

Underlying supplement no. 23-I
*To the prospectus dated April 13, 2023 and
the prospectus supplement dated April 13, 2023*

**Registration Statement Nos. 333-270004
and 333-270004-01**
Dated August 28, 2023
Rule 424(b)(2)

JPMORGAN CHASE & CO.

Notes Linked to the J.P. Morgan Multi-Asset Index

JPMORGAN CHASE FINANCIAL COMPANY LLC

Notes, Fully and Unconditionally Guaranteed by JPMorgan Chase & Co., Linked to the J.P. Morgan Multi-Asset Index

Each of JPMorgan Chase & Co. and JPMorgan Chase Financial Company LLC may, from time to time, offer and sell notes linked in whole or in part to the J.P. Morgan Multi-Asset Index (the “**Index**”). The issuer of the notes, as specified in the relevant terms supplement, is referred to in this underlying supplement as the “**Issuer**.” The Issuer will be either JPMorgan Chase & Co. or JPMorgan Chase Financial Company LLC. For notes issued by JPMorgan Chase Financial Company LLC, JPMorgan Chase & Co., in its capacity as guarantor of those notes, is referred to in this product supplement as the “**Guarantor**.”

This underlying supplement describes the Index, the relationship between JPMorgan Chase & Co., JPMorgan Chase Financial Company LLC and the sponsor of the Index and terms that will apply generally to notes linked in whole or in part to the Index and other relevant information. This underlying supplement supplements the terms described in the accompanying product supplement, the prospectus supplement and the prospectus. A separate term sheet or pricing supplement, as the case may be, will describe terms that apply to specific issuances of the notes, including any changes to the terms specified below. These term sheets and pricing supplements are referred to generally in this underlying supplement as terms supplements. The accompanying product supplement, the relevant terms supplement or another accompanying underlying supplement will describe any other index or reference asset to which the notes are linked. If the terms described in the relevant terms supplement are inconsistent with those described in this underlying supplement, any other accompanying underlying supplement, the accompanying product supplement, the prospectus supplement or the prospectus, the terms described in the relevant terms supplement will control. In addition, if this underlying supplement and the accompanying product supplement or another accompanying underlying supplement contain information relating to the Index, the information contained in the document with the most recent date will control.

The Index is subject to a 1.00% per annum daily deduction.

Investing in the notes involves a number of risks. See “Risk Factors” beginning on page S-2 of the prospectus supplement, “Risk Factors” in the accompanying product supplement and “Risk Factors” beginning on page US-4 of this underlying supplement.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of the notes or passed upon the accuracy or the adequacy of the relevant terms supplement, this underlying supplement, any other accompanying underlying supplement, the accompanying product supplement, the prospectus supplement or the prospectus. Any representation to the contrary is a criminal offense.

The notes are not bank deposits, are not insured by the Federal Deposit Insurance Corporation or any other governmental agency and are not obligations of, or guaranteed by, a bank.

J.P.Morgan

August 28, 2023

TABLE OF CONTENTS

| | <u>Page</u> |
|---|-------------|
| Summary | US-1 |
| Risk Factors | US-4 |
| The J.P. Morgan Multi-Asset Index..... | US-20 |
| Background on the J.P. Morgan Futures Indices..... | US-27 |
| Background on Futures Contracts | US-32 |
| Background on the DAX® Index..... | US-37 |
| Background on the Russell 2000® Index | US-47 |
| Background on the S&P 500® Index | US-50 |
| Background on the TOPIX® Index..... | US-55 |
| Background on the Federal Republic of Germany..... | US-58 |
| Background on Japan | US-59 |
| Supplemental Terms of the Notes | US-60 |
| Annex A: The J.P. Morgan Multi-Asset Index Rules..... | A-1 |
| Annex B: The J.P. Morgan Futures Index Series Rules | B-1 |

The Issuer and the Guarantor (if applicable) have not authorized anyone to provide any information other than that contained or incorporated by reference in the relevant terms supplement, this underlying supplement, any other accompanying underlying supplement, the accompanying product supplement, the prospectus supplement or the prospectus with respect to the notes offered by the relevant terms supplement and with respect to the Issuer and the Guarantor (if applicable). The Issuer and the Guarantor (if applicable) take no responsibility for, and can provide no assurance as to the reliability of, any other information that others may give you. The relevant terms supplement, together with this underlying supplement, any other accompanying underlying supplement, the accompanying product supplement, the prospectus supplement and the prospectus, will contain the terms of the notes and will supersede all other prior or contemporaneous oral statements as well as any other written materials, including preliminary or indicative pricing terms, correspondence, trade ideas, structures for implementation, sample structures, fact sheets, brochures or other educational materials of the Issuer. The information in each of the relevant terms supplement, this underlying supplement, any other accompanying underlying supplement, the accompanying product supplement, the prospectus supplement and the prospectus may be accurate only as of the date of that document.

The notes are not appropriate for all investors and involve a number of risks and important legal and tax consequences that should be discussed with your professional advisers. You should be aware that the regulations of Financial Industry Regulatory Authority, Inc., or FINRA, and the laws of certain jurisdictions (including regulations and laws that require brokers to ensure that investments are suitable for their customers) may limit the availability of the notes. The relevant terms supplement, this underlying supplement, any other accompanying underlying supplement, the accompanying product supplement, the prospectus supplement and the prospectus do not constitute an offer to sell or a solicitation of an offer to buy the notes under any circumstances in which that offer or solicitation is unlawful.

The notes are not commodity futures contracts or swaps and are not regulated under the Commodity Exchange Act of 1936, as amended (the “**Commodity Exchange Act**”). If the notes are linked in whole or in part to a Commodity Index (as defined below), the notes are offered pursuant to an exemption from regulation under the Commodity Exchange Act, commonly known as the hybrid instrument exemption, that is available to securities that have one or more payments indexed to the value, level or rate of one or more commodities, as set out in section 2(f) of that statute. Accordingly, you are not afforded any protection provided by the Commodity Exchange Act or any regulation promulgated by the Commodity Futures Trading Commission.

In this underlying supplement, “we,” “us” and “our” refer to the Issuer, unless the context requires otherwise, and “JPMorgan Financial” refers to JPMorgan Chase Financial Company LLC. To the extent applicable, the index described in this underlying supplement is deemed to be one of the “Indices” referred to in the accompanying product supplement.

SUMMARY

The J.P. Morgan Multi-Asset Index (the “**Index**”) was developed and is maintained and calculated by J.P. Morgan Securities LLC (“**JPMS**”). The description of the Index and methodology included in this underlying supplement is based on rules formulated by JPMS (the “**Rules**”). The Rules, and not this description, will govern the calculation and constitution of the Index and other decisions and actions related to its maintenance. The Rules in effect as of the date of this underlying supplement are attached as Annex A to this underlying supplement. The Index is the intellectual property of JPMS, and JPMS reserves all rights with respect to its ownership of the Index. The Index is reported by Bloomberg L.P. under the ticker symbol “MAX Index.”

The Index seeks to provide a dynamic and diversified asset allocation based on a momentum investment strategy. The Index tracks the return of (a) a dynamic notional portfolio consisting of up to 10 excess return futures-based indices (each a “**Constituent**,” and collectively the “**Constituents**”), converted into U.S. dollars (in the case of Constituents not denominated in U.S. dollars), *less* (b) a 1.00% per annum daily deduction. The Constituents represent a broad range of asset classes (equities, fixed income and commodities) and developed markets (the United States, Germany and Japan).

The Index selects and rebalances into a new notional portfolio composed of the Constituents at least once each month using a methodology that is designed to:

- maintain a diversified allocation at all times;
- allocate dynamically based on the market cycle; and
- select allocations that attempt to deliver a stable volatility over time.

Maintaining a diversified allocation. A diversified portfolio’s return is the weighted average of its constituents’ returns, but its volatility is less than the weighted average of its constituents’ volatilities, because different assets don’t always move in the same direction — in this sense, a diversified portfolio can be said to deliver average returns with below-average volatility. In order to ensure diversification, the Index constitutes its selected portfolio from a universe of 10 Constituents, and imposes caps and floors on the Constituent weights at the individual and asset class levels. Each Constituent’s assigned weight must also be an increment of 5%, and the assigned weights must sum to 100%. The following table sets forth the current Constituents, the ticker for each Constituent, the minimum and maximum assigned weight for each Constituent and the minimum and maximum aggregate assigned weight for each asset class. For additional information about the Constituents, see “Background on the J.P. Morgan Futures Indices” below.

| | Constituent | Ticker | Individual Assigned Weight Constraints | Aggregate Assigned Weight Constraints |
|---|---|--------------|--|---------------------------------------|
| 1 | J.P. Morgan US Large Cap Equities Futures Index | JPUSLGE Q | Minimum: -10% Maximum: 40% | Minimum: 10% Maximum: 60% |
| 2 | J.P. Morgan US Small Cap Equities Futures Index | JPUSSME Q | | |
| 3 | J.P. Morgan German Equities Futures Index | JPDEEQ | | |
| 4 | J.P. Morgan Japanese Equities Futures Index | JPJPEQ | | |

| | Constituent | Ticker | Individual Assigned Weight Constraints | Aggregate Assigned Weight Constraints |
|----|--|----------|--|---------------------------------------|
| 5 | J.P. Morgan 5Y U.S. Treasury Futures Index | JPUS5YT | Minimum: -10% Maximum: 40% | Minimum: 10% Maximum: 80% |
| 6 | J.P. Morgan 10Y U.S. Treasury Futures Index | JPUS10YT | | |
| 7 | J.P. Morgan German Government Bond Futures Index | JPDEBUND | | |
| 8 | J.P. Morgan Japanese Government Bond Futures Index | JPJP10YB | | |
| 9 | J.P. Morgan Brent Crude Oil Futures Index | JPBRENT | Minimum: -20% Maximum: 20% | Minimum: -30% Maximum: 30% |
| 10 | J.P. Morgan Gold Futures Index | JPMGOLD | | |

Allocating dynamically based on the market cycle. Historical data and statistical analysis support the premise that assets tend to move in multi-year cycles. Depending on the asset class, these cycles can range from five to 30 years. The presence of these trends is one possible explanation for the academic research showing that, historically, asset classes exhibiting strong recent returns have been more likely to continue to exhibit positive returns. The Index attempts to take advantage of this dynamic by identifying a selected portfolio that reflects the strongest recent returns in local-currency terms from among the possible portfolios that meet the weight constraints set forth above and the volatility threshold described below.

Targeting stable volatility. One measure of risk used by many investors is volatility, which reflects the degree of variation in the value of an asset or portfolio over a period of time. Unlike asset-allocation approaches that aim to maintain stable proportions of different assets throughout the market cycle, the Index attempts to maintain a stable level of volatility over time. As compared to an approach that maintains consistent weights through the market cycle, the Index is designed to take on more volatility risk in calm markets and deliver lower volatility in choppy ones.

Identifying a selected portfolio. At least once each month, the Index identifies every notional portfolio that meets the individual Constituent and asset class weight constraints set forth above with weights in increments of 5% and a total weight of 100% and that has a recent historical volatility at or below a volatility threshold of 4%. The Index then selects and rebalances into the notional portfolio from that set with the strongest recent performance in local-currency terms. If no such notional portfolio exists, then the volatility threshold is increased by 1% (e.g., from 4% to 5%), and the procedure described in this paragraph is repeated, including the increase to the volatility threshold, until a notional portfolio has been selected.

Calculating the level of the Index. On any given day, the closing level of the Index (the “**Index Level**”) reflects (a) the weighted U.S. dollar performance of the Constituents tracked by the Index on that day *less* (b) the 1.00% per annum daily deduction. The Index Level was set equal to 100.00 on February 22, 1994, the base date of the Index. The Index Calculation Agent (as defined below) began calculating the Index on a live basis on November 18, 2022.

The Index is an “excess return” index because it provides notional exposure to the Constituents that in turn provide exposure to futures contract returns that reflect changes in the price of those futures contracts, as well as their “roll” returns. The Index is not a “total return” index because the Constituents do not reflect interest that could be earned on funds notionally committed to the trading of futures contracts.

JPMS is currently the sponsor of the Index (the “**Index Sponsor**”) and the calculation agent of the Index (the “**Index Calculation Agent**”).

See “The J.P. Morgan Multi-Asset Index” in this underlying supplement for additional information about the Index.

No assurance can be given that the investment strategy used to construct the Index will be successful or that the Index will outperform any alternative portfolio or strategy that might be constructed from the Constituents. There is no guarantee that past performance trends referenced in identifying a selected portfolio will continue during the subsequent period when the Index provides exposure to that selected portfolio. In addition, no assurance can be given that the actual realized volatility of the Index will approximate 4%. The actual realized volatility of the Index will depend on the performance of the Constituents included in the selected portfolio(s) from time to time, and, at any time or for extended periods, may be greater than 4%, perhaps significantly, or less than 4%. Furthermore, the volatility threshold is subject to upward adjustment and, thus, the realized volatility threshold used to determine any selected portfolio may be greater than 4%, perhaps significantly.

The Index is described as a “notional” or “synthetic” portfolio of assets because there is no actual portfolio of assets to which any person is entitled or in which any person has any ownership interest. The Index merely references certain assets, the performance of which will be used as a reference point for calculating the Index Level.

RISK FACTORS

*Your investment in the notes will involve certain risks. Investing in the notes is not equivalent to investing directly in the Index, any Constituent or any of the futures contracts underlying any Constituent, or any futures contracts or exchange-traded or over-the-counter instruments based on, or other instruments linked to, any of the foregoing. **You should consider carefully the following discussion of risks, as well as the discussion of risks included in the relevant terms supplement, the accompanying product supplement and any other accompanying underlying supplement, before you decide that an investment in the notes is suitable for you.***

Capitalized terms used in this section without definition are as defined in "Summary" above.

Risks Relating to the Index

JPMS, the Index Sponsor and the Index Calculation Agent, may adjust the Index in a way that affects its level, and JPMS has no obligation to consider your interests.

JPMS, one of our affiliates, currently acts as the Index Sponsor and the Index Calculation Agent and is responsible for calculating and maintaining the Index and developing the guidelines and policies governing its composition and calculation. In performing these duties, JPMS may have interests adverse to the interests of the holders of the notes, which may affect your return on the notes, particularly where JPMS, as the Index Sponsor and the Index Calculation Agent, is entitled to exercise discretion. The rules governing the Index may be amended at any time by the Index Sponsor, in its sole discretion. The rules also permit the use of discretion by the Index Sponsor and the Index Calculation Agent in relation to the Index in specific instances, including, but not limited to, the determination of whether to replace a Constituent with a substitute or successor upon the occurrence of certain events affecting that Constituent, the selection of any substitute or successor and the determination of the levels to be used in the event of market disruptions that affect the ability of the Index Calculation Agent to calculate and publish the levels of the Index and the interpretation of the rules governing the Index. Although JPMS, acting as the Index Sponsor and the Index Calculation Agent, will make all determinations and take all action in relation to the Index acting in good faith, it should be noted that JPMS may have interests adverse to the interests of the holders of the notes and the policies and judgments for which JPMS is responsible could have an impact, positive or negative, on the level of the Index and the value of your notes.

Although judgments, policies and determinations concerning the Index are made by JPMS, JPMorgan Chase & Co., as the ultimate parent company of JPMS, ultimately controls JPMS. JPMS has no obligation to consider your interests in taking any actions that might affect the value of your notes. Furthermore, the inclusion of any Constituent in the Index is not an investment recommendation by us or JPMS of that Constituent or any of the futures contracts underlying that Constituent. See "The J.P. Morgan Multi-Asset Index."

The Index is subject to a 1.00% per annum daily deduction.

One way in which the Index may differ from a typical index is that its level will include a 1.00% per annum daily deduction (the "**Index adjustment**"). The Index adjustment will be deducted daily. As a result of the deduction of the Index adjustment, the level of the Index will trail the value of a hypothetical identically constituted notional portfolio from which no such Index adjustment is deducted.

The deduction of the Index adjustment will place a significant drag on the performance of the Index, potentially offsetting positive returns of the Constituents, exacerbating negative returns of the Constituents and causing the level of the Index to decline steadily if the returns of the Constituents are relatively flat. The Index will not appreciate unless the returns of the Constituents are sufficient to offset the negative effects of the Index adjustment, and then only to the extent that the returns of the Constituents are greater than the amount of the Index adjustment. As a result of the Index adjustment, the level of the Index may decline even if the returns of the Constituents are positive.

The Index may not be successful or outperform any alternative strategy that might be employed in respect of the Constituents.

The Index follows a notional rules-based proprietary strategy that operates on the basis of pre-determined rules. No assurance can be given that the investment strategy on which the Index is based will be successful or that the Index will outperform any alternative strategy that might be employed in respect of the Constituents.

An investment in the notes carries the risks associated with the Index's momentum investment strategy.

The Index construction reflects a momentum investment strategy. Momentum investing generally seeks to capitalize on positive trends in the returns of financial instruments. As such, the weights of the Constituents in the Index are based in part on the recent performance of the Constituents. However, there is no guarantee that recent performance trends will continue in the future. In addition, the caps and floors on the Constituent weights applied at the individual and asset class levels will result in lower weights for the Constituents with the best recent performance than would be the case if those caps and floors were not applied. Moreover, the aggregate assigned weights of the J.P. Morgan US Large Cap Equities Futures Index, the J.P. Morgan US Small Cap Equities Futures Index, the J.P. Morgan German Equities Futures Index and the J.P. Morgan Japanese Equities Futures Index (the "**Equity Constituents**") and the aggregate assigned weights of the J.P. Morgan 5Y U.S. Treasury Futures Index, the J.P. Morgan 10Y U.S. Treasury Futures Index, the J.P. Morgan German Government Bond Futures Index and the J.P. Morgan Japanese Government Bond Futures Index (the "**Bond Constituents**") will, in each case, not be less than 10%, even in cases where the recent performance of the Equity Constituents or the Bond Constituents, as applicable, is significantly worse than the recent performance of the remaining Constituents.

Furthermore, the Index will maintain a 100% net long exposure to the Constituents at all times, even when most or all Constituents are displaying negative performance. Moreover, once a selected portfolio has been identified and implemented, the Index will track the performance of the relevant Constituent until the next rebalancing of the Index, even when the performance of those Constituents is worse than their recent performance, or than the performance of the remaining Constituents.

In addition, due to the Index's momentum investment strategy, the Index may fail to realize gains that could occur as a result of obtaining exposures to financial instruments that have experienced returns one direction, but which subsequently experience a sudden return in the other direction. As a result, if market conditions do not represent a continuation of prior observed trends, the level of the Index, which is rebalanced based on prior trends, may decline.

The Index may perform poorly at times when the phase of the market cycle is changing or during periods characterized by short-term volatility.

While historical data and statistical analysis support the premise that assets tend to move in multi-year cycles, performance of assets will be variable, even within a particular phase of a market cycle, and the nature of a market cycle is such that the performance of assets will shift from phases of positive performance to phases of negative performance over time. Because the Index's strategy is based on momentum investing, the Index may perform poorly during times when a Constituent's performance is not consistent with the current phase of the market cycle or when the current phase of the market cycle for that Constituent is changing. In non-trending, sideways markets, momentum investment strategies are subject to "whipsaws." A whipsaw occurs when the market reverses and does the opposite of what is indicated by the trend indicator, resulting in a trading loss during the particular period. Consequently, the Index may perform poorly in non-trending, "choppy" markets characterized by short-term volatility.

Because the Index may include notional short positions, the notes may be subject to additional risks.

During each rebalancing of the Index, the Index may assign negative weights as low as -10% to one or more of the Equity Constituents and the Bond Constituents and negative weights as low as -20% to

one or both of the J.P. Morgan Brent Crude Oil Futures Index and the J.P. Morgan Gold Futures Index (the “**Commodity Constituents**”), thereby providing notional short exposure to one or more Constituents. Unlike long positions, short positions are subject to unlimited risk of loss because there is no limit on the appreciation of the price of the relevant asset before the short position is closed. It is possible that a Constituent may appreciate substantially while the Index is providing a notional short exposure to that Constituent, thus resulting in an adverse effect on the level of the Index and the value of your notes.

Moreover, if the Index provides both notional long and short exposures to the Constituents, the total long and short exposure to the Constituents may exceed 100%, perhaps significantly, which increases the risk that the Index will suffer losses, thereby adversely affecting any payment on the notes and the value of the notes.

The Index may not approximate its initial volatility threshold of 4%.

No assurance can be given that the Index will maintain an annualized realized volatility that approximates its initial volatility threshold of 4%. The actual realized volatility of the Index will depend on the performance of the Constituents included in the selected portfolio(s) from time to time, and, at any time or for extended periods, may be greater than 4%, perhaps significantly, or less than 4%. Furthermore, the volatility threshold is subject to upward adjustment and, thus, the realized volatility threshold used to determine any selected portfolio may be greater than 4%, perhaps significantly. While the assigned weights of the notional portfolio(s) tracked by the Index are based in part on the recent historical volatility of the relevant notional portfolio, there is no guarantee that trends existing in the relevant measurement periods will continue in the future. The volatility of the notional portfolio on any day may change quickly and unexpectedly. Accordingly, the actual realized annualized volatility of the Index on a daily basis may be greater than or less than the volatility threshold used to select the relevant selected portfolio(s), which may adversely affect the level of the Index and the value of the notes.

In addition, due to the weight constraints applied in constructing the Index, the aggregate assigned weights of the Equity Constituents will not be less than 10%, even if Equity Constituents are performing poorly. In general, the Equity Constituents will tend to receive their minimum weight of 10% during periods when equities are experiencing poor performance or high volatility. In addition, during periods when equities are experiencing high volatility, the initial volatility threshold, and the actual realized volatility, may be significantly higher than 4%, even if other assets are not experiencing high volatility.

A significant portion of the Index’s exposure may be allocated to the Bond Constituents.

Under normal market conditions, the Equity Constituents and the Commodity Constituents have tended to exhibit realized volatilities that are higher than the realized volatilities of the Bond Constituents in general over time. As a result, the Index will generally need to reduce its exposure to the Equity Constituents and the Commodity Constituents in order to satisfy the volatility threshold. Therefore, the Index may have significant exposure for an extended period of time to the Bond Constituents, and that exposure may be greater, perhaps significantly greater, than its exposure to the Equity Constituents and the Commodity Constituents. However, the returns of the Bond Constituents may be significantly lower than the returns of the Equity Constituents and the Commodity Constituents, and possibly even negative while the returns of the Equity Constituents and the Commodity Constituents are positive, which will adversely affect the level of the Index and any payment on, and the value of, the notes.

The Index is subject to concentration risk in its allocation among the Constituents.

The strategy employed by the Index involves an asset allocation that imposes certain weight caps and floors that may result in the Index being allocated to as few as three Constituents, with up to 40% of the Index being allocated to a single Equity Constituent and/or any single Bond Constituent. Under these circumstances, the Index may face more risks than if it were diversified broadly over numerous asset classes and geographical regions. Accordingly, the Index may be more adversely affected by negative economic, political or regulatory occurrences affecting its Constituents and the relevant asset classes than a more broadly diversified allocation among its Constituents. Additionally, the Index allocation will sometimes result in exposure to only Equity Constituents and Bond Constituents, without any exposure to the Commodity Constituents.

Correlation of performances between the Constituents may reduce the performance of the notes.

Performances of the Constituents may become highly correlated from time to time during the term of the notes, including, but not limited to, a period in which there is a substantial decline in a particular equity, bond and commodity exposures represented by the Constituents. High correlation during periods of negative returns between Constituents could have an adverse effect on any payment on, and the value of, your notes.

Changes in the values of the Constituents may offset each other.

Price movements between the Constituents may not correlate with each other. At a time when the value of one or more Constituents increases, the values of other Constituents may not increase as much or may decline. Therefore, in calculating the level of the Index, increases in the value of one or more Constituents may be moderated, or more than offset, by lesser increases or declines in the value of the other Constituents, which will adversely affect the level of the Index and any payment on, and the value of, the notes.

The Index will be subject to currency exchange risk.

Because the returns of the Constituent denominated in currencies other than the U.S. dollar are converted into U.S. dollars for the purposes of calculating the level of the Index, the Index will be exposed to currency exchange rate risk with respect to each of the currencies in which those Constituents are denominated. An investor's net exposure will depend on the extent to which those currencies strengthen or weaken against the U.S. dollar and the relative weight of those Constituents. If the U.S. dollar strengthens in value relative to those currencies, the returns of the relevant Constituents and any payment on the notes may be adversely affected.

Of particular importance to potential currency exchange risk are:

- existing and expected rates of inflation;
- existing and expected interest rate levels;
- the balance of payments in the countries issuing those currencies and in the United States and between each country and its major trading partners;
- political, civil or military unrest in the countries issuing those currencies and in the United States; and
- the extent of governmental surpluses or deficits in the countries issuing those currencies and the United States.

All of these factors are, in turn, sensitive to the monetary, fiscal and trade policies pursued by the governments of various countries issuing those currencies, the United States and other countries important to international trade and finance.

We have no control over exchange rates.

Foreign exchange rates can either float or be fixed by sovereign governments. Exchange rates of the currencies used by most economically developed nations are permitted to fluctuate in value relative to the U.S. dollar and to each other. However, from time to time governments and, in the case of countries using the euro, the European Central Bank, may use a variety of techniques, such as intervention by a central bank, the imposition of regulatory controls or taxes or changes in interest rates to influence the exchange rates of their currencies. Governments may also issue a new currency to replace an existing currency or alter the exchange rate or relative exchange characteristics by a devaluation or revaluation of a currency. These governmental actions could change or interfere with currency valuations and currency fluctuations that would otherwise occur in response to economic forces, as well as in response to the movement of currencies across borders. As a consequence, these governmental actions could adversely affect an investment in the notes.

We will not make any adjustment or change in the terms of the notes in the event that exchange rates should become fixed, or in the event of any devaluation or revaluation or imposition of exchange or other regulatory controls or taxes, or in the event of other developments affecting the U.S. dollar or any relevant foreign currency. You will bear those risks.

Hypothetical back-tested data relating to the Index do not represent actual historical data and are subject to inherent limitations.

Hypothetical back-tested performance measures of the Index are purely theoretical and do not represent the actual historical performance of the Index and have not been verified by an independent third party. Hypothetical back-tested performance measures have inherent limitations. Alternative modeling techniques might produce significantly different results and may prove to be more appropriate. Past performance, and especially hypothetical back-tested performance, is not indicative of future results. This type of information has inherent limitations and you should carefully consider these limitations before placing reliance on such information. Hypothetical back-tested performance is derived by means of the retroactive application of a back-tested model that has been designed with the benefit of hindsight.

If the values of the Constituents tracked by the Index change, the level of the Index and the market value of your notes may not change in the same manner.

Owning the notes is not the same as owning a notional position in the Constituents. Accordingly, changes in the values of the Constituents tracked by the Index may not result in a comparable change in the level of the Index or the market value of your notes.

The Index is an “excess return” index and not a “total return” index because the Constituents do not reflect interest that could be earned on funds notionally committed to the trading of futures contracts.

Each of the Constituents is an excess return index and not a total return index. The Index, by providing exposure to the Constituents, is also an excess return index and not a total return index. The return from investing in futures contracts derives from three sources: (a) changes in the price of the relevant futures contracts (which is known as the “price return”); (b) any profit or loss realized when rolling the relevant futures contracts (which is known as the “roll return”); and (c) any interest earned on the cash deposited as collateral for the purchase of the relevant futures contracts (which is known as the “collateral return”).

Some indices, including the Constituents (and indirectly, the Index), that track futures contracts are excess return indices that measure the returns accrued from investing in uncollateralized futures contracts (*i.e.*, the sum of the price return and the roll return associated with an investment in futures contracts). By contrast, a total return index, in addition to reflecting those returns, also reflects interest that could be earned on funds committed to the trading of the underlying futures contracts (*i.e.*, the collateral return associated with an investment in futures contracts). Investing in the notes will not generate the same return as would be generated from investing directly in the relevant futures contracts or in a total return index related to those futures contracts.

The Index comprises notional assets and liabilities.

The exposure of the Index to its Constituents is purely notional and will exist solely in the records maintained by or on behalf of the Index Calculation Agent. There is no actual portfolio of assets to which any person is entitled or in which any person has any ownership interest. Consequently, you will not have any claim against any of the reference assets that compose the Index.

The Index has a limited operating history and may perform in unanticipated ways.

The Index was established on November 18, 2022 and therefore has a limited operating history. Past performance should not be considered indicative of future performance.

The Index is subject to market risks.

The performance of the Index is dependent in part on the performance of its Constituents. As a consequence, your investment in the notes is exposed to the performance of the Constituents.

The investment strategy used to construct the Index involves regular rebalancing and weighting constraints that are applied to the Constituents.

The Constituents are subject to regular rebalancing and weighting constraints applied individually and by asset type. By contrast, a notional portfolio that does not rebalance monthly and is not subject to any weighting constraints could see greater compounded gains over time through exposure to a consistently and rapidly appreciating portfolio consisting of the Constituents. Therefore, your return on the notes may be less than the return you could realize on an alternative investment in the Constituents that is not subject to regular rebalancing or weighting constraints. No assurance can be given that the investment strategy used to construct the Index will outperform any alternative investment in the Constituents.

A Constituent may be replaced by a substitute index upon the occurrence of certain extraordinary events.

As described under “The J.P. Morgan Multi-Asset Index — Succession and Extraordinary Events” below, following the occurrence of certain extraordinary events with respect to a Constituent, the affected Constituent may be replaced by a substitute index or the Index Calculation Agent may cease calculation and publication of the Index on a date determined by the Index Calculation Agent. These extraordinary events generally include events that could materially interfere with the ability of market participants to transact in, or events that could materially change the underlying economic exposure of, positions with respect to the Index, any Constituent or any reference index, where that material interference or change is not acceptable to the Index Calculation Agent. If the Index Calculation Agent determines in its discretion that no suitable substitute is available for an affected Constituent, then the Index Calculation Agent will determine its good faith estimate of the closing level of that Constituent and remove it from the Index. In any such case, the Index Calculation Agent will, in good faith, make related adjustments to the Rules that it determines to be appropriate. See “The J.P. Morgan Multi-Asset Index — Succession and Extraordinary Events” below for a summary of events that could trigger an extraordinary event.

You should realize that the changing of a Constituent may affect the performance of the Index, and therefore, the return on the notes, as the replacement Constituent may perform significantly better or worse than the original Constituent. Moreover, the policies of the sponsor of the substitute index concerning the methodology and calculation of the substitute index, including decisions regarding additions, deletions or substitutions of the assets underlying the substitute index, could affect the level of the substitute index and therefore the value of the notes. The amount payable on the notes and their market value could also be affected if the sponsor of a substitute index or the sponsor of the reference index discontinues or suspends calculation or dissemination of the relevant index, in which case it may become difficult to determine the market value of the notes. The sponsor of the substitute index will have no obligation to consider your interests in calculating or revising such substitute index.

The Index should not be compared to any other index or strategy sponsored by any of our affiliates (each, a “J.P. Morgan Index”) and cannot necessarily be considered a revised, enhanced or modified version of any other J.P. Morgan Index.

The Index follows a notional rules-based proprietary strategy that may have objectives, features and/or constituents that are similar to those of other J.P. Morgan Indices. No assurance can be given that these similarities will form a basis for comparison between the Index and any other J.P. Morgan Index, and no assurance can be given that the Index would be more successful than or outperform any other J.P. Morgan Index. The Index operates independently and does not necessarily revise, enhance, modify or seek to outperform any other J.P. Morgan Index.

Risks Relating to the Constituents Generally

JPMS, the sponsor and calculation agent of each Constituent, may adjust each Constituent in a way that affects its level, and JPMS has no obligation to consider your interests.

JPMS, one of our affiliates, currently acts as the sponsor and calculation agent of the Constituents and is responsible for calculating and maintaining the Constituents and developing the guidelines and policies governing their composition and calculation. In performing these duties, JPMS may have interests adverse to the interests of the holders of the notes, which may affect your return on the notes, particularly where JPMS, as the sponsor and calculation agent of the Constituents, is entitled to exercise discretion. The rules governing the Constituents may be amended at any time by the calculation agent of the Constituents, in its sole discretion. The rules also permit the use of discretion by the sponsor and the determination of whether to replace a futures contract included in a Constituent with a substitute or successor upon the occurrence of certain events affecting that futures contract, the selection of any substitute or successor and the determination of the levels to be used in the event of market disruptions that affect the ability of the Index Calculation Agent to calculate and publish the levels of the Constituents and the interpretation of the rules governing the Constituents. Although JPMS, acting as the sponsor and calculation agent of the Constituents, will make all determinations and take all action in relation to the Constituents acting in good faith, it should be noted that JPMS may have interests adverse to the interests of the holders of the notes and the policies and judgments for which JPMS is responsible could have an impact, positive or negative, on the levels of the Constituents and the value of your notes.

Although judgments, policies and determinations concerning the Constituents are made by JPMS, JPMorgan Chase & Co., as the ultimate parent company of JPMS, ultimately controls JPMS. JPMS has no obligation to consider your interests in taking any actions that might affect the value of your notes. Furthermore, the inclusion of any futures contract in a Constituent is not an investment recommendation by us or JPMS of that futures contract. See “The J.P. Morgan Futures Indices.”

The Constituents are subject to significant risks associated with futures contracts.

The Constituents each track the returns of futures contracts. The price of a futures contract depends not only on the price of the underlying asset referenced by the futures contract, but also on a range of other factors, including but not limited to changing supply and demand relationships, interest rates, governmental and regulatory policies and the policies of the exchanges on which the futures contracts trade. In addition, the futures markets are subject to temporary distortions or other disruptions due to various factors, including the lack of liquidity in the markets, the participation of speculators and government regulation and intervention. These factors and others can cause the prices of futures contracts to be volatile and could adversely affect the level of the Index and any payments on, and the value of, your notes.

Suspension or disruptions of market trading in futures contracts may adversely affect the value of your notes.

Futures markets are subject to temporary distortions or other disruptions due to various factors, including lack of liquidity, the participation of speculators, and government regulation and intervention. In addition, futures exchanges generally have regulations that limit the amount of futures contract price fluctuations that may occur in a single day. These limits are generally referred to as “daily price fluctuation limits” and the maximum or minimum price of a contract on any given day as a result of these limits is referred to as a “limit price.” Once the limit price has been reached in a particular contract, no trades may be made at a price beyond the limit, or trading may be limited for a set period of time. Limit prices have the effect of precluding trading in a particular contract or forcing the liquidation of contracts at potentially disadvantageous times or prices. These circumstances could delay the calculation of the levels of the Constituents and the level of the Index and could affect the levels of the Constituents and adversely affect the level of the Index and any payments on, and the value of, your notes.

An increase in the margin requirements for futures contracts included in the Constituents may adversely affect the level of the Index.

Futures exchanges require market participants to post collateral in order to open and keep open positions in futures contracts. If an exchange increases the amount of collateral required to be posted to hold positions in futures contracts underlying the Constituents, market participants who are unwilling or unable to post additional collateral may liquidate their positions, which may cause the price of the relevant futures contracts to decline significantly. As a result, the level of the Index and any payments on, and the value of, the notes may be adversely affected.

