as practicable after the determination thereof.

7 Purchase by the Issuer

The Issuer and any of its affiliates may purchase Warrants at any time on or after the date of their issue and any Warrants which are so purchased may be surrendered for cancellation or offered from time to time in one or more transactions in the over-the-counter market or otherwise at prevailing market prices or in negotiated transactions, at the discretion of the Issuer or any such affiliate, as the case may be.

8 Global Warrant Certificate

A global warrant certificate (the "**Global Warrant Certificate**") representing the Warrants will be deposited within CCASS and registered in the name of HKSCC Nominees Limited (or its successors). The Global Warrant Certificate will not be exchangeable for definitive warrant certificates.

9 Meeting of Warrantholder and Modification

(A) *Meetings of Warrantholder.* Notices for convening meetings to consider any matter affecting the Warrantholder's interests will be given to the Warrantholder in accordance with the provisions of Condition 10.

Every question submitted to a meeting of the Warrantholder shall be decided by poll. A meeting may be convened by the Issuer or by the Warrantholder holding not less than 10 per cent. of the Warrants for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons (including any nominee appointed by the Warrantholder) holding or representing not less than 25 per cent. of the Warrants for the time being remaining unexercised, or at any adjourned meeting two or more persons (including any nominee appointed by the Warrantholder) being or representing Warrantholder whatever the number of Warrants so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Warrantholder as, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Warrantholder shall be binding on all the holders of the Warrants, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Warrantholder being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Warrantholders, effect any modification of the terms and conditions of the Warrants or the Instrument which, in the opinion of the Issuer and/or the Agent, is:

(i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such modification in any particular jurisdiction);

(ii) of a formal, minor or technical nature;

(iii) made to correct a manifest error; or

(iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Any such modification shall be binding on the Warrantholders and shall be notified to them by the Issuer and/or the Agent as soon as practicable thereafter in accordance with Condition 10.

10 Notices

All notices in English and Chinese to the Warrantholder will be validly given if published on the website of the Hong Kong Exchanges and Clearing Limited. In such circumstances, the Issuer shall not be required to dispatch copies of the notice to the Warrantholders.

11 Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Warrantholder, to create and issue further warrants so as to form a single series with the Warrants.

12 Illegality or Impracticability

The Issuer is entitled to terminate the Warrants if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(A) for it to perform its obligations under the Warrants, or for the Guarantor to perform its obligations under the Guarantee, in whole or in part as a result of:

(i) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(ii) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (i) and (ii), a "**Change in Law Event**"); or

(B) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the Warrants due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Warrantholder a cash amount that the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner to be the fair market value in respect of each Warrant held by such Warrantholder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholders in accordance with Condition 10.

13 Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer and/or the Agent under these Conditions will be made in good faith and in a commercially reasonable manner.

14 Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the Warrants.

15 Governing Law

The Warrants, the Guarantee and the Instrument will be governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer, the Guarantor and the Warrantholder (by its acquisition of the Warrants) shall be deemed to have submitted for all purposes in connection with the Warrants, the Guarantee and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

16 Language

A Chinese translation of these Conditions is available upon request during usual business hours on any weekday (Saturdays, Sundays and holidays excepted) at the offices of the Agent. In the event of any inconsistency between the English version and Chinese translation of these Conditions, the English version shall prevail and be governing.

Agent
J.P. Morgan Securities (Asia Pacific) Limited
23-29/F, Chater House
8 Connaught Road Central
Hong Kong

TERMS AND CONDITIONS OF THE CASH-SETTLED CURRENCY WARRANTS

The relevant Conditions will, together with the supplemental provisions contained in the relevant launch announcement and supplemental listing document and subject to completion and amendment, be endorsed on the back of the global warrant certificate. The applicable launch announcement and supplemental listing document in relation to the issue of any series of Warrants may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with the relevant Conditions, replace or modify the relevant Conditions for the purpose of such series of Warrants. Capitalised terms used in the relevant Conditions and not otherwise defined therein shall have the meanings given to them in the relevant launch announcement and supplemental listing document.

1 Form; Status; Guarantee; Transfer and Title

(A) The Warrants (which expression shall, unless the context otherwise requires, include any further warrants issued pursuant to Condition 11) relating to the Currency Pair are issued in registered form subject to and with the benefit of the amended and restated instrument dated 3 May 2010 (the "**Instrument**"), made by J.P. Morgan Structured Products B.V. (the "**Issuer**") and JPMorgan Chase Bank, National Association (the "**Guarantor**") and the guarantee dated 11 March 2024 (the "**Guarantee**") made by the Guarantor.

Copies of the Instrument and the Guarantee are available for inspection at the office of J.P. Morgan Securities (Asia Pacific) Limited as specified below. The Warrantholders (as hereinafter defined) are entitled to the benefit of, are bound by and are deemed to have notice of, all the provisions of the Instrument and the Guarantee.

(B) The settlement obligation of the Issuer in respect of the Warrants represent general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and *pari passu* with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

Warrants represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of warrants deposit liabilities of the Issuer or a debt obligation of any kind.

In the Guarantee, the Guarantor has, subject to the terms of the Guarantee, unconditionally and irrevocably guaranteed to the Warrantholders the due and punctual settlement in full of all obligations due and owing by the Issuer arising under the issuance of the Warrants after taking account of any set off, combination of accounts, netting or similar arrangement from time to time exercisable by the Issuer against any person to whom obligations are from time to time being owed, when and as due (whether at maturity, by acceleration or otherwise).

(C) Transfers of Warrants may be effected only in Board Lots or integral multiples thereof in the Central Clearing and Settlement System ("**CCASS**") in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time ("**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by or on behalf of the Issuer outside of Hong Kong as the holder shall be treated by the Issuer, the Guarantor and the Agent as the absolute owner and holder of the Warrants. The expression "**Warrantholder**" shall be construed accordingly.

(E) Trading in Warrants on The Stock Exchange of Hong Kong Limited (the "**Stock Exchange**") shall be suspended prior to the Expiry Date in accordance with the requirements of the Stock Exchange.

2 Warrant Rights and Exercise Expenses

(A) Every Board Lot entitles the Warrantholder, upon compliance with Condition 4, to payment of the Cash Settlement Amount (as defined in Condition 4(C)).

(B) The Warrantholder will be required to pay any charges or expenses including any taxes or duties which are incurred or withheld in respect of the exercise of the Warrants (the "**Exercise Expenses**"). To effect such payments, an amount equivalent to the Exercise Expenses will be deducted by the Issuer from the Cash Settlement Amount in accordance with Condition 4(C).

3 Automatic Exercise

(A) Any Warrant in respect of which the Cash Settlement Amount which would be payable by the Issuer if exercised on the Expiry Date shall be deemed to be automatically exercised on the Expiry Date ("**Automatic Exercise**").

(B) Any Warrant which has not been automatically exercised in accordance with Condition 3(A) shall expire immediately without value thereafter and all rights of the Warrantholder and obligations of the Issuer with respect to such Warrant shall cease.

(C) In these Conditions, "**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business and for carrying on foreign exchange transactions in Hong Kong.

4 Exercise of Warrants

(A) Warrants may only be exercised in Board Lots or integral multiples thereof.

(B) Following the Expiry Date the Issuer will, with effect from the first Business Day following the Expiry Date cancel the Global Warrant Certificate.

(C) Subject to an Automatic Exercise in accordance with Condition 3(A), the Issuer will as soon as practicable and not later than the third CCASS Settlement Day after the Valuation Date (the "**Settlement Date**") in accordance with these Conditions procure payment of the aggregate Cash Settlement Amount (following deduction of determined Exercise Expenses) for all Warrants exercised or deemed exercised, electronically through CCASS by crediting the relevant bank account of the Warrantholder as appearing in the register kept by or on behalf of the Issuer.

Subject to adjustment as provided in Condition 6, "**Cash Settlement Amount**" means for every Board Lot, an amount calculated by the Issuer and/or the Agent in accordance with the following formula, provided that where the Currency Amount is expressed in a currency other than the Settlement Currency, the amount calculated in accordance with the following formula shall either be (i) converted (if applicable) into the Settlement Currency at the Settlement Exchange Rate or, as the case may be, (ii) converted (if applicable) into the Interim Currency at the First Exchange Rate and then converted into Settlement Currency at the Second Exchange Rate:

In the case of a series of call Warrants:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{(\text{Spot Rate} - \text{Strike Rate}) \times \text{Currency Amount} \times \text{one Board Lot}}{\text{Divisor}}$$

In the case of a series of put Warrants:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{(\text{Strike Rate} - \text{Spot Rate}) \times \text{Currency Amount} \times \text{one Board Lot}}{\text{Divisor}}$$

"**CCASS Settlement Day**" has the meaning ascribed to the term "**Settlement Day**" in the CCASS Rules, subject to such modification and amendment prescribed by Hong Kong Securities Clearing Company Limited from time to time.

"**Currency Amount**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Currency Pair**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Divisor**" means the number specified as such in the relevant Launch Announcement and Supplemental Listing Document.

"**First Exchange Rate**", if applicable, means the rate specified as such in the relevant Launch Announcement and Supplemental Listing Document.

"**Interim Currency**", if applicable, has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Market Disruption Event**" means:

(i) the occurrence, or existence, on the Valuation Date, of any circumstances beyond the control of the Issuer in which the Spot Rate or, if applicable, the Settlement Exchange Rate, the First Exchange Rate and/or the Second Exchange Rate cannot be determined by the Issuer or the Agent in the manner set out in these Conditions or in such other manner as the Issuer and/or the Agent considers appropriate at such time after taking into account all the relevant circumstances; and/or

(ii) the imposition of any exchange controls in respect of any currencies involved in determining the Cash Settlement Amount.

"**Second Exchange Rate**", if applicable, means the rate specified as such in the relevant Launch Announcement and Supplemental Listing Document.

"**Settlement Currency**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Settlement Exchange Rate**", if applicable, means the rate specified as such in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6.

"**Spot Rate**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6.

"**Strike Rate**" means the rate specified as such in the relevant Launch Announcement and Supplemental Listing Document.

"**Valuation Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document. If the Issuer and/or the Agent determine, in its sole discretion, acting in good faith and in a commercially reasonable manner, that a Market Disruption Event has occurred on the Valuation Date, then the Issuer and/or the Agent shall determine the Spot Rate or, if applicable, the Settlement Exchange Rate, the First Exchange Rate, the Second Exchange Rate and/or any other variables on the basis of its good faith and commercially reasonable estimate of the Spot Rate or, if applicable, the Settlement Exchange Rate, the First Exchange Rate, the Second Exchange Rate and/or any other variables that would have prevailed on that day but for the occurrence of the Market Disruption Event.

Any payment made pursuant to this Condition 4(C) shall be delivered at the risk and expense of the Warrantholder to the Warrantholder, or such bank, broker or other agent in Hong Kong (if any) as is recorded on the register.

(D) If as a result of an event beyond the control of the Issuer ("Settlement Disruption Event"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Warrantholder for any interest in respect of the amount due or any loss or damage that such Warrantholder may suffer as a result of the existence of a Settlement Disruption Event.

(E) These Conditions shall not be construed so as to give rise to any relationship of agency or trust between the Guarantor, the Issuer or its agent or nominee and the Warrantholder and neither the Guarantor, the Issuer nor its agent or nominee shall owe any duty of a fiduciary nature to the Warrantholder.

None of the Issuer, the Guarantor or the Agent shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these terms and conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 4(C) above.

5 Agent

(A) The Agent will be acting as agent of the Issuer in respect of the Warrants and will not assume any obligation or duty to or any relationship or agency or trust for the Warrantholder.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Agent and to appoint another agent provided that it will at all times maintain an agent in Hong Kong for so long as the Warrants are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Warrantholder in accordance with Condition 10.

6 Adjustments

(A) If a Market Disruption Event occurs, the Issuer and/or the Agent has the right to adjust the Spot Rate or, if applicable, the Settlement Exchange Rate, the First Exchange Rate, the Second Exchange Rate and/or any other relevant variables accordingly. The Issuer shall as soon as reasonably practicable under such circumstances notify the Warrantholder in accordance with Condition 10 if it and/or the Agent determine in good faith and in a commercially reasonable manner that a Market Disruption Event has occurred.

(B) If exchange control or other laws, regulations, directives or guidelines are imposed by any central banking authority or other governmental or regulatory body which:

(a) requires the Issuer to obtain permission from such authority or body to purchase the Settlement Currency;

(b) otherwise restricts the Issuer's ability to obtain the Settlement Currency; or

(c) otherwise adversely regulates the purchase or holding of the Settlement Currency such that additional costs are imposed in obtaining the Settlement Currency which would not be imposed in the absence of such laws, regulations, directives or guidelines, or, if applicable, the cost of obtaining the Settlement Currency at the Settlement Exchange Rate or the Second Exchange Rate (as the case may be) is determined in good faith and in a commercially reasonable manner by the Issuer and/or the Agent to be excessive because of a disruption in the foreign exchange market relating to the Settlement Currency,

then, upon notice from the Issuer to the Warrantholder in accordance with Condition 10 to such effect, the Warrantholder whose Warrants are automatically exercised in accordance with Condition 4 shall receive, at the option of the Issuer, in lieu of the Settlement Currency, an amount equal to the Cash Settlement Amount in any other major non-restricted and freely convertible currency as determined in good faith and in a commercially reasonable manner by the Issuer and/or the Agent.

(C) Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer and/or the Agent may (but shall not be obliged to) make such other adjustments to the terms and conditions of the Warrants as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is: (i) not materially prejudicial to the interests of Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such adjustment in any particular jurisdiction); or (ii) determined by the Issuer and/or Agent in good faith to be appropriate and commercially reasonable.

(D) The Issuer and/or the Agent shall determine any adjustment or amendment and its determination shall be conclusive and binding on the Warrantholder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholder in accordance with Condition 10 as soon as practicable after the determination thereof.

7 Purchase by the Issuer

The Issuer and any of its affiliates may purchase Warrants at any time on or after the date of their issue and any Warrants which are so purchased may be surrendered for cancellation or offered from time to time in one or more transactions in the over-the-counter market or otherwise at prevailing market prices or in negotiated transactions, at the discretion of the Issuer or any such affiliate, as the case may be.

8 Global Warrant Certificate

A global warrant certificate (the "**Global Warrant Certificate**") representing the Warrants will be deposited within CCASS and registered in the name of HKSCC Nominees Limited (or its successors). The Global Warrant Certificate will not be exchangeable for definitive warrant certificates.

9 Meeting of Warrantholder and Modification

(A) *Meetings of Warrantholder*. Notices for convening meetings to consider any matter affecting the Warrantholder's interests will be given to the Warrantholder in accordance with the provisions of Condition 10.

Every question submitted to a meeting of the Warrantholder shall be decided by poll. A meeting may be convened by the Issuer or by the Warrantholder holding not less than 10 per cent. of the Warrants for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons (including any nominee appointed by the Warrantholder) holding or representing not less than 25 per cent. of the Warrants for the time being remaining unexercised, or at any adjourned meeting two or more persons (including any nominee appointed by the Warrantholder) being or representing Warrantholder whatever the number of Warrants so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Warrantholder as, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Warrantholder shall be binding on all the holders of the Warrants, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Warrantholder being held if passed unanimously.

(B) *Modification*. The Issuer may, without the consent of the Warrantholders, effect any modification of the terms and conditions of the Warrants or the Instrument which, in the opinion of the Issuer and/or the Agent, is:

(i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such modification in any particular jurisdiction);

(ii) of a formal, minor or technical nature;

(iii) made to correct a manifest error; or

(iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Any such modification shall be binding on the Warrantholders and shall be notified to them by the Issuer and/or the Agent as soon as practicable thereafter in accordance with Condition 10.

10 Notices

All notices in English and Chinese to the Warrantholder will be validly given if published on the website of the Hong Kong Exchanges and Clearing Limited. In such circumstances, the Issuer shall not be required to dispatch copies of the notice to the Warrantholders.

11 Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Warrantholder, to create and issue further warrants so as to form a single series with the Warrants.

12 Illegality or Impracticability

The Issuer is entitled to terminate the Warrants if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(A) for it to perform its obligations under the Warrants, or for the Guarantor to perform its obligations under the Guarantee, in whole or in part as a result of:

(i) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(ii) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (i) and (ii), a "**Change in Law Event**"); or

(B) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the Warrants due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Warrantholder a cash amount that the Issuer and/or Agent determine in good faith and in a commercially reasonable manner to be the fair market value in respect of each Warrant held by such Warrantholder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent, in its sole and absolute discretion, acting in good faith and in a commercially reasonable manner. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholders in accordance with Condition 10.

13 Good Faith and Commercially Reasonable Manner

Any exercise of discretion or determination by the Issuer and/or the Agent under these Conditions will be made in good faith and in a commercially reasonable manner.

14 Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the Warrants.

15 Governing Law

The Warrants, the Guarantee and the Instrument will be governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer, the Guarantor and the Warrantholder (by its acquisition of the Warrants) shall be deemed to have submitted for all purposes in connection with the Warrants, the Guarantee and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

16 Language

A Chinese translation of these Conditions is available upon request during usual business hours on any weekday (Saturdays, Sundays and holidays excepted) at the offices of the Agent. In the event of any inconsistency between the English version and Chinese translation of these Conditions, the English version shall prevail and be governing.

Agent
J.P. Morgan Securities (Asia Pacific) Limited
23-29/F, Chater House
8 Connaught Road Central
Hong Kong

TERMS AND CONDITIONS OF THE CASH-SETTLED STOCK INLINE WARRANTS

The relevant Conditions will, together with the supplemental provisions contained in the relevant launch announcement and supplemental listing document and subject to completion and amendment, be endorsed on the back of the global warrant certificate. The applicable launch announcement and supplemental listing document in relation to the issue of any series of Inline Warrants may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with the relevant Conditions, replace or modify the relevant Conditions for the purpose of such series of Inline Warrants. Capitalised terms used in the relevant Conditions and not otherwise defined therein shall have the meanings given to them in the relevant launch announcement and supplemental listing document.

1 Form; Status; Guarantee; Transfer and Title

(A) The Inline Warrants (which expression shall, unless the context otherwise requires, include any further warrants issued pursuant to Condition 13) relating to the Shares of the Company are issued in registered form subject to and with the benefit of the amended and restated instrument dated 3 May 2010 (the "**Instrument**") made by J.P. Morgan Structured Products B.V. (the "**Issuer**") and JPMorgan Chase Bank, National Association (the "**Guarantor**") and the guarantee dated 11 March 2024 (the "**Guarantee**") made by the Guarantor.

Copies of the Instrument and the Guarantee are available for inspection at the office of J.P. Morgan Securities (Asia Pacific) Limited as specified below. The Warrantholders (as hereinafter defined) are entitled to the benefit of, are bound by and are deemed to have notice of, all the provisions of the Instrument and the Guarantee.

(B) The settlement obligation of the Issuer in respect of the Inline Warrants represent general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and *pari passu* with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

Inline Warrants represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of warrants deposit liabilities of the Issuer or a debt obligation of any kind.