The Constituents may in the future include contracts that are not traded on regulated futures exchanges.

The Constituents are currently based solely on futures contracts traded on regulated futures exchanges (referred to in the United States as “designated contract markets”). If these exchange-traded futures contracts cease to exist, or if the calculation agent for the Constituents substitutes a futures contract in certain circumstances, the Index may in the future include futures contracts or over-the-counter contracts traded on trading facilities that are subject to lesser degrees of regulation or, in some cases, no substantive regulation. As a result, trading in such contracts, and the manner in which prices and volumes are reported by the relevant trading facilities, may not be subject to the provisions of, and the protections afforded by, the U.S. Commodity Exchange Act, or other applicable statutes and related regulations that govern trading on regulated U.S. futures exchanges or similar statutes and regulations that govern trading on regulated non-U.S. futures exchanges. In addition, many electronic trading facilities have only recently initiated trading and do not have significant trading histories. As a result, the trading of contracts on such facilities, and the inclusion of such contracts in the Index, through its exposure to the Constituents, may be subject to certain risks not presented by futures contracts traded on regulated futures exchanges, including risks related to the liquidity and price histories of the relevant contracts.

Each of the Constituents is an “excess return” index and not a “total return” index because it does not reflect interest that could be earned on funds notionally committed to the trading of futures contracts.

Each of the Constituents is an excess return index and not a total return index. The return from investing in futures contracts derives from three sources: (a) changes in the price of the relevant futures contracts (which is known as the “price return”); (b) any profit or loss realized when rolling the relevant futures contracts (which is known as the “roll return”); and (c) any interest earned on the cash deposited as collateral for the purchase of the relevant futures contracts (which is known as the “collateral return”).

Some indices, including the Constituents, that track futures contracts are excess return indices that measure the returns accrued from investing in uncollateralized futures contracts (*i.e.*, the sum of the price return and the roll return associated with an investment in futures contracts). By contrast, a total return index, in addition to reflecting those returns, also reflects interest that could be earned on funds committed to the trading of the underlying futures contracts (*i.e.*, the collateral return associated with an investment in futures contracts). Investing in the notes will not generate the same return as would be generated from investing directly in the relevant futures contracts or in a total return index related to those futures contracts.

Changes in future prices of the futures contracts included in the Constituents relative to their current prices could lead to a decrease in any payment on the notes.

The Constituents are composed of futures contracts. As the contracts underlying the Constituents come to expiration, they are replaced by contracts that have a later expiration. For example, a contract notionally purchased and held in August may specify an October expiration. As time passes, the contract expiring in October is replaced by a contract for delivery in November. This is accomplished by notionally selling the October contract and notionally purchasing the November contract. This process is referred to as “rolling.” Excluding other considerations, if the market for the underlying futures contracts is in “contango,” where the prices are higher in the distant delivery months than in the nearer delivery months,

the notional purchase of the November contract would take place at a price that is higher than the price of the October contract, thereby creating a negative “roll yield.” In addition, excluding other considerations, if the market for the underlying futures contracts is in “backwardation,” where the prices are lower in the distant delivery months than in the nearer delivery months, the notional purchase of the November contract would take place at a price that is lower than the price of the October contract, thereby creating a positive “roll yield.”

When the Index provides long exposure to a Constituent, the presence of contango in the relevant markets could adversely affect the values of that Constituent and the Index and, accordingly, any payment on the notes. In addition, when the Index provides short exposure to a Constituent, the presence of backwardation in the relevant markets could positively affect the value of that Constituent and therefore adversely affect the value of the Index and, accordingly, any payment on the notes.

Some of the Constituents are subject to risks associated with non-U.S. securities markets.

The equity securities composing the indices referenced by the futures contracts underlying two of the Equity Constituents and the government bonds referenced by the futures contracts underlying two of the Bond Constituents (such equity securities and government bonds, the “underlying securities”) have been issued by non-U.S. companies or governments. An investment in the notes, therefore, involves risks associated with the securities markets in those countries where the non-U.S. underlying securities are traded, including risks of volatility in those markets, governmental intervention in those markets and cross shareholdings in companies in certain countries. Also, there is generally less publicly available information about companies and governments in some of these jurisdictions than about U.S. companies that are subject to the reporting requirements of the Securities and Exchange Commission (the “SEC”), and generally non-U.S. companies and governments are subject to accounting, auditing and financial reporting standards and requirements and securities trading rules different from those applicable to U.S. reporting companies.

The prices of securities in non-U.S. markets may be affected by political, economic, financial and social factors in those markets, including changes in a country’s government, economic and fiscal policies, currency exchange laws or other laws or restrictions. Moreover, the economies of these countries may differ favorably or unfavorably from the economy of the United States in such respects as growth of gross national product, rate of inflation, capital reinvestment, resources and self-sufficiency. These countries may be subjected to different and, in some cases, more adverse economic environments.

Some or all of these factors may influence the value of the relevant Constituents, and therefore, the Index. The impact of any of the factors set forth above may enhance or offset some or all of any change resulting from another factor or factors. You cannot predict the future performance of any Constituent based on its historical performance. The value of any Constituent may decrease, which may adversely affect any payments on, and the value of, the notes.

The Constituents comprise notional assets and liabilities.

The exposures to each Constituent’s underlying futures contracts are purely notional and will exist solely in the records maintained by or on behalf of the index calculation agent of the Constituents. There is no actual portfolio of assets to which any person is entitled or in which any person has any ownership interest. Consequently, you will not have any claim against any of the reference assets that compose the Constituents.

The Constituents have a limited operating history and may perform in unanticipated ways.

The Constituents were established on December 22, 2020, November 29, 2021 or October 24, 2022 and therefore have a limited operating history. Past performance should not be considered indicative of future performance.

The futures contracts composing the Constituents may be replaced by substitutes upon the occurrence of certain extraordinary events.

As described under “Background on the J.P. Morgan Futures Indices — Succession and Extraordinary Events” below, following the occurrence of certain extraordinary events with respect to a futures contract, the affected futures contract may be replaced by a substitute futures contract or the calculation agent of a Constituent may cease calculation and publication of that Constituent on a date determined by the calculation agent of that Constituent. These extraordinary events generally include events that could materially interfere with the ability of market participants to transact in, or events that could materially change the underlying economic exposure of, positions with respect to a Constituent, any futures contract or any reference index, where that material interference or change is not acceptable to the calculation agent of the Constituents. See “Background on the J.P. Morgan Futures Indices — Succession and Extraordinary Events” below for a summary of events that could trigger an extraordinary event.

You should realize that the changing of a futures contract may affect the performance of a Constituent, and therefore, the return on the notes, as the replacement futures contract may perform significantly better or worse than the original futures contract.

Risks Relating to the Equity Constituents

JPMorgan Chase & Co., our parent company, is currently one of the companies that makes up the S&P 500® Index, the reference index underlying the futures contracts included in one of the Equity Constituents.

JPMorgan Chase & Co., and the other issuers of the securities included in the reference index underlying the futures contracts included in one of the Equity Constituents, will have no obligation to consider your interests as a holder of the notes in taking any action that might affect the value of your notes.

The Index will be subject to risks associated with small-capitalization stocks.

The stocks that constitute the Russell 2000® Index, the reference index underlying the futures contracts included in one of the Equity Constituents, are issued by companies with relatively small market capitalization. The stock prices of smaller companies may be more volatile than stock prices of large-capitalization companies. Small-capitalization companies may be less able to withstand adverse economic, market, trade and competitive conditions relative to larger companies. These companies tend to be less well-established than large market capitalization companies. Small-capitalization companies are less likely to pay dividends on their stocks, and the presence of a dividend payment could be a factor that limits downward stock price pressure under adverse market conditions.

Risks Relating to the Bond Constituents

JPMS is a primary dealer in connection with purchases and sales of U.S. Treasury securities by the U.S. Federal Reserve and JPMS’s actions in that capacity may affect the levels of two of the Bond Constituents.

One of our affiliates, JPMS, is one of the primary dealers through which the U.S. Federal Reserve conducts open-market purchases and sales of U.S. Treasury and federal agency securities, including U.S. Treasury notes. These activities may affect the prices and yields on the U.S. Treasury notes, which may in turn affect the levels of two of the Bond Constituents and the level of the Index. JPMS has no obligation to take into consideration your interests as a holder of the notes when undertaking these activities.

The notes are subject to significant risks associated with fixed-income securities, including interest rate-related risks.

The Bond Constituents attempt to track the performance of indices composed of fixed-income securities. Investing in the notes that provide exposure to those Bond Constituents differs significantly

from investing directly in bonds to be held to maturity, as the values of those Bond Constituents change, at times significantly, during each trading day based upon the current market prices of their underlying bonds. The market prices of these bonds are volatile and significantly influenced by a number of factors, particularly the duration of the underlying bonds, the yields on these bonds as compared to current market interest rates and the actual or perceived credit quality of the issuer of these bonds.

In general, fixed-income instruments are significantly affected by changes in current market interest rates. As interest rates rise, the prices of fixed-income instruments are likely to decrease. Instruments with longer durations tend to be more sensitive to interest rate changes, usually making them more volatile than securities with shorter durations. As a result, rising interest rates may cause the value of the long-dated bonds underlying the relevant Bond Constituents to decline, possibly significantly, which would adversely affect the value of the notes.

Interest rates are subject to volatility due to a variety of factors, including:

- sentiment regarding underlying strength or weakness in the local economies of the issuers of the securities underlying the relevant Bond Constituents and global economies;
- expectations regarding the level of price inflation;
- sentiment regarding credit quality in the markets of the issuers of the securities underlying the relevant Bond Constituents and global credit markets;
- central bank policies regarding interest rates; and
- the performance of capital markets that include the issuers of the securities underlying the relevant Bond Constituents and foreign capital markets.

Interest rates on the underlying bonds may become negative during the term of the notes. Assuming rates remain unchanged, the value of a position in bonds yielding negative interest rates will decline over time. In addition, if the interest rates on the underlying bonds become negative, their volatility may increase. Accordingly, if the interest rates of the underlying bonds become negative, the Bond Constituent and the value of the notes may be adversely affected.

The value of the notes may be influenced by unpredictable changes in the markets and economies of the local governments of the issuers of the bonds held by the Bond Constituents.

The values of the Bond Constituents may be influenced by unpredictable changes, or expectations of changes, in the local markets for the bonds underlying the futures included in the Bond Constituents. Changes in the local governments of the issuers of those bonds that may influence the value of the notes include:

- economic performance, including any financial or economic crises and changes in the gross domestic product, the principal sectors, inflation, employment and labor, and prevailing prices and wages;
- the monetary system, including the monetary policy, the exchange rate policy, the economic and tax policies, banking regulation, credit allocation and exchange controls;
- the external sector, including the amount and types of foreign trade, the geographic distribution of trade, the balance of payments, and reserves and exchange rates;
- public finance, including the budget process, any entry into or termination of any economic or monetary agreement or union, the prevailing accounting methodology, the measures of fiscal balance, revenues and expenditures, and any government enterprise or privatization program; and
- public debt, including external debt, debt service and the debt record.

These factors interrelate in complex ways, and the effect of one factor on the market value of the bonds underlying the futures included in the Bond Constituents may offset or enhance the effect of another factor. Changes in the values of the Bond Constituents may adversely affect any payment on the notes.

The Bond Constituents may be affected by changes in the perceived creditworthiness of the governments that issue the underlying bonds.

The prices of each underlying bond and the related futures contracts are significantly influenced by the creditworthiness of the government that issues that underlying bond. U.S. rating agencies have downgraded the credit ratings and/or assigned negative outlooks to many governments worldwide, including the United States, Germany and Japan, and may continue to do so in the future. Any perceived decline in the creditworthiness of the governments that issue the underlying bonds, as a result of a credit rating downgrade or otherwise, may cause the yield on the relevant underlying bonds to increase and the prices of such underlying bonds to fall, perhaps significantly, and may cause increased volatility in local or global credit markets. In addition, any perceived improvement in the creditworthiness of the governments that issue the underlying bonds may result in an increase in the risk tolerance of market participants, which may cause the yield on the relevant underlying bonds to increase and the prices of such underlying bonds to fall. Any such decline over the term of the notes would adversely impact the prices of the relevant futures contracts and could have a negative impact on the level of the Index and the value of the notes.

We cannot assure you that the public information provided on the issuer of an underlying bond is accurate or complete.

All disclosures contained in this underlying supplement are derived from publicly available documents and other publicly available information, without independent verification. We have not participated, and will not participate, in the preparation of such documents or made any due diligence inquiry with respect to the issuer of an underlying bond in connection with the offering of the notes. We do not make any representation that such publicly available documents or any other publicly available information regarding the issuer of an underlying bond is accurate or complete, and are not responsible for public disclosure of information by the issuer of an underlying bond, whether contained in filings with the SEC or otherwise. Furthermore, we cannot give any assurance that all events occurring prior to the date of the relevant terms supplement (including events that would affect the accuracy or completeness of the publicly available documents of the issuer of an underlying bond) that would affect the price of that underlying bond will have been publicly disclosed. Subsequent disclosure of any of those events or the disclosure of or failure to disclose material future events concerning the issuer of any underlying bond could adversely affect any payments on the notes. Any prospective purchaser of the notes should undertake an independent investigation of the issuer of any underlying bond as in its judgment is appropriate to make an informed decision with respect to an investment in the notes.

Risks Relating to the Commodity Constituents

The notes are not regulated by the Commodity Futures Trading Commission (the “CFTC”).

The net proceeds to be received by us from the sale of the notes will not be used to purchase or sell any futures contracts or options on futures contracts for your benefit. An investment in the notes thus does not constitute either an investment in futures contracts or options on futures contracts or an investment in a collective investment vehicle that trades in these futures contracts (*i.e.*, the notes will not constitute a direct or indirect investment by you in the futures contracts), and you will not benefit from the regulatory protections of the CFTC. Among other things, this means that, regardless of whether we are registered with the CFTC as a futures commission merchant, you will not benefit from the CFTC’s or any other non-U.S. regulatory authority’s regulatory protections afforded to persons who trade in futures contracts on a regulated futures exchange through a registered futures commission merchant. For example, the price you pay to purchase notes will be used by us for our own purposes and will not be subject to customer funds segregation requirements provided to customers that trade futures on an exchange regulated by the CFTC.

Unlike an investment in the notes, an investment in a collective investment vehicle that invests in futures contracts on behalf of its participants may be subject to regulation as a commodity pool and its operator may be required to register with and be regulated by the CFTC as a commodity pool operator, or qualify for an exemption from the registration requirement. Because the notes will not be interests in a commodity pool, the notes will not be regulated by the CFTC as a commodity pool, we will not be

registered with the CFTC as a commodity pool operator and you will not benefit from the CFTC's or any non-U.S. regulatory authority's protections afforded to persons who invest in regulated commodity pools.

The commodity futures contracts underlying the Commodity Constituents are subject to legal and regulatory regimes that may change in ways that could affect our ability to hedge our obligations under the notes, may have an adverse effect on the level of the Index and/or could lead to a commodity hedging disruption event and its attendant consequences.

Futures contracts and options on futures contracts markets, including the futures contracts underlying the Commodity Constituents, are subject to extensive regulation and margin requirements. The CFTC and the exchanges on which those futures contracts trade are authorized to take extraordinary actions in the event of a market emergency, including, for example, the retroactive implementation of speculative position limits or higher margin requirements, the establishment of daily limits and the suspension of trading. Furthermore, certain exchanges have regulations that limit the amount of fluctuation in futures contract prices that may occur. These limits could adversely affect the market prices of relevant futures contracts and forward contracts. The regulation of commodity transactions in the United States is subject to ongoing modification by governmental and judicial action. In addition, various non-U.S. governments have expressed concern regarding the disruptive effects of speculative trading in the commodity markets and the need to regulate the derivative markets in general. The effect on the value of the notes of any future regulatory change is impossible to predict but could be substantial and adverse to the interests of holders of notes linked to the Index.

Notably, with respect to agricultural and exempt commodities as defined in the Commodity Exchange Act (generally, physical commodities such as agricultural commodities, energy commodities and metals) the CFTC has authority to establish limits on the number of positions, other than bona fide hedge positions, that may be held by any person in a commodity through futures contracts, options on futures contracts and other related derivatives, such as swaps, that are economically equivalent to those contracts. In addition, designated contract markets and swap execution facilities, as defined in the Commodity Exchange Act, are authorized to establish and enforce position limits or position accountability requirements on their own markets or facilities, which must be at least as stringent as the CFTC's where CFTC limits also apply.

In October 2020, the CFTC adopted rules to establish revised or new position limits on 25 agricultural, metals and energy commodity derivatives contracts. The limits apply to a number of commodity futures contracts, such as CBOT Soybeans, Soybean Meal and Wheat futures; ICE Futures US Cotton No. 2, Sugar No. 11 and Sugar No. 16 futures; NYMEX Light Sweet Crude Oil, NYMEX NY Harbor USLD Heating Oil, NY Harbor Gasoline Blendstock and Henry Hub Natural Gas futures; and COMEX Gold, Silver and Copper futures and NYMEX Palladium futures. The limits apply to a person's combined position in the specified 25 futures contracts and options on futures ("core referenced futures contracts"), futures and options on futures directly or indirectly linked to the core referenced futures contracts, and economically equivalent swaps. These rules came into effect on January 1, 2022 for covered futures and options on futures contracts and on January 1, 2023 for covered swaps. The rules may reduce liquidity in the exchange-traded market for those commodity-based futures contracts, which may, in turn, have an adverse effect on any payments, and the value of, on the notes.

Upon the occurrence of legal or regulatory changes that the calculation agent determines have interfered with our or our affiliates' ability to hedge our obligations under the notes, including under the CFTC position limit rules mentioned above, or if for any other reason we or our affiliates are unable to enter into or maintain hedge positions the calculation agent deems necessary to hedge our obligations under the notes, a commodity hedging disruption event may occur. Please see the accompanying product supplement for more information about commodity hedging disruption events and their attendant consequences.

Commodity futures prices may change unpredictably, affecting the values of the Commodity Constituents and the value of the notes in unforeseeable ways.

Trading in commodity futures contracts underlying the Commodity Constituents is speculative and can be extremely volatile. A decrease in the price of any of the commodities upon which the futures

contracts that compose the Commodity Constituents are based may have a material adverse effect on the value of the notes and your return on an investment in the notes. Market prices of the commodities on which the futures contracts that compose the Commodity Constituents are based may fluctuate rapidly based on numerous factors, including: changes in supply and demand relationships, governmental programs and policies, national and international monetary, trade, political, geopolitical and economic events, wars (e.g., Russia's invasion of Ukraine and resulting sanctions) and acts of terror, changes in interest and exchange rates, speculation and trading activities in commodities and related contracts, weather, agricultural, trade, fiscal and exchange control policies, and market confidence in relevant markets, exchanges and custodians. The price volatility of each commodity also affects the value of the futures and forward contracts related to that commodity and therefore its price at any particular time. The price of any one commodity may be correlated to a greater or lesser degree with the prices of any other commodity and factors affecting the general supply and demand as well as the prices of other commodities may affect the particular commodity in question. The commodities markets are subject to temporary distortions or other disruptions due to various factors, including the lack of liquidity in the markets, the participation of speculators and government regulation and intervention. Many commodities are also highly cyclical. These factors, some of which are specific to the nature of each such commodity, may affect the value of the different commodities upon which the futures contracts that compose the Commodity Constituents are based, and may cause the values of the futures contracts themselves to move in inconsistent directions at inconsistent rates. This, in turn, will affect the values of the Commodity Constituents and the value of the notes. It is not possible to predict the aggregate effect of all or any combination of these factors.

In addition, prices of commodity futures contracts may be near zero, zero or negative, which can occur rapidly and unexpectedly. For example, in April 2020, the collapse of demand for fuel following government restrictions on travel contributed to an oversupply of crude oil that rapidly filled most available oil storage facilities. Storage shortages meant that market participants who had contracted to buy and take delivery of crude oil were therefore at risk of default under the terms of the May 2020 NYMEX West Texas Intermediate ("WTI") crude oil futures contract. The critical scarcity of storage forced some market participants to sell their futures contracts at a negative price (effectively paying another market participant to accept delivery of the crude oil referenced by the relevant contracts). As a result, for the first time in history, crude oil futures contracts traded below zero. On April 20, 2020, the last trading day before expiration of the May 2020 WTI crude oil futures contract, prices of that contract fell to negative \$37.63. If any futures contract referenced by a Commodity Constituent reaches a near-zero, zero or negative price, the market value of and return on the notes could be adversely affected, potentially severely and in unanticipated ways, and you may lose a significant portion, perhaps all, of your investment in the notes.

An investment in the notes may be subject to risks associated with the non-U.S. exchanges or markets.

One of the Commodity Constituents tracks futures contracts that are traded on ICE Futures Europe (Brent crude). Investments in securities linked to the value of commodities whose prices are determined by non-U.S. markets or commodity futures contracts that are traded on non-U.S. exchanges involve risks associated with the markets in those countries, including risks of volatility in those markets and governmental intervention in those markets.

The Commodity Constituents do not offer direct exposure to commodity spot prices.

The values of the Commodity Constituents are intended to track generally the performance of commodity-futures contracts on physical commodities, not physical commodities (or their spot prices). The price of a futures contract reflects the expected value of the commodity upon delivery in the future, whereas the spot price of a commodity reflects the immediate delivery value of the commodity. A variety of factors can lead to a disparity between the expected future price of a commodity and the spot price at a given point in time, such as the cost of storing the commodity for the term of the futures contract, interest charges incurred to finance the purchase of the commodity and expectations concerning supply and demand for the commodity. The price movements of a futures contract are typically correlated with the movements of the spot price of the reference commodity, but the correlation is generally imperfect and price movements in the spot market may not be reflected in the futures market (and vice versa).

Accordingly, the notes may underperform a similar investment that reflects the return on physical commodities.

The prices of commodities are volatile and are affected by numerous factors, some of which are specific to the market for each commodity futures contract underlying the Commodity Constituents.

A change in the price of any of the commodity futures contracts underlying the Commodity Constituents may have a material adverse effect on the value of the notes and your return on your investment in the notes. Commodities futures contracts are subject to the effect of numerous factors, certain of which are specific to the commodity for each commodity futures contract underlying the Commodity Constituents, as discussed below.

Brent Crude Oil

The price of IPE Brent blend crude oil futures is primarily affected by the global demand for and supply of crude oil, but is also influenced significantly from time to time by speculative actions, by currency exchange rates and by factors affecting the specific blends deliverable as Brent crude oil, as well as by periodic changes in which blends are deliverable as Brent crude oil. Crude oil prices are volatile and subject to dislocation. Demand for refined petroleum products by consumers, as well as the agricultural, manufacturing and transportation industries, affects the price of crude oil. Crude oil's end-use as a refined product is often as transport fuel, industrial fuel and in-home heating fuel. Potential for substitution in most areas exists, although considerations, including relative cost, often limit substitution levels. Because the precursors of demand for petroleum products are linked to economic activity, demand will tend to reflect economic conditions. Demand is also influenced by government regulations, such as environmental or consumption policies. In addition to general economic activity and demand, prices for crude oil are affected by political events, labor activity and, in particular, direct government intervention (such as embargos) or supply disruptions in major oil-producing regions of the world. Such events tend to affect oil prices worldwide, regardless of the location of the event. Supply for crude oil may increase or decrease depending on many factors. These include production decisions by the Organization of the Petroleum Exporting Countries ("OPEC") and other crude oil producers. Crude oil prices are determined with significant influence by OPEC. OPEC has the potential to influence oil prices worldwide because its members possess a significant portion of the world's oil supply. In the event of sudden disruptions in the supplies of oil, such as those caused by war, natural events, accidents or acts of terrorism, prices of oil futures contracts could become extremely volatile and unpredictable. Also, sudden and dramatic changes in the futures market may occur, for example, upon a cessation of hostilities that may exist in countries producing oil, the introduction of new or previously withheld supplies into the market or the introduction of substitute products or commodities. Crude oil prices may also be affected by short-term changes in supply and demand because of trading activities in the oil market and seasonality (e.g., weather conditions such as hurricanes). It is not possible to predict the aggregate effect of all or any combination of these factors.

Gold

The price of gold futures is primarily affected by the global demand for and supply of gold. The market for gold bullion is global, and gold prices are subject to volatile price movements over short periods of time and are affected by numerous factors, including macroeconomic factors, such as the structure of and confidence in the global monetary system, expectations regarding the future rate of inflation, the relative strength of, and confidence in, the U.S. dollar (the currency in which the price of gold is usually quoted), interest rates, gold borrowing and lending rates and global or regional economic, financial, political, regulatory, judicial or other events. Gold prices may be affected by industry factors, such as industrial and jewelry demand as well as lending, sales and purchases of gold by the official sector, including central banks and other governmental agencies and multilateral institutions that hold gold. Additionally, gold prices may be affected by levels of gold production, production costs and short-term changes in supply and demand due to trading activities in the gold market. From time to time, above-ground inventories of gold may also influence the market. It is not possible to predict the aggregate effect of all or any combination of these factors. The price of gold has recently been, and may continue to be, extremely volatile.

The relevant terms supplement or a separate underlying supplement will provide additional risk factors relating to any other index or reference assets to which the notes are linked.

THE J.P. MORGAN MULTI-ASSET INDEX

Terms defined within this “The J.P. Morgan Multi-Asset Index” section are defined only with respect to this “The J.P. Morgan Multi-Asset Index” section.

The J.P. Morgan Multi-Asset Index (the “**Index**”) was developed and is maintained and calculated by J.P. Morgan Securities LLC (“**JPMS**”). The description of the Index and methodology included in this underlying supplement is based on rules formulated by JPMS (the “**Rules**”). The Rules, and not this description, will govern the calculation and constitution of the Index and other decisions and actions related to its maintenance. The Rules in effect as of the date of this underlying supplement are attached as Annex A to this underlying supplement. The Index is the intellectual property of JPMS, and JPMS reserves all rights with respect to its ownership of the Index. The Index is reported by Bloomberg L.P. under the ticker symbol “MAX Index.”

The Index seeks to provide a dynamic and diversified asset allocation based on a momentum investment strategy. The Index tracks the return of (a) a dynamic notional portfolio consisting of up to 10 excess return futures-based indices (each a “**Constituent**,” and collectively the “**Constituents**”), converted into U.S. dollars (in the case of Constituents not denominated in U.S. dollars), *less* (b) a 1.00% per annum daily deduction. The Constituents represent a broad range of asset classes (equities, fixed income and commodities) and developed markets (the United States, Germany and Japan).

The Index selects and rebalances into a new notional portfolio composed of the Constituents at least once each month using a methodology that is designed to:

- maintain a diversified allocation at all times;
- allocate dynamically based on the market cycle; and
- select allocations that attempt to deliver a stable volatility over time.

Maintaining a diversified allocation. A diversified portfolio’s return is the weighted average of its constituents’ returns, but its volatility is less than the weighted average of its constituents’ volatilities, because different assets don’t always move in the same direction — in this sense, a diversified portfolio can be said to deliver average returns with below-average volatility. In order to ensure diversification, the Index constitutes its selected portfolio from a universe of 10 Constituents, and imposes caps and floors on the Constituent weights at the individual and asset class levels. Each Constituent’s assigned weight must also be an increment of 5%, and the assigned weights must sum to 100%. The following table sets forth the current Constituents, the ticker for each Constituent, the minimum and maximum assigned weight for each Constituent and the minimum and maximum aggregate assigned weight for each asset class. For additional information about the Constituents, see “Background on the J.P. Morgan Futures Indices” below.

| | Constituent | Ticker | Individual Assigned Weight Constraints | Aggregate Assigned Weight Constraints |
|---|---|---------------|--|---------------------------------------|
| 1 | J.P. Morgan US Large Cap Equities Futures Index | JPUSLGE Q | Minimum: -10% Maximum: 40% | Minimum: 10% Maximum: 60% |
| 2 | J.P. Morgan US Small Cap Equities Futures Index | JPUS SME Q | | |
| 3 | J.P. Morgan German Equities Futures Index | JPDEEQ | | |
| 4 | J.P. Morgan Japanese Equities Futures Index | JPJPEQ | | |

| | Constituent | Ticker | Individual Assigned Weight Constraints | Aggregate Assigned Weight Constraints |
|----|--|----------|--|---------------------------------------|
| 5 | J.P. Morgan 5Y U.S. Treasury Futures Index | JPUS5YT | Minimum: -10% Maximum: 40% | Minimum: 10% Maximum: 80% |
| 6 | J.P. Morgan 10Y U.S. Treasury Futures Index | JPUS10YT | | |
| 7 | J.P. Morgan German Government Bond Futures Index | JPDEBUND | | |
| 8 | J.P. Morgan Japanese Government Bond Futures Index | JPJP10YB | | |
| 9 | J.P. Morgan Brent Crude Oil Futures Index | JPBRENT | Minimum: -20% Maximum: 20% | Minimum: -30% Maximum: 30% |
| 10 | J.P. Morgan Gold Futures Index | JPMGOLD | | |

Allocating dynamically based on the market cycle. Historical data and statistical analysis support the premise that assets tend to move in multi-year cycles. Depending on the asset class, these cycles can range from five to 30 years. The presence of these trends is one possible explanation for the academic research showing that, historically, asset classes exhibiting strong recent returns have been more likely to continue to exhibit positive returns. The Index attempts to take advantage of this dynamic by identifying a selected portfolio that reflects the strongest recent returns in local-currency terms from among the possible portfolios that meet the weight constraints set forth above and the volatility threshold described below.

Targeting stable volatility. One measure of risk used by many investors is volatility, which reflects the degree of variation in the value of an asset or portfolio over a period of time. Unlike asset-allocation approaches that aim to maintain stable proportions of different assets throughout the market cycle, the Index attempts to maintain a stable level of volatility over time. As compared to an approach that maintains consistent weights through the market cycle, the Index is designed to take on more volatility risk in calm markets and deliver lower volatility in choppy ones.

Identifying a selected portfolio. At least once each month, the Index identifies every notional portfolio that meets the individual Constituent and asset class weight constraints set forth above with weights in increments of 5% and a total weight of 100% and that has a recent historical volatility at or below a volatility threshold of 4%. The Index then selects and rebalances into the notional portfolio from that set with the strongest recent performance in local-currency terms. If no such notional portfolio exists, then the volatility threshold is increased by 1% (e.g., from 4% to 5%), and the procedure described in this paragraph is repeated, including the increase to the volatility threshold, until a notional portfolio has been selected.

Calculating the level of the Index. On any given day, the closing level of the Index (the “**Index Level**”) reflects (a) the weighted U.S. dollar performance of the Constituents tracked by the Index on that day *less* (b) the 1.00% per annum daily deduction. The Index Level was set equal to 100.00 on February 22, 1994, the base date of the Index. The Index Calculation Agent (as defined below) began calculating the Index on a live basis on November 18, 2022.

The Index is an “excess return” index because it provides notional exposure to the Constituents that in turn provide exposure to futures contract returns that reflect changes in the price of those futures contracts, as well as their “roll” returns. The Index is not a “total return” index because the Constituents do not reflect interest that could be earned on funds notionally committed to the trading of futures contracts.

No assurance can be given that the investment strategy used to construct the Index will be successful or that the Index will outperform any alternative portfolio or strategy that might be constructed from the Constituents. There is no guarantee that past performance trends referenced in identifying a selected portfolio will continue during the subsequent period when the Index provides exposure to that selected portfolio. In addition, no assurance can be given that the actual realized volatility of the Index will approximate 4%. The actual realized volatility of the Index will depend on the performance of the Constituents included in the selected portfolio(s) from time to time, and, at any time or for extended periods, may be greater than 4%, perhaps significantly, or less than 4%. Furthermore, the volatility threshold is subject to upward adjustment and, thus, the realized volatility threshold used to determine any selected portfolio may be greater than 4%, perhaps significantly.

The Index is described as a “notional” or “synthetic” portfolio of assets because there is no actual portfolio of assets to which any person is entitled or in which any person has any ownership interest. The Index merely references certain assets, the performance of which will be used as a reference point for calculating the Index Level.

Identifying the Selected Portfolio

On each selection date, the Index Calculation Agent identifies a single portfolio composed of the Constituents (the “**Selected Portfolio**”) from among the set of hypothetical portfolios that meet the weight constraints, based on an evaluation of the historical performance and volatility of each of those hypothetical portfolios. Selection dates occur monthly on the Weekday immediately preceding the fifth-to-last Index Business Day of each calendar month. In addition, if on any Weekday the volatility of the most recent Selected Portfolio is more than twice the volatility of that Selected Portfolio as of the selection date of that Selected Portfolio, then that Weekday will also be a selection date. For this purpose, the volatility of a Selected Portfolio is the highest of the annualized realized volatilities of that Selected Portfolio over the immediately preceding one-month, three-month and twelve-month periods.

“**Weekday**” means a calendar day that is a Monday, Tuesday, Wednesday, Thursday or Friday.

“**Index Business Day**” means a day on which the New York Stock Exchange is scheduled to open for trading for its regular trading session.

Step 1: Identify All Eligible Portfolios

On each selection date, the Index Calculation Agent identifies all possible portfolios composed of Constituents that satisfy the following weight constraints (each, an “**Eligible Portfolio**”):

- (i) the sum of the assigned weights for all the Constituents is equal to 100% (i.e., the Index is always fully invested without leverage);
- (ii) the assigned weight for each Constituent is an integral multiple of 5% (e.g., -10%, -5%, 0%, 5%, 10%, 15%, etc.);
- (iii) the assigned weight for each Constituent is (a) greater than or equal to any minimum individual assigned weight for that Constituent and (b) less than or equal to any maximum individual assigned weight for that Constituent, in each case, as set forth in the table above; and
- (iv) the sum of the assigned weights for the Constituents in any asset class is (a) greater than or equal to any minimum aggregate assigned weight for that asset class and (b) less than or equal to any maximum aggregate assigned weight for that asset class, in each case, as set forth in the table above.

Step 2: Select the Eligible Portfolio with the Highest Performance, Subject to a Volatility Threshold

On each selection date, the Index Calculation Agent selects the Eligible Portfolio with the highest performance that has a volatility less than or equal to a volatility threshold of 4% as the Selected Portfolio; *provided that*, if there is more than one Eligible Portfolio with the same highest performance, the Eligible

Portfolio that has the lowest volatility will be selected. If none of the Eligible Portfolios has a volatility equal to or less than 4%, the Index Calculation Agent will increase the volatility threshold by 1% and will repeat the procedure described in this paragraph, including the increase to the volatility threshold, until a portfolio has been selected.

For purposes of determining a Selected Portfolio:

- (i) the performance of an Eligible Portfolio is the average of the local-currency performances of that Eligible Portfolio (*i.e.*, Constituents that are not denominated in U.S. dollars are not converted into U.S. dollars) over the immediately preceding one-month, three-month and twelve-month periods; and
- (ii) the volatility of an Eligible Portfolio is the highest of the annualized realized volatilities of that Eligible Portfolio over the immediately preceding one-month, three-month and twelve-month periods.

See the Rules for additional information about how the Index Calculation Agent calculates the returns and annualized realized volatility of each Eligible Portfolio.

Rebalancing of the Index

In connection with each rebalancing, the Index exits its notional position in the Selected Portfolio associated with the prior selection date and enters a notional position in the Selected Portfolio associated with the current selection date. This rebalancing of the Index in respect of each Constituent is effected in equal increments over five rebalancing days, occurring over the five consecutive Dealing Days for that Constituent following each selection date (the “**Rebalancing Period**”), *provided* that rebalancing days for an incoming or outgoing Constituent are subject to postponement or adjustment if a market disruption affecting that Constituent has occurred or is continuing, as described under “Index Market Disruption Events” below. Subject to the occurrence of a disruption, each Constituent is rebalanced on each rebalancing day based on its official closing level, converted into U.S. dollars (if that Constituent is not denominated in U.S. dollars) based on the exchange rate determined by the Index Calculation Agent (generally based on rates published by The WM Company) as set out in the Rules. For time periods prior to the availability of relevant official closing spot rate published by or on behalf of the WM Company used in calculating the Index, any hypothetical back-tested performance of the Index relies on alternative sources for exchange rates.

“**Dealing Day**” is defined in the Rules and means generally, for each Constituent, a Weekday on which (a) the official closing level of that Constituent is scheduled to be calculated and published by the sponsor of that Constituent and (b) the exchange rate for that Constituent (if that Constituent is not denominated in U.S. dollars) is scheduled to be calculated and published by the relevant price source as set out in the Rules.

Calculation and Publication of the Index Level

The Index Calculation Agent will calculate the Index Level with respect to each Weekday and will publish the Index Level to an accuracy of two decimal places on each Index Business Day on which no Constituent is affected by a market disruption. The Index Level on each Weekday reflects the weighted U.S. dollar performance of the Constituents tracked by the Index since the immediately preceding Weekday less the daily deduction of 1.00% per annum. As a result of the daily deduction, the level of the Index will trail the value of a hypothetical identically constituted notional portfolio from which no such deduction is made. The U.S. dollar performance of a Constituent reflects the performance of that Constituent from the immediately preceding Weekday, converted into U.S. dollars (if that Constituent is not denominated in U.S. dollars) based on the exchange rate on that Weekday determined by the Index Calculation Agent as set out in the Rules. If any Weekday is not a Dealing Day for a Constituent or is subject to a market disruption for that Constituent, the official closing level of that Constituent on the immediately preceding Weekday that was not subject to a market disruption is used in calculating the Index Level.

While the Index Calculation Agent will publish the Index Level to an accuracy of two decimal places, the Index Calculation Agent may calculate the Index to a greater degree of accuracy or specificity and may use any rounding convention it considers appropriate for any data used or calculations performed (which may include using data with a higher level of specificity than that which is published on any particular data source) to determine the Index Level.

See the Rules for additional information about the calculation of the Index Level.

Index Market Disruption Events

The calculation and publication of the Index Level and the rebalancing of the Index will be affected by the occurrence of certain market disruptions relating to the Constituents. For purposes of the Index, only the non-publication of the official closing level of a Constituent on a Dealing Day will constitute a market disruption in respect of that Constituent. See “Background on the J.P. Morgan Futures Indices — Index Market Disruption Events” for additional information about the effect of market disruptions on the publication of the official closing levels of the Constituents.

If a market disruption affecting an incoming or outgoing Constituent has occurred or is continuing on a scheduled rebalancing day, that rebalancing day will generally be postponed with respect to that Constituent until no such market disruption is occurring. The five rebalancing days in a Rebalancing Period for an incoming or outgoing Constituent will occur on five separate calendar days, notwithstanding the postponement of one or more days due to a market disruption. If a rebalancing day for a Constituent is postponed, any subsequent rebalancing days in the same Rebalancing Period for that Constituent will also be postponed so as to prevent multiple rebalancing days from occurring on the same day.

See the Rules for additional information about market disruptions and their effects on the Index.

Succession and Extraordinary Events

Upon the occurrence of certain succession events set out in the Rules that affect a Constituent, the Index Calculation Agent will replace the affected Constituent with a successor to that Constituent.

In addition, upon the occurrence of certain events set out in the Rules that are referred to as extraordinary events, and if Index Calculation Agent determines that the applicable event materially interferes with the ability of market participants to transact in positions with respect to the Index, then the Index Calculation Agent will replace the affected Constituent with a successor to that Constituent or with a substitute that the Index Calculation Agent determines, in its sole discretion, possesses substantially similar characteristics or provides substantially similar exposure as compared to the original Constituent. If no such successor or substitute is available, the Index Calculation Agent will replace the affected Constituent with a substitute that the Index Calculation Agent determines to be an appropriate substitute, considering the context of the Index and the weight constraints. If no such substitute is available, the Index Calculation Agent will determine its good faith estimate of the closing level of that Constituent and remove it from the Index. In any such case, the Index Calculation Agent will, in good faith, make related adjustments to the Rules that it determines to be appropriate.

The extraordinary events are set out in full in the Rules and include, without limitation, (a) the permanent cancellation of a Constituent, if no successor exists, (b) the occurrence of a market disruption affecting a Constituent that continues for a sustained period, (c) the occurrence of a material event in respect of the currency in which a Constituent is denominated, if not the U.S. dollar, including, but not limited to, an event affecting the convertibility or delivery of that currency, (d) the termination or impairment of any relevant license or other right relied upon by the Index Calculation Agent in administering the Index and (e) the occurrence of certain changes in law.

The Index Sponsor may, in its reasonable discretion, at any time and without notice, terminate the calculation or publication of the Index, including, without limitation, subsequent to the occurrence of an extraordinary event. The Index Sponsor is under no obligation to continue the calculation and publication of the Index.

Corrections

If the closing level of any Constituent is publicly corrected after its initial dissemination or if the Index Calculation Agent identifies an error or omission in respect of the Index, and if the Index Calculation Agent determines that the correction, error or omission is material, then the Index Calculation Agent may make an adjustment or correction to the Index Level.

The Index Sponsor and the Index Calculation Agent

JPMS is currently the sponsor of the Index (together with any successor sponsor or assign, the “**Index Sponsor**”). The Index Sponsor may appoint a successor sponsor or assign, delegate or transfer any or all of its rights, obligations or responsibilities in its capacity as Index Sponsor in connection with the Index to one or more entities (including an unrelated third party) that the Index Sponsor determines is appropriate.

The Index Sponsor is also responsible for the appointment of the calculation agent of the Index (the “**Index Calculation Agent**”), which may be the Index Sponsor, an unrelated third party or an affiliate or subsidiary of the Index Sponsor. JPMS is currently the Index Calculation Agent. The Index Sponsor may at any time and for any reason (i) appoint a successor Index Calculation Agent if the Index Sponsor is at that time the Index Calculation Agent or (ii) terminate the appointment of the Index Calculation Agent and appoint an alternative entity as a replacement Index Calculation Agent if the Index Sponsor is not at that time the Index Calculation Agent. The Index Calculation Agent (unless the Index Calculation Agent is the same entity as the Index Sponsor) must obtain written permission from the Index Sponsor prior to any delegation or transfer of the Index Calculation Agent’s responsibilities or obligations in connection with the Index. The Index Calculation Agent is responsible for making calculations and determinations as described above and in the Rules.

Index Sponsor and Index Calculation Agent Determinations

The Index Calculation Agent will act in good faith and in a commercially reasonable manner in making determinations, interpretations and calculations pursuant to the Rules. Subject to the prior agreement of the Index Sponsor, the Index Calculation Agent’s determinations, and all calculations related to the Index and the Index Calculation Agent’s interpretations of the Rules, will be final.

None of the Index Sponsor, the Index Calculation Agent and any of their respective affiliates and subsidiaries and any of their respective directors, officers, employees, representatives, delegates and agents (each, a “**Relevant Person**”) will have any responsibility to any person (whether as a result of negligence or otherwise) for any determinations, interpretations or calculations made or anything done (or omitted to be determined or done) in connection with the Index or any use to which any person may put the Index or the Index Levels.

Subject to the prior agreement of the Index Sponsor, the Index Calculation Agent may make certain determinations, adjustments, amendments and interpretations related to the Index. All such determinations, adjustments, amendments and interpretations (in each case, subject to such prior agreement on the part of the Index Sponsor) of the Index Calculation Agent related to the Index and all calculations performed by the Index Calculation Agent related to the Index will be final, conclusive and binding and no person will be entitled to make any claim against the Index Sponsor, the Index Calculation Agent, or any of the Relevant Persons in respect thereof. Once a determination, adjustment, amendment or interpretation is made or action is taken by the Index Calculation Agent (in each case, as agreed in advance by the Index Sponsor) in relation to the Index, or a calculation is performed by the Index Calculation Agent in relation to the Index, none of the Index Sponsor, the Index Calculation Agent or any Relevant Person will be under any obligation to revise any such determination, adjustment, amendment, interpretation or calculation made or anything done (or omitted to be determined, adjusted, amended, interpreted, calculated or done) for any reason.

The Index Calculation Agent’s exercise of discretion or failure to exercise discretion in relation to the Index may have a detrimental effect on the Index Level and the volatility of the Index. The Index Sponsor

or the Index Calculation Agent may make certain determinations or calculations based on information obtained from publicly available sources without independently verifying such information.

Amendment of the Rules; Termination of the Index

The Rules may be supplemented, amended or restated from time to time in the sole discretion of the Index Sponsor. The Rules will be made available (in a manner determined by the Index Sponsor from time to time) following any supplementation, amendment or restatement. Following any amendment, the Index Sponsor will make available (as soon as practicable) the amended version of the Rules and will include the effective date of such amendment in the new version of the Rules. However, the Index Sponsor is under no obligation to inform any person about any amendments to the Index (except as required by law or regulation).

Although the Rules are intended to be comprehensive and accurate, ambiguities may arise and errors or omissions may have been made. In those circumstances, the Index Sponsor will resolve those ambiguities and, if necessary, amend the Rules to reflect their resolution. In the case of any inaccuracy, the Index Sponsor may amend the Rules to address errors or omissions. The Index Sponsor is under no obligation to inform any person of any amendments to the Index (except as may be required by law).

The Index Sponsor may, in its reasonable discretion, at any time and without notice, terminate the calculation or publication of the Index, including, without limitation, subsequent to the occurrence of one of the events described under “— Succession and Extraordinary Events” above. The Index Calculation Agent may, at any time and without notice, change the frequency of publication of the Index Level, the means or place of publication of the Index Level or cease the calculation, publication or dissemination of the Index Level.

BACKGROUND ON THE J.P. MORGAN FUTURES INDICES

Terms defined within this “Background on the J.P. Morgan Futures Indices” section are defined only with respect to this “Background on the J.P. Morgan Futures Indices” section.

Each index in the J.P. Morgan Futures Index Series (each, a “**Futures Index**” and collectively, the “**Futures Indices**”) was developed and is maintained and calculated by J.P. Morgan Securities LLC (“**JPMS**”). The description of the Futures Indices and methodology included in this underlying supplement is based on rules formulated by JPMS (the “**Rules**”). The Rules, and not this description, will govern the calculation and constitution of the Futures Indices and other decisions and actions related to their maintenance. The Rules in effect as of the date of this underlying supplement are attached as Annex B to this underlying supplement. The Futures Indices are the intellectual property of JPMS and its affiliates, and JPMS and its affiliates reserve all rights with respect to their ownership of the Futures Indices. The Futures Indices are reported by Bloomberg L.P. under the relevant ticker symbol set forth in the table below.

Each Futures Index tracks the excess return of a notional rolling futures position in futures contracts (each, a “**Futures Contract**”) in the relevant futures contract series (each, a “**Series**”), denominated in a specified currency (the “**Futures Index Currency**”), in each case as set forth in the table below. Each Futures Index generally tracks the front expiry futures contract in the relevant Series; however, each Futures Index rolls to the next expiry futures contract in the relevant Series over a 5-day period shortly before the expiry of the front expiry futures contract. (The next expiry futures contract will become the front expiry futures contract upon the expiration of the original front expiry futures contract.)

| Futures Index | Ticker | Series | Reference Index | Futures Index Currency | Live Date |
|--|---------------|--|------------------------|-------------------------------|-------------------|
| J.P. Morgan US Large Cap Equities Futures Index | JPUSLGEQ | E-mini® S&P 500® Futures* | S&P 500® Index | U.S. dollars | December 22, 2020 |
| J.P. Morgan US Small Cap Equities Futures Index | JPUSSMEQ | E-mini® Russell 2000® Futures** | Russell 2000® Index | U.S. dollars | November 29, 2021 |
| J.P. Morgan German Equities Futures Index | JPDEEQ | DAX® Futures | DAX® Index | Euros | November 29, 2021 |
| J.P. Morgan Japanese Equities Futures Index | JPJPEQ | TOPIX Futures | TOPIX® Index | Japanese yen | November 29, 2021 |
| J.P. Morgan 5Y U.S. Treasury Futures Index | JPUS5YT | Medium-Term U.S. Treasury Note Futures (5-Year) | N/A | U.S. dollars | November 29, 2021 |
| J.P. Morgan 10Y U.S. Treasury Futures Index | JPUS10YT | Long-Term U.S. Treasury Note Futures (6½ to 10-Year) | N/A | U.S. dollars | November 29, 2021 |
| J.P. Morgan German Government Bond Futures Index | JPDEBUND | Euro-Bund Futures | N/A | Euros | November 29, 2021 |
| J.P. Morgan Japanese Government Bond Futures Index | JPJP10YB | 10-year JGB Futures | N/A | Japanese yen | November 29, 2021 |

| Futures Index | Ticker | Series | Reference Index | Futures Index Currency | Live Date |
|---|---------|-------------------------|-----------------|------------------------|-------------------|
| J.P. Morgan Brent Crude Oil Futures Index | JPBRENT | Brent Crude Oil Futures | N/A | U.S. dollars | October 24, 2022 |
| J.P. Morgan Gold Futures Index | JPMGOLD | Gold Futures | N/A | U.S. dollars | November 29, 2021 |

* Prior to September 15, 2021, the J.P. Morgan US Large Cap Equities Futures Index referenced S&P 500® futures contracts. Since September 8, 2021, the J.P. Morgan US Large Cap Equities Futures Index has referenced E-mini® S&P 500® futures contracts. The overlap in futures contracts is due to the rolling feature of the J.P. Morgan US Large Cap Equities Futures Index.

** From February 4, 1993 to June 17, 2008, and since September 8, 2017, the J.P. Morgan US Small Cap Equities Futures Index has referenced E-mini® Russell 2000® futures contracts traded on the Chicago Mercantile Exchange. From June 12, 2008 to September 13, 2017, the J.P. Morgan US Small Cap Equities Futures Index referenced E-mini® Russell 2000® futures contracts traded on the ICE Futures U.S. The overlap in futures contracts is due to the rolling feature of the J.P. Morgan US Small Cap Equities Futures Index.

The closing level of each Futures Index (the “**Index Level**”) was set equal to 100 on the base date of that Futures Index as specified in the Rules. The Index Calculation Agent (as defined below) began calculating each Futures Index on a live basis on the live date specified in the table above. Each Futures Index is an “excess return” index because it provides notional exposure to futures contract returns that reflect changes in the price of those futures contracts, as well as any profit or loss realized when rolling the relevant futures contracts. Each Futures Index is not a “total return” index because it does not reflect interest that could be earned on funds notionally committed to the trading of futures contracts.

The Futures Indices are described as notional portfolios or baskets of assets because there is no actual portfolio of assets to which any person is entitled or in which any person has any ownership interest. The Futures Indices merely reference certain assets, the performance of which will be used as a reference point for calculating the relevant Index Level.

The construction of the Futures Indices does not reflect any investment strategy. Instead, the Futures Indices have been constructed to track, in the manner described herein, the relevant futures contracts.

Futures Index Rolling

In connection with each roll, each Futures Index exits its notional position in the front expiry futures contract in the relevant Series and enters a notional position in the next expiry futures contract in that Series. This roll of each Futures Index is effected in equal increments over five roll days, occurring over the five consecutive Index Business Days specified for that Futures Index in the Rules. Roll days are subject to postponement or adjustment if a market disruption affecting the futures contracts of the relevant Series has occurred or is continuing, as described under “Index Market Disruption Events” below.

With respect to each Futures Index, an “**Index Business Day**” is defined in the Rules and generally means a day on which the Exchange for that Futures Index is scheduled to be open for its regular trading session.

With respect to a futures contract, the “**Cut-off Day**” means the earlier to occur of (i) the last scheduled trading day for that futures contract and (ii) the first notice date (as determined pursuant to the rules of the relevant Exchange) for that futures contract, in each case as specified by the relevant Exchange.

With respect to each Futures Index, “**Exchange**” is defined in the Rules and generally means the exchange or quotation system on which the futures contracts of a Series are listed for trading (taking into account permanent or temporary successors or replacements).

Calculation and Publication of the Index Level

The Index Calculation Agent will calculate the Index Level with respect to each Index Trading Day and will publish the Index Level to an accuracy of two decimal places on that Index Trading Day. “**Index Trading Day**” is defined in the Rules as “Trading Day” and means generally an Index Business Day on which no market disruption occurs or on which the relevant Futures Index rolls a portion of its exposure from one futures contract to the next, notwithstanding the occurrence of a market disruption.

The Index Level of a Futures Index on each Index Trading Day reflects the weighted excess return performance of the futures contracts tracked by that Futures Index on that Index Trading Day. The excess return performance of a futures contract reflects the performance of the official settlement price of that futures contract. See the Rules for additional information about the calculation of the Index Level.

While the Index Calculation Agent will publish the Index Level of each Futures Index with respect to each Index Trading Day to an accuracy of two decimal places, the Index Calculation Agent may calculate that Futures Index to a greater degree of accuracy or specificity and may use any rounding convention it considers appropriate for any data used or calculations performed (which may include using data with a higher level of specificity than that which is published on any particular data source) to determine the Index Level.

Index Market Disruption Events

The calculation and publication of each Index Level and the roll of each Futures Index will be affected by the occurrence of certain market disruptions relating to the futures contracts in the relevant Series. These events are set out in full in the Rules and include, without limitation, suspensions or disruptions of trading or data unavailability relating to the futures contracts in the relevant Series, their reference indices (if applicable) or related futures or option contracts that the Index Calculation Agent determines in its sole discretion could materially interfere with the ability of market participants to transact in positions with respect to the relevant Futures Index, the futures contracts in the relevant Series, their reference indices (if applicable) or related futures or option contracts.

If a market disruption is continuing on a scheduled roll day, that roll day will generally be postponed until no such market disruption is occurring. However, if that market disruption continues for a sustained period, the Index Calculation Agent may nevertheless roll the relevant Futures Index using good faith estimates, and those estimates may be subject to later correction. Multiple roll days may occur on the same day if one or more roll days (with the aggregate roll amount for each such roll day being effectuated on that day) is postponed. The Index Level of a Futures Index will not be calculated and published on any day on which a market disruption has occurred, except for a roll day on which the Index Calculation Agent rolls a portion of the exposure of that Futures Index notwithstanding the occurrence of a market disruption.

See the Rules for additional information about market disruptions and their effects on the Futures Indices.

Succession and Extraordinary Events

Upon the occurrence of certain succession events set out in the Rules that affect a Series, the Index Calculation Agent will replace the affected Series with a successor to that Series.

In addition, upon the occurrence of certain events set out in the Rules that are referred to as extraordinary events, and if Index Calculation Agent determines that the applicable event materially interferes with the ability of market participants to transact in positions with respect to a Futures Index, then the Index Calculation Agent will replace the affected Series with a successor to that Series or with a substitute that the Index Calculation Agent determines, in its sole discretion, possesses substantially similar characteristics or provides substantially similar exposure as compared to the original Series. If no

such substitute is available, the Index Calculation Agent will replace the affected Series with a substitute that the Index Calculation Agent determines to be an appropriate substitute, considering the context of that Futures Index. In any such case, the Index Calculation Agent will, in good faith, make related adjustments to the Rules that it determines to be appropriate.

The extraordinary events are set out in full in the Rules and include, without limitation, (a) cancellation of, or a material change to the calculation of, or a material modification to, or a sustained failure to publish the level of, the reference index of a Series (if applicable), (b) the de-listing of a Series or the failure to list a futures contract in that Series, (c) the occurrence of a market disruption affecting a Series that continues for a sustained period, (d) the occurrence of a sustained premium or discount in the official settlement price of a Futures Contract as compared to its reference index (if applicable), (e) the termination or impairment of any relevant license or other right relied upon by the Index Calculation Agent in administering a Futures Index, (f) the occurrence of certain changes in law and (g) certain other events affecting the trading, liquidity or listing of a Series.

The Index Sponsor (as defined below) may, in its discretion, at any time and without notice, terminate the calculation or publication of a Futures Index, including, without limitation, subsequent to the occurrence of an extraordinary event. The Index Sponsor is under no obligation to continue the calculation and publication of any Futures Index.

Corrections

If the official settlement price of any futures contract referenced by a Futures Index is publicly corrected after its initial dissemination or if the Index Calculation Agent identifies an error or omission in respect of a Futures Index, and if the Index Calculation Agent determines that the correction, error or omission is material, then the Index Calculation Agent may make an adjustment or correction to the relevant Index Level.

The Index Sponsor and the Index Calculation Agent

JPMS is currently the sponsor of the Futures Indices (together with any successor sponsor or assign, the “**Index Sponsor**”). The Index Sponsor may appoint a successor sponsor or assign, delegate or transfer any or all of its rights, obligations or responsibilities in its capacity as Index Sponsor in connection with the Futures Indices to one or more entities (including an unrelated third party) that the Index Sponsor determines is appropriate.

The Index Sponsor is also responsible for the appointment of the calculation agent of the Futures Indices (the “**Index Calculation Agent**”), which may be the Index Sponsor, an unrelated third party or an affiliate or subsidiary of the Index Sponsor. JPMS is currently the Index Calculation Agent. The Index Sponsor may at any time and for any reason (i) appoint a successor Index Calculation Agent if the Index Sponsor is at that time the Index Calculation Agent or (ii) terminate the appointment of the Index Calculation Agent and appoint an alternative entity as a replacement Index Calculation Agent if the Index Sponsor is not at that time the Index Calculation Agent. The Index Calculation Agent (unless the Index Calculation Agent is the same entity as the Index Sponsor) must obtain written permission from the Index Sponsor prior to any delegation or transfer of the Index Calculation Agent’s responsibilities or obligations in connection with the Futures Indices. The Index Calculation Agent is responsible for making calculations and determinations as described above and in the Rules.

Index Sponsor and Index Calculation Agent Determinations

The Index Calculation Agent will act in good faith and in a commercially reasonable manner in making determinations, interpretations and calculations pursuant to the Rules. Subject to the prior agreement of the Index Sponsor, the Index Calculation Agent’s determinations, and all calculations related to the Futures Indices and the Index Calculation Agent’s interpretations of the Rules, will be final.

None of the Index Sponsor, the Index Calculation Agent and any of their respective affiliates and subsidiaries and any of their respective directors, officers, employees, representatives, delegates and agents (each, a “**Relevant Person**”) will have any responsibility to any person (whether as a result of

negligence or otherwise) for any determinations, interpretations or calculations made or anything done (or omitted to be determined or done) in connection with the Futures Indices or any use to which any person may put the Futures Indices or the Index Levels.

Subject to the prior agreement of the Index Sponsor, the Index Calculation Agent may make certain determinations, adjustments, amendments and interpretations related to the Futures Indices. All such determinations, adjustments, amendments and interpretations (in each case, subject to such prior agreement on the part of the Index Sponsor) of the Index Calculation Agent related to the Futures Indices and all calculations performed by the Index Calculation Agent related to the Futures Indices will be final, conclusive and binding and no person will be entitled to make any claim against the Index Sponsor, the Index Calculation Agent, or any of the Relevant Persons in respect thereof. Once a determination, adjustment, amendment or interpretation is made or action is taken by the Index Calculation Agent (in each case, as agreed in advance by the Index Sponsor) in relation to a Futures Index, or a calculation is performed by the Index Calculation Agent in relation to a Futures Index, none of the Index Sponsor, the Index Calculation Agent or any Relevant Person will be under any obligation to revise any such determination, adjustment, amendment, interpretation or calculation made or anything done (or omitted to be determined, adjusted, amended, interpreted, calculated or done) for any reason.

The Index Calculation Agent's exercise of discretion or failure to exercise discretion in relation to a Futures Index may have a detrimental effect on the Index Level of that Futures Index and the volatility of that Futures Index. The Index Sponsor or the Index Calculation Agent may make certain determinations or calculations based on information obtained from publicly available sources without independently verifying such information.

Amendment of the Rules; Termination of the Futures Indices

The Rules may be supplemented, amended or restated from time to time in the sole discretion of JPMS in its capacity as the Index Sponsor. Although the Rules are intended to be comprehensive and accurate, ambiguities may arise and errors or omissions may have been made. Under these circumstances, the Index Sponsor will resolve these ambiguities and, if necessary, amend the Rules to reflect their resolution. In the case of any errors or omissions, the Index Sponsor may amend the Rules to address those errors or omissions. The Rules will be made available (in a manner determined by the Index Sponsor from time to time) following any supplementation, amendment or restatement. However, the Index Sponsor is under no obligation to inform any person about any amendments to any Futures Index (except as required by law or regulation).

The Index Sponsor may at any time, for any reason and without notice, terminate or cease the calculation or publication of any Futures Index.

BACKGROUND ON FUTURES CONTRACTS

Futures contracts are contracts that legally obligate the holder to buy or sell an asset at a predetermined delivery price during a specified future time period. Each Constituent is an excess return index that tracks futures contracts. See “Background on the J.P. Morgan Futures Indices” above.

Overview of Futures Markets

Futures contracts are traded on regulated futures exchanges, in the over-the-counter market and on various types of physical and electronic trading facilities and markets. As of the date of this underlying supplement, all of the futures contracts associated with the Constituents are exchange-traded futures contracts. An exchange-traded futures contract provides for the purchase and sale of a specified type and quantity of an underlying asset or financial instrument during a stated delivery month for a fixed price. A futures contract provides for a specified settlement month in which the cash settlement is made or in which the underlying asset or financial instrument is to be delivered by the seller (whose position is therefore described as “short”) and acquired by the purchaser (whose position is therefore described as “long”).

A futures contract on a government bond typically permits satisfaction of the delivery obligation by delivery of any of the bonds referenced by that futures contract that meet the specification identified by the relevant exchange. The deliverable bonds may feature different coupons and maturities and consequently also different prices. At any given time, certain deliverable bonds will be more economical to acquire and deliver than others, which are commonly referred to as the “cheapest to deliver.” The price for futures contract on a government bond on any day generally tracks the price of the particular bonds that are “cheapest to deliver” on that day.

No purchase price is paid or received on the purchase or sale of a futures contract. Instead, an amount of cash or cash equivalents must be deposited with the broker as “initial margin.” This amount varies based on the requirements imposed by the exchange clearing houses, but it may be lower than 5% of the notional value of the contract. This margin deposit provides collateral for the obligations of the parties to the futures contract.

By depositing margin, which may vary in form depending on the exchange, with the clearing house or broker involved, a market participant may be able to earn interest on its margin funds, thereby increasing the total return that it may realize from an investment in futures contracts.

In the United States, futures contracts are traded on organized exchanges, known as “designated contract markets.” At any time prior to the expiration of a futures contract, a trader may elect to close out its position by taking an opposite position on the exchange on which the trader obtained the position, subject to the availability of a liquid secondary market. This operates to terminate the position and fix the trader’s profit or loss. Futures contracts are cleared through the facilities of a centralized clearing house and a brokerage firm, referred to as a “futures commission merchant,” which is a member of the clearing house.

Unlike common equity securities, futures contracts, by their terms, have stated expirations. At a specific point in time prior to expiration, trading in a futures contract for the current delivery month will cease. As a result, a market participant wishing to maintain its exposure to a futures contract on a particular asset or financial instrument with the nearest expiration must close out its position in the expiring contract and establish a new position in the contract for the next delivery month, a process referred to as “rolling.” For example, a market participant with a long position in a futures contract expiring in November who wishes to maintain a position in the nearest delivery month will, as the November contract nears expiration, sell the November contract, which serves to close out the existing long position, and buy a futures contract expiring in December. This will “roll” the November position into a December position, and, when the November contract expires, the market participant will still have a long position in the nearest delivery month.

Futures exchanges and clearing houses in the United States are subject to regulation by the Commodity Futures Trading Commission. Exchanges may adopt rules and take other actions that affect trading, including imposing speculative position limits, maximum price fluctuations and trading halts and suspensions and requiring liquidation of contracts in certain circumstances. Futures markets outside the United States are generally subject to regulation by comparable regulatory authorities. The structure and nature of trading on non-U.S. exchanges, however, may differ from this description.

The Futures Contracts

E-mini® S&P 500® Futures

E-mini® S&P 500® futures are U.S. dollar-denominated futures contracts (an “**E-mini® S&P 500® futures contract**”), based on the S&P 500® Index, traded on the Chicago Mercantile Exchange (the “**CME**”), representing a contract unit of \$50 *multiplied by* the S&P 500® Index, measured in cents per index point.

E-mini® S&P 500® futures contracts listed for the nearest nine quarters, for each March, June, September and December, and the nearest three Decembers are available for trading. Trading of the E-mini® S&P 500® futures contracts will terminate at 9:30 A.M. Eastern time on the third Friday of the contract month.

The daily settlement prices of the E-mini® S&P 500® futures contracts are based on trading activity in the relevant contract (and in the case of a lead month also being the expiry month, together with trading activity on lead month-second month spread contracts) on the CME during a specified settlement period. The final settlement price of E-mini® S&P 500® futures contracts is based on the opening prices of the component stocks in the S&P 500® Index, determined on the third Friday of the contract month.

E-mini® Russell 2000® Futures

E-mini® Russell 2000® futures are U.S. dollar-denominated futures contracts (an “**E-mini® Russell 2000® futures contract**”), based on the Russell 2000® Index, traded on the CME, representing a contract unit of \$50 *multiplied by* the Russell 2000® Index, measured in cents per index point. From February 4, 1993 to September 18, 2008, and since July 10, 2017, E-mini® Russell 2000® futures contracts have traded on the CME. From August 8, 2007 to June 15, 2018, E-mini® Russell 2000® futures contracts traded on the ICE Futures U.S.

E-mini® Russell 2000® futures contracts listed for the nearest five quarters, for each March, June, September and December are available for trading. Trading of the E-mini® Russell 2000® futures contracts will terminate at 9:30 A.M. Eastern time on the third Friday of the contract month.

The daily settlement prices of the E-mini® Russell 2000® futures contracts are based on trading activity in the relevant contract (and in the case of a lead month also being the expiry month, together with trading activity on lead month-second month spread contracts) on the CME during a specified settlement period. The final settlement price of E-mini® Russell 2000® futures contracts is determined through the end of month fair value procedure, which fixes a price based on CME Globex activity in the E-mini® Russell 2000® futures contracts between 2:59:30 P.M. and 3:00 P.M. Central time.

DAX® Futures

DAX® futures are euro-denominated futures contracts (a “**DAX® futures contract**”), based on the DAX® Index, traded on the Eurex Exchange (“**Eurex**”), representing a contract unit of 25 euros.

DAX® futures contracts with expiry months falling in the three nearest quarterly months of March, June, September and December are available for trading.

The daily settlement prices for the current expiry month are derived from the volume-weighted average of the prices of all transactions during the minute before 5:30 P.M. Central European time, *provided* that more than five trades transacted within this period. The final settlement price of the DAX® futures contracts is established by Eurex on the final settlement day and is determined by the value of the

DAX® Index, based on Xetra® auction prices of the DAX® Index component shares. The auction starts at 1:00 P.M. Central European time.

TOPIX Futures

TOPIX futures are Japanese yen-denominated futures contracts (a “**TOPIX futures contract**”), based on the TOPIX® Index, traded on the Tokyo Stock Exchange (“**TSE**”), with each TOPIX futures contract representing a contract unit of 10,000 yen.

TOPIX futures contracts with expiries in the nearest five months in the quarterly cycle of March, June, September and December are available for trading. Trading of a TOPIX futures contract will terminate on the business day preceding the second Friday of the relevant expiry month unless that day is a non-business day, in which case trading will terminate on the first preceding date that is a business day.

The final settlement price of a TOPIX futures contract is based on the total opening prices of each component stock of the TOPIX® Index on the business day following the last trading day of that TOPIX futures contract.

Medium-Term U.S. Treasury Note Futures (5-Year)

Medium-term U.S. treasury note futures (5-Year) are U.S. dollar-denominated futures contracts (a “**5-year T-note futures contract**”), traded on the CME, with a face value at maturity of \$100,000 per contract.

5-year T-note futures contracts listed for the nearest three quarters, for each March, June, September and December are available for trading. Trading of the 5-year T-note futures contracts will terminate at 12:01 P.M. Central time on the last business day of the contract month. 5-year T-note futures contracts are delivered upon expiration through the Federal Reserve book-entry wire-transfer system. Delivery occurs on the third business day following the last trading day.

The daily settlement prices of 5-year T-note futures contracts are based on trading activity in the relevant contract (and in the case of a lead month also being the expiry month, together with trading activity on lead month-second month spread contracts) on the CME during a specified settlement period. The final settlement price of 5-year T-note futures contracts is the volume-weighted average price (“**VWAP**”) of trades on CME Globex between 12:00 P.M. Central time and 12:01 P.M. Central time, on the expiring contract’s last day of trading. If a VWAP is not available due to an absence of trades, then the most recent spread trade is applied to the lead month settlement price. If there are no trades in the lead month-expiry month calendar spread, then the prior-day is used.

Long-Term U.S. Treasury Note Futures (6½ to 10-Year)

Long-Term U.S. Treasury Note Futures (6½ to 10-Year) are U.S. dollar-denominated futures contracts (a “**10-year T-note futures contract**”), traded on the CME, with a face value at maturity of \$100,000 per contract.

10-year T-note futures contracts listed for the nearest three quarters, for each March, June, September and December are available for trading. Trading of the 10-year T-note futures contracts will terminate at 12:01 P.M. Central time on the last business day of the contract month. 10-year T-note futures contracts are delivered upon expiration through the Federal Reserve book-entry wire-transfer system. Delivery occurs on the last business day of the delivery month.

The daily settlement prices of 10-year T-note futures contracts are based on trading activity in the relevant contract (and in the case of a lead month also being the expiry month, together with trading activity on lead month-second month spread contracts) on the CME during a specified settlement period. The final settlement price of 10-year T-note futures contracts is the VWAP of trades on CME Globex between 12:00 P.M. Central time and 12:01 P.M. Central time, on the expiring contract’s last day of trading. If a VWAP is not available due to an absence of trades, then the most recent spread trade is applied to the lead month settlement price. If there are no trades in the lead month-expiry month calendar spread, then the prior-day is used.

Euro-Bund Futures

Euro-Bund Futures are euro-denominated futures contracts (a “**Euro-Bund futures contract**”) traded on Eurex, with a face amount of 100,000 euros per contract, that require on the delivery day the delivery of debt securities issued by the Federal Republic of Germany with a remaining term of 8.5 to 10.5 years and a standardized coupon of 6%.