In the Guarantee, the Guarantor has, subject to the terms of the Guarantee, unconditionally and irrevocably guaranteed to the Warrantholders the due and punctual settlement in full of all obligations due and owing by the Issuer arising under the issuance of the Inline Warrants after taking account of any set off, combination of accounts, netting or similar arrangement from time to time exercisable by the Issuer against any person to whom obligations are from time to time being owed, when and as due (whether at maturity, by acceleration or otherwise).

(C) Transfers of Inline Warrants may be effected only in Board Lots or integral multiples thereof in the Central Clearing and Settlement System ("**CCASS**") in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time ("**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by or on behalf of the Issuer outside of Hong Kong as the holder shall be treated by the Issuer, the Guarantor and the Agent as the absolute owner and holder of the Inline Warrants. The expression "**Warrantholder**" shall be construed accordingly.

(E) Trading in Inline Warrants on The Stock Exchange of Hong Kong Limited (the "**Stock Exchange**") shall be suspended prior to the Expiry Date in accordance with the requirements of the Stock Exchange.

2 Inline Warrant Rights and Exercise Expenses

(A) Every Board Lot entitles the Warrantholder, upon compliance with Condition 4, to payment of the Cash Settlement Amount (as defined in Condition 4(C)).

(B) The Warrantholder will be required to pay any charges or expenses including any taxes or duties which are incurred or withheld in respect of the exercise of the Inline Warrants (the "**Exercise Expenses**"). To effect such payment, an amount equivalent to the Exercise Expenses will be deducted by the Issuer from the Cash Settlement Amount in accordance with Condition 4(C).

3 Automatic Exercise

(A) All Inline Warrants shall be deemed to be automatically exercised on the Expiry Date.

(B) In these Conditions, "**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong.

4 Exercise of Inline Warrants

(A) Inline Warrants may only be exercised in Board Lots or integral multiples thereof.

(B) Following the Expiry Date the Issuer will, with effect from the first Business Day following the Expiry Date cancel the Global Warrant Certificate.

(C) The Issuer will as soon as practicable and not later than the third CCASS Settlement Day after the later of: (i) the Expiry Date; and (ii) the day on which the Average Price is determined in accordance with these Conditions (the "**Settlement Date**") in accordance with these Conditions procure payment of the aggregate Cash Settlement Amount (following deduction of determined Exercise Expenses) for all Inline Warrants exercised or deemed exercised, electronically through CCASS by crediting the relevant bank account of the Warrantholder as appearing in the register kept by or on behalf of the Issuer.

Subject to adjustment as provided in Condition 6, "**Cash Settlement Amount**" means EITHER:

(1) if the Average Price is at or below the Upper Strike Price and at or above the Lower Strike Price:

$$\text{Cash Settlement Amount per Board Lot} = \text{Maximum Payoff Amount per Inline Warrant} \times \text{one Board Lot}$$

OR

(2) if the Average Price is above the Upper Strike Price or below the Lower Strike Price,

$$\text{Cash Settlement Amount per Board Lot} = \text{Minimum Payoff Amount per Inline Warrant} \times \text{one Board Lot}$$

"**Average Price**" shall be the arithmetic mean of the closing prices of one Share (as derived from the Daily Quotation Sheet of the Stock Exchange, subject to any adjustment to such closing prices as may be necessary to reflect any event as contemplated in Condition 6 such as capitalisation, rights issue, distribution or the like) in respect of each Valuation Date.

"**CCASS Settlement Day**" has the meaning ascribed to the term "Settlement Day" in the CCASS Rules, subject to such modification and amendment prescribed by Hong Kong Securities Clearing Company Limited from time to time.

"**Lower Strike Price**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6.

"**Market Disruption Event**" means:

(i) the occurrence or existence on any Valuation Date during the one-half hour period that ends at the close of trading of any suspension of, or limitation imposed on, trading (by reason of movements in price exceeding limits permitted by the Stock Exchange or otherwise) on the Stock Exchange in (1) the Shares; or (2) any options or futures contracts relating to the Shares if, in any such case, such suspension or limitation is, in the determination of the Issuer and/or Agent, material;

(ii) the occurrence of any severe weather condition or other event on any day which either (1) results in the Stock Exchange being closed for trading for the entire day; or (2) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of such severe weather condition or other event; or

(iii) a limitation or closure of the Stock Exchange due to unforeseen circumstances.

"**Maximum Payoff Amount per Inline Warrant**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Minimum Payoff Amount per Inline Warrant**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Upper Strike Price**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 6.

"**Valuation Date**" means, subject as provided above in relation to a Market Disruption Event, each of the five Business Days immediately preceding the Expiry Date.

If the Issuer and/or the Agent determine, in its sole discretion, that a Market Disruption Event has occurred on any Valuation Date, then that Valuation Date shall be postponed until the first succeeding Business Day on which there is no Market Disruption Event irrespective of whether that postponed Valuation Date would fall on a Business Day that already is or is deemed to be a Valuation Date. For the avoidance of doubt, in the event that a Market Disruption Event has occurred and a Valuation Date is postponed as aforesaid, the closing price of the Shares on the first succeeding Business Day will be used more than once in determining the Average Price, so that in no event shall there be less than five closing prices used to determine the Average Price.

If the postponement of a Valuation Date as aforesaid would result in the Valuation Date falling on or after the Expiry Date, then:

(i) the Business Day immediately preceding the Expiry Date (the "**Last Valuation Date**") shall be deemed to be the Valuation Date notwithstanding the Market Disruption Event; and

(ii) the Issuer and/or the Agent shall determine the closing price of the Shares on the basis of its good faith estimate of the price that would have prevailed on the Last Valuation Date but for the Market Disruption Event.

Any payment made pursuant to this Condition 4(C) shall be delivered at the risk and expense of the Warrantholder to the Warrantholder, or such bank, broker or agent in Hong Kong (if any) as recorded on the register.

(D) If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Warrantholder for any interest in respect of the amount due or any loss or damage that such Warrantholder may suffer as a result of the existence of a Settlement Disruption Event.

(E) These Conditions shall not be construed so as to give rise to any relationship of agency or trust between the Guarantor, the Issuer or its agent or nominee and the Warrantholder and neither the Guarantor, the Issuer nor its agent or nominee shall owe any duty of a fiduciary nature to the Warrantholder.

None of the Issuer, the Guarantor or the Agent shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these terms and conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 4(C) above.

5 Agent

(A) The Agent will be acting as agent of the Issuer in respect of the Inline Warrants and will not assume any obligation or duty to or any relationship or agency or trust for the Warrantholder.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Agent and to appoint another agent provided that it will at all times maintain an agent in Hong Kong for so long as the Inline Warrants are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Warrantholder in accordance with Condition 10.

6 Adjustments

(A) If and whenever the Company shall, by way of Rights (as defined below), offer new Shares for subscription at a fixed subscription price to the holders of existing Shares pro rata to existing holdings (a "**Rights Offer**"), the Upper Strike Price and the Lower Strike Price (which shall be rounded to the nearest 0.001) shall be adjusted on the Business Day on which the trading in the Shares of the Company becomes ex-entitlement in accordance with the following formula:

Adjusted Upper Strike Price = Upper Strike Price ÷ Adjustment Factor

Adjusted Lower Strike Price = Lower Strike Price ÷ Adjustment Factor

Where:

$$\text{Adjustment Factor} = \frac{1+M}{1 + (R/S) \times M}$$

S: Cum-Rights Share price, being the closing price of an existing Share, as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Shares are traded on a cum-Rights basis

R: Subscription price per new Share specified in the Rights Offer plus an amount equal to any dividends or other benefits foregone to exercise the Rights

M: Number of new Shares (whether a whole or a fraction) per existing Share each holder of an existing Share is entitled to subscribe

Provided that no adjustment will be made if the Adjustment Factor is equal to or less than 1.

For the purposes of these Conditions, "**Rights**" means the right(s) attached to each existing Share or needed to acquire one new Share (as the case may be) which are given to a holder of existing Shares to subscribe at a fixed subscription price for new Shares pursuant to the Rights Offer (whether by the exercise of one Right, a part of a Right or an aggregate number of Rights).

For the avoidance of doubt, the entitlement of the Inline Warrants is always 1 Share and no adjustment will be made to the entitlement.

(B) If and whenever the Company shall make an issue of Shares credited as fully paid to holders of Shares generally by way of capitalisation of profits or reserves (other than pursuant to a scrip dividend or similar scheme for the time being operated by the Company or otherwise in lieu of a cash dividend) (and without any payment or other consideration being made or given by such holders) (a "**Bonus Issue**"), the Upper Strike Price and the Lower Strike Price (which shall be rounded to the nearest 0.001) will be adjusted on the Business Day on which the trading in the Shares of the Company becomes ex-entitlement in accordance with the following formula:

Adjusted Upper Strike Price = Upper Strike Price ÷ Adjustment Factor

Adjusted Lower Strike Price = Lower Strike Price ÷ Adjustment Factor

Where:

Adjustment Factor = 1 + N

N: Number of additional Shares (whether a whole or a fraction) per existing Share each holder of an existing Share is entitled to receive

For the avoidance of doubt, the entitlement of the Inline Warrants is always 1 Share and no adjustment will be made to the entitlement.

(C) If and whenever the Company shall subdivide its outstanding share capital into a greater number of shares (a "**Subdivision**") or consolidate its outstanding share capital into a smaller number of shares (a "**Consolidation**"), then:

(i) in the case of a Subdivision, the Upper Strike Price and the Lower Strike Price (which shall be rounded to the nearest 0.001) shall be decreased in the same ratio as the Subdivision; and

(ii) in the case of a Consolidation, the Upper Strike Price and the Lower Strike Price (which shall be rounded to the nearest 0.001) shall be increased in the same ratio as the Consolidation,

in each case on the day on which the relevant Subdivision or Consolidation (as the case may be) shall have taken effect.

For the avoidance of doubt, the entitlement of the Inline Warrants is always 1 Share and no adjustment will be made to the entitlement.

(D) If it is announced that the Company is to or may merge or consolidate with or into any other corporation (including becoming, by agreement or otherwise, a subsidiary of or controlled by any person or corporation) (except where the Company is the surviving corporation in a merger) or that it is to or may sell or transfer all or substantially all of its assets, the rights attaching to the Inline Warrants may in the absolute discretion of the Issuer and/or the Agent be amended no later than the Business Day preceding the consummation of such merger, consolidation, sale or transfer (each a "**Restructuring Event**") (as determined by the Issuer and/or Agent in its absolute discretion) so that the interests of the holders generally are not materially prejudiced as a consequence of such Restructuring Event (without considering the individual circumstances of any holder or the tax or other consequences that may result in any particular jurisdiction).

For the avoidance of doubt, the entitlement of the Inline Warrants is always 1 Share and no adjustment will be made to the entitlement.

(E) No adjustment will be made for an ordinary cash dividend (whether or not it is offered with a scrip alternative) ("**Ordinary Dividend**"). For any other forms of cash distribution ("**Cash Distribution**") announced by the Company, such as a cash bonus, special dividend or extraordinary dividend, no adjustment will be made unless the value of the Cash Distribution accounts for 2 per cent. or more of the Share's closing price on the day of announcement by the Company.

If and whenever the Company shall make a Cash Distribution credited as fully paid to the holders of Shares generally, the Upper Strike Price and the Lower Strike Price (which shall be rounded to the nearest 0.001) shall be adjusted to take effect on the Business Day on which trading in the Shares becomes ex-entitlement in respect of the relevant Cash Distribution in accordance with the following formula:

Adjusted Upper Strike Price = Upper Strike Price ÷ Adjustment Factor

Adjusted Lower Strike Price = Lower Strike Price ÷ Adjustment Factor

Where:

$$\text{Adjustment Factor} = \frac{S - OD}{S - OD - CD}$$

S: Cum-Cash Distribution Share price, being the closing price of an existing Share, as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Shares are traded on a cum-Cash Distribution basis

CD: The Cash Distribution per Share

OD: The Ordinary Dividend per Share, provided that the Ordinary Dividend and the Cash Distribution have the same ex-entitlement date. For the avoidance of doubt, the OD shall be zero if the Ordinary Dividend and the Cash Distribution have different ex-entitlement dates

For the avoidance of doubt, the entitlement of the Inline Warrants is always 1 Share and no adjustment will be made to the entitlement.

(F) Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer and/or the Agent may (but shall not be obliged to) make such other adjustments to the terms and conditions of the Inline Warrants as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is: (i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such adjustment in any particular jurisdiction); or (ii) determined by the Issuer and/or the Agent in good faith to be appropriate and commercially reasonable.

For the avoidance of doubt, the entitlement of the Inline Warrants is always 1 Share and no adjustment will be made to the entitlement.

(G) The Issuer and/or the Agent shall determine any adjustment or amendment and its determination shall be conclusive and binding on the Warrantholder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholder in accordance with Condition 10 as soon as practicable after the determination thereof.

7 Purchase by the Issuer

The Issuer and any of its affiliates may purchase Inline Warrants at any time on or after the date of their issue and any Inline Warrants which are so purchased may be surrendered for cancellation or offered from time to time in one or more transactions in the over-the-counter market or otherwise at prevailing market prices or in negotiated transactions, at the discretion of the Issuer or any such affiliate, as the case may be.

8 Global Warrant Certificate

A global warrant certificate (the "**Global Warrant Certificate**") representing the Inline Warrants will be deposited within CCASS and registered in the name of HKSCC Nominees Limited (or its successors). The Global Warrant Certificate will not be exchangeable for definitive warrant certificates.

9 Meeting of Warrantholder and Modification

(A) *Meetings of Warrantholder*. Notices for convening meetings to consider any matter affecting the Warrantholder's interests will be given to the Warrantholder in accordance with the provisions of Condition 10.

Every question submitted to a meeting of the Warrantholder shall be decided by poll. A meeting may be convened by the Issuer or by the Warrantholder holding not less than 10 per cent. of the Inline Warrants for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons (including any nominee appointed by the Warrantholder) holding or representing not less than 25 per cent. of the Inline Warrants for the time being remaining unexercised, or at any adjourned meeting two or more persons (including any nominee appointed by the Warrantholder) being or representing Warrantholder whatever the number of Inline Warrants so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Warrantholder as, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Warrantholder shall be binding on all the holders of the Inline Warrants, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Warrantholder being held if passed unanimously.

(B) *Modification*. The Issuer may, without the consent of the Warrantholders, effect any modification of the terms and conditions of the Inline Warrants or the Instrument which, in the opinion of the Issuer and/or the Agent, is:

(i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such modification in any particular jurisdiction);

(ii) of a formal, minor or technical nature;

(iii) made to correct a manifest error; or

(iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Any such modification shall be binding on the Warrantholders and shall be notified to them by the Issuer and/or the Agent as soon as practicable thereafter in accordance with Condition 10.

10 Notices

All notices in English and Chinese to the Warrantholder will be validly given if published on the website of the Hong Kong Exchanges and Clearing Limited. In such circumstances, the Issuer shall not be required to dispatch copies of the notice to the Warrantholders.

11 Liquidation

In the event of a liquidation, or winding up or dissolution of the Company or the appointment of a liquidator, receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the undertaking, property or assets of the Company, all unexercised Inline Warrants shall lapse and cease to be valid for any purpose, in the case of a voluntary liquidation or winding up of the Company, on the effective date of the relevant resolution and, in the case of an involuntary liquidation, winding up or dissolution, on the date of the relevant court order or, in the case of the appointment of a liquidator or receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the undertaking, property or assets of the Company, on the date when such appointment is effective but subject (in any such case) to any contrary mandatory requirement of the applicable law.

12 Delisting of Company

(A) If at any time the Shares cease to be listed on the Stock Exchange, the Issuer shall give effect to these Conditions in such manner and make such adjustments to the rights attaching to the Inline Warrants as it shall, in its absolute discretion, consider appropriate to ensure, so far as it is reasonably able to do so, that the interests of the Warrantholder generally are not materially prejudiced as a consequence of such delisting (without considering the individual circumstances of the Warrantholder or the tax or other consequences that may result in any particular jurisdiction).

(B) Without prejudice to the generality of Condition 12(A), where the Shares are or, upon the delisting, become, listed on any other stock exchange, these Conditions may, in the absolute discretion of the Issuer, be amended to the extent necessary to allow for the substitution of that other stock exchange in place of the Stock Exchange and the Issuer may, without the consent of the Warrantholder, make such adjustments to the entitlements of the Warrantholder on exercise (including, if appropriate, by converting foreign currency amounts at prevailing market rates into the relevant currency) as it shall consider appropriate in the circumstances.

(C) Any adjustment, amendment or determination made by the Issuer pursuant to this Condition 12 shall be conclusive and binding on the Warrantholder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholder in accordance with Condition 10 as soon as practicable after they are determined.

13 Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Warrantholder, to create and issue further warrants so as to form a single series with the Inline Warrants.

14 Illegality or Impracticability

The Issuer is entitled to terminate the Inline Warrants if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(A) for it to perform its obligations under the Inline Warrants, or for the Guarantor to perform its obligations under the Guarantee, in whole or in part as a result of:

(i) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(ii) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (i) and (ii), a "**Change in Law Event**"); or

(B) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the Inline Warrants due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Warrantholder a cash amount that the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner to be the fair market value in respect of each Inline Warrant held by such Warrantholder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholders in accordance with Condition 10.

15 Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer and/or the Agent under these Conditions will be made in good faith and in a commercially reasonable manner.

16 Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the Inline Warrants.

17 Governing Law

The Inline Warrants, the Guarantee and the Instrument will be governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("**Hong Kong**"). The Issuer, the Guarantor and the Warrantholder (by its acquisition of the Inline Warrants) shall be deemed to have submitted for all purposes in connection with the Inline Warrants, the Guarantee and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

18 Language

A Chinese translation of these Conditions is available upon request during usual business hours on any weekday (Saturdays, Sundays and holidays excepted) at the offices of the Agent. In the event of any inconsistency between the English version and Chinese translation of these Conditions, the English version shall prevail and be governing.

Agent
J.P. Morgan Securities (Asia Pacific) Limited
23-29/F, Chater House
8 Connaught Road Central
Hong Kong

TERMS AND CONDITIONS OF THE CASH-SETTLED INDEX INLINE WARRANTS

The relevant Conditions will, together with the supplemental provisions contained in the relevant launch announcement and supplemental listing document and subject to completion and amendment, be endorsed on the back of the global warrant certificate. The applicable launch announcement and supplemental listing document in relation to the issue of any series of Inline Warrants may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with the relevant Conditions, replace or modify the relevant Conditions for the purpose of such series of Inline Warrants. Capitalised terms used in the relevant Conditions and not otherwise defined therein shall have the meanings given to them in the relevant launch announcement and supplemental listing document.

1 Form; Status; Guarantee; Transfer and Title

(A) The Inline Warrants (which expression shall, unless the context otherwise requires, include any further warrants issued pursuant to Condition 11) relating to the Index as published by the Index Compiler are issued in registered form subject to and with the benefit of the amended and restated instrument dated 3 May 2010 (the "**Instrument**"), made by J.P. Morgan Structured Products B.V. (the "**Issuer**") and JPMorgan Chase Bank, National Association (the "**Guarantor**") and the guarantee dated 11 March 2024 (the "**Guarantee**") made by the Guarantor.