The delivery day is the tenth calendar day of the relevant expiry month unless that day is a non-exchange day, in which case, the delivery day is the exchange day immediately succeeding that day. Euro-Bund futures contracts with expiry months falling in the three nearest quarterly months of March, June, September and December are available for trading.

The daily settlement prices for the current expiry month are determined during the closing auction of the relevant Euro-Bund futures contract. For the remaining expiry months, the daily settlement price for a Euro-Bund futures contract is determined based on the average bid/ask spread of the combination order book. The final settlement price of the Euro-Bund futures contracts is established by Eurex on the final settlement day at 12:30 P.M. Central European time based on the volume-weighted average price of all trades during the final minute of trading *provided* that more than 10 trades occurred during this minute; otherwise, the volume-weighted average price of the last 10 trades of the day, *provided* that these are not older than 30 minutes. If such price cannot be determined, or does not reasonably reflect the prevailing market conditions, Eurex will establish the final settlement price.

10-year JGB Futures

10-year JGB Futures are Japanese yen-denominated futures contracts (a “**JGB futures contract**”) traded on the TSE, with a face amount of 100,000,000 yen per contract, that require on the delivery day the delivery of debt securities issued by the Japanese Government with a remaining term of seven to 11 years and a standardized coupon of 6%.

JGB futures contracts with expiries in the nearest three months in the quarterly cycle of March, June, September and December are available for trading. Trading of a JGB futures contract will terminate on the fifth business day prior to each delivery date, which is the 20th day of each contract month unless that day is a non-business day, in which case it will be moved down accordingly.

The amount to be paid or received at delivery is determined on the basis of the final settlement price on the last trading day of the JGB futures contract. While JGB futures contracts are based on the 6% coupon, each eligible bond has a different coupon, maturity and consequently value. Therefore, the value of JGB futures contracts is adjusted for delivery using conversion factors calculated on the basis of a semi-annually compounded interest rate. The Osaka Exchange provides the conversion factor for each deliverable bond for each contract month.

Brent Crude Oil Futures

Brent crude oil futures are U.S. dollar-denominated futures contracts (a “**crude oil futures contract**”) on U.S. light, sweet crude oil, traded on ICE Futures Europe (“**ICE**”), quoted in U.S. dollars per barrel, with each crude oil futures contract representing a contract unit of 1,000 barrels.

Monthly crude oil futures contracts listed for up to 96 consecutive months are available for trading.

Trading of the crude oil futures contracts ceases at the end of the designated settlement period on the last business day of the second month preceding the relevant contract month. If the day on which trading is due to cease would be either the business day preceding Christmas Day or New Year’s Day, then trading will cease on the next preceding business day. Crude oil futures contracts are deliverable contracts based on an exchange of futures for physical delivery with an option to cash settle against the ICE Brent Index price for the last trading day of the futures contract. The ICE Brent Index represents the average price of trading in the prevailing North Sea “cash” or forward market in the relevant delivery month.

The daily settlement prices of crude oil futures contracts are based on the weighted average price of trades during a two minute settlement period from 7:28 P.M. to 7:30 P.M., London time. ICE will publish a cash settlement price (the ICE Brent Index price) on the next trading day following the last trading day for the contract month.

Gold Futures

Gold futures are U.S. dollar-denominated futures contracts (a “**Gold futures contract**”) on gold, traded on the CME, quoted in U.S. dollars per troy ounce, with each Gold futures contract representing a contract unit of 100 troy ounces.

Gold futures contracts listed for the nearest three months, for each February, April, August and October in the nearest 23 months and for each June and December in the nearest 72 months are available for trading. Trading of the Gold futures contracts will terminate at 12:30 P.M. Central time on the third last business day of the contract month. Gold futures contracts are physically delivered upon expiration. Delivery may take place on any business day beginning on the first business day of the expiry month or any subsequent business day of the expiry month, but not later than the last business day of the current expiry month.

The daily settlement prices of Gold futures contracts are based on trading activity in the relevant contract (in the case of non-active months, together with trading activity on calendar spread contracts) on the CME during a specified settlement period.

BACKGROUND ON THE DAX® INDEX

All information contained in this underlying supplement regarding the DAX® Index (Price Return), including, without limitation, its make-up, method of calculation and changes in its components, has been derived from publicly available information, without independent verification. This information reflects the policies of, and is subject to change by, STOXX Ltd. (“**STOXX**”). The DAX® Index (Price Return) is calculated, maintained and published by STOXX.

STOXX has no obligation to continue to publish, and may discontinue publication of, the DAX® Index (Price Return).

The DAX® Index (Price Return) is reported by Bloomberg L.P. under the ticker symbol “DAXK.”

The DAX® Index (Price Return) comprises the 40 largest companies with the highest turnover on the FWB® Frankfurt Stock Exchange. These companies are selected from the continuously traded companies in the Prime Standard segment that meet certain selection criteria. To be listed in the Prime Standard, a company must meet minimum statutory requirements, which include the regular publication of financial reports, and must satisfy additional transparency requirements. The reference date of the DAX® Index (Price Return) is December 30, 1987.

The DAX® Index (Price Return) is capital-weighted, meaning the weight of any individual issue is proportionate to its respective share in the overall capitalization of all index component issuers. The weight of any single company is capped at 10% of the DAX® Index (Price Return) capitalization, measured quarterly. Weighting is based exclusively on the free float portion of the issued share capital of any class of shares involved. Both the number of shares included in the issued share capital and the free float factor are updated on one day each quarter (this date, the “chaining date” and the process by which these updates are made, “chaining”). The DAX® Index (Price Return) is a price index, which measures the actual price performance and is only adjusted for income from subscription rights and special distributions.

Methodology of the Index

The Advisory Board for Equity Indices of STOXX

The Advisory Board for Equity Indices (the “**Board**”) advises STOXX on topics related to the DAX® Index (Price Return). The Board acts as an advisory body based on the basic principles mentioned and the rules of the guidelines. The Board does not make binding decisions on behalf of STOXX.

The Board consists of STOXX employees and representatives of leading national and international financial institutions. The Board’s meetings usually take place not later than the sixth trading day in March and September. Extraordinary meetings may also be convened.

Free Float

Free float refers to the freely tradable shares of a company that are not held in fixed ownership. The following rules apply to determine the free float:

1. All shareholdings of an owner which, on an accumulated basis, account for at least 5% of a company’s share capital attributed to a class of shares are considered to be non-free float. Shareholdings of an owner also include shareholdings:

- held by the family of the owner as defined by section 19 of the Market Abuse Regulation;
- for which a pooling has been arranged in which the owner has an interest;
- managed or kept in safe custody by a third party for the account of the owner;
- held by a company which the owner controls as defined by section 290(2) of the German Commercial Code; and

- subject to a statutory or contractual qualifying period of at least six months.

This does not include shareholdings of:

- asset managers and trust companies;
- funds and pension funds; and
- investment companies or foreign investment companies in their respective special fund assets

insofar as they are held as part of short-term investment strategies and the size of a shareholding does not exceed 25% of a company's share capital. This does not apply to shareholdings held by venture capital companies, government funds or shareholdings held by their financial agencies or supranational funds.

In this context, shares for which the acquirer has at the time of purchase clearly and publicly stated that strategic goals are being pursued and that the intention is to influence the company policies and ongoing business of the company in the long-term are not considered a short-term investment. In addition, shares having been acquired through a public purchase offer will not be considered a short-term investment.

2. Shares of an owner that are subject to a statutory or contractual qualifying period of at least six months with regard to their disposal and shares held by the issuing company (treasury shares) are — irrespective of the size of a shareholding — always considered fixed holdings.

3. In the case of an ongoing takeover, shares that are under the control of the overtaking companies via derivatives will also be considered for the determination of the stock's free float. The derivatives need to be subject to registration and correspondingly registered according to legislation in the German Securities Trading Act ("**WpHG**") and the German Securities Acquisition and Takeover Act ("**WpÜG**").

The various criteria in numbers 1 to 3 are also fully applied to classes of shares that are subject to restrictions of ownership. For the purpose of the determination of the free float as described above, each ISIN under which shares are traded is considered a separate share class.

If STOXX determines and publishes a company's free float within the framework of a scheduled chaining, this free float factor will only be changed or corrected at the next scheduled chaining date. This is also the case if STOXX learns of facts or circumstances following the determination of the free float that would have resulted in the determination of a different free float factor had they been known at the time of the determination.

Index Composition

Selection Criteria

The basic criteria for including companies in the DAX® Index (Price Return) are:

- an existing listing on the Regulated Market of the FWB® Frankfurt Stock Exchange;
- continuous trading on Deutsche Börse's electronic trading system Xetra®;
- a minimum free float of 10%;
- legal headquarters or operating headquarters in Germany;
- publication of audited Annual Financial Report prepared according to the requirements of the WpHG;
- publication of audited half-yearly Financial Report (for the first six months of the fiscal year) prepared according to the requirements of WpHG;

- publication of the Quarterly Statement or Quarterly Financial Report for the first and third fiscal quarters;
- no deviations are declared with respect to recommendations C.10 (with sole reference to its applicability to the Chair of the Audit Committee), D.3, D.9, D.10, D.11 of the German Corporate Governance Code;
- a minimum liquidity on the FWB® Frankfurt Stock Exchange of an order book volume of 1 billion euros over the past 12 month as of the Ranking List cut-off date or a Turnover Rate of 20% in order for initial eligibility; and for continued eligibility, an order book volume of 0.8 billion euros over the past 12 month as of the Ranking List cut-off date or a Turnover Rate of 10%; and
- a minimum period since first listing of at least 30 trading days

There is expanded criteria for foreign companies, under which foreign companies must:

- have legal headquarters in the European Union (“**EU**”) or in a European Free Trade Association (“**EFTA**”) country; or
- have an operating headquarter in Germany.

Companies that satisfy the prerequisites listed above are selected for inclusion in the DAX® Index (Price Return) based on free float market capitalization. The reporting date for collecting data is the last trading day of the month for which the ranking list is created (the “**Ranking List cut-off date**”). The ranking list is created and published monthly by STOXX.

Creating the Ranking List

To create the ranking list, the parameters relevant for the allocation of a rank, *i.e.*, number of shares, free float factor and volume-weighted average price (“**VWAP**”), are recorded on the Ranking List cut-off date to determine the free float market capitalization for each company. On that date, compliance with the basis criteria is also checked and the EBITDA is collected to determine eligibility.

A VWAP over 20 trading days (20-trading day VWAP) is used to calculate the free float market capitalization. This is calculated as the average value of daily VWAPs based on Xetra® prices of the last 20 trading days in a share class. The 20-trading day VWAP on the last trading day of a month is used to create the ranking list.

The order book volume is the sum of the daily turnover of a class over a period of twelve months. The following special provisions apply:

- if the order book volumes of a company are not available for the whole twelve-month period due to the time of its commencement of trading or its initial listing on one of the transparency standards, the order book volumes of the first 20 trading days are taken away and the remainder of the relevant data is linearly projected for twelve months. This procedure, however, is only applicable to companies that have been traded for at least 30 days as per the reporting date, taking order book volumes of at least ten days into account for projection purposes;
- if a company has changed its trading segment (Open Market, General Standard and Prime Standard) the order book volume from the previous segment is taken into account as of the Ranking List cut-off date following the segment change if it has a total trading history of more than thirty days;
- in the case of a company that is not a component of the DAX® Index (Price Return) at the time the ranking list is compiled, the company must have a positive EBITDA (earnings before interest, taxes, depreciation and amortization) for the two most recent fiscal years as calculated by Refinitiv; and

- in the case of a merger of two companies, the order book volumes of both companies are aggregated, *provided* that both companies were listed on the FWB® Frankfurt Stock Exchange prior to the merger. A requirement for aggregating order book volumes is that the company or companies that no longer exist are no longer listed on any stock exchange. The order book volumes are aggregated retroactively at this point for the allocation of a rank.

Inclusion in the Ranking List

All of the share classes listed on Regulated Market of the FWB® Frankfurt Stock Exchange are listed on the ranking list. A ranking is given to the share classes that meet the basic criteria outlined above. Companies that are first listed on the FWB® Frankfurt Stock Exchange have to additionally be listed for a minimum of at least 30 trading days. Classes that do not meet the above criteria given are listed on the ranking list but do not receive a ranking. Each ISIN under which shares in a company are traded is considered a separate class in this regard. If a company has several share classes, only the largest and most liquid share class is given a ranking, as measured by a combined metric of market capitalization and order book volume. If the shares classes are evaluated equally based on this metric, the most liquid class receives a ranking.

If subscription rights issued as part of a capital increase are of value on the date of creating the ranking list, the market capitalization shown on the ranking list will be determined in consideration of the capital increase. In this case, an acceptance ratio of 100% is assumed. If the share capital at the end of the subscription period differs from this, the market capitalization will be adjusted accordingly.

For inclusion in the DAX® Index (Price Return), if a company is eligible for inclusion based on its free float market capitalization ranking, but does not meet the EBITDA criterion, the next ranked company in the ranking list that does meet the EBITDA criterion is considered for inclusion.

Exclusion from Ranking

1. Companies that do not meet the necessary liquidity criteria for initial or continued eligibility, as described above, are not ranked.

2. To ensure that the composition of the DAX® Index (Price Return) reflects the market and/or economic reality which it aims to represent and to avoid application of the stated rules leading to misrepresenting results, STOXX reserves the right to exclude certain companies from being ranked on the ranking list. An example of an appropriate reason for exclusion may be that a foreign company has its headquarters in Germany but the focus of its business activity is abroad.

Adjustments to Index Composition

The index composition of the DAX® Index (Price Return) is reviewed quarterly based on the Fast Exit and Fast Entry rules and semi-annually based on the Regular Exit and Regular Entry rules.

The purpose of the review on the basis of the Fast Exit and Fast Entry rules is to account for significant changes in rankings. These changes may occur when companies no longer possess the required size (free float market capitalization), which may arise due to large issues (e.g., major changes in the free float or a steep price drop) and should be taken into consideration promptly in the index.

The selection of companies in the DAX® Index (Price Return) is based on free float market capitalization. The currently valid ranking list always forms the basis for the application of the rules outlined below. The four rules are applied successively.

- Fast Exit: a company is replaced if it has a worse rank than the “candidate rank” in free float market capitalization (e.g., greater than 60 in the free float market capitalization criterion in the DAX® Index (Price Return) ranks). It is replaced by the company with the highest free float market capitalization that has the corresponding ranking position for free float market capitalization in the “alternate candidate rank” (e.g., smaller than or equal to in the free float market capitalization criterion in the DAX® Index (Price Return) ranks). If there is still no company

that meets these criteria, the company with the highest free float market capitalization is determined as the successor.

- **Fast Entry:** a company is included if it has the same or better rank than the “candidate rank” in the free float market capitalization (e.g., smaller than or equal to rank 33 for the free float market capitalization criterion in the DAX® Index (Price Return) ranks). The company with the lowest free float market capitalization that is ranked worse than the “alternate candidate rank” is excluded (e.g., greater than 47 in the free float market capitalization criterion in the DAX® Index (Price Return) ranks). If there are no companies in the selection index that meet these criteria, the company with the lowest free float market capitalization is removed from the DAX® Index (Price Return).
- **Regular Exit:** a company will be replaced if it has a worse rank than the “candidate rank” in free float market capitalization (e.g., greater than 53 in the free float market capitalization criterion in the DAX® Index (Price Return) ranks). It will be replaced by the company with the highest free float market capitalization that has the corresponding ranking positions in the “alternate candidate rank” (e.g., smaller than or equal to 47 in the free float market capitalization criterion in the DAX® Index (Price Return) ranks). If no successor can be determined, no change takes place.
- **Regular Entry:** a company will be included if it has the same or better rank than the “candidate rank” in the free float market capitalization (e.g., a smaller than or equal to rank 40 for the free float market capitalization criterion in the DAX® Index (Price Return) ranks). The company with the lowest free float market capitalization that is ranked worse than the “alternate candidate rank” will be excluded (e.g., greater than 47 in the free float market capitalization criterion in the DAX® Index (Price Return) ranks). If no alternate candidate can be determined, no exchange takes place.

In exceptional cases, for example, takeovers announced at short notice or significant changes in the free float, STOXX may deviate from rules 1 through 4 mentioned above.

Decisions regarding changes to the composition of the DAX® Index (Price Return) are published after 10 p.m. Central European time on the third trading day in March, June, September and December.

Actions in Case of Shortfalls

A shortfall in the number of constituents may occur in the DAX® Index (Price Return) during the index review. This may occur when a company no longer meets the basic criteria. An example would be a company publicly announcing the discontinuation of the Prime Standard listing. Remaining in the DAX® Index (Price Return) is, therefore, no longer justified. However, this will only take effect in the next regular review. In this case, the company would be removed during the regular review before the application of the four rules above. Consequently, there would be a shortfall in the DAX® Index (Price Return).

If a shortfall exists in the DAX® Index (Price Return), this shortfall is treated as a Fast Exit. Consequently, the Fast Exit rule of the DAX® Index (Price Return) is applied. In this case, the company which caused the shortfall is considered the Fast Exit candidate. A company that, in turn, could be accepted into the DAX® Index (Price Return) is found using the Fast Exit rule.

The DAX® Index (Price Return) is restored to the fixed number of companies before the four rules are applied (Fast Exit, Fast Entry, Regular Exit, Regular Entry). The aim of this is to ensure that the DAX® Index (Price Return) contains the designated number of companies before the review of the DAX® Index (Price Return) is performed.

Extraordinary Index Review

Notwithstanding the rules on ordinary adjustment, extraordinary changes to the composition must be made if the events described below take place. A successor is selected based on the currently applicable, i.e., most recently published ranking list and the rules for an ordinary adjustment. The changes in principle take place after the announcement with a notice period of two trading days.

Insolvency of Companies

- If an insolvency event occurs in relation to a constituent, the securities of the constituent shall be deleted from the DAX® Index (Price Return) based on the traded stock price on its primary market, if available. If the last price is not available, the constituent will be deleted at market close in local currency of 0.001. The constituent shall be extraordinarily replaced. Such replacement shall be announced at 10 p.m. Central European time on the day STOXX became aware of the insolvency event based on publicly available information. The change shall be implemented two trading days after the calendar day of the announcement by STOXX and shall become effective the next trading day after implementation. In case such security has already been announced as a new index constituent or replacement for a current index constituent, the announcement will be revoked, and a new constituent implemented with two trading days' notice. This may lead to the DAX® Index (Price Return) having less constituents than required by index methodology until a replacement is effective.

The securities of a constituent for which an insolvency event occurs are not eligible as an index constituent or replacement index constituent for any future selection, with immediate effect at the date of STOXX's announcement. The respective securities will be kept on the monthly ranking list without receiving a rank. The respective securities may receive a rank again once the proceeding in relation to the insolvency event have been concluded resulting in the continuance of the business operated by the issuer of the security, but not earlier than one calendar year after exclusion became effective.

- An insolvency event shall be deemed to have occurred if STOXX has been informed by the constituent, a national competent authority or a court in writing or through public announcement (other than by entry into a register) that:
 - i. insolvency proceedings over the assets of the constituent will be filed or have been filed for;
 - ii. insolvency proceedings have been opened in relation to the constituent;
 - iii. the constituent seeks or becomes subject to the appointment of an administrator, receiver, trustee, custodian or other similar official for it or for all or substantially all its assets;
 - iv. the insolvency proceedings are rejected due to a lack of assets; or
 - v. constituents in liquidation, be it as a result of insolvency proceedings or a shareholders' decision or otherwise.
- An insolvency proceeding shall refer to any applicable insolvency, bankruptcy, dissolution, liquidation or winding up proceedings or similar proceedings in relation to the assets of such constituent.

Breach of the Basic Criteria

- Companies no longer meeting the basic criteria necessary in order to remain in the DAX® Index (Price Return) are removed from the DAX® Index (Price Return), where the type of basic criteria the company is breaching determines the timing of removal.
- A breach of one of the following basic criteria leads to an exclusion from the DAX® Index (Price Return) with two days' notice from the date STOXX becomes aware of the breach:
 - i. minimum free float
 - ii. listing on Regulated Market of the FWB® Frankfurt Stock Exchange
 - iii. continuous trading
 - iv. timely publication of audited Annual Financial Report

- v. timely publication of the half-yearly Financial Report
- vi. timely publication of the Quarterly Statement or Quarterly Financial Report
- A breach of the timely reporting requirement is given if a company fails to publish after the added grace period:
 - i. the Annual Financial Report within four months from the end of the relevant reporting period
 - ii. the Half-yearly Financial Report within three months from the end of the relevant reporting period
 - iii. the Quarterly Statement or Quarterly Financial Report within 75 days from the end of the relevant reporting period

Additionally, the withdrawal of the required financial reporting or of an audit, when required, after the aforementioned terms is considered equivalent to a breach of the timely reporting requirement.

- A company in breach of the required financial reporting criteria will remain on the existing ranking list until the end of the current month, but it will not be eligible for index membership. If a company succeeds in publishing the required financial reporting after its exclusion from the DAX[®] Index (Price Return), it can be ranked on the upcoming ranking list again, provided it fulfils the necessary criteria. The standard notice period of two trading days will be extended such that the effective date does not conflict with the monthly Ranking List cut-off date (t) and publication dates or the review implementation process. The effective date of an extraordinary index change would be modified as follows:
 - i. On any month: an ad hoc correction that would be effective after t and before t+6 is postponed being effective on t+6 based on the ranking list published on t+3.
 - ii. On review months only: an ad hoc correction that would be effective after the Thursday prior to the second Friday and before the review effective day is postponed so to become effective on the review effective day.
 - iii. Any information received on the review implementation day or the preceding day is processed to be effective on the second or the first trading day after the review effective day.
- A breach of the required recommendations of German Corporate Governance Code and the required minimum liquidity, which are monitored on a monthly basis as part of the ranking list creation process, will leave the respective company without a rank until the next index review. The company will then be removed from the DAX[®] Index (Price Return) during the next index review process.
- In all aforementioned cases, the company in breach is replaced by applying the Fast Exit rule.

Conversion of Preferred Shares into Ordinary Shares

- If the ordinary shares are already included in the DAX[®] Index (Price Return), then no chaining is carried out. The number of shares remains unchanged until the next chaining date.
- If preferred shares are already included in the DAX[®] Index (Price Return), then the ordinary shares are included in the DAX[®] Index (Price Return), taking the place of the preferred shares. The number of ordinary shares and the free float factor are adopted from the class of the preferred shares, and are subject to adjustment only on the next regular chaining date. If the conversion occurs in the ratio 1:1, no further amendments will be carried out. In all other cases, the mathematical price difference will be balanced by the C_i factor described under "Index Calculation" below.

Extraordinary Free Float Adjustments

- If the free float factor of a company included in the DAX® Index (Price Return) changes by more than 10 percentage points during the period between two regular chaining dates due to a corporate measure (e.g., subscription right or changes in share capital), the free float factor will be updated extraordinarily. The rule does not apply if the corporate measure is deemed market capitalization neutral. STOXX will announce the new free float factor at least two trading days before the change becomes effective.
- Free float adjustments resulting from ongoing acquisitions (acquisitions as defined by the WpÜG) will be made extraordinarily in the DAX® Index (Price Return) after the initial announcement and the final announcement at the end of the offer period or after the tender offer cancellation. Index changes will be announced two trading days before the change becomes effective. Shares held in fixed ownership will remain unchanged until further information, i.e., according to the WpHG or other official sources, is available.
- The extraordinary adjustment in each case will be carried out as described above, with the only difference that the index composition will not be changed and only the free float factor of the affected company will be updated.

Adjustments in the Case of Mergers and Acquisitions

Two possible scenarios may occur in this context:

- If the absorbing or emerging company meets the basis criteria for inclusion in the DAX® Index (Price Return), then as soon as the free float of the absorbed company falls below 10%, the company is removed from the DAX® Index (Price Return). The absorbed company is replaced by the absorbing or emerging company on the same date.
- If the absorbing company is already included in the DAX® Index (Price Return) or does not meet the basis criteria for inclusion in the DAX® Index (Price Return), then as soon as the free float of the absorbed company falls below 10%, the company is removed from the DAX® Index (Price Return). On the same date, the absorbed company is replaced by a new company.

Conversion into Tendered Shares

The conversion of tendered shares is subject to the following process during the period between the first offer and the closing of the transaction:

- If the company being taken over is a component in the DAX® Index (Price Return), the company's shares in the DAX® Index (Price Return) will be replaced by the tendered shares without chaining if the acceptance rate is greater than 50% (according to section 23 WpÜG). The number of shares and the free float factor are assumed by the replaced shares and modified during the next regular chaining. A requirement for this replacement is that the tendered shares, as well as the shares that the tendered shares will be converted into, fulfill the basis criteria to remain in the DAX® Index (Price Return) and the new or acquiring company is not included in the DAX® Index (Price Return).
- If the takeover bid or mandatory offer fails, then the shares tendered for exchange shall be removed from the DAX® Index (Price Return) without chaining and replaced by the shares that were previously included in the DAX® Index (Price Return).

Index Calculation

The DAX® Index (Price Return) is weighted by market capitalization; however, only freely available and tradable shares ("free float") are taken into account. The DAX® Index (Price Return) is a price index, which measures the actual price performance and is only adjusted for income from subscription rights and special distributions.

The Index Formula

The DAX® Index (Price Return) uses the Laspeyres formula set out below:

$$Index_t = K_t \times \frac{\sum p_{it} \times ff_{iT} \times q_{iT} \times c_{it}}{\sum p_{i0} \times q_{i0}} \times Base$$

whereby:

| | | |
|-------------|---|--|
| c_{it} | = | Adjustment factor of company i at time t |
| ff_{iT} | = | Free float factor of share class i at time T |
| n | = | Number of shares in the DAX® Index (Price Return) |
| p_{i0} | = | Closing price of share i on the trading day before the first inclusion in the DAX® Index (Price Return) |
| p_{iT} | = | Price of share i at time t |
| q_{i0} | = | Number of shares of company i on the trading day before the first inclusion in the DAX® Index (Price Return) |
| q_{iT} | = | Number of shares of company i at time T |
| t | = | Calculation time of the DAX® Index (Price Return) |
| K_T | = | The chaining factor valid as of chaining date T |
| T | = | Date of the last chaining |
| Base | = | Value of the DAX® Index (Price Return) at base date |

The formula set out below is equivalent in analytic terms, but designed to achieve relative weighting:

$$Index_t = K_t \times \frac{\sum_{i=1}^n p_{it} \left(K_T \frac{ff_{iT} q_{iT}}{\sum_{i=1}^n q_{i0}} 100 C_{it} \right)}{\sum_{i=1}^n p_{i0} \frac{q_{i0}}{\sum_{i=1}^n q_{i0}} 100} Base = \frac{\sum_{i=1}^n p_{it} F_i}{A} Base$$

$$whereby: A = \frac{\sum_{i=1}^n p_{i0} q_{i0} 100}{\sum_{i=1}^n q_{i0}}$$

$$and: F_i = K_t \frac{ff_{iT} q_{iT}}{\sum_{i=1}^n q_{i0}} 100 c_{it}$$

The DAX® Index (Price Return) calculation can be reproduced in simplified terms by using the expression F_i :

- Multiply the current price by the respective F_i weighting factor;
- Take the sum of these products; and

- Divide this by the base value (A) which remains constant until a modification in the index composition occurs.

The F_i factors provide information on the number of shares required from each company to track the underlying index portfolio.

Calculation Frequency

Index calculation is performed on every trading day of FWB® Frankfurt Stock Exchange, using prices traded on Deutsche Börse's electronic trading system Xetra® or Börse Frankfurt, whereby the last determined prices are used. The DAX® Index (Price Return) is calculated once a day, at the close of trading. The DAX® Index (Price Return) is distributed as soon as current prices are available for all companies included in the DAX® Index (Price Return) (but no later than 9:06 a.m.). If no opening prices for individual companies are available, the respective closing prices of the previous day are used instead to calculate the DAX® Index (Price Return).

In the event of a suspension during trading hours, the last price determined before such a suspension is used for all subsequent computations. If such suspension occurs before the start of trading, the closing price of the previous day is taken instead. The "official" closing index level is calculated using the respective closing prices (or last prices) established on Xetra® or Börse Frankfurt.

Adjustments and Corrections

The DAX® Index (Price Return) is only adjusted for income from subscription rights and special distributions.

STOXX corrects a calculation error without delay on the dissemination day it occurred, provided that STOXX becomes aware of such calculation error before 3:30 p.m. Central European time of that dissemination day and insofar as technically and operationally feasible. STOXX does not change intraday index composition of an index. If STOXX became aware of a calculation error at or after 3:30 p.m. Central European time aims at correcting the calculations errors as of the end of the next dissemination day, including corrections to index constituents. STOXX amends without undue delay previous incorrect index values or input data only if they are required for the subsequent index values calculation. Incorrect real-time index values disseminated before the effective time of the correction are not restated.

BACKGROUND ON THE RUSSELL 2000® INDEX

All information contained in this underlying supplement regarding the Russell 2000® Index, including, without limitation, its make-up, method of calculation and changes in its components, has been derived from publicly available information, without independent verification. This information reflects the policies of, and is subject to change by, FTSE Russell (“**FTSE**”), which is wholly owned by the London Stock Exchange Group. The Russell 2000® Index, together with the Russell 1000® Index and the Russell 3000® Index (each, a “**Russell Index**,” and collectively, the “**Russell Indices**”), is calculated, maintained and published by FTSE. FTSE has no obligation to continue to publish, and may discontinue publication of, the Russell 2000® Index.

The Russell Indices are sub-indices of the Russell 3000E™ Index, which is composed of the 4,000 largest U.S. companies as determined by total market capitalization and represents approximately 97% of the U.S. equity market.

The Russell 2000® Index measures the capitalization-weighted price performance of 2,000 U.S. small-capitalization stocks listed on eligible U.S. exchanges and is designed to track the performance of the small-capitalization segment of the U.S. equity market. The companies included in the Russell 2000® Index are the middle 2,000 of the companies that form the Russell 3000E™ Index (*i.e.*, those ranking from 1,001 to 3,000 in the Russell 3000E™ Index). The Russell 2000® Index represents approximately 7% of the Russell 3000® Index. The Russell 2000® Index is reported by Bloomberg L.P. under the ticker symbol “RTY.”

Selection of Stocks Underlying the Russell Indices

To be eligible for inclusion in the Russell 3000E™ Index and, consequently, a Russell Index, a company must meet the following criteria as of the rank day in April (except that initial public offerings (“**IPOs**”) are considered for inclusion on a quarterly basis):

- **U.S. Equity Market.** The company must be determined to be part of the U.S. equity market, meaning that its home country is the United States. If a company incorporates in, has a stated headquarters location in, and also trades in the same country (ADRs and ADSs are not eligible), the company is assigned to its country of incorporation.

If any of the three criteria do not match, FTSE then defines three Home Country Indicators (“**HCIs**”): country of incorporation, country of headquarters and country of the most liquid exchange as defined by two-year average daily dollar trading volume from all exchanges within a country. After the HCIs are defined, the next step in the country assignment involves an analysis of assets by location. FTSE cross-compares the primary location of the company’s assets with the three HCIs. If the primary location of assets matches any of the HCIs, then the company is assigned to its primary asset location.

If there is not enough information to determine a company’s primary location of assets, FTSE uses the primary location of the company’s revenue for the same cross-comparison and assigns the company to the appropriate country in a similar fashion. FTSE uses an average of two years of assets or revenue data for analysis to reduce potential turnover.

If conclusive country details cannot be derived from assets or revenue, FTSE assigns the company to the country in which its headquarters are located unless the country is a Benefit Driven Incorporation (“**BDI**”) country. If the country in which its headquarters are located is a BDI country, the company is assigned to the country of its most liquid stock exchange. The BDI countries are Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bonaire, British Virgin Islands, Cayman Islands, Channel Islands, Cook Islands, Curacao, Faroe Islands, Gibraltar, Guernsey, Isle of Man, Jersey, Liberia, Marshall Islands, Panama, Saba, Sint Eustatius, Sint Maarten and Turks and Caicos Islands.

- **U.S. Eligible Exchange.** The following exchanges and markets are deemed to be eligible U.S. exchanges: the Chicago Board Options Exchange, the New York Stock Exchange,

NYSE American, The Nasdaq Stock Market and NYSE Arca. Stocks that are not traded on an eligible U.S. exchange (Bulletin Board, Pink Sheet and over-the-counter securities, including securities for which prices are displayed on the FINRA Alternative Display Facility) are not eligible for inclusion.

- *Minimum Closing Price.* A stock must have a close price at or above \$1.00 (on its primary exchange), subject to exceptions to reduce turnover.
- *Minimum Total Market Capitalization.* Companies with a total market capitalization less than \$30 million are not eligible for inclusion.
- *Minimum Free Float.* Companies with less than an absolute 5% of their shares available in the marketplace are not eligible for inclusion.
- *Company Structure.* Companies structured in the following ways are not eligible for inclusion: royalty trusts, U.S. limited liability companies, closed-end investment companies, business development companies (and other companies that are required to report Acquired Fund Fees and Expenses, as defined by the SEC), blank-check companies, special-purpose acquisition companies, limited partnerships, exchange-traded funds and mutual funds.
- *UBTI.* Real estate investment trusts and publicly traded partnerships that generate or have historically generated unrelated business taxable income ("**UBTI**") and have not taken steps to block UBTI to equity holders are not eligible for inclusion. Information used to confirm UBTI impact includes the following publicly available sources: 10-K, SEC Form S-3, K-1, company annual report, dividend notices or company website.
- *Security Types.* The following types of securities are not eligible for inclusion: preferred and convertible preferred stock, redeemable shares, participating preferred stock, warrants, rights, depositary receipts, installment receipts and trust receipts.
- *Minimum Voting Rights.* As of August 2017, more than 5% of a company's voting rights (aggregated across all of its equity securities, including, where identifiable, those that are not listed or trading) must be in the hands of unrestricted shareholders. Shares referenced as "non-voting" or providing legally minimum rights only will be viewed as having no voting power as it relates to the minimum voting rights review.
- *Multiple Share Classes.* If an eligible company trades under multiple share classes, each share class is reviewed independently for eligibility for inclusion. Share classes in addition to the primary share class must meet the following minimum size, liquidity and float requirements to be eligible: (i) total market capitalization must be larger than \$30 million; (ii) average daily dollar trading value must exceed that of the global median; and (iii) more than 5% of shares must be available in the marketplace.

Securities of eligible companies are included in Russell Indices based on total market capitalization. Total market capitalization is determined by multiplying total outstanding shares by the market price (generally, the last price traded on the primary exchange of the share class with the highest two-year trading volume, subject to exceptions) as of the rank day in April (except that IPOs are considered for inclusion on a quarterly basis). Common stock, non-restricted exchangeable shares and partnership units/membership interests (but not operating partnership units of umbrella partnership real estate investment trusts) are used to calculate a company's total market capitalization. If multiple share classes of common stock exist, they are combined to determine total shares outstanding; however, in cases where the common stock share classes act independently of each other (e.g., tracking stocks), each class is considered for inclusion separately. For merger and spin-off transactions that are effective between rank day in April and the business day immediately before the index lock-down takes effect ahead of the annual reconstitution in June, the market capitalizations of the impacted securities are recalculated and membership is re-evaluated as of the effective date of the corporate action.

The 4,000 securities with the greater total market capitalization become members of the Russell 3000E™ Index. All remaining Russell Indices are a subset of the Russell 3000E™ Index. Market capitalization breakpoints for the Russell Indices are determined by the breaks between the rankings of companies (based on descending total market capitalization). Market capitalization breakpoints for the Russell 2000® Index are determined by the break between the companies ranked #1,001 through #3,000.

New members are assigned on the basis of the breakpoints, and existing members are reviewed to determine if they fall within a cumulative 5% market cap range around these new market capitalization breakpoints. If an existing member's market cap falls within this cumulative 5% of the market capitalization breakpoint, it will remain in its current Russell Index rather than be moved to a different Russell Index.

After membership is determined, a security's shares are adjusted to include only those shares available to the public ("free float"). The purpose of this adjustment is to exclude from market calculations the capitalization that is not available for purchase and is not part of the investable opportunity set. Stocks in the Russell Indices are weighted by their available (also called float-adjusted) market capitalization. The following types of shares are removed from total market capitalization to arrive at free float or available market capitalization, based on information recorded in SEC corporate filings: officers' and directors' holdings, private holdings exceeding 10% of shares outstanding, institutional holdings exceeding 30% of shares outstanding, shares held by publicly listed companies, shares held by an Employee Stock Ownership Plan or a Leveraged Employee Stock Ownership Plan; shares locked up during an IPO; direct government holdings; and indirect government holdings exceeding 10% of shares outstanding.

Reconstitution occurs on the fourth Friday in June. A full calendar for reconstitution is published each spring, with such reconstitution schedule governed by FTSE guidelines.

Corporate Actions and Events Affecting the Russell Indices

FTSE applies corporate actions to the Russell Indices on a daily basis. FTSE applies the following methodology guidelines, among others, when adjusting the applicable Russell Index in response to corporate actions:

- *"No Replacement" Rule.* Securities that leave the relevant Russell Index for any reason (e.g., mergers, acquisitions or other similar corporate activity) are not replaced. Thus, the number of securities in the relevant Russell Index over a year will fluctuate according to corporate activity.
- *Statement of Principles and Adjustments for Specific Corporate Events.* FTSE has stated as general principles that the treatment of corporate events (a) should reflect how such events are likely to be dealt with in investment portfolios to maintain the portfolio structure in line with the target set out in the index objective and index methodology and (b) should normally be designed to minimize the trading activity required by investors to match the index performance. No assurance can be provided that corporate actions and events will be treated by FTSE in a manner consistent with its statement of general principles.

In addition, FTSE has established guidance for the treatment of corporate actions and events, including, but not limited to, dividends, capital repayments, companies converting to a REIT structure, share buybacks, rights issues, mergers, acquisitions, tender offers, split-offs, spin-offs, bankruptcies, insolvencies, liquidations and trading suspensions. However, because of the complexities involved in some cases, those guidelines are not definitive rules that will determine FTSE's actions in all circumstances. FTSE reserves the right to determine the most appropriate method of implementation for any corporate event which is not covered by those guidelines or which is of a complex nature.

BACKGROUND ON THE S&P 500® INDEX

All information contained in this underlying supplement regarding the S&P 500® Index, including, without limitation, its make-up, method of calculation and changes in its components, has been derived from publicly available information, without independent verification. This information reflects the policies of, and is subject to change by, S&P Dow Jones Indices LLC (“**S&P Dow Jones**”). The S&P 500® Index, together with the S&P MidCap 400® Index and the S&P SmallCap 600® Index (each, an “**S&P U.S. Index**,” and collectively the “**S&P U.S. Indices**”), is calculated, maintained and published by S&P Dow Jones. S&P Dow Jones has no obligation to continue to publish, and may discontinue publication of, the S&P 500® Index.

The S&P U.S. Indices are part of a family of indices that are each designed to measure different market segments of the U.S. equity markets.

The S&P 500® Index consists of stocks of 500 companies selected to provide a performance benchmark for the U.S. equity markets. The S&P 500® Index is reported by Bloomberg L.P. under the ticker symbol “SPX.”

Composition of the S&P 500® Index

Additions to the S&P U.S. Indices are evaluated based on the following:

- *Domicile.* The company should be a U.S. company, meaning a company that has the following characteristics:
 - the company should satisfy the periodic reporting obligations imposed by the U.S. Securities Exchange Act by filing forms for domestic issuers, such as, but not limited to, Form 10-K annual reports, Form 10-Q quarterly reports and Form 8-K current reports;
 - the U.S. portion of fixed assets and revenues should constitute a plurality of the total but need not exceed 50%. When these factors are in conflict, fixed assets determine plurality. Revenue determines plurality when there is incomplete asset information. Geographic information for revenue and fixed asset allocations are determined by the company as reported in its annual filings. If this criteria is not met or is ambiguous, S&P Dow Jones may still deem the company to be a U.S. company for index purposes if its primary listing, headquarters and incorporation are all in the United States and/or “**a domicile of convenience**” (Bermuda, Channel Islands, Gibraltar, islands in the Caribbean, Isle of Man, Luxembourg, Liberia or Panama); and
 - the primary listing must be on an eligible U.S. exchange as described under “Exchange Listing” below.

In situations where the only factor suggesting that a company is not a U.S. company is its tax registration in a domicile of convenience or another location chosen for tax-related reasons, S&P Dow Jones normally determines that the company is still a U.S. company. The final determination of domicile eligibility is made by the S&P Dow Jones’s U.S. index committee.

- *Exchange Listing.* A primary listing on one of the following U.S. exchanges is required: New York Stock Exchange, NYSE Arca, NYSE American, Nasdaq Global Select Market, Nasdaq Select Market, Nasdaq Capital Market, Cboe BZX, Cboe BYX, Cboe EDGA or Cboe EDGX exchanges. Ineligible exchanges include the OTC Bulletin Board and Pink Sheets.
- *Organizational Structure and Share Type.* Eligible organizational structures and share types are corporations, including equity and mortgage real estate investment trusts (“**REITs**”), and common stock (*i.e.*, shares). Ineligible organizational structures and share types include, but are not limited to, business development companies, limited partnerships, master limited partnerships, limited liability companies, closed-end funds, exchange-traded funds,

exchange-traded notes, royalty trusts, special purposes acquisition companies, tracking stocks, preferred and convertible preferred stock, unit trusts, equity warrants, convertible bonds, investment trusts, rights and American depositary receipts.

As of April 2023, the securities of companies with multiple share class structures (including companies with listed and unlisted share classes) are eligible to be added to the S&P U.S. Indices, subject to the eligibility requirements of each index.

- *Market Capitalization.* The total company market capitalization should be within a specified range for the relevant S&P U.S. Index. These ranges are reviewed quarterly and updated as needed to ensure they reflect current market conditions. A company meeting the total company market capitalization criteria is also required to have a security level float-adjusted market capitalization (“**FMC**”) that is at least 50% of the relevant S&P U.S. Index’s total company level minimum market capitalization threshold. For spin-offs, S&P U.S. Index membership eligibility is determined using when-issued prices, if available.
- *Investable Weight Factor (“**IWF**”).* For each component, S&P Dow Jones calculates an IWF, which represents the portion of the total shares outstanding that are considered part of the public float for purposes of the relevant S&P U.S. Index. An IWF of at least 0.10 is required for S&P U.S. Indices.
- *Liquidity.* A float-adjusted liquidity ratio (“**FALR**”), defined as the annual dollar value traded divided by the FMC, is used to measure liquidity. Using composite pricing and consolidated volume (excluding dark pools) across all venues (including historical values), annual dollar value traded is defined as the average closing price multiplied by the historical volume over the 365 calendar days prior to the evaluation date. This is reduced to the available trading period for initial public offerings (“**IPOs**”) or spin-offs that do not have 365 calendar days of trading history. In these cases, the dollar value traded available as of the evaluation date is annualized. The price, shares outstanding and IWF as of the evaluation date are used to calculate the FMC. The evaluation date is the open of trading on the day prior to the announcement date. The stock should trade a minimum of 250,000 shares in each of the six months leading up to the evaluation date. The FALR must be greater than or equal to 0.75 at the time of addition to an S&P U.S. Index. Current index constituents have no minimum requirement.
- *Financial Viability.* The sum of the most recent four consecutive quarters’ Generally Accepted Accounting Principles (“**GAAP**”) earnings (net income excluding discontinued operations) should be positive as should the most recent quarter. For equity REITs, financial viability is based on GAAP earnings and/or funds from operations, if reported.
- *Treatment of IPOs.* IPOs should be traded on an eligible exchange for at least 12 months before being considered for addition to an S&P U.S. Index. For former special purpose acquisition companies (“**SPACs**”), S&P Dow Jones considers the de-SPAC transaction to be an event equivalent to an IPO, and 12 months of trading post the de-SPAC event are required before a former SPAC can be considered for inclusion in an S&P U.S. Index. Spin-offs or in-specie distributions from existing constituents do not need to be seasoned for 12 months prior to their inclusion in an S&P U.S. Index.
- *Sector Classification.* The company is evaluated for its contribution to sector balance maintenance, as measured by a comparison of each Global Industry Classification Standard sector’s weight in the relevant S&P U.S. Index with its weight in the S&P Total Market Index, in the relevant market capitalization range. The S&P Total Market Index is a float-adjusted market capitalization-weighted index designed to track the broad U.S. equity market, including large-, mid-, small- and micro-cap stocks.

Companies that migrate from an ineligible exchange, emerge from bankruptcy, are newly designated to be domiciled in the U.S. for index purposes by S&P Dow Jones or convert from an ineligible share or

organizational type to an eligible type do not need to trade on an eligible U.S. exchange for 12 months before being considered for addition to an S&P U.S. Index.

Current constituents of an S&P U.S. Index can be migrated from one S&P U.S. Index to another provided they meet the total company level market capitalization eligibility criteria for the new index. Migrations from an S&P U.S. Index to another do not need to meet the financial viability, liquidity or 50% of the respective index's total company level minimum market capitalization threshold criteria.

Companies that are spun-off from current index constituents do not need to meet the outside addition criteria, but they should be considered U.S. domiciled for index purposes and have a total market cap representative of the relevant S&P U.S. Index.

Removals from the S&P U.S. Indices are evaluated based as follows:

- *Companies that are involved in mergers, acquisitions or significant restructuring such that they no longer meet the eligibility criteria.* Companies delisted as a result of merger, acquisition or other corporate action are removed at a time announced by S&P Dow Jones, normally at the close of the last day of trading or expiration of a tender offer. Constituents that are halted from trading may be kept in an S&P U.S. Index until trading resumes, at the discretion of S&P Dow Jones's U.S. index committee. If a stock is moved to Pink Sheets or the OTC Bulletin Board, the stock is removed.
- Any company that is removed from an S&P U.S. Index (including discretionary and bankruptcy/exchange delistings) must wait a minimum of one year from its index removal date before being screened for the eligibility criteria.
- *Companies that substantially violate one or more of the addition criteria.* S&P Dow Jones believes turnover in index membership should be avoided when possible. At times, a stock may appear to temporarily violate one or more of the addition criteria. However, the addition criteria are for addition to an S&P U.S. Index, not for continued membership. As a result, an S&P U.S. Index constituent that appears to violate criteria for addition to that index is not deleted unless ongoing conditions warrant an index change. When a stock is removed from an S&P U.S. Index, S&P Dow Jones explains the basis for the removal.

Calculation of the S&P 500® Index

The S&P U.S. Indices are float-adjusted market capitalization-weighted indices. On any given day, the index value of each S&P U.S. Index is the total float-adjusted market capitalization of that S&P U.S. Index's constituents *divided* by its divisor. The float-adjusted market capitalization reflects the price of each stock in the relevant S&P U.S. Index *multiplied* by the number of shares used in the index value calculation.

Float Adjustment. Float adjustment means that the number of shares outstanding is reduced to exclude closely held shares from the calculation of the index value because such shares are not available to investors. The goal of float adjustment is to adjust each company's total shares outstanding for long-term strategic shareholders, who often have interests such as maintaining control rather than the shorter-term economic fortunes of the company. Generally, these long-term strategic shareholders include, but are not limited to, officers and directors, private equity, venture capital and special equity firms, asset managers and insurance companies with direct board of director representation, other publicly traded companies that hold shares, holders of restricted shares, company-sponsored employee share plans/trusts, defined contribution plans/savings, and investment plans, foundations or family trusts associated with the company, government entities at all levels (other than government retirement/pension funds), sovereign wealth funds and any individual person who controls a 5% or greater stake in a company as reported in regulatory filings. Restricted shares are generally not included in total shares outstanding except for shares held as part of a lock-up agreement. Shares that are not considered outstanding are also not included in the available float. These generally include treasury stock, stock options, equity participation units, warrants, preferred stock, convertible stock and rights.

Divisor. Continuity in index values of each S&P U.S. Index is maintained by adjusting its divisor for all changes in its constituents' share capital after its base date. This includes additions and deletions to the relevant S&P U.S. Index, rights issues, share buybacks and issuances and non-zero price spin-offs. The value of each S&P U.S. Index's divisor over time is, in effect, a chronological summary of all changes affecting the base capital of that S&P U.S. Index. The divisor of each S&P U.S. Index is adjusted such that the index value of that S&P U.S. Index at an instant just prior to a change in base capital equals the index value of that S&P U.S. Index at an instant immediately following that change.

Maintenance of the S&P U.S. Indices

Changes to index composition are made on an as-needed basis. There is no scheduled reconstitution. Rather, changes in response to corporate actions and market developments can be made at any time. Index additions and deletions are announced with at least three business days advance notice. Less than three business days' notice may be given at the discretion of the S&P Dow Jones's U.S. index committee.

Quarterly Update. Share counts are updated to the latest publicly available filings on a quarterly basis. IWF changes will only be made at the quarterly review if the change represents at least 5% of total current shares outstanding and is related to a single corporate action that did not qualify for the accelerated implementation rule, regardless of whether there is an associated share change.

Share/IWF Reference Date and Freeze Period. A reference date, after the market close five weeks prior to the third Friday in March, June, September and December, is the cutoff for publicly available information used for quarterly shares outstanding and IWF changes. All shares outstanding and ownership information contained in public filings and/or official sources dated on or before the reference date are included in that quarter's update. In addition, there is a freeze period on a quarterly basis for any changes that result from the accelerated implementation rule. The freeze period begins after the market close on the Tuesday prior to the second Friday of each rebalancing month (*i.e.*, March, June, September and December) and ends after the market close on the third Friday of the rebalancing month.

Pro-forma files for float-adjusted market capitalization indices are generally released after the market close on the first Friday, two weeks prior to the rebalancing effective date. For illustration purposes, if rebalancing pro-forma files are scheduled to be released on Friday, March 5, the share/IWF freeze period will begin after the close of trading on Tuesday, March 9, and will end after the close of trading the following Friday, March 19 (*i.e.*, the third Friday of the rebalancing month).

During the share/IWF freeze period, shares and IWFs are not changed and the accelerated implementation rule is suspended, except for mandatory corporate action events (such as merger activity, stock splits and rights offerings). The suspension includes all changes that qualify for accelerated implementation and would typically be announced or effective during the share/IWF freeze period. At the end of the freeze period, all suspended changes will be announced on the third Friday of the rebalancing month and implemented five business days after the quarterly rebalancing effective date.

Other Adjustments. In cases where there is no achievable market price for a stock being deleted, it can be removed at a zero or minimal price at the S&P Dow Jones's U.S. index committee's discretion.

The table below summarizes the treatment of certain corporate actions.

| Corporate Action | Treatment |
|----------------------------------|---|
| Company addition/deletion | <p><u>Addition</u> Companies are added at the float market capitalization weight. The net change to the market capitalization of the relevant S&P U.S. Index causes a divisor adjustment.</p> <p><u>Deletion</u> The weights of all stocks in the relevant S&P U.S. Index will proportionally change. Relative weights will stay the same. The index divisor will change due to the net change in the market capitalization of that S&P U.S. Index.</p> |

| Corporate Action | Treatment |
|-------------------------------------|--|
| Change in shares outstanding | Increasing (decreasing) the shares outstanding increases (decreases) the market capitalization of the relevant S&P U.S. Index. The change to the market capitalization of that S&P U.S. Index causes a divisor adjustment. |
| Split/reverse split | Shares outstanding are adjusted by the split ratio. Stock price is adjusted by the split ratio. There is no change to the market capitalization of the relevant S&P U.S. Index and no divisor adjustment. |
| Spin-off | <p>Generally, the spin-off is added to the relevant S&P U.S. Index on the ex-date at a price of zero and will remain in that S&P U.S. Index for at least one trading day. As a result, there will be no change to the index divisor on the ex-date.</p> <p>However, if the spin-off is ineligible for continued inclusion, it will be removed after the ex-date. The weight of the spin-off being deleted is reinvested across all the index components proportionally such that the relative weights of all index components are unchanged. The net change in the market capitalization of the relevant S&P U.S. Index will cause a divisor change.</p> |
| Change in IWF | Increasing (decreasing) the IWF increases (decreases) the market capitalization of the relevant S&P U.S. Index. A net change to the market capitalization of that S&P U.S. Index causes a divisor adjustment. |
| Ordinary dividend | When a company pays an ordinary cash dividend, the relevant S&P U.S. Index does not make any adjustments to the price or shares of the stock. As a result, there are no divisor adjustments to that S&P U.S. Index. |
| Special dividend | The stock price is adjusted by the amount of the dividend. The net change to the market capitalization of the relevant S&P U.S. Index causes a divisor adjustment. |
| Rights offering | All rights offerings that are in the money on the ex-date are applied under the assumption that the rights are fully subscribed. The stock price is adjusted by the value of the rights and the shares outstanding are increased by the rights ratio. The net change in the market capitalization of the relevant S&P U.S. Index causes a divisor adjustment. |

Governance of the S&P U.S. Indices

The S&P U.S. Indices are maintained by S&P Dow Jones's U.S. index committee. All index committee members are full-time professional members of S&P Dow Jones' staff. The index committee meets monthly. At each meeting, the index committee reviews pending corporate actions that may affect index constituents, statistics comparing the composition of the S&P U.S. Indices to the market, companies that are being considered as candidates for addition to an S&P U.S. Index and any significant market events. In addition, the index committee may revise index policy covering rules for selecting companies, treatment of dividends, share counts or other matters.

BACKGROUND ON THE TOPIX® INDEX

All information contained in this underlying supplement regarding the Tokyo Stock Price Index, or the TOPIX® Index, including, without limitation, its make-up, method of calculation and changes in its components, has been derived from publicly available information, without independent verification. This information reflects the policies of, and is subject to change by, JPX Market Innovation & Research, Inc. (the “JPXI”). The TOPIX® Index is calculated, maintained and published by the JPXI. The JPXI has no obligation to continue to publish, and may discontinue publication of, the TOPIX® Index.

The TOPIX® Index is reported by Bloomberg L.P. under the ticker symbol “TPX.”

The TOPIX® Index was developed by the Tokyo Stock Exchange, Inc. (the “TSE”). Publication of the TOPIX® Index began on July 1, 1969, based on an initial index value of 100 at January 4, 1968. The TOPIX® Index is computed and published every second through the Market Information System, and is reported to securities companies across Japan and available worldwide through computerized information networks.

Composition and Maintenance of the TOPIX® Index

The TOPIX® Index is a free float-adjusted market capitalization-weighted index of common stocks listed on the TSE covering an extensive portion of the Japanese stock market. On April 4, 2022, JPXI began revisions to the TOPIX® Index in conjunction with the restructuring of the TSE into three new market segments: the Prime Market, the Standard Market and the Growth Market.

Prior to April 4, 2022, the component stocks of the TOPIX® Index consisted of all Japanese common stocks listed on the First Section of the TSE. Japanese stocks admitted to the TSE were previously assigned to one of the First Section, the Second Section or the Mothers. Stocks listed on the First Section were typically limited to larger, longer established and more actively traded issues, stocks listed on the Second Section were typically limited to mid-sized companies and stocks listed on the Mothers were typically limited to high-growth start-up companies. Stocks that were components of the TOPIX® Index as of April 1, 2022 remain as its components after the market restructuring, regardless of their new market segment. However, component stocks with tradeable share market capitalization of under JPY 10 billion on the base date of June 20, 2021 are designated as “phased weighting reduction constituents,” and their weighting will be gradually reduced in ten stages on the last business day of each quarter beginning in October 2022 and ending in January 2025. Subject to a re-evaluation after the fourth stage, they will be removed from the TOPIX® Index on the last business day of January 2025.

During the transition period, additions to the component stocks can occur (1) through the initial listing of a company on or transfer to the Prime Market, with those changes taking effect on the last business day of the month after such initial listing; (2) through the initial listing of a new company resulting from a corporate consolidation that results in an index constituent being delisted, with those changes taking effect on the new listing date; (3) through the delisting of an index constituent due to a merger with a surviving stock that is not an index constituent, with those changes taking effect on the delisting date; or (4) through the cancellation, as of the last business day of August 2023, of the designation “Securities on Alert” on a former component stock that had caused that stock to be removed from the TOPIX® Index, *provided* that that stock meets tradeable share market capitalization and annual traded value ratio requirements, with those changes taking effect on the last business day of October 2023.

Deletions of constituents can occur due to (1) de-listing, resulting from a corporate consolidation, when the surviving company re-lists with the TSE, with those changes taking effect on the initial listing date of the new company (normally two business days after the delisting date); (2) de-listing of a company for reasons other than those stated above, with those changes taking effect on the de-listing date; or (3) designation of stocks to be de-listed, with those changes taking effect four business days after such designation. Any component stock designated as a “Security on Alert” as of April 4, 2022 was removed from the TOPIX® Index as of the last business day of April 2022.

Rules for addition of component stocks after January 31, 2025 will be determined following the transition period.

Calculation of the TOPIX® Index

The TOPIX® Index is calculated using market capitalization weighting, with the market price of each component stock multiplied by the number of shares listed, as adjusted by multiplying by a free float weight (“**FFW**”) that incorporates both a liquidity factor (to take into account only the listed shares deemed to be available for trading in the market) and a transition factor (in the case of a component stock identified for phased weighting reduction as described above). The upper weighting limit for any one component stock is 10%. The JPXI amended its free-float weight calculation methodology as of April 4, 2022, with changes to any component's FFW phased in over three months.

The TOPIX® Index is not expressed in Japanese yen, but is presented in terms of points (as a decimal figure), rounded to the nearest one-hundredth. The TOPIX® Index is calculated by multiplying 100 by the figure obtained by dividing the current free float-adjusted market value (the current market price per share at the time of the index calculation multiplied by the number of free float-adjusted common shares listed on the TSE at the same instance) (as adjusted by multiplying the FFW) (the “**Current Market Value**”) by the base market value (*i.e.*, the Current Market Value on the base date) (the “**Base Market Value**”).

The calculation of the TOPIX® Index can be represented by the following formula:

$$\text{Index} = \frac{\text{Current Market Value}}{\text{Base Market Value}} \times 100$$

The number of free float-adjusted shares at the time of the index calculation is the number of common shares listed on the TSE multiplied by the free float weight. The free float weight is the percentage of listed shares deemed to be available for trading in the market and is calculated by the JPXI for each listed company for purposes of index calculation. The free float weight is determined by estimating the number of non-free float shares on the basis of published materials such as securities reports. In determining the free float weight, the JPXI deems the following shares as non-free float shares: shares held by the top 10 major shareholders (subject to certain exceptions), treasury stocks (including certain cross-shareholdings), shares held by board members of the relevant company, equity securities held for investment purposes other than pure investment and other shares JPXI deems not available for trading in the market. The free float weight is equal to 1 minus the number of non-free float shares divided by the number of listed shares. In the case of some companies with low liquidity, the JPXI may adjust their free float downwards by applying a “liquidity factor.”

The free float weight assigned to each listed company is reviewed annually, with timings that vary according to the earnings release date of each listed company. Free float weights may also be subject to extraordinary review at JPXI’s discretion in the case of certain corporate actions (*e.g.*, allocation of new shares, conversion of preferred shares or exercise of subscription warrants, spin-offs, mergers, stock swaps, take-overs) and for other reasons the JPXI believes appropriate.

In order to maintain continuity, the Base Market Value is adjusted from time to time to ensure that it reflects only price movements resulting from auction market activity, and to eliminate the effects of other factors and prevent any instantaneous change or discontinuity in the level of the TOPIX® Index. These factors include, without limitation: new listings, delistings, new share issues either through public offerings or through rights offerings to shareholders (limited to cases where the allotted subscription warrant securities are listed) and issuance of shares as a consequence of exercise of convertible bonds or warrants.

The formula for the adjustment is as follows:

$$\frac{\text{Free float-adjusted Market Value on business day before adjustment date}}{\text{Base Market Value before adjustment}} = \frac{(\text{Free float-adjusted Market Value on business day before adjustment date} \pm \text{Adjustment Amount})}{\text{Base Market Value after adjustment}}$$

Where “**Adjustment Amount**” is equal to the changes in the number of shares included in the calculation of the TOPIX® Index multiplied by the price of those shares used for the purposes of the adjustment.

Therefore,

$$\text{New Base Market Value} = \frac{\text{Old Base Market Value} \times (\text{Free float-adjusted Market Value on business day before adjustment date} \pm \text{Adjustment Amount})}{\text{Free float-adjusted Market Value on business day before adjustment date}}$$

The Base Market Value remains at the new value until a further adjustment is necessary as a result of another change. As a result of this change affecting the Current Market Value or any stock underlying the TOPIX® Index, the Base Market Value is adjusted in a way that the new value of the TOPIX® Index will equal the level of the TOPIX® Index immediately prior to this change.

No adjustment is made to the Base Market Value, however, in the case of events such as stock splits or decreases in capital without compensation, which theoretically do not affect market capitalization.

BACKGROUND ON THE FEDERAL REPUBLIC OF GERMANY

Any and all disclosures contained in this underlying supplement regarding the Federal Republic of Germany (“**Germany**”) and German debt securities, including Bund (the “**German Bonds**”), have been derived from publicly available documents, without independent verification. In connection with any offering of the notes, the Issuer and the Guarantor (if applicable) have not participated in the preparation of those documents or made any due diligence inquiry with respect to the information provided in those documents. Furthermore, no assurance can be given that all events occurring prior to the date of this underlying supplement (including events that would affect the accuracy or completeness of the publicly available documents) that would affect the performance of Germany or the German Bonds have been publicly disclosed. Subsequent disclosure of any such events or the disclosure of or failure to disclose material future events concerning Germany or the German Bonds described in those publicly available documents could affect the performance of the German Bonds and, therefore, the value of the notes. Neither the Issuer nor the Guarantor (if applicable) nor any of their affiliates make any representation to you as to the performance of Germany or the German Bonds.

Germany

Germany is a foreign sovereign government. Germany, as co-signatory with respect to Landwirtschaftliche Rentenbank and as guarantor and co-signatory with respect to KfW, has filed financial and other information with the SEC in registration statements under Schedule B of the Securities Act of 1933. Information filed by Germany with the SEC can be accessed through <http://www.sec.gov> and can be located by reference to Landwirtschaftliche Rentenbank’s CIK Code: 0001144797 and KfW’s CIK Code: 0000821533.

Various third-party websites contain detailed information regarding Germany and its government, economy and fiscal affairs, including (i) <http://www.cia.gov> (World Factbook); (ii) <http://databank.worldbank.org> (World dataBank); and (iii) <http://www.imf.org> (International Monetary Fund). Information contained in these third-party websites is not incorporated by reference in, and should not be considered a part of, this underlying supplement. The Issuer and the Guarantor (if applicable) make no representation or warranty as to the accuracy or completeness of information contained on these third-party websites.

Germany and its various agencies and affiliates also maintain websites that contain such information, in English, including (i) <http://www.deutsche-finanzagentur.de> (Bundesrepublik Deutschland Finanzagentur GmbH); (ii) <http://www.bundesbank.de> (Deutsche Bundesbank); and (iii) <http://www.destatis.de> (Statistisches Bundesamt Deutschland). Information contained in these German websites is not incorporated by reference in, and should not be considered a part of, this underlying supplement. The Issuer and the Guarantor (if applicable) make no representation or warranty as to the accuracy or completeness of information contained on these German websites.

German Bonds

The German Bonds are German-government debt securities issued by the German Finance Agency. The German Bonds pay a fixed coupon every year until maturity, at which point the holder is entitled to receive the final coupon payment and the return of the principal. The coupon rate for German Bond issuances varies, with the rate generally reflecting the market interest rate at the time of the first issue of the relevant German Bonds.

BACKGROUND ON JAPAN

Any and all disclosures contained in this underlying supplement regarding Japan and Japanese government bonds (“**Japanese Bonds**”) have been derived from publicly available documents, without independent verification. In connection with any offering of the notes, the Issuer and the Guarantor (if applicable) have not participated in the preparation of those documents or made any due diligence inquiry with respect to the information provided in those documents. Furthermore, no assurance can be given that all events occurring prior to the date of this underlying supplement (including events that would affect the accuracy or completeness of the publicly available documents) that would affect the performance of Japan or the Japanese Bonds have been publicly disclosed. Subsequent disclosure of any such events or the disclosure of or failure to disclose material future events concerning Japan or the Japanese Bonds described in those publicly available documents could affect the performance of the Japanese Bonds and, therefore, the value of the notes. Neither the Issuer nor the Guarantor (if applicable) nor any of their affiliates make any representation to you as to the performance of Japan or the Japanese Bonds.

Japan

Japan is a foreign sovereign government. Japan, as registrant, has filed financial and other information specified by the SEC in annual reports pursuant to the Securities Act of 1933. Additionally, Japan, as guarantor with respect to the Japan Finance Corporation, has filed financial and other information with the SEC in registration statements under Schedule B of the Securities Act of 1933. Information filed by Japan with the SEC can be accessed through <http://www.sec.gov> and can be located by reference to its CIK Code: 0000837056 and as guarantor by reference to Japan Finance Corporation’s CIK Code: 0001109604.

Various third party websites contain detailed information regarding Japan and its government, economy and fiscal affairs, including (i) <http://www.cia.gov> (World Factbook); (ii) <http://databank.worldbank.org> (World dataBank); and (iii) <http://www.imf.org> (International Monetary Fund). Information contained in these third-party websites is not incorporated by reference in, and should not be considered a part of, this underlying supplement. The Issuer and the Guarantor (if applicable) make no representation or warranty as to the accuracy or completeness of information contained on these third-party websites.

Japan and its various agencies and affiliates also maintain websites that contain such information, in English, including (i) <http://www.mof.go.jp> (Ministry of Finance Japan); (ii) <http://www.boj.or.jp> (Bank of Japan); and (iii) <http://www.stat.go.jp> (Statistics Bureau and Director-General for Policy Planning of Japan). Information contained in these Japanese websites is not incorporated by reference in, and should not be considered a part of, this underlying supplement. The Issuer and the Guarantor (if applicable) make no representation or warranty as to the accuracy or completeness of information contained on these Japanese websites.

Japanese Bonds

Japanese Bonds are Japan-government debt securities issued by the Ministry of Finance Japan. Japanese Bonds pay a fixed coupon every six months until maturity, at which point the holder is entitled to receive the final coupon payment and the return of the principal. The coupon rate for Japanese Bond issuances varies, with the rate generally reflecting the market interest rate at the time of the first issue of the Japanese Bonds.

SUPPLEMENTAL TERMS OF THE NOTES

The following supplemental terms of the notes supplement, and to the extent they are inconsistent, supersede, the description of the general terms of the notes set forth in the accompanying product supplement. Except as noted below, capitalized terms used in this section without definition are as defined in "The J.P. Morgan Multi-Asset Index" above.

Postponement of a Determination Date

Notes linked solely to the Index

Notwithstanding any contrary provision in the accompanying product supplement, for notes linked solely to the Index, the following provisions will apply. If a Determination Date (as defined in the accompanying product supplement) is a Disrupted Day (as defined in the accompanying product supplement), the applicable Determination Date will be postponed to the immediately succeeding scheduled trading day that is not a Disrupted Day.

In no event, however, will any Determination Date be postponed to a date that is after the applicable Final Disrupted Determination Date (as defined in the accompanying product supplement). If a Determination Date is or has been postponed to the applicable Final Disrupted Determination Date and that day is a Disrupted Day, the calculation agent will determine the closing level of the Index for that Determination Date on that Final Disrupted Determination Date in accordance with the formula for and method of calculating the closing level of the Index last in effect prior to the commencement of the market disruption event (or prior to the non-trading day), using, for any Constituent (including any successor Constituent), the official closing level of that Constituent (or, if a market disruption event or a non-trading day that affected that Constituent has occurred, the closing level of that Constituent determined by the calculation agent in accordance with the formula for and method of calculating the closing level of that Constituent last in effect prior to the commencement of the market disruption event (or prior to the non-trading day), using the calculation agent's good faith estimate of the closing price or other trading price or level of each futures contract most recently composing that Constituent that would have prevailed but for that suspension or limitation or non-trading day) on the scheduled trading day immediately preceding that Final Disrupted Determination Date.

Notes linked to the Index and other reference assets

If the notes are linked to the Index and other reference assets, the provisions relating to postponement of a Determination Date as set forth in the accompanying product supplement will apply, except that if a Determination Date is or has been postponed to the applicable Final Disrupted Determination Date and, on that day, the closing level of the Index has not been established in accordance with the postponement provisions of the accompanying product supplement that apply prior to the applicable Final Disrupted Determination Date, the closing level of the Index for that Determination Date will be determined by the calculation agent on the applicable Final Disrupted Determination Date in accordance with the formula for and method of calculating the closing level of the Index last in effect prior to the commencement of the market disruption event (or prior to the non-trading day), using, for any Constituent (including any successor Constituent), the official closing level of that Constituent (or, if a market disruption event or a non-trading day that affected that Constituent has occurred, the closing level of that Constituent determined by the calculation agent in accordance with the formula for and method of calculating the closing level of that Constituent last in effect prior to the commencement of the market disruption event (or prior to the non-trading day), using the calculation agent's good faith estimate of the closing price or other trading price or level of each futures contract most recently composing that Constituent that would have prevailed but for that suspension or limitation or non-trading day) on the scheduled trading day immediately preceding that Final Disrupted Determination Date.

Additional Defined Terms

Notwithstanding any contrary definition in the accompanying product supplement, a "**scheduled trading day**" is, unless otherwise specified in the relevant terms supplement, a day, as determined by the calculation agent, on which the Index or any relevant successor index is scheduled to be published in

accordance with the rules or methodology that governs the Index or relevant Successor Index, as applicable.

Notwithstanding any contrary definition in the accompanying product supplement, a “**trading day**” is, unless otherwise specified in the relevant terms supplement, a day, as determined by the calculation agent, on which the Index or any relevant successor index is published.