Copies of the Instrument and the Guarantee are available for inspection at the office of J.P. Morgan Securities (Asia Pacific) Limited as specified below. The Warrantholders (as hereinafter defined) are entitled to the benefit of, are bound by and are deemed to have notice of, all the provisions of the Instrument and the Guarantee.

(B) The settlement obligation of the Issuer in respect of the Inline Warrants represent general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and *pari passu* with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

Inline Warrants represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of warrants deposit liabilities of the Issuer or a debt obligation of any kind.

In the Guarantee, the Guarantor has, subject to the terms of the Guarantee, unconditionally and irrevocably guaranteed to the Warrantholders the due and punctual settlement in full of all obligations due and owing by the Issuer arising under the issuance of the Inline Warrants after taking account of any set off, combination of accounts, netting or similar arrangement from time to time exercisable by the Issuer against any person to whom obligations are from time to time being owed, when and as due (whether at maturity, by acceleration or otherwise).

(C) Transfers of Inline Warrants may be effected only in Board Lots or integral multiples thereof in the Central Clearing and Settlement System ("**CCASS**") in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time ("**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by or on behalf of the Issuer outside of Hong Kong as the holder shall be treated by the Issuer, the Guarantor and the Agent as the absolute owner and holder of the Inline Warrants. The expression "**Warrantholder**" shall be construed accordingly.

(E) Trading in Inline Warrants on The Stock Exchange of Hong Kong Limited (the "**Stock Exchange**") shall be suspended prior to the Expiry Date in accordance with the requirements of the Stock Exchange.

2 Inline Warrant Rights and Exercise Expenses

(A) Every Board Lot entitles the Warrantholder, upon compliance with Condition 4, to payment of the Cash Settlement Amount (as defined in Condition 4(C)).

(B) The Warrantholder will be required to pay any charges or expenses including any taxes or duties which are incurred or withheld in respect of the exercise of the Inline Warrants (the "**Exercise Expenses**"). To effect such payments, an amount equivalent to the Exercise Expenses will be deducted by the Issuer from the Cash Settlement Amount in accordance with Condition 4(C).

3 Automatic Exercise

(A) All Inline Warrants shall be deemed to be automatically exercised on the Expiry Date.

(B) In these Conditions, "**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong.

4 Exercise of Inline Warrants

(A) Inline Warrants may only be exercised in Board Lots or integral multiples thereof.

(B) Following the Expiry Date the Issuer will, with effect from the first Business Day following the Expiry Date cancel the Global Warrant Certificate.

(C) The Issuer will as soon as practicable and not later than the third CCASS Settlement Day after the later of: (i) the Expiry Date; and (ii) the day on which the Closing Level is determined in accordance with these Conditions (the "**Settlement Date**") in accordance with these Conditions procure payment of the aggregate Cash Settlement Amount (following deduction of determined Exercise Expenses) for all Inline Warrants exercised or deemed exercised, electronically through CCASS by crediting the relevant bank account of the Warrantholder as appearing in the register kept by or on behalf of the Issuer.

Subject to adjustment as provided in Condition 6, "**Cash Settlement Amount**" means EITHER:

(1) if the Closing Level is at or below the Upper Strike Level and at or above the Lower Strike Level:

Cash Settlement Amount per Board Lot	=	Maximum Payoff Amount per Inline Warrant x one Board Lot

OR

(2) if the Closing Level is above the Upper Strike Level or below the Lower Strike Level:

$$\frac{\text{Cash Settlement Amount}}{\text{per Board Lot}} = \frac{\text{Minimum Payoff Amount per Inline Warrant} \times}{\text{one Board Lot}}$$

either (i) converted (if applicable) into the Settlement Currency at the Exchange Rate or, as the case may be, (ii) converted into the Interim Currency at the First Exchange Rate and then (if applicable) converted into Settlement Currency at the Second Exchange Rate;

"**CCASS Settlement Day**" has the meaning ascribed to the term "**Settlement Day**" in the CCASS Rules, subject to such modification and amendment prescribed by Hong Kong Securities Clearing Company Limited from time to time.

"**Index Business Day**" means a day on which the Index Exchange is scheduled to open for trading for its regular trading sessions.

"**Index Exchange**" means the Stock Exchange or any other exchange as specified in the relevant Launch Announcement and Supplemental Listing Document.

"**Lower Strike Level**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Market Disruption Event**" means:

(1) the occurrence or existence, on the Valuation Date during the one-half hour period that ends at the close of trading on the Index Exchange, of any of:

(i) the suspension or material limitation of the trading of a material number of constituent securities that comprise the Index; or

(ii) the suspension or material limitation of the trading of options or futures contracts relating to the Index on any exchanges on which such contracts are traded; or

(iii) the imposition of any exchange controls in respect of any currencies involved in determining the Cash Settlement Amount;

for the purpose of paragraph (1), (x) the limitation of the number of hours or days of trading will not constitute a Market Disruption Event if it results from an announced change in the regular business hours of any relevant exchange, and (y) a limitation on trading imposed by reason of the movements in price exceeding the levels permitted by any relevant exchange will constitute a Market Disruption Event; or

(2) where the Index Exchange is the Stock Exchange, the occurrence of any severe weather condition or other event on any day which either (i) results in the Stock Exchange being closed for trading for the entire day; or (ii) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of such severe weather condition or other event; or

(3) the limitation or closure of the Index Exchange due to any unforeseen circumstances; or

(4) any circumstances beyond the control of the Issuer in which the Closing Level or, if applicable, the Exchange Rate, the First Exchange Rate or the Second Exchange Rate (as the case may be) cannot be determined by the Issuer and/or the Agent in the manner set out in these Conditions or in such other manner as the Issuer considers appropriate at such time after taking into account all the relevant circumstances.

"**Maximum Payoff Amount per Inline Warrant**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Minimum Payoff Amount per Inline Warrant**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Settlement Currency**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Upper Strike Level**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Valuation Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document. If the Issuer and/or the Agent determine, in its sole discretion, that a Marker Disruption Event has occurred on the Valuation Date, then the Issuer and/or the Agent shall determine the Closing Level on the basis of its good faith estimate of the Closing Level that would have prevailed on that day but for the occurrence of the Market Disruption Event provided that the Issuer, if applicable, may, but shall not be obliged to, determine such Closing Level by having regard to the manner in which futures contracts relating to the Index are calculated.

Any payment made pursuant to this Condition 4(C) shall be delivered at the risk and expense of the Warrantholder to the Warrantholder, or such bank, broker or other agent in Hong Kong (if any) as is recorded on the register.

(D) If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant bank account of the Warrantholder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Warrantholder for any interest in respect of the amount due or any loss or damage that such Warrantholder may suffer as a result of the existence of a Settlement Disruption Event.

(E) These Conditions shall not be construed so as to give rise to any relationship of agency or trust between the Guarantor, the Issuer or its agent or nominee and the Warrantholder and neither the Guarantor, the Issuer nor its agent or nominee shall owe any duty of a fiduciary nature to the Warrantholder.

None of the Issuer, the Guarantor or the Agent shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these terms and conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 4(C) above.

5 Agent

(A) The Agent will be acting as agent of the Issuer in respect of the Inline Warrants and will not assume any obligation or duty to or any relationship or agency or trust for the Warrantholder.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Agent and to appoint another agent provided that it will at all times maintain an agent in Hong Kong for so long as the Inline Warrants are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Warrantholder in accordance with Condition 10.

6 Adjustments

(A) If the Index is (i) not calculated and announced by the Index Compiler but is calculated and published by a successor to the Index Compiler (the "**Successor Index Compiler**") acceptable to the Agent or (ii) replaced by a successor index using, in the determination of the Agent, the same or a substantially similar formula for and method of calculation as used in the calculation of the Index, then the Index will be deemed to be the index so calculated and announced by the Successor Index Compiler or that successor index, as the case may be.

(B) If (i) on or prior to the Valuation Date, the Index Compiler or (if applicable) the Successor Index Compiler makes a material change in the formula for or the method of calculating the Index or in any other way materially modifies the Index (other than a modification prescribed in that formula or method to maintain the Index in the event of changes in constituent securities, contracts or commodities and other routine events), or (ii) on the Valuation Date, the Index Compiler or (if applicable) the Successor Index Compiler fails to calculate and publish the Index (other than as a result of a Market Disruption Event), then the Issuer and/or the Agent shall determine the Closing Level using, in lieu of a published level for the Index, the level for the Index as at the Valuation Date as determined by the Issuer and/or the Agent in accordance with the formula for and method of calculating the Index last in effect prior to the change or failure, but using only those securities, contracts or commodities that comprised the Index immediately prior to that change or failure (other than those securities that have since ceased to be listed on the relevant exchange).

(C) Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer and/or the Agent may (but shall not be obliged to) make such other adjustments to the terms and conditions of the Inline Warrants as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is: (i) not materially prejudicial to the interests of Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such adjustment in any particular jurisdiction); or (ii) determined by the Issuer and/or Agent in good faith to be appropriate and commercially reasonable.

(D) The Issuer and/or the Agent shall determine any adjustment or amendment and its determination shall be conclusive and binding on the Warrantholder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Warrantholder in accordance with Condition 10 as soon as practicable after the determination thereof.

7 Purchase by the Issuer

The Issuer and any of its affiliates may purchase Inline Warrants at any time on or after the date of their issue and any Inline Warrants which are so purchased may be surrendered for cancellation or offered from time to time in one or more transactions in the over-the-counter market or otherwise at prevailing market prices or in negotiated transactions, at the discretion of the Issuer or any such affiliate, as the case may be.

8 Global Warrant Certificate

A global warrant certificate (the "**Global Warrant Certificate**")representing the Inline Warrants will be deposited within CCASS and registered in the name of HKSCC Nominees Limited (or its successors). The Global Warrant Certificate will not be exchangeable for definitive warrant certificates.

9 Meeting of Warrantholder and Modification

(A) Meetings of Warrantholder. Notices for convening meetings to consider any matter affecting the Warrantholder's interests will be given to the Warrantholder in accordance with the provisions of Condition 10.

Every question submitted to a meeting of the Warrantholder shall be decided by poll. A meeting may be convened by the Issuer or by the Warrantholder holding not less than 10 per cent. of the Inline Warrants for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons (including any nominee appointed by the Warrantholder) holding or representing not less than 25 per cent. of the Inline Warrants for the time being remaining unexercised, or at any adjourned meeting two or more persons (including any nominee appointed by the Warrantholder) being or representing Warrantholder whatever the number of Inline Warrants so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Warrantholder as, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Warrantholder shall be binding on all the holders of the Inline Warrants, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Warrantholder being held if passed unanimously.

(B) Modification. The Issuer may, without the consent of the Warrantholders, effect any modification of the terms and conditions of the Inline Warrants or the Instrument which, in the opinion of the Issuer and/or the Agent, is:

(i) not materially prejudicial to the interests of the Warrantholders generally (without considering the circumstances of any individual Warrantholder or the tax or other consequences of such modification in any particular jurisdiction);

(ii) of a formal, minor or technical nature;

(iii) made to correct a manifest error; or

(iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Any such modification shall be binding on the Warrantholders and shall be notified to them by the Issuer and/or the Agent as soon as practicable thereafter in accordance with Condition 10.

10 Notices

All notices in English and Chinese to the Warrantholder will be validly given if published on the website of the Hong Kong Exchanges and Clearing Limited. In such circumstances, the Issuer shall not be required to dispatch copies of the notice to the Warrantholders.

11 Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Warrantholder, to create and issue further warrants so as to form a single series with the Inline Warrants.

12 Illegality or Impracticability

The Issuer is entitled to terminate the Inline Warrants if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or it will become illegal or impracticable:

(A) for it to perform its obligations under the Inline Warrants, or for the Guarantor to perform its obligations under the Guarantee, in whole or in part as a result of:

(i) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(ii) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (i) and (ii), a "**Change in Law Event**"); or

(B) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the Inline Warrants due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Warrantholder a cash amount that the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner to be the fair market value in respect of each Inline Warrant held by such Warrantholder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion. Payment will be made to each Warrantholder in such manner as shall be notified to the Warrantholders in accordance with Condition 10.

13 Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer and/or the Agent under these Conditions will be made in good faith and in a commercially reasonable manner.

14 Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the Inline Warrants.

15 Governing Law

The Inline Warrants, the Guarantee and the Instrument will be governed by and construed in accordance with the laws of the Hong Kong Special Administrative Region of the People's Republic of China ("Hong Kong"). The Issuer, the Guarantor and the Warrantholder (by its acquisition of the Inline Warrants) shall be deemed to have submitted for all purposes in connection with the Inline Warrants, the Guarantee and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

16 Language

A Chinese translation of these Conditions is available upon request during usual business hours on any weekday (Saturdays, Sundays and holidays excepted) at the offices of the Agent. In the event of any inconsistency between the English version and Chinese translation of these Conditions, the English version shall prevail and be governing.

Agent
J.P. Morgan Securities (Asia Pacific) Limited
23-29/F, Chater House
8 Connaught Road Central
Hong Kong

TERMS AND CONDITIONS OF THE CASH-SETTLED CALLABLE BULL/BEAR CONTRACTS OVER SINGLE STOCK

The relevant Conditions will, together with the supplemental provisions contained in the relevant launch announcement and supplemental listing document and subject to completion and amendment, be endorsed on the back of the global certificate. The applicable launch announcement and supplemental listing document in relation to the issue of any series of CBBCs may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with the relevant Conditions, replace or modify the relevant Conditions for the purpose of such series of CBBCs. Capitalised terms used in the relevant Conditions and not otherwise defined therein shall have the meanings given to them in the relevant launch announcement and supplemental listing document.

1 Form; Status; Guarantee; Transfer and Title

(A) The CBBCs (which expression shall, unless the context otherwise requires, include any further CBBCs issued pursuant to Condition 12) relating to the Shares of the Company are issued in registered form subject to and with the benefit of the amended and restated instrument dated 3 May 2010 (the "**Instrument**") made by J.P. Morgan Structured Products B.V. (the "**Issuer**") and JPMorgan Chase Bank, National Association (the "**Guarantor**") and the guarantee dated 11 March 2024 (the "**Guarantee**") made by the Guarantor.

Copies of the Instrument and the Guarantee are available for inspection at the office of J.P. Morgan Securities (Asia Pacific) Limited as specified below. The Holders (as hereinafter defined) are entitled to the benefit of, are bound by and are deemed to have notice of, all the provisions of the Instrument and the Guarantee.

(B) The settlement obligation of the Issuer in respect of the CBBCs represent general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

CBBCs represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of CBBCs deposit liabilities of the Issuer or a debt obligation of any kind.

In the Guarantee, the Guarantor has, subject to the terms of the Guarantee, unconditionally and irrevocably guaranteed to the Holders the due and punctual settlement in full of all obligations due and owing by the Issuer arising under the issuance of the CBBCs after taking account of any set off, combination of accounts, netting or similar arrangement from time to time exercisable by the Issuer against any person to whom obligations are from time to time being owed, when and as due (whether at maturity, by acceleration or otherwise).

(C) Transfers of CBBCs may be effected only in Board Lots or integral multiples thereof in the Central Clearing and Settlement System ("**CCASS**") in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time ("**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by or on behalf of the Issuer outside of Hong Kong as the holder shall be treated by the Issuer, the Guarantor and the Agent as the absolute owner and holder of the CBBCs. The expression "**Holder**" shall be construed accordingly.

(E) Trading in CBBCs on The Stock Exchange of Hong Kong Limited (the "**Stock Exchange**") shall be suspended immediately upon the occurrence of a Mandatory Call Event or at the close of trading for the Trading Day immediately preceding the Expiry Date (whichever is earlier) in accordance with the requirements of the Stock Exchange.

2 CBBC Rights and Exercise Expenses

(A) Every Board Lot entitles the Holder, upon compliance with Condition 3, to payment of the Cash Settlement Amount.

(B) The Holder will be required to pay any charges or expenses including any taxes or duties which are incurred or withheld in respect of the exercise of the CBBCs (the "**Exercise Expenses**"). To effect such payment, an amount equivalent to the Exercise Expenses will be deducted by the Issuer from the Cash Settlement Amount in accordance with Condition 3(E).

(C) For the purposes of these Conditions:

"**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong.

"**Cash Settlement Amount**" means, subject to adjustment as provided in Condition 5:

(a) following a Mandatory Call Event:

(i) in the case of a series of Category R CBBCs, the Residual Value; or

(ii) in the case of a series of Category N CBBCs, zero; and

(b) at expiry:

(i) in the case of a series of bull CBBCs:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{\text{Entitlement} \times (\text{Closing Price} - \text{Strike Price}) \times \text{one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

(ii) in the case of a series of bear CBBCs:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{\text{Entitlement} \times (\text{Strike Price} - \text{Closing Price}) \times \text{one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

For the avoidance of doubt, if the Cash Settlement Amount is a negative figure, it shall be deemed to be zero.

"**Category N CBBCs**" means a series of CBBCs where the Call Price is equal to the Strike Price.

"**Category R CBBCs**" means a series of CBBCs where the Call Price is different from the Strike Price.

"**CCASS Settlement Day**" has the meaning ascribed to the term "**Settlement Day**" in the CCASS Rules, subject to such modification and amendment prescribed by HKSCC from time to time.

"**Closing Price**" means the closing price of one Share (as derived from the Daily Quotation Sheet of the Stock Exchange, subject to any adjustment to such closing price as may be necessary to reflect any event as contemplated in Condition 5 such as capitalisation, rights issue, distribution or the like) on the Valuation Date.

"**Day of Notification**" means the Trading Day immediately following the day on which the Mandatory Call Event occurs.

"**Entitlement**" means the number of Shares to which the CBBCs relate, as specified in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 5.

"**HKEX**" means Hong Kong Exchanges and Clearing Limited.

"**HKSCC**" means Hong Kong Securities Clearing Company Limited.

"**Hong Kong**" means the Hong Kong Special Administrative Region of the People's Republic of China.

"**Mandatory Call Event**" occurs when the Spot Price is, at any time on any Trading Day during the Observation Period:

(a) in the case of a series of bull CBBCs, at or below the Call Price; and

(b) in the case of a series of bear CBBCs, at or above the Call Price.

"**Market Disruption Event**" means:

(1) the occurrence or existence on any Trading Day during the one-half hour period that ends at the close of trading of any suspension of, or limitation imposed on, trading (by reason of movements in price exceeding limits permitted by the Stock Exchange or otherwise) on the Stock Exchange in (1) the Shares; or (2) any options or futures contracts relating to the Shares if, in any such case, such suspension or limitation is, in the determination of the Issuer and/or Agent, material;

(2) the occurrence of any severe weather condition or other event on any day which (i) results in the Stock Exchange being closed for trading for the entire day; or (ii) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of such severe weather condition or other event; or

(3) a limitation or closure of the Stock Exchange due to any unforeseen circumstances.

"**Maximum Trade Price**" means the highest Spot Price (subject to any adjustment to such Spot Price as may be necessary to reflect any event as contemplated in Condition 5 such as capitalisation, rights issue, distribution or the like) during the MCE Valuation Period.

"**MCE Valuation Period**" means the period commencing from and including the moment upon which the Mandatory Call Event occurs (the trading session during which the Mandatory Call Event occurs is the "**1st Session**") and up to the end of the trading session on the Stock Exchange immediately following the 1st Session ("**2nd Session**") unless, in the determination of the Issuer in its good faith, the 2nd Session for any reason (including, without limitation, a Market Disruption Event occurring and subsisting in the 2nd Session) does not contain any continuous period of 1 hour or more than 1 hour during which trading in the Shares is permitted on the Stock Exchange with no limitation imposed, the MCE Valuation Period shall be extended to the end of the subsequent trading session following the 2nd Session during which trading in the Shares is permitted on the Stock Exchange with no limitation imposed for a continuous period of at least 1 hour notwithstanding the existence or continuance of a Market Disruption Event in such postponed trading session, unless the Issuer and/or the Agent determine in its good faith that each trading session on each of the four Trading Days immediately following the day on which the Mandatory Call Event occurs does not contain any continuous period of 1 hour or more than 1 hour during which trading in the Shares is permitted on the Stock Exchange with no limitation imposed. In that case:

(a) the period commencing from the 1st Session up to, and including, the last trading session on the Stock Exchange of the fourth Trading Day immediately following the date on which the Mandatory Call Event occurs shall be deemed to be the MCE Valuation Period; and

(b) the Issuer and/or the Agent shall determine the Maximum Trade Price or the Minimum Trade Price (as the case may be) having regard to the then prevailing market conditions, the last reported Spot Price of the Shares and such other factors as the Issuer and/or the Agent may determine to be relevant in its good faith.

For the avoidance of doubt, all Spot Prices available throughout the extended MCE Valuation Period shall be taken into account to determine the Maximum Trade Price or the Minimum Trade Price (as the case may be) for the calculation of the Residual Value.

For the purposes of this definition:

(A) the pre-opening session, the morning session and, in the case of half day trading, the closing auction session (if applicable) of the same day; and

(B) the afternoon session and the closing auction session (if applicable) of the same day,

shall each be considered as one trading session.

"**Minimum Trade Price**" means the lowest Spot Price (subject to any adjustment to such Spot Price as may be necessary to reflect any event as contemplated in Condition 5 such as capitalisation, rights issue, distribution or the like) during the MCE Valuation Period.

"**Observation Period**" means the period commencing from and including the Observation Commencement Date (Hong Kong time) and ending at and including the close of trading (Hong Kong time) on the Trading Day immediately preceding the Expiry Date.

"**Post MCE Trades**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document, subject to such modification and amendment prescribed by the Stock Exchange from time to time.

"**Residual Value**" means, subject to adjustment as provided in Condition 5:

(a) in the case of a series of bull CBBCs:

$$\text{Residual Value per Board Lot} = \frac{\text{Entitlement} \times (\text{Minimum Trade Price} - \text{Strike Price}) \times \text{one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

(b) in the case of a series of bear CBBCs:

$$\text{Residual Value per Board Lot} = \frac{\text{Entitlement} \times (\text{Strike Price} - \text{Maximum Trade Price}) \times \text{one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

"**Settlement Date**" means the third CCASS Settlement Day after (i) the end of the MCE Valuation Period or (ii) the later of: (a) the Expiry Date; and (b) the day on which the Closing Price is determined in accordance with these Conditions (as the case may be).

"**Spot Price**" means:

(a) in respect of a continuous trading session of the Stock Exchange, the price per Share concluded by means of automatic order matching on the Stock Exchange as reported in the official realtime dissemination mechanism for the Stock Exchange during such continuous trading session of the Stock Exchange in accordance with the Trading Rules, excluding direct business (as defined in the Trading Rules); and

(b) in respect of a pre-opening session or a closing auction session (if applicable) of the Stock Exchange (as the case may be), the final Indicative Equilibrium Price (IEP) (as defined in the Trading Rules) of the Share (if any) calculated at the end of the pre-order matching period of such pre-opening session or closing auction session (if applicable) (as the case may be) in accordance with the Trading Rules, excluding direct business (as defined in the Trading Rules),

subject to such modification and amendment prescribed by the Stock Exchange from time to time.

"**Trading Day**" means a day on which the Stock Exchange is scheduled to be open for trading for its regular trading sessions.

"**Trading Rules**" means the Rules and Regulations of the Exchange prescribed by the Stock Exchange from time to time.

"**Valuation Date**" means the Trading Day immediately preceding the Expiry Date unless the Issuer and/or the Agent determine, in its sole discretion, that a Market Disruption Event has occurred, then that day shall be postponed until the first succeeding Trading Day on which there is no Market Disruption Event, unless the Issuer and/or the Agent determine that there is a Market Disruption Event occurring on each of the four Trading Days immediately following the original date which (but for the Market Disruption Event) would have been the Valuation Date. In that case:

(i) the fourth Trading Day immediately following the original date shall be deemed to be the Valuation Date (regardless of the Market Disruption Event); and

(ii) the Issuer and/or the Agent shall determine the Closing Price having regard to the then prevailing market conditions, the last reported trading price of the Share on the Stock Exchange and such other factors as the Issuer and/or the Agent determine to be relevant.

3 Exercise of CBBCs

(A) CBBCs may only be exercised in Board Lots or integral multiples thereof.

(B) If no Mandatory Call Event has occurred during the Observation Period, the CBBCs will be deemed to be automatically exercised on the Expiry Date.

(C) (i) Subject to Condition 3(C)(ii), following the occurrence of a Mandatory Call Event, the CBBCs will terminate automatically and the Issuer shall have no further obligation under the CBBCs except for the payment of the Cash Settlement Amount (if any) following the Mandatory Call Event on the relevant Settlement Date. The Issuer will give notice to the Holders in accordance with Condition 9. Trading in the CBBCs will be suspended immediately upon the occurrence of a Mandatory Call Event and any Post MCE Trades will be cancelled and will not be recognised by the Stock Exchange.

(ii) A Mandatory Call Event is irrevocable unless it is triggered as a result of any of the following events:

(1) system malfunction or other technical errors of HKEX (such as the setting up of wrong Call Price and other parameters); or

(2) manifest errors caused by the relevant third party price source where applicable;

and

(a) in the case of paragraph (1) above, such event is reported by the Stock Exchange to the Issuer and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked; and

(b) in the case of paragraph (2) above, such event is reported by the Issuer to the Stock Exchange and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked,

in each case:

(aa) such mutual agreement must be reached no later than 30 minutes before the commencement of trading (including the pre-opening session) (Hong Kong time) or such other time frame as prescribed by the Stock Exchange from time to time on the Day of Notification;

(bb) the Mandatory Call Event so triggered will be reversed; and

(cc) all cancelled trades (if any) will be reinstated and trading of the CBBCs will resume no later than the Trading Day immediately following the Day of Notification in accordance with the rules prescribed by the Stock Exchange from time to time.

(D) Upon exercise following a Mandatory Call Event or on the Expiry Date in accordance with these Conditions, the Issuer will, with effect from the first Business Day following the MCE Valuation Period or the Expiry Date, as the case may be, cancel the Global Certificate.

(E) Upon exercise following a Mandatory Call Event or on the Expiry Date in accordance with these Conditions, the Issuer will as soon as practicable and not later than the Settlement Date in accordance with these conditions procure payment of the aggregate Cash Settlement Amount (following deduction of determined Exercise Expenses) for all CBBCs exercised or deemed exercised, electronically through CCASS by crediting the relevant bank account of the Holder as appearing in the register kept by or on behalf of the Issuer.

Any payment made pursuant to this Condition 3(E) shall be delivered at the risk and expense of the Holder to the Holder, or such bank, broker or agent in Hong Kong (if any) as recorded on the register.

(F) If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant bank account of the Holder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant bank account of the Holder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Holder for any interest in respect of the amount due or any loss or damage that such Holder may suffer as a result of the existence of a Settlement Disruption Event.

(G) These Conditions shall not be construed so as to give rise to any relationship of agency or trust between the Guarantor, the Issuer or its agent or nominee and the Holder and neither the Guarantor, the Issuer nor its agent or nominee shall owe any duty of a fiduciary nature to the Holder.

None of the Issuer, the Guarantor or the Agent shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these terms and conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 3(E) above.

4 Agent

(A) The Agent will be acting as agent of the Issuer in respect of the CBBCs and will not assume any obligation or duty to or any relationship or agency or trust for the Holder.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Agent and to appoint another agent provided that it will at all times maintain an agent in Hong Kong for so long as the CBBCs are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Holder in accordance with Condition 9.

5 Adjustments

Adjustments may be made by the Issuer and/or the Agent to the terms of the CBBCs (including, but not limited to, the Call Price, Strike Price and the Entitlement) on the basis of the following provisions:

(A) (i) If and whenever the Company shall, by way of Rights (as defined below), offer new Shares for subscription at a fixed subscription price to the holders of existing Shares pro rata to existing holdings (a "**Rights Offer**"), the Entitlement shall be adjusted on the Business Day on which the trading in the Shares of the Company becomes ex-entitlement in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = \frac{1 + M}{1 + (R/S) \times M}$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

S: Cum-Rights Share price, being the closing price of an existing Share, as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Shares are traded on a cum-Rights basis

R: Subscription price per new Share specified in the Rights Offer plus an amount equal to any dividends or other benefits foregone to exercise the Rights

M: Number of new Shares (whether a whole or a fraction) per existing Share each holder of an existing Share is entitled to subscribe

For the purposes of these Conditions, "**Rights**" means the right(s) attached to each existing Share or needed to acquire one new Share (as the case may be) which are given to a holder of existing Shares to subscribe at a fixed subscription price for new Shares pursuant to the Rights Offer (whether by the exercise of one Right, a part of a Right or an aggregate number of Rights).

(ii) The Call Price and Strike Price (which shall be rounded to the nearest 0.001) shall be adjusted by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Call Price and Strike Price shall take effect on the same day that the Entitlement is adjusted.

(iii) For the purposes of Conditions 5(A) and 5(B), no adjustment will be made if the adjustment to the Entitlement is one per cent. or less of the Entitlement immediately prior to the adjustment.

(B) If and whenever the Company shall make an issue of Shares credited as fully paid to holders of Shares generally by way of capitalisation of profits or reserves (other than pursuant to a scrip dividend or similar scheme for the time being operated by the Company or otherwise in lieu of a cash dividend) (and without any payment or other consideration being made or given by such holders) (a "**Bonus Issue**"), the Entitlement will be adjusted, subject to Condition 5(A)(iii), on the Business Day on which the trading in the Shares of the Company becomes ex-entitlement in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = 1 + N$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

N: Number of additional Shares (whether a whole or a fraction) per existing Share each holder of an existing Share is entitled to receive

In addition, the Issuer and/or the Agent shall adjust the Call Price and Strike Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Call Price and Strike Price shall take effect on the same day that the Entitlement is adjusted.

(C) If and whenever the Company shall subdivide its outstanding share capital into a greater number of shares (a "**Subdivision**") or consolidate its outstanding share capital into a smaller number of shares (a "**Consolidation**"), then:

(i) in the case of a Subdivision, the Entitlement shall be increased whereas the Call Price and Strike Price (which shall be rounded to the nearest 0.001) shall be decreased in the same ratio as the Subdivision; and

(ii) in the case of a Consolidation, the Entitlement shall be decreased whereas the Call Price and Strike Price (which shall be rounded to the nearest 0.001) shall be increased in the same ratio as the Consolidation,

in each case on the day on which the relevant Subdivision or Consolidation (as the case may be) shall have taken effect.

(D) If it is announced that the Company is to or may merge or consolidate with or into any other corporation (including becoming, by agreement or otherwise, a subsidiary of or controlled by any person or corporation) (except where the Company is the surviving corporation in a merger) or that it is to or may sell or transfer all or substantially all of its assets, the rights attaching to the CBBCs may in the absolute discretion of the Issuer and/or the Agent be amended no later than the Business Day preceding the consummation of such merger, consolidation, sale or transfer (each a "**Restructuring Event**") (as determined by the Issuer and/or the Agent in its absolute discretion).

The rights attaching to the CBBCs after the adjustment shall, after such Restructuring Event, relate to the number of shares of the corporation(s) resulting from or surviving such Restructuring Event or other securities (the "**Substituted Securities**") and/or cash offered in substitution for the affected Shares, as the case may be, to which the holder of such number of Shares to which the CBBCs related immediately before such Restructuring Event would have been entitled upon such Restructuring Event. Thereafter the provisions hereof shall apply to such Substituted Securities, provided that any Substituted Securities may, in the absolute discretion of the Issuer and/or the Agent, be deemed to be replaced by an amount in the relevant currency equal to the market value or, if no market value is available, fair value, of such Substituted Securities in each case as determined by the Issuer and/or the Agent as soon as practicable after such Restructuring Event is effected.

For the avoidance of doubt, any remaining Shares shall not be affected by this paragraph (D) and where cash is offered in substitution for Shares or is deemed to replace Substituted Securities as described above, references in these Conditions to the Shares shall include any such cash.

(E) No adjustment will be made for an ordinary cash dividend (whether or not it is offered with a scrip alternative) ("**Ordinary Dividend**"). For any other forms of cash distribution ("**Cash Distribution**") announced by the Company, such as a cash bonus, special dividend or extraordinary dividend, no adjustment will be made unless the value of the Cash Distribution accounts for 2 percent. or more of the Share's closing price on the day of announcement by the Company.

If and whenever the Company shall make a Cash Distribution credited as fully paid to the holders of Shares generally, the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Shares becomes ex-entitlement in respect of the relevant Cash Distribution in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = \frac{S - OD}{S - OD - CD}$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

S: Cum-Cash Distribution price, being the closing price of an existing Share, as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Shares are traded on a cum-Cash Distribution basis

CD: The Cash Distribution per Share

OD: The Ordinary Dividend per Share, provided that the Ordinary Dividend and the Cash Distribution have the same ex-entitlement date. For the avoidance of doubt, the OD shall be zero if the Ordinary Dividend and the Cash Distribution have different ex-entitlement dates

In addition, the Issuer and/or the Agent shall adjust the Strike Price and Call Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Strike Price and Call Price shall take effect on the same date that the Entitlement is adjusted.

(F) Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer and/or the Agent may (but shall not be obliged to) make such other adjustments to the terms and conditions of the CBBCs as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is: (i) not materially prejudicial to the interests of Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such adjustment in any particular jurisdiction); or (ii) determined by the Issuer and/or the Agent in good faith to be appropriate and commercially reasonable.

(G) The Issuer and/or the Agent shall determine any adjustment or amendment and its determination shall be conclusive and binding on the Holder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Holder in accordance with Condition 9 as soon as practicable after the determination thereof.

6 Purchase by the Issuer

The Issuer and any of its affiliates may purchase CBBCs at any time on or after the date of their issue and any CBBCs which are so purchased may be surrendered for cancellation or offered from time to time in one or more transactions in the over-the-counter market or otherwise at prevailing market prices or in negotiated transactions, at the discretion of the Issuer or any such affiliate, as the case may be.

7 Global Certificate

A global certificate (the "**Global Certificate**") representing the CBBCs will be deposited within CCASS and registered in the name of HKSCC Nominees Limited (or its successors). The Global Certificate will not be exchangeable for definitive certificates.

8 Meeting of Holder and Modification

(A) *Meetings of Holder.* Notices for convening meetings to consider any matter affecting the Holder's interests will be given to the Holder in accordance with the provisions of Condition 9.

Every question submitted to a meeting of the Holder shall be decided by poll. A meeting may be convened by the Issuer or by the Holder holding not less than 10 per cent. of the CBBCs for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons (including any nominee appointed by the Holder) holding or representing not less than 25 per cent. of the CBBCs for the time being remaining unexercised, or at any adjourned meeting two or more persons (including any nominee appointed by the Holder) being or representing Holder whatever the number of CBBCs so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Holder as, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Holder shall be binding on all the holders of the CBBCs, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Holder being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Holders, effect any modification of the terms and conditions of the CBBCs or the Instrument which, in the opinion of the Issuer and/or the Agent, is:

(i) not materially prejudicial to the interests of the Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such modification in any particular jurisdiction);

(ii) of a formal, minor or technical nature;

(iii) made to correct a manifest error; or

(iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Any such modification shall be binding on the Holders and shall be notified to them by the Issuer and/or the Agent as soon as practicable thereafter in accordance with Condition 9.

9 Notices

All notices in English and Chinese to the Holder will be validly given if published on the HKEX website. In such circumstances, the Issuer shall not be required to dispatch copies of the notice to the Holders.

10 Liquidation

In the event of a liquidation, winding up or dissolution of the Company or the appointment of a liquidator, receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the undertaking, property or assets of the Company (each an "**Insolvency Event**"), all unexercised CBBCs shall terminate automatically upon the occurrence of any Insolvency Event and the Issuer shall have no further obligation under the CBBCs, except that in the case of a series of callable bear contracts:

(A) if the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner that there is any residual value in the callable bear contracts upon the occurrence of such Insolvency Event:

(i) the Issuer shall pay to each Holder the residual value of the callable bear contract in cash representing the fair market value in respect of each callable bear contract held by such Holder on or about the occurrence of such Insolvency Event less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion, acting in good faith and in a commercially reasonable manner. Payment will be made to each Holder in such manner as shall be notified to the Holders in accordance with Condition 9; and

(ii) the Issuer and/or the Agent may, but shall not be obliged to, determine such cash amount by having regard to the manner in which the options contracts or futures contracts of the Shares traded on the Stock Exchange are calculated;

(B) otherwise, if the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner that there is no residual value in the callable bear contracts upon the occurrence of such Insolvency Event, the callable bear contracts shall lapse and cease to be valid for any purpose upon the occurrence of the Insolvency Event.

For the purpose of this Condition 10, an Insolvency Event occurs:

(i) in the case of a voluntary liquidation or winding up of the Company, on the effective date of the relevant resolution; or

(ii) in the case of an involuntary liquidation, winding up or dissolution of the Company, on the date of the relevant court order; or

(iii) in the case of the appointment of a liquidator or receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the undertaking, property or assets of the Company, on the date when such appointment is effective but subject (in any such case) to any contrary mandatory requirement of the applicable law.

11 Delisting of Company

(A) If at any time the Shares cease to be listed on the Stock Exchange, the Issuer shall give effect to these Conditions in such manner and make such adjustments to the rights attaching to the CBBCs as it shall, in its absolute discretion, consider appropriate to ensure, so far as it is reasonably able to do so, that the interests of the Holder generally are not materially prejudiced as a consequence of such delisting (without considering the individual circumstances of the Holder or the tax or other consequences that may result in any particular jurisdiction).

(B) Without prejudice to the generality of Condition 11(A), where the Shares are or, upon the delisting, become, listed on any other stock exchange, these Conditions may, in the absolute discretion of the Issuer, be amended to the extent necessary to allow for the substitution of that other stock exchange in place of the Stock Exchange and the Issuer may, without the consent of the Holder, make such adjustments to the entitlements of the Holder on exercise (including, if appropriate, by converting foreign currency amounts at prevailing market rates into the relevant currency) as it shall consider appropriate in the circumstances.

(C) Any adjustment, amendment or determination made by the Issuer pursuant to this Condition 11 shall be conclusive and binding on the Holder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Holder in accordance with Condition 9 as soon as practicable after they are determined.

12 Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Holder, to create and issue further callable bull/bear contracts so as to form a single series with the CBBCs.