Market Disruption Events

Notwithstanding any contrary provision in the accompanying product supplement, the following provisions will apply to notes linked in whole or in part to the Index. With respect to the Index or any relevant successor index (as defined in the accompanying product supplement), a “**market disruption event**,” unless otherwise specified in the relevant terms supplement, means:

- (1) any suspension of or limitation imposed on trading in any futures contract referenced by a Constituent on the relevant exchange or any other event that disrupts or impairs the ability of market participants in general to affect transactions in, or obtain market values for, any such futures contract on the relevant exchange, in each case which the calculation agent determines is material;
- (2) all trading in any futures contract referenced by any futures contract referenced by a Constituent is suspended for the entire day;
- (3) all trading in any futures contract referenced by a Constituent is suspended (which term, for the avoidance of doubt, will not include, for purposes of this sub-paragraph (3), a futures contract being bid or offered at the limit price) subsequent to the opening of trading on that day, and trading does not recommence at least ten minutes prior to the actual closing time of the regular trading session of that futures contract on that day; or
- (4) if the relevant exchange establishes limits on the range within which the price of any futures contract referenced by a Constituent may fluctuate, the settlement price of any such futures contract is at the upper or lower limit of that range on that day,
- (5) the closure of a material number of leading commercial banks in the City of New York prior to their scheduled weekday closing time; or
- (6) the failure of the Index Calculation Agent to calculate and publish the official closing level of the Index (or that successor index),

in each case as determined by the calculation agent in its sole discretion; and

- in the case of an event described in clause (1), (2), (3) or (4) above, a determination by the calculation agent in its sole discretion that the applicable event described above materially interfered with our ability or the ability of any of our affiliates to adjust or unwind all or a material portion of any hedge with respect to the notes.

“**Relevant exchange**” means the exchange or quotation system on which the relevant futures contract series are listed for trading (taking into account permanent or temporary successors or replacements).

Consequences of a Commodity Hedging Disruption Event

The concept of a commodity hedging disruption event will apply to notes linked in whole or in part to the Index. Please see the accompanying product supplement for more information about commodity hedging disruption events and their consequences.

Discontinuation of the Index; Alteration of Method of Calculation

The provisions relating to the discontinuation of an index as set forth in the accompanying product supplement will apply, except that, if the calculation agent is to determine the closing level of the Index or any successor index for any Determination Date or other relevant date because no successor index is available at that time, or the calculation agent has previously selected a successor index and publication of that successor index is discontinued prior to, and that discontinuation is continuing on, that Determination Date or other relevant date, then the closing level of the Index will be computed by the calculation agent in accordance with the rules governing the Index or successor index, as applicable, last in effect prior to that discontinuation.

ANNEX A

J.P. Morgan Multi-Asset Index Index Rules

J.P.Morgan

Amended and Restated as of August 22, 2023

© All Rights Reserved

Contents

| | | |
|------|--|----|
| 1. | Introduction..... | 3 |
| 2. | Index Sponsor and Index Calculation Agent..... | 3 |
| 2.1 | <i>Identity and responsibilities.....</i> | 3 |
| 2.2 | <i>Index Sponsor determinations and Index Calculation Agent determinations.....</i> | 4 |
| 3. | Amendments..... | 4 |
| 4. | General notes on the Index..... | 5 |
| 5. | Publication of Index Levels and rounding..... | 6 |
| 6. | The Constituents; Available Levels | 6 |
| 7. | Selection Dates | 7 |
| 7.1 | <i>Calculating the Realized Volatility of the Selected Portfolio.....</i> | 7 |
| 7.2 | <i>Determining a Selection Date</i> | 8 |
| 8. | Determining the Selected Weights for the Constituents in the Selected Portfolio..... | 8 |
| 8.1 | <i>Identifying the Selected Portfolio.....</i> | 8 |
| 8.2 | <i>Determining the Selected Weight to be assigned to each Constituent in the relevant Selected Portfolio..</i> | 11 |
| 9. | Rebalancing and units..... | 11 |
| 9.1 | <i>Calculating the Selected Units for each Constituent in respect of the relevant Selected Portfolio.....</i> | 11 |
| 9.2 | <i>Calculating the Daily Units for each Constituent</i> | 11 |
| 10. | Calculation of the Index Level..... | 12 |
| 11. | Market disruptions | 13 |
| 12. | Extraordinary Events..... | 13 |
| 12.1 | <i>Successors to a Constituent</i> | 13 |
| 12.2 | <i>Substitutes for a Constituent.....</i> | 14 |
| 12.3 | <i>Definitions related to Extraordinary Events</i> | 14 |
| 13. | Corrections..... | 16 |
| | Definitions | 17 |

J.P. Morgan Multi-Asset Index

Index Rules

1. Introduction

This document comprises the rules (as may be supplemented, amended or restated from time to time, the “**Index Rules**”) of the J.P. Morgan Multi-Asset Index (the “**Index**”), a notional, rules-based proprietary index.

ALL PERSONS READING THIS DOCUMENT SHOULD REFER TO THE NOTICES, DISCLAIMERS AND CONFLICTS OF INTEREST SECTIONS BELOW AND CONSIDER THE INFORMATION CONTAINED IN THIS DOCUMENT IN LIGHT OF SUCH NOTICES, DISCLAIMERS AND CONFLICTS OF INTEREST.

NOTHING IN THE INDEX RULES CONSTITUTES AN OFFER TO BUY OR SELL ANY FINANCIAL PRODUCT, PARTICIPATE IN ANY TRANSACTION OR ADOPT ANY INVESTMENT STRATEGY. THE INDEX RULES DO NOT CONSTITUTE INVESTMENT, LEGAL, TAX, REGULATORY OR ACCOUNTING ADVICE.

This document is published by J.P. Morgan Securities LLC (“**JPMS**”) of 383 Madison Avenue, 5th Floor, New York, New York 10179, United States, in its capacity as the Index Sponsor (as defined herein). Further information relating to: (i) the internal governance framework; and (ii) the identity and role of third parties that are non-affiliates of JPMorgan, in respect of this Index is available on request to the Index Sponsor. Capitalized terms not otherwise defined in the relevant section of these Index Rules have the meaning set out in the section entitled “*Definitions*”.

2. Index Sponsor and Index Calculation Agent

2.1 Identity and responsibilities

As of the Live Date (as defined in “*Definitions*”), JPMS is the sponsor of the Index (the “**Index Sponsor**”, which term shall include any successor or assign of the Index Sponsor). The Index Sponsor may appoint a successor sponsor or assign, delegate or transfer any or all of its rights, obligations or responsibilities in its capacity as Index Sponsor in connection with the Index to one or more entities (including an unrelated third party) that the Index Sponsor determines appropriate. The Index Calculation Agent (unless the Index Calculation Agent is the same entity as the Index Sponsor) must obtain written permission from the Index Sponsor prior to any delegation or transfer of the Index Calculation Agent’s responsibilities or obligations in connection with the Index.

The initial Index Sponsor is responsible for, among other things, the creation and design of the Index and the documentation of the Index Rules. The Index Sponsor is responsible for the appointment of the calculation agent of the Index (the “**Index Calculation Agent**”), which may be the Index Sponsor, an unrelated third party or an affiliate or subsidiary of the Index Sponsor. The Index Calculation Agent will (unless the Index Calculation Agent is the same entity as the Index Sponsor) be an agent of the Index Sponsor. As of the Live Date, the Index Sponsor has appointed JPMS to be the initial Index Calculation Agent.

The Index Sponsor may at any time and for any reason (i) appoint a successor Index Calculation Agent, if the Index Sponsor is at that time the Index Calculation Agent or (ii) terminate the appointment of the Index Calculation Agent and appoint an alternative entity as a replacement Index Calculation Agent, if the Index Sponsor is not at that time the Index Calculation Agent.

The Index Calculation Agent is responsible for (i) calculating the Index Level in respect of each Weekday (each as defined herein) in accordance with the Index Rules and (ii) determining (among other things and subject to the prior agreement of the Index Sponsor or at the direction of the Index Sponsor) if a Disrupted Day or Extraordinary Event (as defined in “*Definitions*” and Section 12.3 (*Definitions related to Extraordinary Events*), respectively) has occurred, whether any input necessary to perform any calculations under the Index Rules is not published or otherwise made available by the relevant sponsor of a Constituent (as defined in Section 4

(*General Notes on the Index*)) to the Index Calculation Agent (as further described in Section 11 (*Market disruptions*)), and any related consequences or adjustments in accordance with the Index Rules.

The Index Calculation Agent shall act in good faith and in a commercially reasonable manner in making determinations, interpretations and calculations pursuant to the Index Rules. Subject to the prior agreement of the Index Sponsor, the Index Calculation Agent's determinations and calculations related to the Index and the Index Calculation Agent's interpretations of the Index Rules, shall be final.

None of the Index Sponsor, the Index Calculation Agent, or any of their respective affiliates or subsidiaries or any of their respective directors, officers, employees, representatives, delegates or agents (each, a "**Relevant Person**") shall have any responsibility to any person (whether as a result of negligence or otherwise) for any determinations, interpretations or calculations made or anything done (or omitted to be determined or done) in connection with the Index or any use to which any person may put the Index or the Index Levels.

The Index Sponsor may, in its reasonable discretion, at any time and without notice, terminate the calculation or publication of the Index.

2.2 Index Sponsor determinations and Index Calculation Agent determinations

The Index Calculation Agent's exercise of discretion or failure to exercise discretion in relation to the Index may have a detrimental effect on the Index Level and the volatility of the Index. The Index Sponsor or the Index Calculation Agent may make certain determinations or calculations based on information obtained from publicly available sources without independently verifying such information.

Subject to the prior agreement of the Index Sponsor, the Index Calculation Agent may make certain determinations, adjustments, amendments and interpretations related to the Index. All such determinations, adjustments, amendments and interpretations (in each applicable case, subject to such prior agreement on the part of the Index Sponsor) of the Index Calculation Agent related to the Index and all calculations performed by the Index Calculation Agent related to the Index shall be final, conclusive and binding and no person shall be entitled to make any claim against the Index Sponsor, the Index Calculation Agent, or any of the Relevant Persons in respect thereof. Once a determination, adjustment, amendment or interpretation is made or action is taken by the Index Calculation Agent (in each applicable case, as agreed in advance by the Index Sponsor) in relation to the Index, or a calculation is performed by the Index Calculation Agent in relation to the Index, none of the Index Sponsor, the Index Calculation Agent or any Relevant Person shall be under any obligation to revise any such determination, adjustment, amendment, interpretation or calculation made or anything done (or omitted to be determined, adjusted, amended, interpreted, calculated or done) for any reason.

3. Amendments

The Index Rules may be supplemented, amended or restated from time to time in the sole discretion of the Index Sponsor. The Index Rules will be made available (in a manner determined by the Index Sponsor from time to time) following such supplementation, amendment or restatement. Following any amendment, the Index Sponsor will make available (as soon as practicable) the amended version of the Index Rules and will include the effective date of such amendment in the new version of the Index Rules. However, the Index Sponsor is under no obligation to inform any person about any amendments to the Index (except as required by law or regulation).

Although the Index Rules are intended to be comprehensive and accurate, ambiguities may arise and errors or omissions may have been made. In such circumstances, the Index Sponsor will resolve such ambiguities and, if necessary, amend the Index Rules to reflect such resolution. In the case of any inaccuracy, the Index Sponsor may amend the Index Rules to address errors or omissions. The Index Sponsor is under no obligation to inform any person of any amendments to the Index (except as may be required by law).

4. General notes on the Index

These general notes on the Index set forth in this Section 4 are qualified in their entirety by the remainder of the Index Rules.

Objective. The Index aims to implement a global multi-asset allocation strategy by tracking the return of a notional portfolio of excess return, futures-based indices selected from a predetermined universe, and periodically rebalancing to weights calculated pursuant to these Index Rules.

The Index selects and rebalances into a new notional portfolio at least once each month using a methodology designed to maintain a diversified allocation; allocate dynamically based on the market cycle; and select allocations that attempt to deliver a stable volatility over time.

The Index tracks the return of a dynamic notional portfolio consisting of up to 10 excess return futures-based indices (converted into U.S. dollars in the case of non-U.S. dollar denominated constituents, and each, a “**Constituent**”), *less* a 1.00% *per annum* daily deduction.

The Index aims to maintain a diversified portfolio, the return of which is the weighted average of its constituents’ returns. As the volatility of a diversified portfolio is less than the weighted average of its constituents’ volatilities, the Index therefore tracks a portfolio that may be said to deliver average returns with below-average volatility. In order to ensure diversification, the Index imposes caps and floors on the weights within its selected portfolio at the individual and asset class levels. The Index uses a momentum strategy, identifying a selected portfolio that reflects the strongest recent returns in local-currency terms from among the possible portfolios that meet the relevant weight constraints, while attempting to maintain a stable level of volatility over time. As such, the Index is designed to take on more volatility risk in calm markets and deliver lower volatility in choppy ones.

At each rebalancing, the Index identifies every notional portfolio: that meets the relevant individual constituent and asset class weight constraints, with weights in increments of five percent (5%) and a total weight of one hundred percent (100%), and that has a recent historical volatility at or below a volatility threshold of four percent (4%). The Index then selects and rebalances into the notional portfolio with the strongest recent performance. If no such notional portfolio exists, the volatility threshold is increased in one percent (1%) increments, and the selection process is repeated, until a notional portfolio has been selected. Rebalancing occurs at least monthly, as well as in instances when the volatility of a selected portfolio increases above a certain threshold (relative to its volatility on its initial date of selection). The Index is rebalanced over a five (5) day rebalancing period based on unitized weights set at the initiation of a rebalance. The relative weights of the constituents within each selected portfolio will change over time as compared to the initially selected unitized weights, as the excess return performances of the portfolio constituents vary over time.

No assurance can be given that the investment strategy of the Index will be successful or that the Index will outperform any alternative portfolio or strategy that might be constructed from its constituents. There is no guarantee that past performance trends referenced in identifying a selected portfolio will continue during the subsequent period when the Index provides exposure to that selected portfolio. In addition, no assurance can be given that the actual realized volatility of the Index will approximate four percent (4%). The actual realized volatility of the Index will depend on the performance of the constituents of the relevant selected portfolios and, at any time or for extended periods, may be greater (or less than) four percent (4%). Furthermore, the volatility threshold used by the Index is itself subject to upward adjustment and thus may be greater than 4%, perhaps significantly.

The Index is described as a “notional” or “synthetic” portfolio of assets because there is no actual portfolio of assets to which any person is entitled or in which any person has any ownership interest. The Index merely references certain assets, the performance of which will be used as a reference point for calculating the Index Level.

The daily accruing, per annum deduction will tend to act as a drag on the performance of the Index.

5. Publication of Index Levels and rounding

The Index Calculation Agent shall calculate and publish or otherwise make available (in a manner determined by the Index Calculation Agent from time to time) the Index Level in accordance with the methodology herein. Index Levels that are published may be obtained by reference to Bloomberg ticker “MAX” or from a successor or alternate source for published Index Levels as may be identified by the Index Calculation Agent from time to time.

The Index Calculation Agent will calculate the level of the Index (the “**Index Level**”) for each Weekday for the Index, but will publish the Index Level for a Weekday only if it is an Index Business Day in respect of which, for each Constituent that has non-zero Daily Units in respect of the Weekday immediately preceding such Index Business Day, the most recent Dealing Day on or immediately preceding such Index Business Day is not a Disrupted Day (such day, a “**Publication Day**”).

Notwithstanding anything to the contrary herein, the Index Sponsor may, at any time and without notice, change the frequency of calculation, publication or dissemination of Index Levels, the means or place of publication or dissemination of Index Levels or cease the calculation, publication or dissemination of Index Levels, and nothing in this document shall be construed as an agreement by the Index Sponsor or the Index Calculation Agent to continue to calculate, publish or disseminate Index Levels if the Index Sponsor elects to cease such calculation, publication or dissemination of some or all Index Levels.

For purposes of publication only, the Index Calculation Agent will round all Index Levels to two (2) decimal places before publishing, disseminating or otherwise making such levels available in U.S. dollars (“**USD**” or the “**Currency of the Index**”). The Index Calculation Agent may calculate the Index to a greater degree of accuracy or specificity and may use any rounding convention it considers appropriate for any data used or calculations performed (which may include using data with a higher level of specificity than that which is published on any particular data source) to determine the Index Level.

None of the Index Sponsor, the Index Calculation Agent and any other Relevant Person will be liable to any person for publishing, disseminating or making available or for omitting to publish, disseminate or make available the Index Level at any particular time or on any particular venue or in any particular manner or in accordance with any particular methodology or practice.

The Index Calculation Agent has been calculating the Index Level and publishing it in accordance with these Index Rules since the Live Date (as defined in “*Definitions*”).

6. The Constituents; Available Levels

The Index tracks the excess return of a notional, dynamic basket composed by selecting from among ten (10) Constituents. Each of the Constituents is an index. As of the Live Date, JPMS is the index sponsor of each Constituent.

Each Constituent is set out in Table 1 below. For ease of identification, Table 1 contains, for each Constituent as of the Live Date, its name, Denomination Currency and ticker symbol (provided for ease of identification).

Table 1

| i | Constituents | Denomination Currency | Ticker |
|---|---|--------------------------|----------|
| 1 | J.P. Morgan US Large Cap Equities Futures Index | U.S. Dollars | JPUSLGEQ |
| 2 | J.P. Morgan US Small Cap Equities Futures Index | U.S. Dollars | JPUSMEQ |
| 3 | J.P. Morgan German Equities Futures Index | Euros | JPDEEQ |
| 4 | J.P. Morgan Japanese Equities Futures Index | Japanese Yen | JPJPEQ |
| 5 | J.P. Morgan 5Y U.S. Treasury Futures Index | U.S. Dollars | JPUS5YT |
| 6 | J.P. Morgan 10Y U.S. Treasury Futures Index | U.S. Dollars | JPUS10YT |

| i | Constituents | Denomination Currency | Ticker |
|----|--|--------------------------|----------|
| 7 | J.P. Morgan German Government Bond Futures Index | Euros | JPDEBUND |
| 8 | J.P. Morgan Japanese Government Bond Futures Index | Japanese Yen | JPJP10YB |
| 9 | J.P. Morgan Brent Crude Oil Futures Index | U.S. Dollars | JPBRENT |
| 10 | J.P. Morgan Gold Futures Index | U.S. Dollars | JPMGOLD |

For each Weekday, the Index Calculation Agent will determine the Available Level of each Constituent in accordance with the following:

“**Available Level**” means, for a Constituent and as of a Weekday:

- (a) If such Weekday is a Dealing Day that is not a Disrupted Day for such Constituent, the Closing Level of such Constituent as of such Weekday.
- (b) If such Weekday is not a Dealing Day for such Constituent, the Closing Level of such Constituent as of the first Dealing Day preceding such Weekday that was not a Disrupted Day for such Constituent.
- (c) If such Weekday is a Disrupted Day for such Constituent, the Closing Level of such Constituent as of the first Dealing Day preceding such Weekday that was not a Disrupted Day for such Constituent.

7. Selection Dates

The Index Calculation Agent will determine the weight (the “**Selected Weight**”) to be assigned to each Constituent on each Selection Date (as defined and determined in accordance with the methodology described in Section 7.2 (*Determining a Selection Date*)).

7.1 Calculating the Realized Volatility of the Selected Portfolio

For each Weekday, the Index Calculation Agent shall calculate the annualized observed volatility of the most recently Selected Portfolio (the “**Realized Volatility**”) in accordance with the following formula:

$$\text{Realized Volatility}_t^s = \max(22\text{D Volatility}_t^s, 65\text{D Volatility}_t^s, 260\text{D Volatility}_t^s)$$

where:

Realized Volatility_t^s means the Realized Volatility of the Selected Portfolio as Weekday t.

22D Volatility_t^s means the annualized observed volatility of the Selected Portfolio over the twenty-two (22) Weekdays prior to and including Weekday t, calculated in accordance with the following formula:

$$22\text{D Volatility}_t^s = \sqrt{260 \times \frac{22 \times \sum_{d=t-21}^t (\text{Return}_d^s)^2 - (\sum_{d=t-21}^t \text{Return}_d^s)^2}{22^2}}$$

65D Volatility_t^s means the annualized observed volatility of the Selected Portfolio over the sixty-five (65) Weekdays prior to and including Weekday t, calculated in accordance with the following formula:

$$65\text{D Volatility}_t^s = \sqrt{260 \times \frac{65 \times \sum_{d=t-64}^t (\text{Return}_d^s)^2 - (\sum_{d=t-64}^t \text{Return}_d^s)^2}{65^2}}$$

260D Volatility_t^s means the annualized observed volatility of the Selected Portfolio over the two hundred and sixty (260) Weekdays prior to and including Weekday t, calculated in accordance with the following formula:

$$260D \text{ Volatility}_t^s = \sqrt{260 \times \frac{260 \times \sum_{d=t-259}^t (\text{Return}_d^s)^2 - (\sum_{d=t-259}^t \text{Return}_d^s)^2}{260^2}}$$

Return_d^s means the weighted sum of the natural logarithms of daily returns of each Constituent for Weekday d, calculated in accordance with the following formula:

$$\text{Return}_d^s = \sum_i \left[\text{Selected Weight}_s^i \times \ln \left(\frac{\text{Available Level}_d^i}{\text{Available Level}_{d-1}^i} \right) \right]$$

$\text{Available Level}_d^i$ means the Available Level of Constituent i as of Weekday d.

$\text{Available Level}_{d-1}^i$ means the Available Level of Constituent i as of the Weekday immediately preceding Weekday d.

$\text{Selected Weight}_s^i$ means the Selected Weight of Constituent i within the Selected Portfolio.

7.2 Determining a Selection Date

For each Weekday, a “**Selection Date**” will be determined in accordance with the following:

- (i) If such Weekday is the Weekday immediately preceding the fifth (5th)-to-last Index Business Day of the calendar month, then such Weekday shall be a Selection Date.
- (ii) If such Weekday is not the Weekday immediately preceding the fifth (5th)-to-last Index Business Day of the calendar month, and:
 - (a) If the Realized Volatility of the most recently Selected Portfolio is more than two (2) times the Realized Volatility of such Selected Portfolio for such Selected Portfolio’s applicable Selection Date, then such Weekday shall be a Selection Date.
 - (b) If the Realized Volatility of the most recently Selected Portfolio is less than or equal to two (2) times the Realized Volatility of such Selected Portfolio for such Selected Portfolio’s applicable Selection Date, then such Weekday shall not be a Selection Date.

8. Determining the Selected Weights for the Constituents in the Selected Portfolio

On each Selection Date, the Index Calculation Agent will determine the weight (the “**Selected Weight**”) to be assigned to each Constituent in the Selected Portfolio, whether zero (0) or a positive or negative number, for the relevant Selected Portfolio determined as of such Selection Date, in accordance with Section 8.1 (*Identifying the Selected Portfolio*).

Each Constituent’s Selected Weight is then unitized, in accordance with Section 8.3 (*Unitizing the Selected Weight*). The actual weight identified in respect of each Constituent within a Selected Portfolio identified on the relevant Selection Date is expected to fluctuate, following the unitization of the Selected Weights, due to movements in the levels of the Constituents subsequent to the Selection Date.

8.1 Identifying the Selected Portfolio

With respect to a Selection Date, the Index Calculation Agent will:

- (a) Identify all hypothetical portfolios of Constituents (the “**Eligible Portfolios**” and each, individually, an “**Eligible Portfolio**”) that satisfy the weight constraints below (the “**Weight Constraints**”):

- (i) The Selected Weight assigned to each Constituent numbered one (1) through eight (8) in Table 1 in Section 6 (*The Constituents; Available Levels*) shall be equal to one (1) of the following: negative ten percent (-10%), negative five percent (-5%), zero percent (0%), five percent (5%), ten percent (10%), fifteen percent (15%), twenty percent (20%), twenty five percent (25%), thirty percent (30%), thirty five percent (35%) or forty percent (40%).
- (ii) The Selected Weight assigned to each Constituent numbered nine (9) or ten (10) in Table 1 in Section 6 (*The Constituents; Available Levels*) shall be equal to one (1) of the following: negative twenty percent (-20%), negative fifteen percent (-15%), negative ten percent (-10%), negative five percent (-5%), zero percent (0%), five percent (5%), ten percent (10%), fifteen percent (15%) or twenty percent (20%).
- (iii) The sum of the Selected Weights assigned to all the Constituents shall be equal to one hundred per cent (100%).
- (iv) The sum of Selected Weights assigned to the Constituents numbered: one (1) through four (4) in Table 1 in Section 6 (*The Constituents; Available Levels*) above shall be less than or equal to sixty percent (60%) and greater than or equal to 10% (10%).
- (v) The sum of Selected Weights assigned to the Constituents numbered: five (5) through eight (8) in Table 1 in Section 6 (*The Constituents; Available Levels*) above shall be less than or equal to eighty percent (80%) and greater than or equal to 10% (10%).
- (vi) The sum of Selected Weights assigned to the Constituents numbered: nine (9) and ten (10) in Table 1 in Section 6 (*The Constituents; Available Levels*) above shall be less than or equal to thirty percent (30%) and greater than or equal to negative thirty 30% (-30%).
- (b) Calculate the performance of each Eligible Portfolio (the “**Performance**”) in accordance with the following formula:

$$\text{Performance}_k^j = \sum_i^{10} \left[\frac{\text{Weight}_j^i}{3} \times \left(\frac{\text{Available Level}_k^i}{\text{Available Level}_{k-22}^i} + \frac{\text{Available Level}_k^i}{\text{Available Level}_{k-65}^i} + \frac{\text{Available Level}_k^i}{\text{Available Level}_{k-260}^i} \right) \right] - 1$$

where:

Performance_k^j means the Performance of Eligible Portfolio j as of Selection Date k;

$\text{Available Level}_k^i$ means the Available Level of Constituent i as of Selection Date k.

$\text{Available Level}_{k-22}^i$ means the Available Level of Constituent i as of the Weekday that is twenty two (22) Weekdays prior to Selection Date k.

$\text{Available Level}_{k-65}^i$ means the Available Level of Constituent i as of the Weekday that is sixty five (65) Weekdays prior to Selection Date k.

$\text{Available Level}_{k-260}^i$ means the Available Level of Constituent i as of the Weekday that is two hundred sixty (260) Weekdays prior to Selection Date k.

Weight_j^i means the weight of Constituent i within Eligible Portfolio j.

- (c) Calculate the annualized observed volatility of each Eligible Portfolio as of Selection Date k (the “**Realized Volatility**”) in accordance with the following formula:

$$\text{Realized Volatility}_k^j = \max(22\text{D Volatility}_k^j, 65\text{D Volatility}_k^j, 260\text{D Volatility}_k^j)$$

where:

Realized Volatility_k^j means the Realized Volatility of Eligible Portfolio j as of Selection Date k.

22D Volatility_k^j means the annualized observed volatility of Eligible Portfolio j over the twenty-two (22) Weekdays prior to and including Selection Date k, calculated in accordance with the following formula:

$$22\text{D Volatility}_k^j = \sqrt{260 \times \frac{22 \times \sum_{t=k-21}^k (\text{Return}_t^j)^2 - (\sum_{t=k-21}^k \text{Return}_t^j)^2}{22^2}}$$

65D Volatility_k^j means the annualized observed volatility of Eligible Portfolio j over the sixty-five (65) Weekdays prior to and including Selection Date k, calculated in accordance with the following formula:

$$65\text{D Volatility}_k^j = \sqrt{260 \times \frac{65 \times \sum_{t=k-64}^k (\text{Return}_t^j)^2 - (\sum_{t=k-64}^k \text{Return}_t^j)^2}{65^2}}$$

260D Volatility_k^j means the annualized observed volatility of Eligible Portfolio j over the two hundred and sixty (260) Weekdays prior to and including Selection Date k, calculated in accordance with the following formula:

$$260\text{D Volatility}_k^j = \sqrt{260 \times \frac{260 \times \sum_{t=k-259}^k (\text{Return}_t^j)^2 - (\sum_{t=k-259}^k \text{Return}_t^j)^2}{260^2}}$$

Return_t^j means the weighted sum of the natural logarithms of daily returns of each Constituent for Weekday t, calculated in accordance with the following formula:

$$\text{Return}_t^j = \sum_i^{10} \left[\text{Weight}_i^j \times \ln \left(\frac{\text{Available Level}_t^i}{\text{Available Level}_{t-1}^i} \right) \right]$$

Available Level_tⁱ means the Available Level of Constituent i as of Weekday t.

Available Level_{t-1}ⁱ means the Available Level of Constituent i as of the Weekday immediately preceding Weekday t.

Weight_jⁱ means the weight of Constituent i within Eligible Portfolio j.

- (d) Identify the Eligible Portfolio with the highest Performance that has Realized Volatility equal to or less than the Volatility Constraint; *provided that*, if there is more than one such Eligible Portfolio with the same highest Performance, the Eligible Portfolio that has the lowest annualized Realized Volatility shall be selected. The single Eligible Portfolio that satisfies these criteria is referred to herein as the “**Selected Portfolio**” with respect to the relevant Selection Date.

- (e) If none of the Eligible Portfolios has Realized Volatility equal to or less than four percent (4%, the “**Volatility Constraint**”), the Index Calculation Agent shall increase the Volatility Constraint by one percent (1%) and repeat the step set forth in Section 8.1(d) above until a Selected Portfolio is selected. This step, of increasing the Volatility Constraint, may be repeated until a Selected Portfolio is identified.

8.2 *Determining the Selected Weight to be assigned to each Constituent in the relevant Selected Portfolio*

The Selected Weight to be assigned to each Constituent within a Selected Portfolio will be determined by the Index Calculation Agent as the weight assigned to such Constituent in the Selected Portfolio identified in connection with the relevant Selection Date in accordance with Section 8.1 above.

9. **Rebalancing and units**

The Index will rebalance its exposure to each Constituent over the “**Rebalancing Period**” for such Constituent, which is the period composed of the first five (5) Dealing Days that are not Disrupted Days for such Constituent immediately following a Selection Date (each a “**Rebalancing Date**”).

Such rebalancing will transition the Index to the next Selected Portfolio selected on the most recent Selection Date, by identifying, on such Selection Date, the “unitized” (i.e., converted into a fixed number of units or shares to trade) weights of each Constituent in the relevant Selected Portfolio (the “**Selected Units**”), and rebalancing the Index’s exposure to each Constituent from the unitized exposures as of the immediately preceding Selection Date to such Selected Units.

The unitized exposure of the Index to each Constituent in respect of each Weekday shall be the “**Daily Units**”.

9.1 *Calculating the Selected Units for each Constituent in respect of the relevant Selected Portfolio*

In respect of each Selection Date, the Index Calculation Agent shall calculate the Selected Units of each Constituent in the relevant Selected Portfolio in accordance with the following formula:

$$\text{Selected Units}_k^i = \text{Selected Weight}_k^i \times \frac{\text{Index}_k}{\text{Available Level}_k^i \times \text{FX}_k^i}$$

where:

$\text{Selected Units}_k^i$ means the Selected Units of Constituent i in the Selected Portfolio selected as of Selection Date k.

$\text{Selected Weight}_k^i$ means the Selected Weight of Constituent i in the Selected Portfolio selected as of Selection Date k.

Index_k means the Index Level as of Selection Date k.

$\text{Available Level}_k^i$ means the Available Level of Constituent i as of Selection Date k.

FX_k^i means the FX Rate of Constituent i as of Selection Date k.

9.2 *Calculating the Daily Units for each Constituent*

As of the Base Date, the Daily Units of each Constituent was set equal to the Selected Units calculated in respect of the Selection Date immediately preceding the Base Date. Thereafter, the Index Calculation Agent will calculate the Daily Units of each Constituent i and in respect of each Weekday t as follows:

- (a) For each Weekday t from and including the last Rebalancing Date in Rebalancing Period k for such Constituent i to but excluding the first (1st) Rebalancing Date in the immediately following Rebalancing Period for such Constituent i, $\text{Daily Units}_t^i = \text{Selected Units}_k^i$.

- (b) For each Weekday t from and including the first (1st) Rebalancing Date in Rebalancing Period k for such Constituent i to but excluding the last Rebalancing Date in Rebalancing Period k for such Constituent i, in accordance with the following formula:

$$\text{Daily Units}_t^i = \frac{5 - n}{5} \times \text{Daily Units}_k^i + \frac{n}{5} \times \text{Selected Units}_k^i$$

where:

Daily Units_tⁱ means the Daily Units for Constituent i in respect of Weekday t.

Daily Units_kⁱ means the Daily Units for Constituent i in respect of Selection Date k.

Selected Units_kⁱ means the Selected Units for Constituent i in respect of Selection Date k.

n means the number of Rebalancing Dates that have occurred in Rebalancing Period k prior to and including Weekday t, such that:

- (i) If Weekday t is the first (1st) Rebalancing Date in Rebalancing Period k, n = 1.
- (ii) If Weekday t is the second (2nd) Rebalancing Date in Rebalancing Period k, n = 2.
- (iii) If Weekday t is the third (3rd) Rebalancing Date in Rebalancing Period k, n = 3.
- (iv) If Weekday t is the fourth (4th) Rebalancing Date in Rebalancing Period k, n = 4.
- (v) If Weekday t is the fifth (5th) Rebalancing Date in Rebalancing Period k, n = 5.

10. Calculation of the Index Level

As of the Base Date, the Index Level was set equal to one hundred (100.00). Thereafter, the Index Level will be calculated by the Index Calculation Agent in respect of each Weekday as follows:

$$\text{Index}_t = \text{Index}_{t-1} \times \left(1 - \text{Deduction} \times \frac{\text{Days}_{t-1,t}}{360} \right) + \sum_{i=1}^{10} [\text{Daily Units}_{t-1} \times (\text{Available Level}_t^i - \text{Available Level}_{t-1}^i) \times \text{FX}_t^i]$$

where:

Index_t means the Index Level for Weekday t.

Index_{t-1} means the Index Level for the Weekday immediately preceding Weekday t.

Deduction means one percent(1.00%) per annum.

Days_{t-1,t} means the number of calendar days from but excluding the Weekday immediately preceding Weekday t to and including Weekday t.

Daily Units_{t-1} means the Daily Units for Constituent i in respect of the Weekday immediately preceding Weekday t.

Available Level_tⁱ means the Available Level of Constituent i as of Weekday t.

Available Level_{t-1}ⁱ means the Available Level of Constituent i as of the Weekday immediately preceding Weekday t.

FX_tⁱ means the FX Rate of Constituent i as of Weekday t.

11. Market disruptions

The Index is constructed to account for the occurrence or continuation of market disruption events in respect of one or more Constituents, as outlined in this Section 11 and implemented in the relevant section of the Index Rules identified below. The construction of the underlying Constituents also effectively imposes a limit on the duration of impact on the Index of a continuing market disruption affecting the reference items underlying such Constituents. This general outline is qualified in its entirety by the remainder of the Index Rules and by the rules of each Constituent.

Pursuant to Section 5 (*Publication of Index Levels and rounding*) the Index Calculation Agent will calculate the Index Level for each Weekday, but will publish the Index Level for a Weekday only if the Weekday is also a Publication Day, i.e., an Index Business Day that is not a Disrupted Day for any Constituent that has non-zero Daily Units in respect of the Weekday immediately preceding such Index Business Day.