13 Illegality or Impracticability

The Issuer is entitled to terminate the CBBCs if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or will become illegal or impracticable:

(A) for it to perform its obligations under the CBBCs, or for the Guarantor to perform its obligations under the Guarantee, in whole or in part as a result of:

(i) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

(ii) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (i) and (ii), a "**Change in Law Event**"); or

(B) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the CBBCs due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Holder a cash amount that the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner to be the fair market value in respect of each CBBC held by such Holder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion. Payment will be made in such manner as shall be notified to the Holders in accordance with Condition 9.

14 Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer and/or the Agent under these Conditions will be made in good faith and in a commercially reasonable manner.

15 Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions of the CBBCs has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the CBBCs.

16 Governing Law

The CBBC, the Guarantee and the Instrument will be governed by and construed in accordance with the laws of Hong Kong. The Issuer, the Guarantor and the Holder (by its acquisition of the CBBCs) shall be deemed to have submitted for all purposes in connection with the CBBCs, the Guarantee and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

17 Language

A Chinese translation of these Conditions is available upon request during usual business hours on any weekday (Saturdays, Sundays and holidays excepted) at the offices of the Agent. In the event of any inconsistency between the English version and Chinese translation of these Conditions, the English version shall prevail and be governing.

Agent
J.P. Morgan Securities (Asia Pacific) Limited
23-29/F, Chater House
8 Connaught Road Central
Hong Kong

TERMS AND CONDITIONS OF THE CASH-SETTLED CALLABLE BULL/BEAR CONTRACTS OVER INDEX

The relevant Conditions will, together with the supplemental provisions contained in the relevant launch announcement and supplemental listing document and subject to completion and amendment, be endorsed on the back of the global certificate. The applicable launch announcement and supplemental listing document in relation to the issue of any series of CBBCs may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with the relevant Conditions, replace or modify the relevant Conditions for the purpose of such series of CBBCs. Capitalised terms used in the relevant Conditions and not otherwise defined therein shall have the meanings given to them in the relevant launch announcement and supplemental listing document.

1 Form; Status; Guarantee; Transfer and Title

(A) The CBBCs (which expression shall, unless the context otherwise requires, include any further CBBCs issued pursuant to Condition 10) relating to the Index as published by the Index Compiler are issued in registered form subject to and with the benefit of the amended and restated instrument dated 3 May 2010 (the "**Instrument**"), made by J.P. Morgan Structured Products B.V. (the "**Issuer**") and JPMorgan Chase Bank, National Association (the "**Guarantor**") and the guarantee dated 11 March 2024 (the "**Guarantee**") made by the Guarantor.

Copies of the Instrument and the Guarantee are available for inspection at the office of J.P. Morgan Securities (Asia Pacific) Limited as specified below. The Holders (as hereinafter defined) are entitled to the benefit of, are bound by and are deemed to have notice of, all the provisions of the Instrument and the Guarantee.

(B) The settlement obligation of the Issuer in respect of the CBBCs represent general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

CBBCs represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of CBBCs deposit liabilities of the Issuer or a debt obligation of any kind.

In the Guarantee, the Guarantor has, subject to the terms of the Guarantee, unconditionally and irrevocably guaranteed to the Holders the due and punctual settlement in full of all obligations due and owing by the Issuer arising under the issuance of the CBBCs after taking account of any set off, combination of accounts, netting or similar arrangement from time to time exercisable by the Issuer against any person to whom obligations are from time to time being owed, when and as due (whether at maturity, by acceleration or otherwise).

(C) Transfers of CBBCs may be effected only in Board Lots or integral multiples thereof in the Central Clearing and Settlement System ("**CCASS**") in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time ("**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by or on behalf of the Issuer outside of Hong Kong as the holder shall be treated by the Issuer, the Guarantor and the Agent as the absolute owner and holder of the CBBCs. The expression "**Holder**" shall be construed accordingly.

(E) Trading in CBBCs on The Stock Exchange of Hong Kong Limited (the "**Stock Exchange**") shall be suspended immediately upon the occurrence of a Mandatory Call Event or at the close of trading for the Trading Day immediately preceding the Expiry Date (whichever is earlier) in accordance with the requirements of the Stock Exchange.

2 CBBC Rights and Exercise Expenses

(A) Every Board Lot entitles the Holder, upon compliance with Condition 3, to payment of the Cash Settlement Amount.

(B) The Holder will be required to pay any charges or expenses including any taxes or duties which are incurred or withheld in respect of the exercise of the CBBCs (the "**Exercise Expenses**"). To effect such payments, an amount equivalent to the Exercise Expenses will be deducted by the Issuer from the Cash Settlement Amount in accordance with Condition 3(E).

(C) For the purposes of these Conditions:

"**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong.

"**Cash Settlement Amount**" means, subject to adjustment as provided in Condition 5, an amount calculated by the Issuer and/or the Agent in accordance with the following formula converted (if applicable) (i) into the Settlement Currency at the Exchange Rate or, as the case may be, (ii) into the Interim Currency at the First Exchange Rate and then (if applicable) converted into the Settlement Currency at the Second Exchange Rate:

(a) a Mandatory Call Event:

(i) in the case of a series of Category R CBBCs, the Residual Value; or

(ii) in the case of a series of Category N CBBCs, zero; and

(b) at expiry:

(i) in the case of a series of bull CBBCs:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{(\text{Closing Level} - \text{Strike Level}) \times \text{one Board Lot} \times \text{Index Currency Amount}}{\text{Divisor}}$$

(ii) in the case of a series of bear CBBCs:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{(\text{Strike Level} - \text{Closing Level}) \times \text{one Board Lot} \times \text{Index Currency Amount}}{\text{Divisor}}$$

For the avoidance of doubt, if the Cash Settlement Amount is a negative figure, it shall be deemed to be zero.

"**Category N CBBCs**" means a series of CBBCs where the Call Level is equal to the Strike Level.

“**Category R CBBCs**” means a series of CBBCs where the Call Level is different from the Strike Level.

“**CCASS Settlement Day**” has the meaning ascribed to the term “**Settlement Day**” in the CCASS Rules, subject to such modification and amendment prescribed by HKSCC from time to time.

“**Day of Notification**” means the Trading Day immediately following the day on which the Mandatory Call Event occurs.

“**HKEX**” means Hong Kong Exchanges and Clearing Limited.

“**HKSCC**” means Hong Kong Securities Clearing Company Limited.

“**Hong Kong**” means the Hong Kong Special Administrative Region of the People’s Republic of China.

“**Index Business Day**” means a day on which the Index Exchange is scheduled to open for trading for its regular trading sessions.

“**Index Exchange**” means the Stock Exchange or any other exchange as specified in the relevant Launch Announcement and Supplemental Listing Document.

“**Mandatory Call Event**” occurs when the Spot Level is, at any time on any Index Business Day during the Observation Period:

(a) in the case of a series of bull CBBCs, at or below the Call Level; and

(b) in the case of a series of bear CBBCs, at or above the Call Level.

“**Market Disruption Event**” means:

(1) the occurrence or existence, on any Index Business Day during the one-half hour period that ends at the close of trading on the Index Exchange of any of:

  (i) the suspension or material limitation of the trading of a material number of constituent securities that comprise the Index; or

  (ii) the suspension or material limitation of the trading of options or futures contracts relating to the Index on any exchange on which such contracts are traded; or

  (iii) the imposition of any exchange controls in respect of any currency involved in determining the Cash Settlement Amount.

  For the purposes of this paragraph (1), (x) the limitation of the number of hours or days of trading will not constitute a Market Disruption Event if it results from an announced change in the regular business hours of any relevant exchange, and (y) a limitation on trading imposed by reason of the movements in price exceeding the levels permitted by any relevant exchange will constitute a Market Disruption Event; or

(2) where the Index Exchange is the Stock Exchange, the occurrence of any severe weather condition or other event on any day which (i) results in the Stock Exchange being closed for trading for the entire day; or (ii) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning

trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of such severe weather condition or other event; or

(3) a limitation or closure of the Index Exchange due to any unforeseen circumstances; or

(4) any circumstances beyond the control of the Issuer in which the Closing Level or, if applicable, the Exchange Rate, the First Exchange Rate or the Second Exchange Rate (as the case may be) cannot be determined by the Issuer and/or the Agent in the manner set out in these Conditions or in such other manner as the Issuer considers appropriate at such time after taking into account all the relevant circumstances.

"**Maximum Index Level**" means the highest Spot Level during the MCE Valuation Period.

"**MCE Valuation Period**" means:

(a) in respect of an Index Exchange located in Hong Kong, the period commencing from and including the moment upon which the Mandatory Call Event occurs (the trading session during which the Mandatory Call Event occurs is the "**1st Session**") and up to the end of the trading session on the Index Exchange immediately following the 1st Session ("**2nd Session**") unless, in the determination of the Issuer in its good faith, the 2nd Session for any reason (including, without limitation, a Market Disruption Event occurring and subsisting in the 2nd Session) does not contain any continuous period of 1 hour or more than 1 hour during which Spot Levels are available, the MCE Valuation Period shall be extended to the end of the subsequent trading session on the Index Exchange following the 2nd Session during which Spot Level(s) is/are available for a continuous period of at least 1 hour notwithstanding the existence or continuance of a Market Disruption Event in such postponed trading session, unless the Issuer and/or the Agent determine in its good faith that each trading session on each of the four Index Business Days immediately following the day on which the Mandatory Call Event occurs does not contain any continuous period of 1 hour or more than 1 hour during which Spot Level(s) is/are available. In that case:

   (i) the period commencing from the 1st Session up to, and including, the last trading session of the fourth Index Business Day on the Index Exchange immediately following the date on which the Mandatory Call Event occurs shall be deemed to be the MCE Valuation Period; and

   (ii) the Issuer and/or the Agent shall determine the Maximum Index Level or the Minimum Index Level (as the case may be) having regard to the then prevailing market conditions, the last reported Spot Level of the Index and such other factors as the Issuer and/or the Agent may determine to be relevant in its good faith.

   For the avoidance of doubt, all Spot Levels available throughout the extended MCE Valuation Period shall be taken into account to determine the Maximum Index Level or the Minimum Index Level (as the case may be) for the calculation of the Residual Value.

   For the purposes of this definition:

   (A) the pre-opening session, the morning session and, in the case of half day trading, the closing auction session (if applicable) of the same day; and

(B) the afternoon session and the closing auction session (if applicable) of the same day, shall each be considered as one trading session.

(b) in respect of an Index Exchange located outside Hong Kong, the period specified in the relevant Launch Announcement and Supplemental Listing Document.

"**Minimum Index Level**" means the lowest Spot Level during the MCE Valuation Period.

"**Observation Period**" means the period commencing from and including the Observation Commencement Date (Hong Kong time) and ending at and including the close of trading (Hong Kong time) on the Trading Day immediately preceding the Expiry Date.

"**Post MCE Trades**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document, subject to such modification and amendment prescribed by the Stock Exchange from time to time.

"**Residual Value**" means, subject to adjustment as provided in Condition 5, an amount calculated by the Issuer and/or the Agent in accordance with the following formula converted (if applicable) (i) into the Settlement Currency at the Exchange Rate or, as the case may be, (ii) into the Interim Currency at the First Exchange Rate and then (if applicable) converted into the Settlement Currency at the Second Exchange Rate:

(a) in the case of a series of bull CBBCs:

$$\text{Residual Value per Board Lot} = \frac{(\text{Minimum Index Level} - \text{Strike Level}) \times \text{one Board Lot} \times \text{Index Currency Amount}}{\text{Divisor}}$$

(b) in the case of a series of bear CBBCs:

$$\text{Residual Value per Board Lot} = \frac{(\text{Strike Level} - \text{Maximum Index Level}) \times \text{one Board Lot} \times \text{Index Currency Amount}}{\text{Divisor}}$$

"**Settlement Currency**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document.

"**Settlement Date**" means the third CCASS Settlement Day after (i) the end of the MCE Valuation Period or (ii) the later of: (a) the Expiry Date; and (b) the day on which the Closing Level is determined in accordance with these Conditions (as the case may be).

"**Spot Level**" means the spot level of the Index as complied and published by the Index Compiler or, as the case may be, the Successor Index Compiler.

"**Trading Day**" means a day on which the Stock Exchange is scheduled to be open for trading for its regular trading sessions.

"**Trading Rules**" means the Rules and Regulations of the Exchange prescribed by the Stock Exchange from time to time.

"**Valuation Date**" means the date specified as such in the relevant Launch Announcement and Supplemental Listing Document. If the Issuer and/or the Agent determine, in its sole discretion, that a Market Disruption Event has occurred on the Valuation Date, then the Issuer and/or the Agent shall determine the Closing Level on the basis of its good faith estimate of the Closing Level that would have prevailed on that day but for the occurrence of the Market Disruption Event provided that the Issuer, if applicable, may, but shall not be obliged to, determine such Closing Level by having regard to the manner in which futures contracts relating to the Index are calculated.

3 Exercise of CBBCs

(A) CBBCs may only be exercised in Board Lots or integral multiples thereof.

(B) If no Mandatory Call Event has occurred during the Observation Period, the CBBCs will be deemed to be automatically exercised on the Expiry Date.

(C) (i) Subject to Condition 3(C)(ii), following the occurrence of a Mandatory Call Event, the CBBCs will terminate automatically and the Issuer shall have no further obligation under the CBBCs except for the payment of the Cash Settlement Amount (if any) following the Mandatory Call Event on the relevant Settlement Date. The Issuer will give notice to the Holders in accordance with Condition 9. Trading in the CBBCs will be suspended immediately upon the occurrence of a Mandatory Call Event and any Post MCE Trades will be cancelled and will not be recognised by the Stock Exchange.

(ii) A Mandatory Call Event is irrevocable unless it is triggered as a result of any of the following events:

(1) system malfunction or other technical errors of HKEX (such as the setting up of wrong Call Level and other parameters); or

(2) manifest errors caused by the relevant third party price source where applicable;

and

(a) in the case of paragraph (1) above, such event is reported by the Stock Exchange to the Issuer and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked; and

(b) in the case of paragraph (2) above, such event is reported by the Issuer to the Stock Exchange and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked,

in each case:

(aa) such mutual agreement must be reached no later than 30 minutes before the commencement of trading (including the pre-opening session) (Hong Kong time) or such other time frame as prescribed by the Stock Exchange from time to time on the Day of Notification;

(bb) the Mandatory Call Event so triggered will be reversed; and

(cc) all cancelled trades (if any) will be reinstated and trading of the CBBCs will resume no later than the Trading Day immediately following the Day of Notification in accordance with the rules prescribed by the Stock Exchange from time to time.

(D) Upon exercise following a Mandatory Call Event or on the Expiry Date in accordance with these Conditions, the Issuer will, with effect from the first Business Day following the MCE Valuation Period or the Expiry Date, as the case may be, cancel the Global Certificate.

(E) Upon exercise following a Mandatory Call Event or on the Expiry Date in accordance with these Conditions, the Issuer will as soon as practicable and not later than the Settlement Date in accordance with these Conditions procure payment of the aggregate Cash Settlement Amounts (following deduction of determined Exercise Expenses) for all CBBCs exercised or deemed exercised, electronically through CCASS by crediting the relevant bank account of the Holder as appearing in the register kept by or on behalf of the Issuer.

Any payment made pursuant to this Condition 3(E) shall be delivered at the risk and expense of the Holder to the Holder, or such bank, broker or other agent in Hong Kong (if any) as is recorded on the register.

(F) If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant bank account of the Holder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant bank account of the Holder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Holder for any interest in respect of the amount due or any loss or damage that such Holder may suffer as a result of the existence of a Settlement Disruption Event.

(G) These Conditions shall not be construed so as to give rise to any relationship of agency or trust between the Guarantor, the Issuer or its agent or nominee and the Holder and neither the Guarantor, the Issuer nor its agent or nominee shall owe any duty of a fiduciary nature to the Holder.

None of the Issuer, the Guarantor or the Agent shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these terms and conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 3(E) above.

4 Agent

(A) The Agent will be acting as agent of the Issuer in respect of the CBBCs and will not assume any obligation or duty to or any relationship or agency or trust for the Holder.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Agent and to appoint another agent provided that it will at all times maintain an agent in Hong Kong for so long as the CBBCs are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Holder in accordance with Condition 9.

5 Adjustments

(A) If the Index is (i) not calculated and announced by the Index Compiler but is calculated and published by a successor to the Index Compiler (the "**Successor Index Compiler**") acceptable to the Agent or (ii) replaced by a successor index using, in the determination of the Agent, the same or a substantially similar formula for and method of calculation as used in the calculation of the Index, then the Index will be deemed to be the index so calculated and announced by the Successor Index Compiler or that successor index, as the case may be.

(B) If (i) on or prior to the Valuation Date, the Index Compiler or (if applicable) the Successor Index Compiler makes a material change in the formula for or the method of calculating the Index or in any other way materially modifies the Index (other than a modification prescribed in that formula or method to maintain the Index in the event of changes in constituent securities, contracts or commodities and other routine events), or (ii) on the Valuation Date, the Index Compiler or (if applicable) the Successor Index Compiler fails to calculate and publish the Index (other than as a result of a Market Disruption Event), then the Issuer and/or the Agent shall determine the Closing Level using, in lieu of a published level for the Index, the level for the Index as at the Valuation Date as determined by the Issuer and/or the Agent in accordance with the formula for and method of calculating the Index last in effect prior to the change or failure, but using only those securities, contracts or commodities that comprised the Index immediately prior to that change or failure (other than those securities that have since ceased to be listed on the relevant exchange).

(C) Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer and/or the Agent may (but shall not be obliged to) make such other adjustments to the terms and conditions of the CBBCs as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is: (i) not materially prejudicial to the interests of Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such adjustment in any particular jurisdiction); or (ii) determined by the Issuer and/or Agent in good faith to be appropriate and commercially reasonable.

(D) The Issuer and/or the Agent shall determine any adjustment or amendment and its determination shall be conclusive and binding on the Holder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Holder in accordance with Condition 9 as soon as practicable after the determination thereof.

6 Purchase by the Issuer

The Issuer and any of its affiliates may purchase CBBCs at any time on or after the date of their issue and any CBBCs which are so purchased may be surrendered for cancellation or offered from time to time in one or more transactions in the over-the-counter market or otherwise at prevailing market prices or in negotiated transactions, at the discretion of the Issuer or any such affiliate, as the case may be.

7 Global Certificate

A global certificate (the "**Global Certificate**") representing the CBBCs will be deposited within CCASS and registered in the name of HKSCC Nominees Limited (or its successors). The Global Certificate will not be exchangeable for definitive certificates.

8 Meeting of Holder and Modification

(A) *Meetings of Holder.* Notices for convening meetings to consider any matter affecting the Holder's interests will be given to the Holder in accordance with the provisions of Condition 9.

Every question submitted to a meeting of the Holder shall be decided by poll. A meeting may be convened by the Issuer or by the Holder holding not less than 10 per cent. of the CBBCs for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons (including any nominee appointed by the Holder) holding or representing not less than 25 per cent. of the CBBCs for the time being remaining unexercised, or at any adjourned meeting two or more persons (including any nominee appointed by the Holder) being or representing Holder whatever the number of CBBCs so held or represented.

A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Holder as, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Holder shall be binding on all the holders of the CBBCs, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Holder being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Holders, effect any modification of the terms and conditions of the CBBCs or the Instrument which, in the opinion of the Issuer and/or the Agent, is:

(i) not materially prejudicial to the interests of the Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such modification in any particular jurisdiction);

(ii) of a formal, minor or technical nature;

(iii) made to correct a manifest error; or

(iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Any such modification shall be binding on the Holders and shall be notified to them by the Issuer and/or the Agent as soon as practicable thereafter in accordance with Condition 9.

9 Notices

All notices in English and Chinese to the Holder will be validly given if published on the HKEX website. In such circumstances, the Issuer shall not be required to dispatch copies of the notice to the Holders.

10 Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Holder, to create and issue further callable bull/bear contracts so as to form a single series with the CBBCs.

11 Illegality or Impracticability

The Issuer is entitled to terminate the CBBCs if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or will become illegal or impracticable:

(A) for it to perform its obligations under the CBBCs, or for the Guarantor to perform its obligations under the Guarantee, in whole or in part as a result of:

  (i) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

  (ii) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

  (each of (i) and (ii), a "**Change in Law Event**"); or

(B) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the CBBCs due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Holder a cash amount that the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner to be the fair market value in respect of each CBBC held by such Holder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion. Payment will be made in such manner as shall be notified to the Holders in accordance with Condition 9.

12 Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer and/or the Agent under these Conditions will be made in good faith and in a commercially reasonable manner.

13 Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the CBBCs.

14 Governing Law

The CBBCs, the Guarantee and the Instrument will be governed by and construed in accordance with the laws of Hong Kong. The Issuer, the Guarantor and the Holder (by its acquisition of the CBBCs) shall be deemed to have submitted for all purposes in connection with the CBBCs, the Guarantee and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

15 Language

A Chinese translation of these Conditions is available upon request during usual business hours on any weekday (Saturdays, Sundays and holidays excepted) at the offices of the Agent. In the event of any inconsistency between the English version and Chinese translation of these Conditions, the English version shall prevail and be governing.

Agent
J.P. Morgan Securities (Asia Pacific) Limited
23-29/F, Chater House
8 Connaught Road Central
Hong Kong

TERMS AND CONDITIONS OF THE CASH-SETTLED CALLABLE BULL/BEAR CONTRACTS OVER EXCHANGE TRADED FUND

The relevant Conditions will, together with the supplemental provisions contained in the relevant launch announcement and supplemental listing document and subject to completion and amendment, be endorsed on the back of the global certificate. The applicable launch announcement and supplemental listing document in relation to the issue of any series of CBBCs may specify other terms and conditions which shall, to the extent so specified or to the extent inconsistent with the relevant Conditions, replace or modify the relevant Conditions for the purpose of such series of CBBCs. Capitalised terms used in the relevant Conditions and not otherwise defined therein shall have the meanings given to them in the relevant launch announcement and supplemental listing document.

1 Form; Status; Guarantee; Transfer and Title

(A) The CBBCs (which expression shall, unless the context otherwise requires, include any further CBBCs issued pursuant to Condition 12) relating to the Units of the Fund are issued in registered form subject to and with the benefit of the amended and restated instrument dated 3 May 2010 (the "**Instrument**") made by J.P. Morgan Structured Products B.V. (the "**Issuer**") and JPMorgan Chase Bank, National Association (the "**Guarantor**") and the guarantee dated 11 March 2024 (the "**Guarantee**") made by the Guarantor.

Copies of the Instrument and the Guarantee are available for inspection at the office of J.P. Morgan Securities (Asia Pacific) Limited as specified below. The Holders (as hereinafter defined) are entitled to the benefit of, are bound by and are deemed to have notice of, all the provisions of the Instrument and the Guarantee.

(B) The settlement obligation of the Issuer in respect of the CBBCs represent general unsecured contractual obligations of the Issuer and of no other person which rank, and will rank, equally among themselves and pari passu with all other present and future unsecured and unsubordinated contractual obligations of the Issuer, except for obligations accorded preference by mandatory provisions of applicable law.

CBBCs represent general contractual obligations of the Issuer, and are not, nor is it the intention (expressed, implicit or otherwise) of the Issuer to create by the issue of CBBCs deposit liabilities of the Issuer or a debt obligation of any kind.

In the Guarantee, the Guarantor has, subject to the terms of the Guarantee, unconditionally and irrevocably guaranteed to the Holders the due and punctual settlement in full of all obligations due and owing by the Issuer arising under the issuance of the CBBCs after taking account of any set off, combination of accounts, netting or similar arrangement from time to time exercisable by the Issuer against any person to whom obligations are from time to time being owed, when and as due (whether at maturity, by acceleration or otherwise).

(C) Transfers of CBBCs may be effected only in Board Lots or integral multiples thereof in the Central Clearing and Settlement System ("**CCASS**") in accordance with the General Rules of CCASS and the CCASS Operational Procedures in effect from time to time ("**CCASS Rules**").

(D) Each person who is for the time being shown in the register kept by or on behalf of the Issuer outside of Hong Kong as the holder shall be treated by the Issuer, the Guarantor and the Agent as the absolute owner and holder of the CBBCs. The expression "**Holder**" shall be construed accordingly.

(E) Trading in CBBCs on The Stock Exchange of Hong Kong Limited (the "**Stock Exchange**") shall be suspended immediately upon the occurrence of a Mandatory Call Event or at the close of trading for the Trading Day immediately preceding the Expiry Date (whichever is earlier) in accordance with the requirements of the Stock Exchange.

2 CBBC Rights and Exercise Expenses

(A) Every Board Lot entitles the Holder, upon compliance with Condition 3, to payment of the Cash Settlement Amount.

(B) The Holder will be required to pay any charges or expenses including any taxes or duties which are incurred or withheld in respect of the exercise of the CBBCs (the "**Exercise Expenses**"). To effect such payment, an amount equivalent to the Exercise Expenses will be deducted by the Issuer from the Cash Settlement Amount in accordance with Condition 3(E).

(C) For the purposes of these Conditions:

"**Business Day**" means a day (excluding Saturdays) on which the Stock Exchange is scheduled to open for dealings in Hong Kong and banks are open for business in Hong Kong.

"**Cash Settlement Amount**" means, subject to adjustment as provided in Condition 5:

(a) following a Mandatory Call Event:

(i) in the case of a series of Category R CBBCs, the Residual Value; or

(ii) in the case of a series of Category N CBBCs, zero; and

(b) at expiry:

(i) in the case of a series of bull CBBCs:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{\text{Entitlement} \times (\text{Closing Price} - \text{Strike Price}) \times \text{one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

(ii) in the case of a series of bear CBBCs:

$$\text{Cash Settlement Amount per Board Lot (if any) payable at expiry} = \frac{\text{Entitlement} \times (\text{Strike Price} - \text{Closing Price}) \times \text{one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

For the avoidance of doubt, if the Cash Settlement Amount is a negative figure, it shall be deemed to be zero.

"**Category N CBBCs**" means a series of CBBCs where the Call Price is equal to the Strike Price.

"**Category R CBBCs**" means a series of CBBCs where the Call Price is different from the Strike Price.

"**CCASS Settlement Day**" has the meaning ascribed to the term "**Settlement Day**" in the CCASS Rules, subject to such modification and amendment prescribed by HKSCC from time to time.

"**Closing Price**" means the closing price of one Unit (as derived from the Daily Quotation Sheet of the Stock Exchange, subject to any adjustment to such closing prices as may be necessary to reflect any event as contemplated in Condition 5 such as capitalisation, rights issue, distribution or the like) on the Valuation Date.

"**Day of Notification**" means the Trading Day immediately following the day on which the Mandatory Call Event occurs.

"**Entitlement**" means the number of Units to which the CBBCs relate, as specified in the relevant Launch Announcement and Supplemental Listing Document, subject to any adjustment in accordance with Condition 5.

"**HKEX**" means Hong Kong Exchanges and Clearing Limited.

"**HKSCC**" means Hong Kong Securities Clearing Company Limited.

"**Hong Kong**" means the Hong Kong Special Administrative Region of the People's Republic of China.

"**Mandatory Call Event**" occurs when the Spot Price is, at any time on any Trading Day during the Observation Period:

(a) in the case of a series of bull CBBCs, at or below the Call Price; and

(b) in the case of a series of bear CBBCs, at or above the Call Price.

"**Market Disruption Event**" means:

(1) the occurrence or existence on any Trading Day during the one-half hour period that ends at the close of trading of any suspension of, or limitation imposed on, trading (by reason of movements in price exceeding limits permitted by the Stock Exchange or otherwise) on the Stock Exchange in (1) the Units; or (2) any options or futures contracts relating to the Units if, in any such case, such suspension or limitation is, in the determination of the Issuer and/or Agent, material;

(2) the occurrence of any severe weather condition or other event on any day which (i) results in the Stock Exchange being closed for trading for the entire day; or (ii) results in the Stock Exchange being closed prior to its regular time for close of trading for the relevant day (for the avoidance of doubt, in the case when the Stock Exchange is scheduled to open for the morning trading session only, closed prior to its regular time for close of trading for the morning session), PROVIDED THAT there shall be no Market Disruption Event solely by reason of the Stock Exchange opening for trading later than its regular time for opening of trading on any day as a result of such severe weather condition or other event; or

(3) a limitation or closure of the Stock Exchange due to any unforeseen circumstances.

"**Maximum Trade Price**" means the highest Spot Price (subject to any adjustment to such Spot Price as may be necessary to reflect any event as contemplated in Condition 5 such as capitalisation, rights issue, distribution or the like) during the MCE Valuation Period.

"**MCE Valuation Period**" means the period commencing from and including the moment upon which the Mandatory Call Event occurs (the trading session during which the Mandatory Call Event occurs is the "**1st Session**") and up to the end of the trading session on the Stock Exchange immediately following the 1st Session ("**2nd Session**") unless, in the determination of the Issuer in its good faith, the 2nd Session for any reason (including, without limitation, a Market Disruption Event occurring and subsisting in the 2nd Session) does not contain any continuous period of 1 hour or more than 1 hour during which trading in the Units is permitted on the Stock Exchange with no limitation imposed, the MCE Valuation Period shall be extended to the end of the subsequent trading session following the 2nd Session during which trading in the Units is permitted on the Stock Exchange with no limitation imposed for a continuous period of at least 1 hour notwithstanding the existence or continuance of a Market Disruption Event in such postponed trading session, unless the Issuer and/or the Agent determine in its good faith that each trading session on each of the four Trading Days immediately following the day on which the Mandatory Call Event occurs does not contain any continuous period of 1 hour or more than 1 hour during which trading in the Units is permitted on the Stock Exchange with no limitation imposed. In that case:

(a) the period commencing from the 1st Session up to, and including, the last trading session on the Stock Exchange of the fourth Trading Day immediately following the date on which the Mandatory Call Event occurs shall be deemed to be the MCE Valuation Period; and

(b) the Issuer and/or the Agent shall determine the Maximum Trade Price or the Minimum Trade Price (as the case may be) having regard to the then prevailing market conditions, the last reported Spot Price of the Units and such other factors as the Issuer and/or the Agent may determine to be relevant in its good faith.

For the avoidance of doubt, all Spot Prices available throughout the extended MCE Valuation Period shall be taken into account to determine the Maximum Trade Price or the Minimum Trade Price (as the case may be) for the calculation of the Residual Value.

For the purposes of this definition:

(A) the pre-opening session, the morning session and, in the case of half day trading, the closing auction session (if applicable) of the same day; and

(B) the afternoon session and the closing auction session (if applicable) of the same day,

shall each be considered as one trading session.

"**Minimum Trade Price**" means the lowest Spot Price (subject to any adjustment to such Spot Price as may be necessary to reflect any event as contemplated in Condition 5 such as capitalisation, rights issue, distribution or the like) during the MCE Valuation Period.

"**Observation Period**" means the period commencing from and including the Observation Commencement Date (Hong Kong time) and ending at and including the close of trading (Hong Kong time) on the Trading Day immediately preceding the Expiry Date.

"**Post MCE Trades**" has the meaning given to it in the relevant Launch Announcement and Supplemental Listing Document, subject to such modification and amendment prescribed by the Stock Exchange from time to time.

"**Residual Value**" means, subject to adjustment as provided in Condition 5:

(a) in the case of a series of bull CBBCs:

$$\text{Residual Value per Board Lot} = \frac{\text{Entitlement} \times (\text{Minimum Trade Price} - \text{Strike Price}) \times \text{one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

(b) in the case of a series of bear CBBCs:

$$\text{Residual Value per Board Lot} = \frac{\text{Entitlement} \times (\text{Strike Price} - \text{Maximum Trade Price}) \times \text{one Board Lot}}{\text{Number of CBBC(s) per Entitlement}}$$

"**Settlement Date**" means the third CCASS Settlement Day after (i) the end of the MCE Valuation Period or (ii) the later of: (a) the Expiry Date; and (b) the day on which the Closing Price is determined in accordance with these Conditions (as the case may be).

"**Spot Price**" means:

(a) in respect of a continuous trading session of the Stock Exchange, the price per Unit concluded by means of automatic order matching on the Stock Exchange as reported in the official realtime dissemination mechanism for the Stock Exchange during such continuous trading session of the Stock Exchange in accordance with the Trading Rules, excluding direct business (as defined in the Trading Rules); and

(b) in respect of a pre-opening session or a closing auction session (if applicable) of the Stock Exchange (as the case may be), the final Indicative Equilibrium Price (IEP) (as defined in the Trading Rules) of the Unit (if any) calculated at the end of the pre-order matching period of such pre-opening session or closing auction session (if applicable) (as the case may be) in accordance with the Trading Rules, excluding direct business (as defined in the Trading Rules),

subject to such modification and amendment prescribed by the Stock Exchange from time to time.

"**Trading Day**" means a day on which the Stock Exchange is scheduled to be open for trading for its regular trading sessions.

"**Trading Rules**" means the Rules and Regulations of the Exchange prescribed by the Stock Exchange from time to time.

"**Valuation Date**" means the Trading Day immediately preceding the Expiry Date unless the Issuer and/or the Agent determine, in its sole discretion, that a Market Disruption Event has occurred, then that day shall be postponed until the first succeeding Trading Day on which there is no Market Disruption Event, unless the Issuer and/or the Agent determine that there is a Market Disruption Event occurring on each of the four Trading Days immediately following the original date which (but for the Market Disruption Event) would have been the Valuation Date. In that case:

(i) the fourth Trading Day immediately following the original date shall be deemed to be the Valuation Date (regardless of the Market Disruption Event); and

(ii) the Issuer and/or the Agent shall determine the Closing Price having regard to the then prevailing market conditions, the last reported trading price of the Unit on the Stock Exchange and such other factors as the Issuer and/or the Agent determine to be relevant.

3 Exercise of CBBCs

(A) CBBCs may only be exercised in Board Lots or integral multiples thereof.

(B) If no Mandatory Call Event has occurred during the Observation Period, the CBBCs will be deemed to be automatically exercised on the Expiry Date.

(C) (i) Subject to Condition 3(C)(ii), following the occurrence of a Mandatory Call Event, the CBBCs will terminate automatically and the Issuer shall have no further obligation under the CBBCs except for the payment of the Cash Settlement Amount (if any) following the Mandatory Call Event on the relevant Settlement Date. The Issuer will give notice to the Holders in accordance with Condition 9. Trading in the CBBCs will be suspended immediately upon the occurrence of a Mandatory Call Event and any Post MCE Trades will be cancelled and will not be recognised by the Stock Exchange.

(ii) A Mandatory Call Event is irrevocable unless it is triggered as a result of any of the following events:

(1) system malfunction or other technical errors of HKEX (such as the setting up of wrong Call Price and other parameters); or

(2) manifest errors caused by the relevant third party price source where applicable;

and

(a) in the case of paragraph (1) above, such event is reported by the Stock Exchange to the Issuer and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked; and

(b) in the case of paragraph (2) above, such event is reported by the Issuer to the Stock Exchange and the Issuer and the Stock Exchange mutually agree that such Mandatory Call Event is to be revoked,

in each case:

(aa) such mutual agreement must be reached no later than 30 minutes before the commencement of trading (including the pre-opening session) (Hong Kong time) or such other time frame as prescribed by the Stock Exchange from time to time on the Day of Notification;

(bb) the Mandatory Call Event so triggered will be reversed; and

(cc) all cancelled trades (if any) will be reinstated and trading of the CBBCs will resume no later than the Trading Day immediately following the Day of Notification in accordance with the rules prescribed by the Stock Exchange from time to time.

(D) Upon exercise following a Mandatory Call Event or on the Expiry Date in accordance with these Conditions, the Issuer will, with effect from the first Business Day following the MCE Valuation Period or the Expiry Date, as the case may be, cancel the Global Certificate.

(E) Upon exercise following a Mandatory Call Event or on the Expiry Date in accordance with these Conditions, the Issuer will as soon as practicable and not later than the Settlement Date in accordance with these conditions procure payment of the aggregate Cash Settlement Amount (following deduction of determined Exercise Expenses) for all CBBCs exercised or deemed exercised, electronically through CCASS by crediting the relevant bank account of the Holder as appearing in the register kept by or on behalf of the Issuer.

Any payment made pursuant to this Condition 3(E) shall be delivered at the risk and expense of the Holder to the Holder, or such bank, broker or agent in Hong Kong (if any) as recorded on the register.

(F) If as a result of an event beyond the control of the Issuer ("**Settlement Disruption Event**"), it is not possible for the Issuer to procure payment electronically through CCASS by crediting the relevant bank account of the Holder on the original Settlement Date, the Issuer shall use its reasonable endeavours to procure payment electronically through CCASS by crediting the relevant bank account of the Holder as soon as reasonably practicable after the original Settlement Date. The Issuer will not be liable to the Holder for any interest in respect of the amount due or any loss or damage that such Holder may suffer as a result of the existence of a Settlement Disruption Event.

(G) These Conditions shall not be construed so as to give rise to any relationship of agency or trust between the Guarantor, the Issuer or its agent or nominee and the Holder and neither the Guarantor, the Issuer nor its agent or nominee shall owe any duty of a fiduciary nature to the Holder.

None of the Issuer, the Guarantor or the Agent shall have any responsibility for any errors or omissions in the calculation and dissemination of any variables published by a third party and used in any calculation made pursuant to these terms and conditions or in the calculation of the Cash Settlement Amount arising from such errors or omissions.

The Issuer's obligations to pay the Cash Settlement Amount shall be discharged by payment in accordance with Condition 3(E) above.

4 Agent

(A) The Agent will be acting as agent of the Issuer in respect of the CBBCs and will not assume any obligation or duty to or any relationship or agency or trust for the Holder.

(B) The Issuer reserves the right, subject to the appointment of a successor, at any time to vary or terminate the appointment of the initial Agent and to appoint another agent provided that it will at all times maintain an agent in Hong Kong for so long as the CBBCs are listed on the Stock Exchange. Notice of any such termination or appointment will be given to the Holder in accordance with Condition 9.