Pursuant to Section 9 (*Rebalancing and units*), if any of the first five (5) Dealing Days following a Selection Date is a Disrupted Day for a Constituent, then the portion of the rebalancing scheduled to occur for such Constituent on or following such day in the calendar month shall be postponed, effectively extending the applicable Rebalancing Period. However, the corresponding Selection Date for such Constituent will be unaffected by such day being a Disrupted Day.

As of the Live Date, pursuant to the rules of each Constituent, if a market disruption event occurs and is continuing in respect of such Constituent for a period of six (6) or more consecutive Dealing Days, the index calculation agent for such Constituent will calculate its good faith estimate of the Closing Level as of each Dealing Day starting on the sixth (6th) consecutive Dealing Day that is also a disrupted day for such Constituent, regardless of whether underlying market disruption event continues beyond such sixth (6th) day. Consequently, the publication of the Closing Level for a particular Constituent is never expected to be interrupted for a period of more than five (5) consecutive Dealing Days.

12. Extraordinary Events

12.1 Successors to a Constituent

- (a) (x) If the Closing Level of a Constituent is calculated or announced in the ordinary course, but is not calculated or is not announced by or on behalf of the relevant sponsor for the Constituent or the relevant calculation agent or information provider that such sponsor designates, (y) yet Closing Level is calculated and announced by or on behalf of a successor sponsor acceptable to the Index Calculation Agent or a calculation agent or information provider (in either case, that such successor sponsor designates) acceptable to the Index Calculation Agent; or
- (b) (x) If a Constituent is replaced by a successor Constituent (including, if applicable, in the instance where the corresponding underlying equity reference index or its sponsor is replaced by a successor), (y) yet such successor Constituent uses, in the determination of the Index Calculation Agent, the same or a substantially similar formula for and method of calculation as used in the calculation of the of the replaced Constituent (or, if applicable, the successor underlying equity reference index or successor sponsor is acceptable to the Index Calculation Agent), possesses substantially similar characteristics or provides a substantially similar exposure as compared to the Constituent that is being succeeded or such successor Constituent is otherwise acceptable to the Index Calculation Agent;

then, in each case, that Constituent (or the associated underlying equity reference index or its sponsor, if applicable) or the relevant sponsor, calculation agent or information provider for such Constituent will thereafter be deemed to be the successor Constituent (or the associated underlying equity reference index or its sponsor, if applicable) or successor sponsor, calculation agent or information provider described in the relevant clause above, with effect from a date determined by the Index Calculation Agent, which may make such adjustments to the Index Rules as it determines in good faith are appropriate to account for such change (including, without limitation, adjustments to market disruption provisions in respect of an index that includes securities or components that are bonds).

For the avoidance of doubt, the Index Calculation Agent shall not accept a particular successor Constituent or sponsor if the Index Calculation Agent determines, in its sole discretion, that doing so would immediately result in the occurrence of an Extraordinary Event. Upon the acceptance of a successor Constituent or sponsor, such successor shall take the place of the relevant Constituent or sponsor for purposes of calculating the Index. For the avoidance of doubt, the prior performance of such successor Constituent shall be used in the identification of the Selected Portfolio for future Selection Dates if the relevant prior Performance of such successor is available; *provided that*, if some portion of the relevant prior performance of such successor is not available, the prior performance of the replaced Constituent shall be used (in place of such portion of the relevant prior performance of such successor that is not available) in the identification of the Selected Portfolio for future Selection Dates with such adjustments as the Index Calculation Agent determines in good faith are appropriate to account for the use of prior performance of both such successor and such replaced Constituent.

12.2 Substitutes for a Constituent

If an Extraordinary Event occurs in respect of a Constituent, the Index Calculation Agent, acting in good faith and a commercially reasonable manner, shall select as a substitute for such Constituent an index that, in any case, the Index Calculation Agent determines, in its sole discretion, possesses substantially similar characteristics or provides a substantially similar exposure (as considered prior to the occurrence of such Extraordinary Event) as compared to the Constituent that is being replaced, *provided that*, if the Index Calculation Agent determines that no such substitute (that the Index Calculation Agent determines, in its sole discretion, possesses substantially similar characteristics or provides a substantially similar exposure) is available, the Index Calculation Agent shall instead select an appropriate substitute by considering the context of the Index and its Weight Constraints; *provided further that*, if the Index Calculation Agent determines, in its sole discretion, that neither a substantially similar nor an appropriate substitute index is available, then the Index Calculation Agent will, in its sole discretion, (x) determine its good faith estimate of the closing level of such Constituent as of a date on or prior to the occurrence of such Extraordinary Event and (y) remove such Constituent from the Index.

In any such case, the Index Calculation Agent shall, in good faith, make such adjustments that it determines to be appropriate to any variable, calculation methodology, valuation terms or any other rule in relation to the Index to account for such substitution. The Index Sponsor may, in its discretion, at any time and without notice, terminate the calculation or publication of the Index, including, without limitation, subsequent to the occurrence of an Extraordinary Event.

The Index Calculation Agent shall not select a particular substitute index if the Index Calculation Agent determines, in its sole discretion, that doing so would immediately result in the occurrence of an Extraordinary Event. Upon the selection of a substitute index, such substitute shall take the place of the relevant Constituent. For the avoidance of doubt, the prior performance of such substitute index shall be used in the identification of the Selected Portfolio for future Selection Dates if the relevant prior performance of such substitute is available; *provided that*, if some portion of the relevant prior performance of such substitute is not available, the prior performance of the replaced index shall be used (in place of such portion of the relevant prior performance of such substitute that is not available) in the identification of the Selected Portfolio for future Selection Dates with such adjustments as the Index Calculation Agent determines in good faith are appropriate to account for the use of prior Performance of both such substitute and such replaced index.

12.3 Definitions related to Extraordinary Events

An “**Extraordinary Event**” occurs if the Index Calculation Agent determines in its sole discretion that (i) on any Dealing Day in respect of a Constituent one or more of the following events has occurred and (ii) the applicable event or events described below materially interferes with the ability of market participants to transact in positions with respect to the Index (including, without limitation, positions with respect to any Constituent):

- (i) for any Constituent, the sponsor of the Constituent permanently cancels the Constituent, and no successor exists, or the Constituent’s level is not calculated and is not announced by or on behalf of the relevant sponsor of the Constituent for ten (10) consecutive Dealing Days for such Constituent or

for a period of indeterminate duration that the Index Calculation Agent determines is reasonably likely to include ten (10) consecutive Dealing Days for such Constituent, and is not calculated and announced by or on behalf of a successor sponsor acceptable to the Index Calculation Agent;

- (ii) for any Constituent, the event specified in clause (x) of subsection (a) or (b) of Section 12.1 above occurs, but the relevant event specified in clause (y) of such subsection of Section 12.1 above does not occur;
- (iii) for any Constituent whose Denomination Currency is not the Currency of the Index, an FX Material Event (as defined in this Section 12.3) occurs;
- (iv) if, at any time, any relevant license or other right or ability of the Index Calculation Agent or the Index Sponsor (or any of their affiliates) to use any Constituent, underlying reference input or relevant data or information or to refer to the level or price or other information in respect of any Constituent, underlying reference input or relevant data or information (or other component or input of the Index or other matter that could affect the Index) terminates, becomes impaired, ceases or cannot be obtained or will cease to be available on commercially reasonable terms or the Index Calculation Agent's right or ability to use (i) any Constituent for the purposes of the Index or (ii) the Index in connection with the grant or receipt of any other inbound or outbound licensing or sub-licensing rights is otherwise impaired, ceases or cannot be obtained or will cease to be available on commercially reasonable terms (for any reason); or
- (v) the occurrence or continuation of a Change in Law (as defined below in this Section 12.3).

An "**FX Material Event**" means, in respect of a Constituent and a Denomination Currency, in each case as determined by the Index Calculation Agent in its sole discretion:

- (i) an event in relation to any currency relevant to the determination of the relevant FX Rate between the Denomination Currency and the Currency of the Index that the Index Calculation Agent determines has the effect of preventing, restricting or delaying:
 - (a) the convertibility of the Denomination Currency into the Currency of the Index through customary legal channels;
 - (b) the convertibility of the Denomination Currency into the Currency of the Index at a rate at least as favorable as the rate for domestic institutions located in the country (or countries) whose lawful currency is the Denomination Currency (for the purposes of this definition, the "**Relevant Country**");
 - (c) the delivery of the Denomination Currency from accounts inside the Relevant Country to accounts outside the Relevant Country; or
 - (d) the delivery of the Denomination Currency between accounts inside the Relevant Country or to a party that is a non-resident of the Relevant Country;
- (ii) the imposition by the Relevant Country (or any political or regulatory authority thereof) of any capital controls, or the publication of any notice of an intention to do so, that the Index Calculation Agent determines is likely to have a material effect on the ability of market participants to obtain reliable spot exchange rates for the Denomination Currency from a recognized financial source;
- (iii) the implementation by the Relevant Country (or any political or regulatory authority thereof) or the publication of any notice of an intention to implement any changes to the laws or regulations relating to foreign investment in the Relevant Country (including, but not limited to, changes in tax laws or laws relating to capital markets and corporate ownership), that the Index Calculation Agent determines are

likely to have a material effect on the ability of market participants to obtain reliable spot exchange rates for the Denomination Currency from a recognized financial information source; or

- (iv) any other event that the Index Calculation Agent determines affects the convertibility of the Denomination Currency into the Currency of the Index in a material way for market participants on any date or at any relevant time.

A “**Change in Law**” occurs when, due to either:

- (a) the adoption of, or any change in, any applicable law, regulation or rule (including, without limitation, (x) any tax law or (y) adoption or promulgation of new regulations authorized or mandated by existing statute); or
- (b) the promulgation of, or any change in, the announcement or statement of a formal or informal interpretation by any court, tribunal or regulatory authority with competent jurisdiction of any applicable law, rule, regulation or order (including, without limitation, as implemented by the U.S. Commodity Futures Trading Commission, the U.S. Securities and Exchange Commission or any exchange or trading facility), and

the Index Calculation Agent determines in good faith that (x) it is contrary to such law, rule, regulation or order for any market participants that are brokers or financial intermediaries (individually or collectively) to hold, acquire or dispose of (in whole or in part) a position in or a transaction referencing or relating to (1) a Constituent or (2) a component of a Constituent (each such underlying described in any of the immediately preceding clauses (1) and (2), being a “**Relevant Underlying**”) or (y) holding a position in or a transaction referencing or relating to a Relevant Underlying is (or, but for the consequent disposal or termination thereof, would otherwise be) in excess of any allowable position limit(s) applicable to any market participants that are brokers or financial intermediaries (individually or collectively) under any such law, rule or regulation in relation to a Relevant Underlying, including in any case traded on any exchange(s), market or other trading facility.

13. Corrections

If (i) the Closing Level of any Constituent as of any date that is published or otherwise made available to the Index Calculation Agent in respect of the relevant Constituent is subsequently corrected and such correction is published or otherwise made available to the Index Calculation Agent in respect of such Constituent; or (ii) the Index Calculation Agent identifies an error or omission in any of its calculations, determinations or interpretations in respect of the Index, then the Index Calculation Agent may, if practicable and if the Index Calculation Agent determines in good faith that such correction, error or omission (as the case may be) is material, adjust or correct the relevant calculation, determination or interpretation or the Index Level as of any Index Business Day to take into account any such correction.

Definitions

Terms not otherwise defined herein, shall have the following meanings:

- “Available Level”** has the meaning, in respect of a Constituent and a Dealing Day, given to such term in Section 6 (*The Constituents; Available Levels*).
- “Base Date”** means February 22, 1994.
- “Change in Law”** has the meaning given to such term in Section 12.3 (*Definitions related to Extraordinary Events*).
- “Closing Level”** means, subject to the provisions of Section 11 (*Market disruptions*) and Section 12 (*Extraordinary Events*), in respect of a Constituent and a Dealing Day, the official closing level of such Constituent published by the Constituent Sponsor in respect of such Dealing Day; provided, however that if the Index Calculation Agent determines that such official closing level reflects manifest error on the part of the Constituent Sponsor, the Index Calculation Agent shall determine the closing level of such Constituent in good faith and in a commercially reasonable manner based on the formula for and method of calculating such Constituent.
- “Constituent”** has the meaning given to such term in Section 4 (*General notes on the Index*).
- “Constituent Sponsor”** means, for each Constituent, the sponsor or successor sponsor of such Constituent. As of the Live Date, JPMS is the sponsor of each Constituent.
- “Currency of the Index”** has the meaning given to such term in Section 5 (*Publication of Index Levels and rounding*).
- “Daily Units”** has the meaning given to such term in Section 9 (*Rebalancing and units*).
- “Dealing Day”** means:
- (i) for each Constituent for which the Denomination Currency (as specified in Section 6, Table (i)) is USD, a Weekday as of which the Closing Level for such Constituent is scheduled to be calculated and published by the relevant Constituent Sponsor; and
 - (ii) for each Constituent for which the Denomination Currency (as specified in Section 6, Table (i)) is not USD, a Weekday as of which (a) the Closing Level for such Constituent is scheduled to be calculated and published by the relevant Constituent Sponsor, and (b) the FX Rate for the Denomination Currency of such Constituent is scheduled to be calculated and published by the relevant FX Price Source.
- “Deduction”** means the *per annum* rate representing a daily deduction from the Index Level, as specified in Section 10 (*Calculation of the Index Level*).
- “Denomination Currency”** means, in respect of a Constituent, the currency in which the Closing Level of such Constituent is published by the Index Calculation Agent.
- “Disrupted Day”** means, in respect of a Constituent, a Dealing Day in respect of which no Closing Level for such Constituent is published or otherwise made available to the Index Calculation Agent.
- “Eligible Portfolio”** has the meaning given to such term in Section 8.1 (*Identifying the Selected Portfolio*).

| | |
|----------------------------------|--|
| “Extraordinary Event” | has the meaning given to such term in Section 12.3 (<i>Definitions related to Extraordinary Events</i>). |
| “FX Material Event” | has the meaning given to such term in Section 12.3 (<i>Definitions related to Extraordinary Events</i>). |
| “FX Price Source” | The WM Company, or any successors or assigns. |
| “FX Rate” | <p>means:</p> <ul style="list-style-type: none"> (i) in respect of a Constituent and a Dealing Day, (a) if the Denomination Currency (as specified in Section 6, Table (i)) is USD, one (1) or (b) the “mid” exchange rate for the Denomination Currency per USD (provided that if such exchange rate is customarily quoted as a number of USD per one (1) unit of the Denomination Currency, this shall be calculated as one (1) divided by the number of USD per one (1) unit of the Denomination Currency), as determined by the Index Calculation Agent by reference to the official closing spot rate published or otherwise made available to the Index Calculation Agent by or on behalf of the FX Price Source on or by means of the relevant page, service or other source (or any successor or replacement page, service or other authorized source, reasonably determined by the Index Calculation Agent to be reliable), at or around the 4:00 PM London, United Kingdom time, or such other time as the FX Price Source publishes or otherwise makes available to the Index Calculation Agent the official closing spot rate on the relevant date, or, only if the FX Price Source ceases providing such service, such other information service provider, vendor or source identified or selected by the Index Calculation Agent, for the purpose of displaying rates or prices comparable to that rate; provided that if the relevant exchange rate is not published on the relevant Dealing Day, the relevant closing spot rate in respect of such day shall be determined by the Index Calculation Agent in good faith and in a commercially reasonable manner taking into account all information it deems relevant to such determination; and (ii) in respect of a Constituent and a Weekday that is not a Dealing Day for such Constituent, the FX Rate in respect of such Constituent and the Dealing Day immediately preceding such Weekday. |
| “Index” | means the J.P. Morgan Multi-Asset Index, as provided in Section 1 (<i>Introduction</i>). |
| “Index Business Day” | means a day on which the New York Stock Exchange is scheduled to open for trading for its regular trading session. |
| “Index Calculation Agent” | has the meaning given to such term in Section 2.1 (<i>Identity and responsibilities</i>). |
| “Index Level” | has the meaning given to such term in Section 5 (<i>Publication of Index Levels and rounding</i>). |
| “Index Rules” | means, as provided in Section 1 (<i>Introduction</i>), the rules of the Dynamic Allocation Index as set out in this document, as the same may be supplemented, amended or restated from time to time. |
| “Index Sponsor” | has the meaning given to such term in Section 2.1 (<i>Identity and responsibilities</i>). |
| “JPMS” | has the meaning provided in Section 2.1 (<i>Identity and responsibilities</i>). |
| “Live Date” | means November 18, 2022 |

| | |
|--------------------------------|---|
| “Performance” | has the meaning given to such term in Section 8.1 (<i>Identifying the Selected Portfolio</i>). |
| “Publication Day” | has the meaning given to such term in Section 5 (<i>Publication of Index Levels and rounding</i>). |
| “Rebalancing Date” | has the meaning given to such term in Section 9 (<i>Rebalancing and units</i>). |
| “Rebalancing Period” | has the meaning given to such term in Section 9 (<i>Rebalancing and units</i>). |
| “Realized Volatility” | has the meaning given to such term in Section 8.1 (<i>Identifying the Selected Portfolio</i>). |
| “Volatility Constraint” | has the meaning given to such term in Section 8.1 (<i>Identifying the Selected Portfolio</i>). |
| “Relevant Person” | has the meaning given to such term in Section 2.1 (<i>Identity and Responsibilities</i>). |
| “Relevant Underlying” | has the meaning given to such term in Section 12.3 (<i>Definitions related to Extraordinary Events</i>). |
| “Selected Portfolio” | has the meaning given to such term in Section 8.1 (<i>Identifying the Selected Portfolio</i>). |
| “Selected Units” | has the meaning given to such term in Section 9 (<i>Rebalancing and units</i>). |
| “Selected Weight” | has the meaning given to such term in Section 8 (<i>Determining the Selected Weights for the Constituents in the Selected Portfolio</i>). |
| “Selection Date” | has the meaning given to such term in Section 7.2 (<i>Determining a Selection Date</i>). |
| “USD” | has the meaning given to such term in Section 5 (<i>Publication of Index Levels and rounding</i>). |
| “Weekday” | means a calendar day that is a Monday, Tuesday, Wednesday, Thursday or Friday. |
| “Weight Constraints” | has the meaning given to such term in Section 8.1 (<i>Identifying the Selected Portfolio</i>). |

Notices, Disclaimers and Conflicts of Interest

The Index Rules have been prepared solely for informational purposes and nothing in the Index Rules constitutes (i) an offer to buy or sell any securities, participate in any transaction or adopt any investment linked to the Index (each, a **“Product”**) or (ii) legal, tax, regulatory, financial or accounting advice. The Index Rules may change at any time without prior notice. As of the Live Date, all relevant internal approvals had been obtained by the Index Sponsor in respect of the Index Rules.

None of the Relevant Persons makes any representation or warranty, whatsoever, express or implied, as to the results that may be obtained through the use of this document or the Index. Each Relevant Person hereby expressly disclaims, to the fullest extent permitted by law, all warranties of accuracy, completeness, merchantability, or fitness for a particular purpose with respect to any information contained in this document. No Relevant Person shall have any liability or responsibility to any person or entity (including, without limitation, any investor in any Product or investment referencing the Index) for any loss, damages, costs, charges, expenses or other liabilities howsoever arising, including, without limitation, liability for any special, punitive, indirect, consequential or other damages (including loss of business or loss of profit, loss of time and loss of goodwill), even if notified of the possibility of any such damages.

Except as provided in the following paragraph, neither the Index Sponsor nor the Index Calculation Agent gives any representation, warranty or undertaking, of any type (whether express or implied, statutory or otherwise) in relation to an Index, as to (i) the condition, satisfactory quality, performance or fitness for purpose of the Index, (ii) the results to be achieved by an investment in any Product, (iii) any data included in or omissions from the Index, (iv) the use of the Index in connection with a Product, (v) the Index Level at any time on any day, (vi) the veracity, currency, completeness or accuracy of the information on which the Index is based (and without limitation, the Index Sponsor and the Index Calculation Agent accept no liability to any investor in a Product for any errors or omissions in that information or the results of any interruption to it and the Index Sponsor and the Index Calculation Agent shall be under no obligation to advise any person of any such error, omission or interruption), or (vii) any other matter. To the extent any such representation, warranty or undertaking could be deemed to have been given by the Index Sponsor or the Index Calculation Agent, it is excluded save to the extent that such exclusion is prohibited by law.

To the fullest extent permitted by law, the Index Sponsor and the Index Calculation Agent has no liability or responsibility to any person or entity (including, without limitation, any investor in any Product) for any loss, damages, costs, charges, expenses or other liabilities howsoever arising, including, without limitation, liability for any special, punitive, indirect or consequential damages (including loss of business or loss of profit, loss of time and loss of goodwill), even if notified of the possibility of the same, arising in connection with the design, compilation, calculation, maintenance or sponsoring of an Index or in connection with any Product.

Nothing in these Index Rules shall be taken to exclude any liability for fraud on the part of the Index Sponsor or Index Calculation Agent.

No Relevant Person is under any obligation to continue the calculation, publication and dissemination of the Index or the Index Level. The Index Sponsor may at any time and without notice terminate the calculation, publication or dissemination of the Index. The Index Sponsor may delegate or transfer to a third party some or all of its functions in relation to the Index. Further information relating to: (i) the internal governance framework; and (ii) the identity and role of third parties that are non-affiliates of J.P. Morgan, in respect of the Index is available upon request from the Index Sponsor.

Potential conflicts of interest may exist between the structure and operation of the Index, roles and responsibilities of the Index Sponsor and Index Calculation Agent and the normal business activities of the Index Sponsor, the Index Calculation Agent or any other Relevant Person. During the course of their normal business, the Index Sponsor or any of the other Relevant Persons may (i) enter into or promote, offer or sell transactions or investments (structured or otherwise) linked to the Index or any of the Constituents or (ii) act as an investment manager, investment advisor, administrator, custodian, prime broker or other service provider to entities connected to the Constituents. In addition, any Relevant Person may have, or may have

had, interests (including general commercial interests related to the Index, any Constituent, associated Reference Index, or any constituent or sponsor of such Constituent or Reference Index) or positions, or may buy, sell or otherwise trade positions in or relating to the Index or any of the Constituents, or may invest or engage in transactions with other persons, or on behalf of such persons relating to any of these items. Such activity may or may not have an impact on the Index Level but all persons reading this document should be aware that a conflict of interest could arise where anyone is acting in more than one capacity, and such conflict may have an impact, positive or negative, on the Index Level. Neither the Index Calculation Agent nor any other Relevant Person has any duty to consider the circumstances of any person when participating in such transactions or to conduct themselves in a manner that is favorable to anyone with exposure to the Index. Furthermore, neither the Index Sponsor nor any other Relevant Person has any obligation or liability in connection with the administration, marketing or trading of any instrument or investment that references the Index and is not obliged to enter into or promote any such instrument or investment.

The Index Rules have been developed with the possibility of the Index Sponsor or any of the other Relevant Persons entering into or promoting, offering or selling transactions or investments (structured or otherwise) linked to the Index and hedging such transactions or investments in any manner that they see fit. Accordingly it should be assumed that the Index Rules have and will be analyzed from this point of view.

The Index Sponsor or the Index Calculation Agent may make certain calculations based on information obtained from publicly available sources without independently verifying such information and accepts no responsibility or liability in respect of such calculations or information.

As mentioned above, the Index is described as a notional basket because there is no actual portfolio of assets to which any person is entitled or in which any person has any ownership interest. The Index merely identifies certain reference assets, the performance of which will be used as a reference point for calculating the Index Level.

Notwithstanding anything to the contrary herein, nothing in these Index Rules should be construed to be investment advice or a recommendation to purchase a specific instrument or make a specific investment. Nothing in these Index Rules or any other communication between you and J.P. Morgan Chase & Co. (together with its affiliates, "**J.P. Morgan**") should be deemed to or be construed as creating a "fiduciary relationship". J.P. Morgan and its subsidiaries, officers, directors, employees and agents, are not your fiduciary. You should make your own investment decision based on your own judgment and on your own examination of the specific Product that you are purchasing or investment that you are entering into, and you should consult your own legal, regulatory, investment, tax, accounting and other professional advisers as you deem necessary in connection with any purchase of a financial product or undertaking any investment.

The Index is the exclusive property of the Index Sponsor and the Index Sponsor retains all proprietary rights in the Index.

The Index is protected by copyright and trade secret rights and is and will always remain the sole property of J.P. Morgan, all rights, title and full ownership in and to the Index are expressly reserved to and will remain with J.P. Morgan, the Index was developed, compiled, prepared and arranged by J.P. Morgan through the expenditure of substantial time, effort and money and constitutes valuable intellectual property and trade secrets of J.P. Morgan and all proprietary and intellectual property rights of any nature, including patents, copyrights, trademarks and trade secrets regarding the Index and the Index Rules, and any and all copies, modifications, enhancements and derivative works thereof are owned by and will remain the property of J.P. Morgan.

Third parties shall not use the Index Sponsor's intellectual property without the prior written consent of the Index Sponsor (including in situations where a third party performs certain functions in relation to the Index) and may not (directly or indirectly) (a) share, reproduce, distribute or otherwise disseminate the Index, Index Rules or any related data in any form without the express prior written consent of J.P. Morgan (b) alter, remove or conceal any copyright, trademark or other proprietary notice or disclaimer regarding the Index, (c) modify, copy, translate, distribute, recompile, decompile, disassemble or reverse engineer the Index; (d) make or

distribute any other form of or any derivative work from, the Index or (e) grant any rights in, permit or provide access to the Index or the Index Rules in a manner that could infringe the intellectual property rights of J.P. Morgan or any third party or violate any applicable laws, tariffs, rules or regulations.

Any third party who enters into a transaction or investment or purchases a Product that references the Index is thereby deemed to acknowledge that (i) THE INDEX, INDEX RULES AND RELATED DATA ARE PROVIDED "AS IS" WITH ALL FAULTS, (ii) ALL WARRANTIES AND REPRESENTATIONS OF ANY KIND WITH REGARD TO THE INDEX ARE DISCLAIMED BY J.P. MORGAN, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY, QUALITY, ACCURACY, FITNESS FOR A PARTICULAR PURPOSE OR AGAINST INFRINGEMENT AND WARRANTIES AS TO ANY RESULTS TO BE OBTAINED BY OR FROM THE USE OF THE INDEX, (iii) J.P. MORGAN DOES NOT GUARANTEE THE AVAILABILITY, SEQUENCE, TIMELINESS, ACCURACY OR COMPLETENESS OF THE INDEX, (iv) J.P. MORGAN MAY DISCONTINUE CALCULATION OF THE INDEX AT ANY TIME WITHOUT PRIOR NOTICE AND, (v) TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, J.P. MORGAN WILL NOT BE LIABLE (IN CONTRACT, TORT OR OTHERWISE) FOR ANY ORDINARY, DIRECT, INDIRECT, CONSEQUENTIAL, SPECIAL, PUNITIVE OR EXEMPLARY DAMAGES IN CONNECTION WITH ANY USE OF THE INDEX, THE INDEX RULES OR ANY ASSOCIATED DATA, EVEN IF J.P. MORGAN HAS BEEN APPRISED OF THE LIKELIHOOD OF SUCH DAMAGES OCCURRING, and agrees to release, indemnify, defend and hold J.P. Morgan harmless from and against any claim, liability, loss, injury, damage, cost, or expense of any kind (including reasonable attorney's fees), as incurred, relating to or arising out of such third party's use of the Index, the Index Rules or any associated data.

No one may reproduce or disseminate the information contained in this document or the Index Level of the Index without the prior written consent of the Index Sponsor. This document is not intended for distribution to, or use by any person in, a jurisdiction where such distribution is prohibited by law or regulation.

The foregoing notices, disclaimers and conflicts disclosure is not intended to be exhaustive. Anyone reading these Index Rules should seek such advice as they consider necessary from their professional advisors, legal, tax or otherwise, without reliance on the Index Sponsor, Index Calculation Agent or any Relevant Person to satisfy them that they fully understand these Index Rules and the risks associated with an Index.

Copyright JPMorgan Chase & Co. 2022. All rights reserved. J.P. Morgan is the marketing name for JPMorgan Chase & Co. and its subsidiaries and affiliates worldwide. The Index Sponsor owns all intellectual property rights in: (i) the development of and methodology for producing the Index, (ii) the Index Levels and (iii) these Index Rules. Third parties shall not use the Index Sponsor's intellectual property without the prior written consent of the Index Sponsor (including in situations where a third party performs certain functions in relation to the Index).

ANNEX B

J.P. Morgan Futures Index Series Index Rules

J.P.Morgan

December 22, 2020, as last supplemented on October 24, 2022

© All Rights Reserved

Contents

| | | |
|------|--|----|
| 1. | Introduction..... | 3 |
| 2. | Index Sponsor and Index Calculation Agent..... | 3 |
| 2.1 | <i>Identity and responsibilities.....</i> | 3 |
| 2.2 | <i>Index Sponsor determinations and Index Calculation Agent determinations.....</i> | 4 |
| 3. | Amendments..... | 4 |
| 4. | General notes on the Index..... | 5 |
| 5. | Publication of the Index Level | 5 |
| 6. | Scheduled Roll Period; Actual Roll Period..... | 6 |
| 7. | Earlier Expiry Contract; Later Expiry Contract..... | 6 |
| 8. | Calculation of the Index Level | 7 |
| 9. | Market disruption | 8 |
| 9.1 | <i>Calculation of the Index Level in respect of a Final Disruption Determination Date.....</i> | 8 |
| 9.2 | <i>Market disruption on a Scheduled Roll Day</i> | 8 |
| 9.3 | <i>Definitions related to market disruption.....</i> | 9 |
| 10. | Succession Events and Extraordinary Events..... | 11 |
| 10.1 | <i>Succession Events</i> | 11 |
| 10.2 | <i>Extraordinary Events</i> | 12 |
| 10.3 | <i>Definitions related to Extraordinary Events</i> | 12 |
| 11. | Corrections | 15 |
| | Definitions | 16 |

Part A

J.P. Morgan Futures Index Series

Index Rules

1. Introduction

This document comprises the rules (as may be supplemented, amended or restated from time to time, the “**Index Rules**”) of the J.P. Morgan Futures Index Series, a family of notional, rules-based proprietary indices. The Index Rules are divided into Part A, which applies to every index in the J.P. Morgan Futures Index Series, and Part B, which contains a module (each, a “**Module**”) for each index in the J.P. Morgan Futures Index Series (each, an “**Index**”) containing the relevant parameters for such Index. The provisions and variables set out in these Index Rules are applicable to each particular Index in the J.P. Morgan Futures Index Series separately and individually. Accordingly, these Index Rules may be read and construed, in the case of each particular Index, as referring solely to that singular, individual Index.

Capitalized terms not otherwise defined in the relevant section of these Index Rules have the meaning set out in the section entitled “*Definitions*” at the end of Part A of these Index Rules.

ALL PERSONS READING THIS DOCUMENT SHOULD REFER TO THE NOTICES, DISCLAIMERS AND CONFLICTS OF INTEREST SECTIONS BELOW AND CONSIDER THE INFORMATION CONTAINED IN THIS DOCUMENT IN LIGHT OF SUCH NOTICES, DISCLAIMERS AND CONFLICTS OF INTEREST.

NOTHING IN THE INDEX RULES CONSTITUTES AN OFFER TO BUY OR SELL ANY FINANCIAL PRODUCT, PARTICIPATE IN ANY TRANSACTION OR ADOPT ANY INVESTMENT STRATEGY. THE INDEX RULES DO NOT CONSTITUTE INVESTMENT, LEGAL, TAX, REGULATORY OR ACCOUNTING ADVICE.

This document is published by the Index Sponsor.

2. Index Sponsor and Index Calculation Agent

2.1 Identity and responsibilities

As of the Live Date (as specified in the applicable Module), J.P. Morgan Securities LLC (“**JPMS**”) of 383 Madison Avenue, 5th Floor, New York, New York 10179, United States is the sponsor of the Index (the “**Index Sponsor**”, which term shall include any successor or assign of the Index Sponsor). The Index Sponsor may appoint a successor sponsor or assign, delegate or transfer any or all of its rights, obligations or responsibilities in its capacity as Index Sponsor in connection with the Index to one or more entities (including an unrelated third party) that the Index Sponsor determines appropriate. The Index Calculation Agent (unless the Index Calculation Agent is the same entity as the Index Sponsor) must obtain written permission from the Index Sponsor prior to any delegation or transfer of the Index Calculation Agent’s responsibilities or obligations in connection with the Index.

The initial Index Sponsor is responsible for, among other things, the creation and design of the Index and the documentation of the Index Rules. The Index Sponsor is responsible for the appointment of the calculation agent of the Index (the “**Index Calculation Agent**”), which may be the Index Sponsor, an unrelated third party or an affiliate or subsidiary of the Index Sponsor. The Index Calculation Agent will (unless the Index Calculation Agent is the same entity as the Index Sponsor) be an agent of the Index Sponsor. As of the Live Date, the Index Sponsor has appointed JPMS to be the initial Index Calculation Agent.

The Index Sponsor may at any time and for any reason (i) appoint a successor Index Calculation Agent, if the Index Sponsor is at that time the Index Calculation Agent or (ii) terminate the appointment of the Index Calculation Agent and appoint an alternative entity as a replacement Index Calculation Agent, if the Index Sponsor is not at that time the Index Calculation Agent.

The Index Calculation Agent is responsible for (i) calculating the Index Level (as defined in Section 5 (*Publication of the Index Levels*)) in respect of each Trading Day (as defined in “*Definitions*”) in accordance with the Index Rules and (ii) determining (among other things and subject to the prior agreement of the Index Sponsor or at the direction of the Index Sponsor) if a Market Disruption Event or Extraordinary Event (as defined in Section 9.3 (*Definitions related to market disruption*) and Section 10.3 (*Definitions related to Extraordinary Events*), respectively) has occurred, whether any input necessary to perform any calculations under the Index Rules is not published or otherwise made available by the relevant data provider, sponsor of a Reference Index (as defined in “*Definitions*”), other input sponsor or exchange to the Index Calculation Agent (as further described in Section 5 (*Publication of the Index Levels and rounding*)), and any related consequences or adjustments in accordance with the Index Rules.

The Index Calculation Agent shall act in good faith and in a commercially reasonable manner in making determinations, interpretations and calculations pursuant to the Index Rules. Subject to the prior agreement of the Index Sponsor, the Index Calculation Agent’s determinations and calculations related to the Index and the Index Calculation Agent’s interpretations of the Index Rules, shall be final.

None of the Index Sponsor, the Index Calculation Agent, or any of their respective affiliates or subsidiaries or any of their respective directors, officers, employees, representatives, delegates or agents (each, a “**Relevant Person**”) shall have any responsibility to any person (whether as a result of negligence or otherwise) for any determinations, interpretations or calculations made or anything done (or omitted to be determined or done) in connection with the Index or any use to which any person may put the Index or the Index Levels.

The Index Sponsor may, in its reasonable discretion, at any time and without notice, terminate the calculation or publication of the Index.

2.2 *Index Sponsor determinations and Index Calculation Agent determinations*

The Index Calculation Agent’s exercise of discretion or failure to exercise discretion in relation to the Index may have a detrimental effect on the Index Level and the volatility of the Index. The Index Sponsor or the Index Calculation Agent may make certain determinations or calculations based on information obtained from publicly available sources without independently verifying such information.