5 Adjustments

Adjustments may be made by the Issuer and/or the Agent to the terms of the CBBCs (including, but not limited to, the Call Price, Strike Price and the Entitlement) on the basis of the following provisions:

(A) (i) If and whenever the Fund shall, by way of Rights (as defined below), offer new Units for subscription at a fixed subscription price to the holders of existing Units pro rata to existing holdings (a "**Rights Offer**"), the Entitlement shall be adjusted on the Business Day on which the trading in the Units of the Fund becomes ex-entitlement in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = \frac{1 + M}{1 + (R/S) \times M}$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

S: Cum-Rights Unit price, being the closing price of an existing Unit, as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Units are traded on a cum-Rights basis

R: Subscription price per new Unit specified in the Rights Offer plus an amount equal to any distributions or other benefits foregone to exercise the Rights

M: Number of new Unit(s) (whether a whole or a fraction) per existing Unit each holder of an existing Unit is entitled to subscribe

For the purposes of these Conditions, "**Rights**" means the right(s) attached to each existing Unit or needed to acquire one new Unit (as the case may be) which are given to a holder of existing Units to subscribe at a fixed subscription price for new Units pursuant to the Rights Offer (whether by the exercise of one Right, a part of a Right or an aggregate number of Rights).

(ii) The Call Price and Strike Price (which shall be rounded to the nearest 0.001) shall be adjusted by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Call Price and Strike Price shall take effect on the same day that the Entitlement is adjusted.

(iii) For the purposes of Conditions 5(A) and 5(B), no adjustment will be made if the adjustment to the Entitlement is one per cent. or less of the Entitlement immediately prior to the adjustment.

(B) If and whenever the Fund shall make an issue of Units credited as fully paid to holders of Units generally by way of capitalisation of profits or reserves (other than pursuant to a scrip distribution or similar scheme for the time being operated by the Fund or otherwise in lieu of a cash distribution) (and without any payment or other consideration being made or given by such holders) (a "**Bonus Issue**"), the Entitlement will be adjusted, subject to Condition 5(A)(iii), on the Business Day on which the trading in the Units of the Fund becomes ex-entitlement in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = 1 + N$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

N: Number of additional Unit(s) (whether a whole or a fraction) per existing Unit each holder of an existing Unit is entitled to receive

In addition, the Issuer and/or the Agent shall adjust the Call Price and Strike Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Call Price and Strike Price shall take effect on the same day that the Entitlement is adjusted.

(C) If and whenever the Fund shall subdivide its Units or any class of its outstanding Units into a greater number of units or shares (a "**Subdivision**") or consolidate the Units or any class of its outstanding Units into a smaller number of units or shares (a "**Consolidation**"), then:

(i) in the case of a Subdivision, the Entitlement shall be increased whereas the Call Price and Strike Price (which shall be rounded to the nearest 0.001) shall be decreased in the same ratio as the Subdivision; and

(ii) in the case of a Consolidation, the Entitlement shall be decreased whereas the Call Price and Strike Price (which shall be rounded to the nearest 0.001) shall be increased in the same ratio as the Consolidation,

in each case on the day on which the relevant Subdivision or Consolidation (as the case may be) shall have taken effect.

(D) If it is announced that the Fund is to or may merge or consolidate with or into any other trust or corporation (including becoming, by agreement or otherwise, a subsidiary of or controlled by any person or corporation) (except where the Fund is the surviving entity in a merger) or that it is to or may sell or transfer all or substantially all of its assets, the rights attaching to the CBBCs may in the absolute discretion of the Issuer and/or the Agent be amended no later than the Business Day preceding the consummation of such merger, consolidation, sale or transfer (each a "**Restructuring Event**") (as determined by the Issuer and/or the Agent in its absolute discretion).

The rights attaching to the CBBCs after the adjustment shall, after such Restructuring Event, relate to the number of units or shares of the trust(s) or corporation(s) resulting from or surviving such Restructuring Event or other securities (the "**Substituted Securities**") and/or cash offered in substitution for the affected Units, as the case may be, to which the holder of such number of Units to which the CBBCs related immediately before such Restructuring Event would have been entitled upon such Restructuring Event. Thereafter the provisions hereof shall apply to such Substituted Securities, provided that any Substituted Securities may, in the absolute discretion of the Issuer and/or the Agent, be deemed to be replaced by an amount in the relevant currency equal to the market value or, if no market value is available, fair value, of such Substituted Securities in each case as determined by the Issuer and/or the Agent as soon as practicable after such Restructuring Event is effected.

For the avoidance of doubt, any remaining Units shall not be affected by this paragraph (D) and, where cash is offered in substitution for Units or is deemed to replace Substituted Securities as described above, references in these Conditions to the Units shall include any such cash.

(E) No adjustment will be made for an ordinary cash distribution (whether or not it is offered with a scrip alternative) ("**Ordinary Distribution**"). For any other forms of cash distribution ("**Cash Distribution**") announced by the Fund, such as a cash bonus, special distribution or extraordinary distribution, no adjustment will be made unless the value of the Cash Distribution accounts for 2 percent. or more of the Unit's closing price on the day of announcement by the Fund.

If and whenever the Fund shall make a Cash Distribution credited as fully paid to the holders of Units generally, the Entitlement shall be adjusted to take effect on the Business Day on which trading in the Units becomes ex-entitlement in respect of the relevant Cash Distribution in accordance with the following formula:

$$\text{Adjusted Entitlement} = \text{Adjustment Factor} \times E$$

Where:

$$\text{Adjustment Factor} = \frac{S - OD}{S - OD - CD}$$

E: Existing Entitlement immediately prior to the relevant event giving rise to the adjustment

S: Cum-Cash Distribution Unit price, being the closing price of an existing Unit, as derived from the Daily Quotation Sheet of the Stock Exchange on the last Business Day on which the Units are traded on a cum-Cash Distribution basis

CD: The Cash Distribution per Unit

OD: The Ordinary Distribution per Unit, provided that the Ordinary Distribution and the Cash Distribution have the same ex-entitlement date. For the avoidance of doubt, the OD shall be zero if the Ordinary Distribution and the Cash Distribution have different ex-entitlement dates

In addition, the Issuer and/or the Agent shall adjust the Strike Price and Call Price (which shall be rounded to the nearest 0.001) by the reciprocal of the Adjustment Factor, where the reciprocal of the Adjustment Factor means one divided by the relevant Adjustment Factor. The adjustment to the Strike Price and Call Price shall take effect on the same date that the Entitlement is adjusted.

(F) Without prejudice to and notwithstanding any prior adjustment(s) made pursuant to the applicable Conditions, the Issuer and/or the Agent may (but shall not be obliged to) make such other adjustments to the terms and conditions of the CBBCs as appropriate where any event (including the events as contemplated in the applicable Conditions) occurs and irrespective of, in substitution for, or in addition to the provisions contemplated in the applicable Conditions, provided that such adjustment is: (i) not prejudicial to the interests of Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such adjustment in any particular jurisdiction); or (ii) determined by the Issuer and/or the Agent in good faith to be appropriate and commercially reasonable.

(G) The Issuer and/or the Agent shall determine any adjustment or amendment and its determination shall be conclusive and binding on the Holder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Holder in accordance with Condition 9 as soon as practicable after the determination thereof.

6 Purchase by the Issuer

The Issuer and any of its affiliates may purchase CBBCs at any time on or after the date of their issue and any CBBCs which are so purchased may be surrendered for cancellation or offered from time to time in one or more transactions in the over-the-counter market or otherwise at prevailing market prices or in negotiated transactions, at the discretion of the Issuer or any such affiliate, as the case may be.

7 Global Certificate

A global certificate (the "**Global Certificate**") representing the CBBCs will be deposited within CCASS and registered in the name of HKSCC Nominees Limited (or its successors). The Global Certificate will not be exchangeable for definitive certificates.

8 Meeting of Holder and Modification

(A) *Meetings of Holder.* Notices for convening meetings to consider any matter affecting the Holder's interests will be given to the Holder in accordance with the provisions of Condition 9. Every question submitted to a meeting of the Holder shall be decided by poll. A meeting may be convened by the Issuer or by the Holder holding not less than 10 per cent. of the CBBCs for the time being remaining unexercised. The quorum at any such meeting for passing an Extraordinary Resolution will be two or more persons (including any nominee appointed by the Holder) holding or representing not less than 25 per cent. of the CBBCs for the time being remaining unexercised, or at any adjourned meeting two or more persons (including any nominee appointed by the Holder) being or representing Holder whatever the number of CBBCs so held or represented. A resolution will be an Extraordinary Resolution when it has been passed at a duly convened meeting by not less than three-quarters of the votes cast by such Holder as, being entitled to do so, vote in person or by proxy.

An Extraordinary Resolution passed at any meeting of the Holder shall be binding on all the holders of the CBBCs, whether or not they are present at the meeting.

Resolutions can be passed in writing without a meeting of the Holder being held if passed unanimously.

(B) *Modification.* The Issuer may, without the consent of the Holders, effect any modification of the terms and conditions of the CBBCs or the Instrument which, in the opinion of the Issuer and/or the Agent, is:

(i) not materially prejudicial to the interests of the Holders generally (without considering the circumstances of any individual Holder or the tax or other consequences of such modification in any particular jurisdiction);

(ii) of a formal, minor or technical nature;

(iii) made to correct a manifest error; or

(iv) necessary in order to comply with mandatory provisions of the laws or regulations of Hong Kong.

Any such modification shall be binding on the Holders and shall be notified to them by the Issuer and/or the Agent as soon as practicable thereafter in accordance with Condition 9.

9 Notices

All notices in English and Chinese to the Holder will be validly given if published on the HKEX website. In such circumstances, the Issuer shall not be required to dispatch copies of the notice to the Holders.

10 Termination or Liquidation

In the event of a Termination or the liquidation, winding up or dissolution of the Fund or, if applicable, the trustee of the Fund (including any successor trustee appointed from time to time) ("**Trustee**") (in its capacity as trustee of the Fund) or the appointment of a liquidator, receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of the Fund's or the Trustee's (as the case may be) undertaking, property or assets all unexercised CBBCs shall lapse and cease to be valid for any purpose. In the case of a Termination the unexercised CBBCs shall lapse and cease to be valid on the effective date of the Termination, in the case of a voluntary liquidation or winding up, on the effective date of the relevant resolution and, in the case of an involuntary liquidation, winding up or dissolution, on the date of the relevant court order or, in the case of the appointment of a liquidator or receiver or administrator or analogous person under any applicable law in respect of the whole or substantially the whole of such Fund's or Trustee's (as the case may be) undertaking, property or assets, on the date when such appointment is effective but subject (in any such case) to any contrary mandatory requirement of the applicable law.

For the purpose of this Condition 10, "**Termination**" means (i) the Fund is terminated or required to be terminated for whatever reason, or the termination of the Fund commences; (ii) where applicable, the Fund is held or is conceded by the Trustee or the manager of the Fund (including any successor manager appointed from time to time) not to have been constituted or to have been imperfectly constituted; (iii) where applicable, the Trustee ceases to be authorised under the Fund to hold the property of the Fund in its name and perform its obligations under the trust deed constituting the Fund; or (iv) the Fund ceases to be authorised as an authorised collective investment scheme under the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong).

11 Delisting of Fund

(A) If at any time the Units cease to be listed on the Stock Exchange, the Issuer shall give effect to these Conditions in such manner and make such adjustments to the rights attaching to the CBBCs as it shall, in its absolute discretion, consider appropriate to ensure, so far as it is reasonably able to do so, that the interests of the Holder generally are not materially prejudiced as a consequence of such delisting (without considering the individual circumstances of the Holder or the tax or other consequences that may result in any particular jurisdiction).

(B) Without prejudice to the generality of Condition 11(A), where the Units are or, upon the delisting, become, listed on any other stock exchange, these Conditions may, in the absolute discretion of the Issuer, be amended to the extent necessary to allow for the substitution of that other stock exchange in place of the Stock Exchange and the Issuer may, without the consent of the Holder, make such adjustments to the entitlements of the Holder on exercise (including, if appropriate, by converting foreign currency amounts at prevailing market rates into the relevant currency) as it shall consider appropriate in the circumstances.

(C) Any adjustment, amendment or determination made by the Issuer pursuant to this Condition 11 shall be conclusive and binding on the Holder save in the case of manifest error. Notice of any adjustments or amendments shall be given to the Holder in accordance with Condition 9 as soon as practicable after they are determined.

12 Further Issues

The Issuer shall be at liberty from time to time, without the consent of the Holder, to create and issue further CBBCs so as to form a single series with the CBBCs.

13 Illegality or Impracticability

The Issuer is entitled to terminate the CBBCs if it determines in good faith and in a commercially reasonable manner that, for reasons beyond its control, it has become or will become illegal or impracticable:

(A) for it to perform its obligations under the CBBCs, or for the Guarantor to perform its obligations under the Guarantee, in whole or in part as a result of:

- (i) the adoption of, or any change in, any relevant law or regulation (including any tax law); or

- (ii) the promulgation of, or any change in, the interpretation by any court, tribunal, governmental, administrative, legislative, regulatory or judicial authority or power with competent jurisdiction of any relevant law or regulation (including any tax law),

(each of (i) and (ii), a "**Change in Law Event**"); or

(B) for it or any of its affiliates to maintain the Issuer's hedging arrangements with respect to the CBBCs due to a Change in Law Event.

Upon the occurrence of a Change in Law Event, the Issuer will, if and to the extent permitted by the applicable law or regulation, pay to each Holder a cash amount that the Issuer and/or the Agent determine in good faith and in a commercially reasonable manner to be the fair market value in respect of each CBBC held by such Holder immediately prior to such termination (ignoring such illegality or impracticability) less the cost to the Issuer of unwinding any related hedging arrangement as determined by the Issuer and/or the Agent in its sole and absolute discretion. Payment will be made in such manner as shall be notified to the Holders in accordance with Condition 9.

14 Good Faith and Commercially Reasonable Manner

Any exercise of discretion by the Issuer and/or the Agent under these Conditions will be made in good faith and in a commercially reasonable manner.

15 Contracts (Rights of Third Parties) Ordinance

A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of the CBBCs.

16 Governing Law

The CBBC, the Guarantee and the Instrument will be governed by and construed in accordance with the laws of Hong Kong. The Issuer, the Guarantor and the Holder (by its acquisition of the CBBCs) shall be deemed to have submitted for all purposes in connection with the CBBCs, the Guarantee and the Instrument to the non-exclusive jurisdiction of the courts of Hong Kong.

17 Language

A Chinese translation of these Conditions is available upon request during usual business hours on any weekday (Saturdays, Sundays and holidays excepted) at the offices of the Agent. In the event of any inconsistency between the English version and Chinese translation of these Conditions, the English version shall prevail and be governing.

Agent

J.P. Morgan Securities (Asia Pacific) Limited
23-29/F, Chater House
8 Connaught Road Central
Hong Kong

ANNEX 2

FORM OF GUARANTEE

Form of Guarantee

The following is the form of the Guarantee dated March 11, 2024 made by JPMorgan Chase Bank, National Association:

"J.P. Morgan Structured Products B.V. Hong Kong Structured Products Programme (the "**Programme**").

J.P. Morgan Structured Products B.V., a private company with limited liability (*besloten vennootschap met beperkte aansprakelijkheid*) incorporated under the laws of The Netherlands ("**Obligor**"), from time to time issues standard warrants, inline warrants, callable bull/bear contracts and equity linked instruments (collectively, the "**Structured Products**") (all holders of Structured Products, the "**Beneficiaries**"), (a) pursuant to an amended and restated instrument dated as of May 3rd 2010 (as amended and/or restated and/or supplemented from time to time) between the Obligor and JPMorgan Chase Bank, National Association, a national banking association organised under the federal laws of the United States of America (the "**Guarantor**"), (b) with the benefit of this guarantee (the "**Guarantee**") and (c) under the terms and conditions of the Structured Products (the "**Conditions**") set out in the base listing document for the Programme to be dated on or about March 11, 2024 (the "**Base Listing Document**") and the Launch Announcement and Supplemental Listing Document (as defined in the Base Listing Document) to be prepared for each series of Structured Products (the foregoing, together, as amended and/or supplemented and/or restated from time to time, the "**Programme Documents**").

This Guarantee is made by way of deed poll by the Guarantor in favour of the Beneficiaries and dated as of March 11, 2024. This Guarantee amends, supplants and replaces in its entirety, for all Structured Products issued by the Obligor under the Programme on or after March 11, 2024 (the "**Effective Date**"), the guarantee referenced in the base listing document for the Programme dated March 23, 2023 (the "**Original Guarantee**") save as provided in the immediately following sentence. The Original Guarantee applies to all Structured Products issued under the Programme on or after March 23, 2023 and before the Effective Date and to any Structured Products which are expressed to be consolidated and form a single series with any Structured Products issued prior to the Effective Date.

Now, therefore, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Guarantor hereby agrees as follows:

(1) **Guarantee.** The Guarantor, subject to the terms hereof and except as specifically set forth herein, absolutely and unconditionally guarantees to the Beneficiaries, the timely and complete payment and performance, as and when due, whether by acceleration or otherwise, of all contractual obligations and liabilities, whether now in existence or hereafter arising, of the Obligor to the Beneficiaries, set out under the Conditions applicable to the Structured Products from and after the Effective Date (the "**Obligations**") and strictly in accordance with the Conditions, during the period from and including the Effective Date until no further obligations remain outstanding under such Structured Products. If the Obligor fails to meet any of its Obligations in full as and when due under the Conditions, the Guarantor shall meet or cause to be met such Obligation to such Beneficiary strictly in accordance with the Conditions, as if such Obligation were met by the Obligor.

(2) **Guarantee of Obligation, not Collection.** This Guarantee is a guarantee of payment and performance and not of collection only. The Beneficiaries shall not be required to exhaust any right or remedy or to take any action against the Obligor or any other person or entity or any collateral as a condition to payment by the Guarantor hereunder.

(3) **Guarantee Irrevocable.** This Guarantee is a continuing guarantee of all Obligations now or hereafter existing and shall remain in full force and effect until complete payment and performance of all Obligations and until no Structured Products enjoying the benefit of this Guarantee remains outstanding and no further Structured Products may be issued under the Programme. Notwithstanding anything to the contrary contained herein, this Guarantee shall not apply if, and to the extent that, the Guarantor or the Beneficiaries have so agreed in writing.

(4) **Nature of Guarantee.** The Guarantor guarantees that the Obligations shall be timely performed and paid strictly in accordance with all applicable terms of the Programme Documents. The Guarantor's liability hereunder is irrespective of:

(a) any change in the amount, time, manner or place of payment or performance of, or in any other term of, any Obligation, or any other amendment or waiver of or any consent to departure from any term of any Obligation;

(b) any release or amendment or waiver of, or consent to departure from, any other guarantee or support document, or any exchange, release or non-perfection of any collateral for any Obligation;

(c) the absence of any demand on the Obligor or any other person for payment or performance of any Obligation;

(d) the absence of any action to enforce any Obligation or any collateral therefor;

(e) any lack of validity, regularity or enforceability of any Programme Document or Obligation;

(f) the rendering of any judgment against the Obligor or any action to enforce the same;

(g) any liquidation, bankruptcy or insolvency of the Obligor or any proceeding relating thereto;

(h) any consolidation, merger, conveyance or transfer by the Obligor or other event which would afford to a guarantor relief, legal or equitable, from its obligation under the guarantee or other security; and

(i) any lack or limitation of status or of corporate power of the Obligor, or any incapacity or disability of any signatory for the Obligor, or of any other guarantor or obligor in respect of any Obligation, or any change whatsoever in the objects, capital structure, or business of the Obligor;

provided, however, that except as expressly set forth herein, (i) the Guarantor shall not be liable hereunder: (A) for any Obligation which the Obligor is excused from under and in accordance with the terms of the Programme Documents; (B) for any amount or performance in excess of the amount or performance actually due and owing by the Obligor to a Beneficiary, including but not limited to any set-off to which the Obligor would be entitled; or (C) if the Obligor is prohibited, unable or otherwise fails to make any payment, or any portion thereof or to perform any other obligation, because or arising out of an act of war, insurrection or civil strife; an action by the government or any governmental authority or instrumentality thereof (whether de jure or de facto); legal constraint; terrorism; riots; or catastrophe; and (ii) any and all defences available to a guarantor under applicable law are reserved by the Guarantor and any defences, set-offs and counterclaims of the Obligor shall be available to the Guarantor to the same extent as such defences, set-offs or counterclaims are available to the Obligor and may be asserted by the Guarantor in respect of its obligations hereunder, in each case whether or not asserted by the Obligor.

(5) **Formalities.** The Guarantor hereby waives diligence, presentment, demand of payment, any right to require a proceeding against the Obligor, protest or notice with respect to the Obligations or the amounts payable by the Obligor under the Programme Documents and all demands whatsoever, and covenants that this Guarantee shall not be discharged except by complete payment and performance of the Obligations. The grant of time or other indulgence to the Obligor shall in no manner release the Guarantor from any of its obligations hereunder.

(6) **Reinstatement.** This Guarantee shall continue to be effective or be reinstated, as the case may be, if at any time any payment and performance of any of the Obligations is rescinded or must otherwise be returned by a Beneficiary upon the insolvency, bankruptcy or reorganisation of the Obligor or otherwise, all as though the payment and performance had not been made.

(7) **Subrogation.** The Guarantor (1) shall have the right to assume the rights and payment obligations of the Obligor to such Beneficiary, together with any right of the Obligor to cure any event of default by or relating to the Obligor, notwithstanding any notice of default/termination previously sent by such Beneficiary to the Obligor, and thereby rescind any notice of default/termination given by such Beneficiary, and (2) shall be subrogated to all rights of the Beneficiaries against the Obligor in respect of any amounts paid by the Guarantor pursuant to the provisions of this Guarantee; provided, however, that the Guarantor shall not be entitled to enforce or to receive any payments arising out of, or based upon, such right of subrogation until all amounts due and payable by the Obligor to the Beneficiaries in respect of the Obligations, up to the time of such subrogation, have been paid in full.

(8) **Representations/Warranties.** The Guarantor represents and warrants to each Beneficiary that, as of the date hereof:

(a) it is a national banking association, duly formed and validly existing under the federal laws of the United States of America;

(b) it has the full power and authority to execute and deliver this Guarantee and to perform its obligations hereunder; it has taken all necessary action to authorise such execution, delivery and performance; and this Guarantee has been duly executed and delivered by the Guarantor and the execution, delivery and performance of this Guarantee by the Guarantor does not contravene or constitute a default under any statute, regulation or rule of any applicable governmental authority or under any provision of the Guarantor's certificate of incorporation or by-laws or any contractual restriction binding on the Guarantor;

(c) this Guarantee constitutes a legal, valid and binding obligation of the Guarantor, enforceable against the Guarantor in accordance with its terms, except as such enforceability may be limited by bankruptcy, insolvency, receivership or other similar laws affecting the rights of creditors generally or by general principles of equity; and

(d) no authorisation, approval or consent of, and no filing or registration with, any governmental authority is necessary for the execution, delivery or performance by the Guarantor of this Guarantee or for the validity or enforceability hereof.

(9) **Captions.** The headings and captions in this Guarantee are for convenience only and shall not affect the interpretation or construction of this Guarantee.

(10) **Not Insured.** This Guarantee is not insured by the Federal Deposit Insurance Corporation of the United States of America.

(11) A person who is not a Beneficiary has no right under the Contracts (Rights of Third Parties) Ordinance (Cap. 623 of the Laws of Hong Kong) to enforce or to enjoy the benefit of any term of this Guarantee.

(12) **Integration.** This Guarantee alone sets forth the entire understanding of the Guarantor and each Beneficiary relating to the guarantee of the Obligations and constitutes the entire contract between the parties relating to the subject matter hereof and supersedes any and all previous agreements and understandings, oral or written, express or implied, relating to the subject matter hereof.

(13) **Service of Process.** The Guarantor agrees that service of process in Hong Kong may be made on it at the offices of J.P. Morgan Securities (Asia Pacific) Limited, which is currently at 23-29/F, Chater House, 8 Connaught Road Central, Hong Kong. Nothing in this Guarantee shall affect the right to serve process in any other manner permitted by law.

(14) **GOVERNING LAW.** THIS GUARANTEE AND ALL MATTERS ARISING OUT OF OR RELATING TO THIS GUARANTEE SHALL BE GOVERNED BY, AND THIS GUARANTEE SHALL BE CONSTRUED IN ACCORDANCE WITH, THE LAWS OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION OF THE PEOPLE'S REPUBLIC OF CHINA ("**HONG KONG**"). THE GUARANTOR AGREES TO THE NON-EXCLUSIVE JURISDICTION OF THE COURTS OF HONG KONG OVER ANY DISPUTES ARISING UNDER OR RELATING TO THIS GUARANTEE.

IN WITNESS WHEREOF, the Guarantor has caused this Guarantee to be duly executed and delivered by its authorized officer as of the date first above written.

Dated as of March 11, 2024"

ANNEX 3

PURCHASE AND SALE

General

No action has been or will be taken by the Issuer or the Managers that would permit a public offering (other than Hong Kong) of any series of structured products or possession or distribution of any offering material in relation to any structured products in any jurisdiction where action for that purpose is required. No offers, sales, re-sales, transfers or deliveries of any structured products, or distribution of any offering material relating to structured products, may be made in or from any jurisdiction except in circumstances which will result in compliance with any applicable laws and regulations and will not impose any obligations on the Issuer.

United States of America

The structured products which are subject to the base listing document and the relevant launch announcement and supplemental listing document and the Guarantee have not been and will not be registered under the U.S. Securities Act of 1933, as amended (the "**Securities Act**"), or any state securities law. Trading in the structured products has not been approved by the U.S. Commodity Futures Trading Commission under the U.S. Commodities Exchange Act, as amended, any U.S. federal or state banking authority or any other U.S. or foreign regulatory authority. The Guarantee has not been and will not be registered under the rules of the U.S. Office of the Comptroller of the Currency (the "**OCC**"). The Issuer has not registered, and does not intend to register, as an investment company under the U.S. Investment Company Act of 1940, as amended (the "**Investment Company Act**"). Accordingly, the structured products may not be legally or beneficially owned by any U.S. Person at any time nor offered, sold, transferred, pledged, assigned, delivered, exercised or redeemed at any time within the United States or to, or for the account or benefit of, any U.S. Person. The structured products and the Guarantee are being offered and sold only to non-U.S. Persons in offshore transactions in accordance with Regulation S under the Securities Act ("**Regulation S**"). Each of the Managers has represented and agreed, and any other entity who is appointed by the Issuer as a manager in connection with an issue of the structured products will represent and agree, that it, its affiliates, and any person acting on its or their behalf has not offered or sold and will not offer or sell the structured products at any time, directly or indirectly, within the United States or to, or for the account or benefit of, any U.S. Person, and that neither it, its affiliates nor any persons acting on its or their behalf have engaged or will engage in any directed selling efforts with respect to such structured products, and it and they have complied and will comply with the offering restrictions requirement of Regulation S. The Guarantee may also be offered or sold in reliance upon the exemption from the registration requirements of the Securities Act provided by Section 3(a)(2) thereof and will be offered and sold pursuant to an exemption from the registration requirements of the OCC (including in compliance with Regulation S as such regulation is incorporated into the regulations of the OCC pursuant to 12 C.F.R. Section 16.5(g)). The terms used in this paragraph have the meanings given to them under Regulation S.

Each of the Managers has also agreed, and any other entity who is appointed by the Issuer in connection with an issue of the structured products will agree, that, at or prior to confirmation of a sale of the structured products, it, its affiliates, and any person acting on its or their behalf will have sent to each distributor, dealer or person receiving a selling concession, fee or other remuneration that purchases such structured products from it (whether upon original issuance or in any secondary transaction) a written confirmation or notice stating that the purchaser is subject to the same restrictions on offers and sales and setting forth the restrictions on offers and sales of such structured products within the United States or to, or for the account or benefit of, any U.S. Person.

As used in this section, "United States" means the United States of America, its territories or possessions, any state of the United States, the District of Columbia or any other enclave of the United States government, its agencies or instrumentalities, and "U.S. person" means (a) any person who is a U.S. person as defined in Regulation S or (b) any person or entity other than one of the following:

(i) a natural person who is not a resident of the United States;

(ii) a partnership, corporation or other entity, other than an entity organized principally for passive investment, organized under the laws of a jurisdiction other than the United States and which has its principal place of business in a jurisdiction other than the United States;

(iii) an estate or trust, the income of which is not subject to United States income tax regardless of source;

(iv) an entity organized principally for passive investment such as a pool, investment company or other similar entity, provided that units of participation in the entity held by U.S. persons represent in the aggregate less than 10% of the beneficial interest in the entity, and that such entity was not formed principally for the purpose of facilitating investment by U.S. persons; or

(v) a pension plan for the employees, officers or principals of an entity organized and with its principal place of business outside the United States.

No ownership by U.S. Persons

The structured products and the Guarantee may not be legally or beneficially owned by U.S. Persons at any time. Each holder and each beneficial owner of a structured product hereby represents, as a condition to purchasing or owning the structured product or any beneficial interest therein, that neither it nor any person for whose account or benefit the structured products are being purchased is located in the United States, is a U.S. Person or was solicited to purchase the structured products while present in the United States. Each holder and each beneficial owner of a structured product hereby agrees not to offer, sell or deliver any of the structured products at any time, directly or indirectly in the United States or to any U.S. Person.

ERISA Restrictions

In addition, unless otherwise specified in the launch announcement and supplemental listing document relating to a series of structured products, each purchaser (or transferee) and any person directing such purchase (or transfer) will represent and warrant, or will be deemed to have represented and warranted, on each day from the date on which the purchaser (or transferee) acquires the structured products through and including the date on which the purchaser (or transferee) disposes of its interest in the structured products, that the purchaser (or transferee) is not an "employee benefit plan" (as defined in Section 3(3) of Title I of the U.S. Employee Retirement Income Security Act of 1974, as amended ("**ERISA**")) that is subject to the fiduciary responsibility provisions of ERISA, a "plan" that is subject to Section 4975 of the Internal Revenue Code, any entity whose underlying assets include "plan assets" by reason of any such employee plan's or plan's investment in the entity, or a governmental, church, non-U.S. or other plan that is subject to any law or regulation that is substantially similar to the provisions of Section 406 of ERISA or Section 4975 of the Internal Revenue Code.

European Economic Area

Each of the Issuer and the Managers represents and agrees, and each further dealer appointed in respect of the structured products will be required to represent and agree, that it has not offered, sold or otherwise made available and will not offer, sell, or otherwise make available any structured products which are the subject of the offering as contemplated by the base listing document to any retail investor in the European Economic Area. For the purposes of this provision:

(a) the expression "**retail investor**" means a person who is one (or more) of the following:

i. a retail client as defined in point (11) of Article 4(1) of Directive (EU) 2014/65 (as amended, "**MiFID II**"); or

ii. a customer within the meaning of Directive (EU) 2016/97 (as amended, the Insurance Distribution Directive), where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or

iii. not a qualified investor as defined in Regulation (EU) 2017/1129 (as amended and superseded, the "**Prospectus Regulation**"); and

(b) the expression "**offer**" includes the communication in any form and by any means of sufficient information on the terms of the offer and the structured products, to be offered so as to enable an investor to decide to purchase or subscribe the structured products.

Consequently no key information document required by Regulation (EU) No 1286/2014 (as amended the "**PRIIPs Regulation**") for offering or selling the structured products or otherwise making them available to retail investors in the European Economic Area has been prepared and therefore offering or selling the structured products or otherwise making them available to any retail investor in the European Economic Area may be unlawful under the PRIIPs Regulation.

United Kingdom

Each of the Issuer and the Managers represents, warrants and agrees, and each further dealer appointed in respect of the structured products will be required to represent, warrant and agree, that it has not offered, sold or otherwise made available and will not offer, sell or otherwise make available any structured products which are the subject of the offering contemplated by this base listing document to any retail investor in the United Kingdom. For the purposes of this provision:

(a) the expression "**retail investor**" means a person who is one (or more) of the following:

i. a retail client, as defined in point (8) of Article 2 of Regulation (EU) No 2017/565 as it forms part of domestic law by virtue of the European Union (Withdrawal) Act 2018 ("**EUWA**"); or

ii. a customer within the meaning of the provisions of the Financial Services and Markets Act, as amended (the "**FSMA**") and any rules or regulations made under the FSMA to implement Directive (EU) 2016/97, where that customer would not qualify as a professional client, as defined in point (8) of Article 2(1) of Regulation (EU) No 600/2014 as it forms part of domestic law by virtue of the EUWA; or

iii. not a qualified investor as defined in Article 2 of Regulation (EU) 2017/1129 as it forms part of domestic law by virtue of the EUWA; and

(b) the expression an "**offer**" includes the communication in any form and by any means of sufficient information on the terms of the offer and the structured products to be offered so as to enable an investor to decide to purchase or subscribe for the structured products.

Each of the Issuer and the Managers further represents, warrants and agrees, and each further dealer appointed in respect of the structured products will be required to further represent, warrant and agree, that:

(a) in respect to structured products having a maturity of less than one year: (i) it is a person whose ordinary activities involve it in acquiring, holding, managing or disposing of investments (as principal or agent) for the purposes of its business; and (ii) it has not offered or sold and will not offer or sell any structured products other than to persons whose ordinary activities involve them in acquiring, holding, managing or disposing of investments (as principal or agent) for the purposes of their businesses or who it is reasonable to expect will acquire, hold, manage or dispose of investments (as principal or agent) for the purposes of their businesses where the issue of the structured products would otherwise constitute a contravention of Section 19 of FSMA by the Issuer;

(b) it has only communicated or caused to be communicated and will only communicate or cause to be communicated an invitation or inducement to engage in investment activity (within the meaning of Section 21 of the FSMA) received by it in connection with the issue or sale of any structured products in circumstances in which Section 21(1) of the FSMA does not apply to the Issuer or the Guarantor; and

(c) it has complied with and will comply with all applicable provisions of the FSMA with respect to anything done by it in relation to any structured products in, from or otherwise involving the United Kingdom.

The Netherlands

For selling restrictions in respect of The Netherlands, see "**European Economic Area**" above and the additional restrictions set forth below.

Regulatory capacity to offer structured products in The Netherlands: Each Manager has represented and agreed, and any other entity who is appointed by the Issuer as a manager in connection with an issue of the structured products which are the subject of the offering contemplated by the base listing document will represent and agree, that it has not offered to the public or sold, and will not offer to the public or sell, any of the structured products which are the subject of the offering contemplated by the base listing document in The Netherlands if it does not have the requisite Dutch regulatory capacity to make such offers or sales in The Netherlands.

General

The offer and sale of structured products will also be subject to such other restrictions and requirements as may be set out in the relevant Launch Announcement and Supplemental Listing Document.

Persons interested in acquiring structured products should inform themselves and obtain appropriate professional advice as to (i) the legal requirements within the countries of their nationality, residence, ordinary residence or domicile for such acquisition; (ii) any foreign exchange restrictions or exchange control requirements which they might encounter on the acquisition of structured products or their redemption; or (iii) the acquisition, holding or disposal of structured products.

ANNEX 4

A BRIEF GUIDE TO CREDIT RATINGS

Information set out in this Annex 4 is based on, extracted or reproduced from the website of S&P at *https://www.spglobal.com/ratings/en* and the website of Moody's at *https://www.moodys.com,* as of the day immediately preceding the date of this base listing document. Information appearing on those websites does not form part of this base listing document, and we accept no responsibility for the accuracy or completeness of the information appearing on those websites, except that we have accurately extracted and reproduced such information in this Annex 4 and take responsibility for such extraction and reproduction. We have not separately verified such information. There can be no assurance that such information will not be revised by the relevant rating agency in the future and we have no responsibility to notify you of such change. If you are unsure about any information provided in this Annex 4 and/or what a credit rating means, you should seek independent professional advice.

What is a credit rating?

A credit rating is a forward looking opinion by a credit rating agency of a company's overall ability to meet its financial obligations. The focus is on the company's capacity to pay its debts as they become due. The rating does not necessarily apply to any specific obligation.

What do the credit ratings mean?

Below are guidelines issued by S&P and Moody's on what each of their investment-grade ratings means, as of the day immediately preceding the date of this base listing document.

S&P long-term issuer credit ratings

AAA

An obligor rated 'AAA' has extremely strong capacity to meet its financial commitments. 'AAA' is the highest issuer credit rating assigned by S&P.

AA

An obligor rated 'AA' has very strong capacity to meet its financial commitments. It differs from the highest-rated obligors only to a small degree.

A

An obligor rated 'A' has strong capacity to meet its financial commitments but is somewhat more susceptible to adverse effects of changes in circumstances and economic conditions than obligors in higher-rated categories.

BBB

An obligor rated 'BBB' has adequate capacity to meet its financial commitments. However, adverse economic conditions or changing circumstances are more likely to weaken the obligor's capacity to meet its financial commitments.

Plus (+) or minus (-)

The above ratings (except for 'AAA') may be modified by the addition of a plus (+) or minus (-) sign to show relative standing within the rating categories.

Please refer to *https://www.standardandpoors.com/en_US/web/guest/article/-/view/sourceId/504352* (in English version only) for further details.

Moody's long-term ratings definitions

Aaa

Obligations rated Aaa are judged to be of the highest quality, with minimal risk.

Aa

Obligations rated Aa are judged to be of high quality and are subject to very low credit risk.

A

Obligations rated A are considered upper medium-grade and are subject to low credit risk.

Baa

Obligations rated Baa are subject to moderate credit risk. They are considered medium-grade and as such may possess speculative characteristics.

Modifiers "1", "2" and "3"

Moody's appends numerical modifiers 1, 2 and 3 to each of the above generic rating classifications (except for Aaa). The modifier 1 indicates that the obligation ranks in the higher end of its generic rating category; the modifier 2 indicates a mid-range ranking; and the modifier 3 indicates a ranking in the lower end of that generic rating category.

Please refer to *https://ratings.moodys.io/ratings* for further details.

Rating Outlooks

A rating outlook is an opinion regarding the likely rating direction over the medium term (for example, this is typically six months to two years for S&P). A rating outlook issued by S&P or Moody's will usually indicate whether the rating direction is likely to be "positive", "negative", "stable" or "developing". Please refer to the abovementioned websites of the relevant credit rating agencies for further details regarding rating outlooks published by the relevant credit rating agencies.

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