Subject to the prior agreement of the Index Sponsor, the Index Calculation Agent may make certain determinations, adjustments, amendments and interpretations related to the Index. All such determinations, adjustments, amendments and interpretations (in each applicable case, subject to such prior agreement on the part of the Index Sponsor) of the Index Calculation Agent related to the Index and all calculations performed by the Index Calculation Agent related to the Index shall be final, conclusive and binding and no person shall be entitled to make any claim against the Index Sponsor, the Index Calculation Agent, or any of the Relevant Persons in respect thereof. Once a determination, adjustment, amendment or interpretation is made or action is taken by the Index Calculation Agent (in each applicable case, as agreed in advance by the Index Sponsor) in relation to the Index, or a calculation is performed by the Index Calculation Agent in relation to the Index, none of the Index Sponsor, the Index Calculation Agent or any Relevant Person shall be under any obligation to revise any such determination, adjustment, amendment, interpretation or calculation made or anything done (or omitted to be determined, adjusted, amended, interpreted, calculated or done) for any reason.

3. **Amendments**

The Index Rules may be supplemented, amended or restated from time to time in the sole discretion of the Index Sponsor. The Index Sponsor will notify the Index Calculation Agent (if a different entity from the Index Sponsor) before making any such supplement, amendment or restatement pursuant to this Section 3. The Index Sponsor may, but is not obliged to, take into account the views of the Index Calculation Agent regarding any proposed supplement, amendment or restatement.

The Index Rules will be made available (in a manner determined by the Index Sponsor from time to time) following such supplementation, amendment or restatement. Copies of the current Index Rules are available from the Index Sponsor upon request.

Although the Index Rules are intended to be comprehensive and accurate, ambiguities may arise and errors or omissions may have been made. In such circumstances, the Index Sponsor will resolve such ambiguities and, if necessary, amend the Index Rules to reflect such resolution. In the case of any inaccuracy, the Index Sponsor may amend the Index Rules to address errors or omissions. The Index Sponsor is under no obligation to inform any person of any amendments to the Index (except as may be required by law).

4. General notes on the Index

These general notes on the Index set forth in this Section 4 are qualified in their entirety by the remainder of the Index Rules.

Objective. Each Index is designed to track the excess return, where applicable, converted into a specified currency (the “**Currency of the Index**” set forth in the applicable Module), of a notional rolling futures position in futures contracts (each, a “**Contract**”) in a specified futures contract series (the “**Series**” set forth in the applicable Module) pursuant to these Index Rules.

Excess return indices track returns from hypothetical exposures to certain futures contracts that take into account changes in the price level of the underlying futures contracts as well as roll yield, but not “total returns.” A futures index that reflects “total returns” would reflect the returns from a notional fully collateralized investment in the underlying futures contracts, including any interest that could be earned on funds committed to the margin on the underlying futures contracts.

No assurance can be given that the investment strategy used to construct the Index will be successful or that the Index will outperform any alternative basket or strategy that might be constructed from the futures contracts.

The Index is described as a notional rolling futures position because there is no actual portfolio of financial instruments to which any person is entitled or in which any person has any ownership interest. The Index merely references certain financial instruments, the performance of which will be used as a reference point for calculating the Index Level.

5. Publication of the Index Level

The Index Calculation Agent shall calculate and publish or otherwise make available (in a manner determined by the Index Calculation Agent from time to time) the Index Level in accordance with the methodology herein. Index Levels that are published may be obtained by reference to the Bloomberg ticker set forth in the applicable Module, or from a successor or alternate source for published Index Levels as may be identified by the Index Calculation Agent from time to time.

The level of the Index (the “**Index Level**”) will be published on each Trading Day, *i.e.* on each Index Business Day (as defined in “*Definitions*”) that is not a Disrupted Day (as defined in Section 9.3 (*Definitions related to market disruption*)), and on each Final Disruption Determination Date (as defined in Section 9.1 (*Calculation of the Index Level in respect of a Final Disruption Determination Date*)) regardless of whether a market disruption has caused such Final Disruption Determination Date to be a Disrupted Day.

Notwithstanding anything to the contrary herein, the Index Sponsor may, at any time and without notice, change the frequency of calculation, publication or dissemination of Index Levels, the means or place of publication or dissemination of Index Levels or cease the calculation, publication or dissemination of Index Levels, and nothing in this document shall be construed as an agreement by the Index Sponsor or the Index Calculation Agent to continue to calculate, publish or disseminate Index Levels if the Index Sponsor elects to cease such calculation, publication or dissemination of some or all Index Levels.

For purposes of publication only, the Index Calculation Agent will round all Index Levels to two (2) decimal places before publishing, disseminating or otherwise making such levels available in the Currency of the Index. The Index Calculation Agent may calculate the Index to a greater degree of accuracy or specificity and may use

any rounding convention it considers appropriate for any data used or calculations performed (which may include using data with a higher level of specificity than that which is published on any particular data source) to determine the Index Level.

None of the Index Sponsor, the Index Calculation Agent or any other Relevant Person will be liable to any person for publishing, disseminating or making available or for omitting to publish, disseminate or make available the Index Level at any particular time or on any particular venue or in any particular manner or in accordance with any particular methodology or practice.

The Index Calculation Agent has been calculating the Index Level and publishing it in accordance with these Index Rules since the Live Date.

6. Scheduled Roll Period; Actual Roll Period

On a periodic basis consistent with the expiries relevant to each Series (as set forth in the applicable Module the “**Relevant Contract Expiries**”), the Index Calculation Agent will roll the exposure from the particular futures contract to which the Index has current exposure (such particular futures contract, the Earlier Expiry Contract, as defined in Section 7 (*Earlier Expiry Contract; Later Expiry Contract*)) to a different particular futures contract, identified pursuant to Section 7 (such different particular futures contract, the Later Expiry Contract, also as defined in Section 7).

The “**Scheduled Roll Period**” for a Contract will consist of the five (5) successive Index Business Days (each, a “**Scheduled Roll Day**”) commencing on and including the first day of such Scheduled Roll Period (such first day, the “**Scheduled Roll Initiation Day**”, as set forth in the applicable Module). Twenty percent (20%) of the total notional exposure is scheduled to be rolled as of each Scheduled Roll Day during a Scheduled Roll Period.

For each Contract and its associated Scheduled Roll Period, the Index Calculation Agent shall determine, for the portion (twenty percent (20%)) of the roll scheduled to occur on a Scheduled Roll Day, the Index Business Day on which the roll of such portion shall actually be effected (such Index Business Day, an “**Actual Roll Day**”), as follows:

- (i) If such Scheduled Roll Day is a Trading Day, then the Actual Roll Day associated with such Scheduled Roll Day shall be such Scheduled Roll Day.
- (ii) If such Scheduled Roll Day is not a Trading Day, then the Actual Roll Day associated with such Scheduled Roll Day shall be the first Trading Day immediately following such Scheduled Roll Day.

The proportion of the total exposure scheduled to be rolled on a Scheduled Roll Day (twenty percent (20%)) for each Scheduled Roll Day) will be rolled on the Actual Roll Day associated with such Scheduled Roll Day. If two (2) or more consecutive Scheduled Roll Days during the same Scheduled Roll Period are associated with the same Actual Roll Day, then the proportion of the total exposure to be rolled for any such Scheduled Roll Days will be aggregated and rolled on that same Actual Roll Day. The “**Actual Roll Completion Day**” for a Contract shall be the Actual Roll Day associated with its fifth Scheduled Roll Day.

7. Earlier Expiry Contract; Later Expiry Contract

For a given Index Business Day, the “**Earlier Expiry Contract**” shall be:

- (i) From and including the Base Date (as defined in “*Definitions*”) specified in the applicable Module to and including the Actual Roll Completion Day for the Initial Contract (as defined in “*Definitions*”) specified in the applicable Module, such Initial Contract.
- (ii) Following the Actual Roll Completion Day for the Initial Contract, the particular futures contract that the Index Calculation Agent identified as the Later Expiry Contract (as defined in this Section 7) for the immediately preceding Scheduled Roll Period.

For a given Scheduled Roll Period, the “**Later Expiry Contract**” shall be the particular Contract whose expiry is the Relevant Contract Expiry that immediately follows the expiry of the Earlier Expiry Contract.

8. Calculation of the Index Level

As of the Base Date set forth in the applicable Module, the Index Level was set equal to one thousand (1,000.00). Thereafter, subject to the provisions of Section 9.1 (*Calculation of the Index Level in respect of a Final Disruption Determination Date*), the Index Level will be calculated by the Index Calculation Agent in the Currency of the Index in respect of each Trading Day t as follows:

- (i) If the Trading Day immediately preceding Trading Day t occurs prior to the Scheduled Roll Initiation Day for the Earlier Expiry Contract for such Trading Day t:

$$\text{Index}_t = \text{Index}_{t-1} \times \left[1 + \left(\frac{\text{Earlier}_t}{\text{Earlier}_{t-1}} - 1 \right) \times \frac{\text{FX}_t}{\text{FX}_{t-1}} \right]$$

- (ii) If the Trading Day immediately preceding Trading Day t is the Scheduled Roll Initiation Day for the Earlier Expiry Contract for such Trading Day t:

$$\text{Index}_t = \text{Index}_{t-1} \times \left[1 + \left(\frac{80\% \times \text{Earlier}_t + 20\% \times \text{Later}_t}{80\% \times \text{Earlier}_{t-1} + 20\% \times \text{Later}_{t-1}} - 1 \right) \times \frac{\text{FX}_t}{\text{FX}_{t-1}} \right]$$

- (iii) If the Trading Day immediately preceding Trading Day t is the second Scheduled Roll Day for the Earlier Expiry Contract for such Trading Day:

$$\text{Index}_t = \text{Index}_{t-1} \times \left[1 + \left(\frac{60\% \times \text{Earlier}_t + 40\% \times \text{Later}_t}{60\% \times \text{Earlier}_{t-1} + 40\% \times \text{Later}_{t-1}} - 1 \right) \times \frac{\text{FX}_t}{\text{FX}_{t-1}} \right]$$

- (iv) If the Trading Day immediately preceding Trading Day t is the third Scheduled Roll Day for the Earlier Expiry Contract for such Trading Day:

$$\text{Index}_t = \text{Index}_{t-1} \times \left[1 + \left(\frac{40\% \times \text{Earlier}_t + 60\% \times \text{Later}_t}{40\% \times \text{Earlier}_{t-1} + 60\% \times \text{Later}_{t-1}} - 1 \right) \times \frac{\text{FX}_t}{\text{FX}_{t-1}} \right]$$

- (v) If the Trading Day immediately preceding Trading Day t is the fourth Scheduled Roll Day for the Earlier Expiry Contract for such Trading Day:

$$\text{Index}_t = \text{Index}_{t-1} \times \left[1 + \left(\frac{20\% \times \text{Earlier}_t + 80\% \times \text{Later}_t}{20\% \times \text{Earlier}_{t-1} + 80\% \times \text{Later}_{t-1}} - 1 \right) \times \frac{\text{FX}_t}{\text{FX}_{t-1}} \right]$$

where:

Index_t means the Index Level for Trading Day t.

Index_{t-1} means the Index Level for the Trading Day immediately preceding Trading Day t.

Earlier_t^i means the Closing Level (as defined in “Definitions”) of the Earlier Expiry Contract for Trading Day t.

Earlier_{t-1}^i means, in respect of a Trading Day t, the Closing Level for the Trading Day immediately preceding such Trading Day t of the Earlier Expiry Contract in respect of such Trading Day t.

Later_t^i means the Closing Level of the Later Expiry Contract for Trading Day t.

| | |
|-----------------|---|
| $Later_{t-1}^i$ | means, in respect of a Trading Day t , the Closing Level for the Trading Day immediately preceding such Trading Day t of the Later Expiry Contract in respect of such Trading Day t . |
| FX_t^i | means the FX Rate for Trading Day t . |
| FX_{t-1}^i | means the FX Rate for the Trading Day immediately preceding Trading Day t . |
| FX Rate | means, in respect of an Index Business Day, (i) if the Series Denomination Currency (as defined in “Definitions” and specified as of the Live Date in the applicable Module) is the Currency of the Index, one (1) or (ii) the “mid” exchange rate for the Series Denomination Currency per unit of Currency of the Index (provided that if such exchange rate is customarily quoted as a number of units of the Currency of the Index per one (1) unit of the Series Denomination Currency, this shall be calculated as one (1) divided by the number of units of the Currency of the Index per one (1) unit of the Series Denomination Currency), as determined by the Index Calculation Agent by reference to the official closing spot rate published or otherwise made available to the Index Calculation Agent by or on behalf of the FX Price Source (as defined in “Definitions”) and as specified in the applicable Module), or any successor or assigns, on or by means of the relevant page, service or other source (or any successor or replacement page, service or other authorized source, reasonably determined by the Index Calculation Agent to be reliable), at or around the Fixing Time (as defined in “Definitions” and as specified in the applicable Module) or such other time as the FX Price Source publishes or otherwise makes available to the Index Calculation Agent the official closing spot rate on the relevant date, or, only if the FX Price Source ceases providing such service, such other information service provider, vendor or source identified or selected by the Index Calculation Agent, for the purpose of displaying rates or prices comparable to that rate; <i>provided</i> that if the relevant exchange rate is not published on the relevant Index Business Day, the relevant closing spot rate in respect of such day shall be determined by the Index Calculation Agent in good faith and in a commercially reasonable manner taking into account all information it deems relevant to such determination. |

9. Market disruption

9.1 Calculation of the Index Level in respect of a Final Disruption Determination Date

An Index Business Day that is a Disrupted Day shall be a “**Final Disruption Determination Date**” if it either:

- (i) immediately follows five (5) consecutive Index Business Days that are each Disrupted Days; or
- (ii) is the Cut-off Day (as defined in Section 9.3 (*Definitions related to market disruption*)) for the Earlier Expiry Contract in respect of such Index Business Day.

On each Final Disruption Determination Date, the Index Calculation Agent will calculate its good faith estimate of the Index Level as of such Final Disruption Determination Date (notwithstanding the fact that such Final Disruption Determination Date is a Disrupted Day) using its good faith estimate of (i) the Closing Level for any Referenced Contract and (ii) the FX Rate, in each case if relevant to the occurrence or continuation of a Market Disruption Event. Any such estimated levels may be subject to correction on the first succeeding Index Business Day that is not a Disrupted Day.

Such Final Disruption Determination Date shall be treated as a Trading Day for the purposes of these Index Rules, notwithstanding the fact that it is a Disrupted Day.

9.2 Market disruption on a Scheduled Roll Day

If any Scheduled Roll Day is a Disrupted Day, then the portion of the roll scheduled to occur on such Scheduled Roll Day shall be postponed to the date that is the first Trading Day immediately following such Scheduled Roll Day. If such immediately following Trading Day is a Final Disruption Determination Date, the Index Calculation

Agent will effect the portion of the roll on such day in accordance with Section 8 (*Calculation of the Index Level*) using its good faith estimates determined pursuant to Section 9.1 (*Calculation of the Index Level in respect of a Final Disruption Determination Date*).

9.3 *Definitions related to market disruption*

- (a) **“Disrupted Day”** means an Index Business Day on which a Market Disruption Event occurs or is continuing.
- (b) A **“Market Disruption Event”** occurs if the Index Calculation Agent determines in its sole discretion that on any Index Business Day there has been one (1) or more of the following occurrences:
 - (i) a failure by the Exchange (as defined in *“Definitions”*) or its agent to publish the Closing Level of any Referenced Contract (as defined in this Section 9.3) for such Index Business Day;
 - (ii) any event that, in the determination of the Index Calculation Agent, disrupts or impairs the ability of market participants to effect transactions in or obtain levels or market values for (a) any Referenced Contract or (b) any options contracts or other financial contracts relating to any Referenced Contract;
 - (iii) the occurrence or existence of a suspension, absence or material limitation of trading in any Referenced Contract (as defined in this Section 9.3), including, without limitation, a suspension of trading by reason of (a) a price change exceeding limits set by an exchange or market, (b) an imbalance of orders or (c) a disparity in bid and ask quotes;
 - (iv) the occurrence or existence of a suspension, absence or material limitation of trading on the Exchange or the primary exchange or market for trading in any Referenced Contract for more than two (2) hours of trading during, or during the last one-half (½) hour period preceding the close of, the principal trading session on the Exchange, or such primary exchange or market;
 - (v) the occurrence or existence of a suspension, absence or material limitation of trading on the Exchange or the primary exchange or market for trading in any futures contracts that are part of the Series that, in the aggregate, represents a material proportion of the liquidity in such Series for more than two (2) hours of trading during, or during the last one-half (½) hour period preceding the close of, the principal trading session on the Exchange, or such primary exchange or market;
 - (vi) if the Series Denomination Currency is not the Currency of the Index, any event that the Index Calculation Agent determines in its sole discretion affects the convertibility of the Series Denomination Currency into the Currency of the Index in a material way for market participants during the last one-half (½) hour period preceding or during the first one-half (½) hour period following the Fixing Time on such Index Business Day; or
 - (vii) if the Series has a Reference Index, a Reference Index Disruption Event in respect of such Reference Index;

and the Index Calculation Agent determines in its sole discretion that the applicable event or events described above could materially interfere with the ability of market participants to transact in positions with respect to the Index (including, without limitation, positions with respect to any Contract or the Reference Index of a Series, if the Series has one).

- (c) **“Referenced Contract”** means, in respect of an Index Business Day:

- (i) if such Index Business Day occurs on or prior to the first Actual Roll Day for the Earlier Expiry Contract in respect of such Index Business Day, the Earlier Expiry Contract; and
 - (ii) if such Index Business Day occurs following the first Actual Roll Day for the Earlier Expiry Contract in respect of such Index Business Day, the Earlier Expiry Contract and the Later Expiry Contract.
- (d) **“Cut-off Day”** means, in respect of a Contract, the earlier to occur of (i) the last scheduled trading day for such Contract and (ii) first notice date for such Contract, in each case as specified by the relevant Exchange.
- (e) **“Reference Index Disruption Event”** means, for a Reference Index, in each case as determined by the Index Calculation Agent in its sole discretion:
- (i) the occurrence or existence of a suspension, absence or material limitation of trading of securities then constituting twenty percent (20%) or more of the level of such Reference Index on the relevant primary exchanges for such securities for more than two (2) hours of trading during, or during the last one-half (½) hour period preceding the close of, the principal trading session on such relevant primary exchanges; or
 - (ii) if applicable, the occurrence or existence of a suspension, absence or material limitation of trading on the primary exchange or market for trading in futures or options contracts related to such Reference Index for more than two (2) hours of trading during, or during the last one-half (½) hour period preceding the close of, the principal trading sessions on such applicable exchange or market.

For the purpose of determining whether a Reference Index Disruption Event in respect of a Reference Index has occurred:

- (i) a limitation on the hours or number of days of trading will not constitute a Reference Index Disruption Event if it results from an announced change in the regular business hours of the relevant primary exchange or the primary exchange or market for trading in futures or options contracts related to the relevant securities;
- (ii) limitations pursuant to the rules of any relevant primary exchange similar to New York Stock Exchange Rule 80B (or any applicable rule or regulation enacted or promulgated by any other self-regulatory organization or any government agency of scope similar to New York Stock Exchange Rule 80B as determined by the Index Calculation Agent) on trading during significant market fluctuations will constitute a suspension, absence or material limitation of trading;
- (iii) a suspension of trading in futures or options contracts on such Reference Index by the primary exchange or market for trading in such contracts by reason of (a) a price change exceeding limits set by such exchange or market, (b) an imbalance of orders relating to such contracts or securities or (c) a disparity in bid and ask quotes relating to such contracts or securities, will constitute a suspension, absence or material limitation of trading in futures or options contracts related to such Reference Index; and
- (iv) a suspension, absence or material limitation of trading on any relevant primary exchange or, if applicable, on the primary exchange or market on which futures or options contracts related to such Reference Index are traded will not include any time when such exchange or market is itself closed for trading under ordinary circumstances.

For the purpose of determining whether a Reference Index Disruption Event with respect to an Index Business Day exists at any time, if trading in a security or component included in the applicable

Reference Index is materially suspended or materially limited at that time, then the relevant percentage contribution of that security or component to the level of the applicable Reference Index will be based on a comparison of (x) the portion of the level of the applicable Reference Index attributable to that security or component relative to (y) the overall level of the applicable Reference Index, in each case immediately before that suspension or limitation.

10. Succession Events and Extraordinary Events

10.1 Succession Events

- (a) (x) if the contract specifications of the Series or its Contracts are modified by the Exchange (including, without limitation, the frequency of listed expiries), (y) yet such modified contract specifications are acceptable to the Index Calculation Agent;
- (b) (x) if any associated currency is lawfully eliminated and replaced, converted, redenominated or exchanged for any successor currency, (y) yet such replacement or successor currency is acceptable to the Index Calculation Agent;
- (c) (x) if the Series Denomination Currency changes, (y) yet such replacement or successor Series Denomination Currency is acceptable to the Index Calculation Agent;
- (d) for the Reference Index of a Series that has a Reference Index, (x) if the Reference Index is replaced by a successor index, (y) yet such successor index uses, in the determination of the Index Calculation Agent, the same or a substantially similar formula for and method of calculation as used in the calculation of the relevant index or such successor index is otherwise acceptable to the Index Calculation Agent;
- (e) for the Reference Index of a Series that has a Reference Index, (x) if the relevant index sponsor makes a material change in the formula for or the method of calculating that index or in any other way materially modifies that index (other than a modification prescribed in that formula or method to maintain that index in routine circumstances), (y) yet such change or modification is acceptable to the Index Calculation Agent;
- (f) for the Reference Index of a Series that has a Reference Index, (x) if such Reference Index not calculated and announced by the relevant index sponsor (y) yet is calculated and announced by a successor sponsor acceptable to the Index Calculation Agent; or
- (g) (x) if the Closing Levels are calculated or announced in the ordinary course, but are not calculated or are not announced by or on behalf of the Exchange or the relevant agent or information provider that such Exchange designates, (y) yet such Closing Levels are calculated and announced by or on behalf of a successor exchange acceptable to the Index Calculation Agent or an agent or information provider (in either case, that such successor exchange designates) acceptable to the Index Calculation Agent,

then, in each case, that currency, that Series Denomination Currency, that Reference Index or sponsor or the Exchange, agent or information provider will thereafter be deemed to be the successor Series, successor currency, successor Series Denomination Currency, successor Reference Index or sponsor or the successor Exchange, agent or information provider described in the relevant clause above, in each case, with effect from a date determined by the Index Calculation Agent. In each such case, the Index Calculation Agent shall, in good faith, make such adjustments that it determines to be appropriate to any variable, calculation methodology, valuation terms or any other rule in relation to the Index to account for such change (including, in relation to such currency, to the extent that any such elimination and replacement, conversion, redenomination or exchange results in two (2) or more currencies that were formally associated with the original currency, the Index Calculation Agent may modify these Index Rules to account for such elimination and replacement, conversion, redenomination or exchange, for example, by selecting one of the applicable currencies to be a

successor currency or amending the formulas for calculating the Index to account for the new relevant currency or FX Rate, if any).

For the avoidance of doubt, the Index Calculation Agent shall not accept a particular successor Series, successor currency or successor index if the Index Calculation Agent determines, in its sole discretion, that doing so would immediately result in the occurrence of an Extraordinary Event. Upon the acceptance of a successor series, successor currency, successor index or sponsor or successor exchange such successor shall take the place of the Series, currency, Reference Index or sponsor or Exchange, respectively, for purposes of calculating the Index.

10.2 Extraordinary Events

If an Extraordinary Event occurs with respect to a Series, the Index Calculation Agent, acting in good faith and a commercially reasonable manner, shall select as a substitute a futures contract series (a “**Substitute Futures Contract Series**”) that, in any such event, the Index Calculation Agent determines, in its sole discretion, possesses substantially similar characteristics or provides a substantially similar exposure (as considered prior to the occurrence of such Extraordinary Event).

In such a case, the Index Calculation Agent shall, in good faith, make such adjustments that it determines to be appropriate to any variable, calculation methodology, valuation terms or any other rule in relation to the Index to account for such substitution; *provided* that if the Index Calculation Agent determines, in its sole discretion, that no such substitute futures contract or substitute index is available, then the Index Calculation Agent will terminate the Index.

The Index Calculation Agent shall not select a particular substitute futures contract series if the Index Calculation Agent determines, in its sole discretion, that doing so would immediately result in the occurrence of an Extraordinary Event. Upon the selection of a substitute futures contract series, such substitute shall take the place of the Series for purposes of calculating the Index.

10.3 Definitions related to Extraordinary Events

An “**Extraordinary Event**” occurs if the Index Calculation Agent determines in its sole discretion that on any Index Business Day, one (1) or more of the following events has occurred:

- (a) if the Series has a Reference Index, the sponsor of the relevant index permanently cancels the Reference Index, and no successor exists, or the level of the Reference Index is not calculated and is not announced by or on behalf of the relevant sponsor of such index, and is not calculated and announced by or on behalf of a successor sponsor acceptable to the Index Calculation Agent;
- (b) the Exchange delists a Referenced Contract;
- (c) the Exchange does not list a Later Expiry Contract before the Scheduled Roll Initiation Day of the Earlier Expiry Contract;
- (d) the event specified in clause (x) of subsection (a), (b), (c), (d), (e), (f) or (g) of Section 10.1 (*Succession Events*) above occurs, but the relevant event specified in clause (y) of such subsection of Section 10.1 does not occur;
- (e) a Market Disruption Event occurs for ten (10) consecutive Index Business Days and the Index Calculation Agent determines that such Market Disruption Event is reasonably likely to continue for a period of an indeterminate duration;
- (f) if the Series has a Reference Index, a failure by the relevant sponsor to publish the closing level for such Reference Index for ten (10) consecutive Index Calculation Days and the Index Calculation Agent determines that such non-publication is reasonably likely to continue for a period of an indeterminate duration;

- (g) (x) a suspension or limitation on trading in respect of a Relevant Underlying (as defined in this Section 10.3) is announced or imposed for ten (10) consecutive relevant days or for a period of indeterminate duration that the Index Calculation Agent determines is reasonably likely to include ten (10) consecutive relevant days or (y) any other event occurs or condition exists that causes trading to cease in respect of a Relevant Underlying for ten (10) consecutive relevant days;
- (h) if the Series Denomination Currency is not the Currency of the Index, an FX Material Event (as defined in this Section 10.3) occurs;
- (i) the exchange or the central counterparty or other legal obligor in respect of any Contract becomes, for any reason, subject to voluntary or involuntary termination, liquidation, bankruptcy, insolvency, dissolution or winding-up or any other analogous proceeding;
- (j) the Aggregate Open Interest (as defined in “Definitions”) has, as of a date following the Live Date, declined below an amount equal to twenty percent (20%) of the Aggregate Open Interest on (i) the Live Date if the futures contract series of the Earlier Expiry Contract was the Series as of the Live Date, or (ii) the date on which such futures contract series became the Series;
- (k) the Average Aggregate Volume (as defined in “Definitions”) has, as of a date following the Live Date, declined below an amount equal to twenty percent (20%) of the Average Aggregate Volume on (i) the Live Date if the futures contract series of the Earlier Expiry Contract was the Series as of the Live Date, or (ii) the date on which such futures contract series became the Series;
- (l) if the Series has a Reference Index, the Closing Level of the Earlier Expiry Contract reflects a premium greater than twenty percent (20%) or a discount greater than twenty percent (20%) as compared to the official closing level of the Reference Index for a period of five (5) consecutive Index Business Days;
- (m) if, at any time, any relevant license or other right or ability of the Index Calculation Agent or the Index Sponsor (or any of their affiliates) to use the Series or any Contract thereof, underlying reference input or relevant data or information or to refer to the level or price or other information in respect of the Series or any Contract thereof, underlying reference input or relevant data or information (or other component or input of the Index or other factor that could affect the Index) terminates, becomes impaired, ceases or cannot be obtained or will cease to be available on commercially reasonable terms or the Index Calculation Agent’s right or ability to use (i) the Series or any Contract thereof for the purposes of the Index or (ii) the Index in connection with the grant or receipt of any other inbound or outbound licensing or sub-licensing rights is otherwise impaired, ceases or cannot be obtained or will cease to be available on commercially reasonable terms (for any reason); or
- (n) the occurrence or continuation of a Change in Law (as defined in this Section 10.3),

and the Index Calculation Agent determines in its sole discretion that the applicable event or events described above could materially interfere with the ability of market participants to transact in positions with respect to the Index (including, without limitation, positions with respect to any Contract or the Reference Index of a Series, if the Series has one).

An “**FX Material Event**” means, in each case as determined by the Index Calculation Agent in its sole discretion:

- (i) an event in relation to any currency relevant to the determination of the relevant FX Rate between the Series Denomination Currency and the Currency of the Index that the Index Calculation Agent determines has the effect of preventing, restricting or delaying:
 - (a) the convertibility of the Series Denomination Currency into the Currency of the Index through customary legal channels;

- (b) the convertibility of the Series Denomination Currency into the Currency of the Index at a rate at least as favorable as the rate for domestic institutions located in the country (or countries) whose lawful currency is the Series Denomination Currency (for the purposes of this definition, the **“Relevant Country”**);
- (c) the delivery of the Series Denomination Currency from accounts inside the Relevant Country to accounts outside the Relevant Country; or
- (d) the delivery of the Series Denomination Currency between accounts inside the Relevant Country or to a party that is a non-resident of the Relevant Country;
- (ii) the imposition by the Relevant Country (or any political or regulatory authority thereof) of any capital controls, or the publication of any notice of an intention to do so, that the Index Calculation Agent determines is likely to have a material effect on the ability of market participants to obtain reliable spot exchange rates for the Series Denomination Currency from a recognized financial source;
- (iii) the implementation by the Relevant Country (or any political or regulatory authority thereof) or the publication of any notice of an intention to implement any changes to the laws or regulations relating to foreign investment in the Relevant Country (including, but not limited to, changes in tax laws or laws relating to capital markets and corporate ownership), that the Index Calculation Agent determines are likely to have a material effect on the ability of market participants to obtain reliable spot exchange rates for the Series Denomination Currency from a recognized financial information source; or
- (iv) any other event that the Index Calculation Agent determines affects the convertibility of the Series Denomination Currency into the Currency of the Index in a material way for market participants on any date or at any relevant time.

A **“Change in Law”** occurs on or after the Live Date when, due to either:

- (i) the adoption of, or any change in, any applicable law, regulation or rule (including, without limitation, (x) any tax law or (y) adoption or promulgation of new regulations authorized or mandated by existing statute); or
- (ii) the promulgation of, or any change in, the announcement or statement of a formal or informal interpretation by any court, tribunal or regulatory authority (or any representative thereof) with competent jurisdiction of any applicable law, rule, regulation or order (including, without limitation, as implemented by the U.S. Commodity Futures Trading Commission, the U.S. Securities and Exchange Commission or any exchange or trading facility), and

the Index Calculation Agent determines in good faith that (x) it is contrary to such law, rule, regulation or order for any market participants that are brokers or financial intermediaries (individually or collectively) to hold, acquire or dispose of (in whole or in part) a position in or a transaction referencing or relating to (1) the Index, (2) any Contract, (3) a deliverable security or commodity in respect of a Contract that is physically settled, (4) a component of any Reference Index of a Series that has a Reference Index, (5) a reference security or commodity in respect of a Contract that is physically settled but does not have a Reference Index, (6) the Currency of the Index or (7) the Series Denomination Currency (each such underlying described in any of the immediately preceding clauses (2), (3), (4), (5), (6), and (7) being a **“Relevant Underlying”**) or (y) holding a position in or a transaction referencing or relating to the Index or any Relevant Underlying is (or, but for the consequent disposal or termination thereof, would otherwise be) in excess of any allowable position limits applicable to any market participants that are brokers or financial intermediaries (individually or collectively) under any such law, rule or regulation in relation to the Index or any Relevant Underlying, including in any case traded on any exchange, market or other trading facility.

11. Corrections

If (i) the Closing Level of any Contract as of any date that is published or otherwise made available to the Index Calculation Agent in respect of the relevant Contract is subsequently corrected and such correction is published or otherwise made available to the Index Calculation Agent in respect of such Contract; or (ii) the Index Calculation Agent identifies an error or omission in any of its calculations, determinations or interpretations in respect of the Index, then the Index Calculation Agent may, if practicable and if the Index Calculation Agent determines in good faith that such correction, error or omission (as the case may be) is material, adjust or correct the relevant calculation, determination or interpretation or the Index Level as of any Index Business Day to take into account any such correction.

Definitions

Terms not otherwise defined herein, shall have the following meanings:

“Actual Roll Completion Day” has the meaning given to such term in Section 6 (*Scheduled Roll Period; Actual Roll Period*).

“Actual Roll Day” has the meaning given to such term in Section 6 (*Scheduled Roll Period; Actual Roll Period*).

“Aggregate Open Interest” means, with respect to an Index Business Day, the aggregate open interest in all Contracts of a Series, as reported by the relevant Exchange. The Aggregate Open Interest as of the Live Date is provided in the applicable Module.

“Average Aggregate Volume” means, with respect to an Index Business Day, the ratio of (i) the total volume of trading in all Contracts of the Series from but excluding the calendar day six (6) months prior to such Index Business Day, to and including such Index Business Day, as reported by the Exchange, divided by (ii) the total number of Index Business Days from but excluding the calendar day six (6) months prior to such Index Business Day, to and including such Index Business Day. The Average Aggregate Volume as of the Live Date for an Index is provided in the applicable Module.

“Base Date” means, with respect to an Index, the Base Date specified in the applicable Module.

“Bloomberg” means Bloomberg Finance L.P. and its affiliates, or any successor or assign.

“Change in Law” has the meaning given to such term in Section 10.3 (*Definitions related to Extraordinary Events*).

“Closing Level” means, for a Contract and with respect to an Index Business Day, the official settlement price of such Contract on such Index Business Day as calculated and published by the Exchange.

“Contract” has the meaning given to such term in Section 4 (*General notes on the Index*).

“Currency of the Index” means, with respect to an Index, the currency of the Index specified in the applicable Module.

“Cut-off Day” has the meaning given to such term in Section 9.3 (*Definitions related to market disruption*).

“Disrupted Day” has the meaning given to such term in Section 9.3 (*Definitions related to market disruption*).

“Earlier Expiry Contract” has the meaning given to such term in Section 7 (*Earlier Expiry Contract; Later Expiry Contract*).

“Exchange” means the exchange or quotation system on which the Contracts of a Series are listed for trading, any successor to such exchange or quotation system or any substitute exchange or quotation system to which trading has temporarily relocated (so long as the Index Calculation Agent has determined that there is comparable liquidity relative to the Contracts on such temporary substitute exchange or quotation system as on the original exchange or quotation system). The Exchange as of the Live Date for an Index is provided in the applicable Module.

| | |
|--|---|
| “Extraordinary Event” | has the meaning given to such term in Section 10.3 (<i>Definitions related to Extraordinary Events</i>). |
| “Final Disruption Determination Date” | has the meaning given to such term in Section 9.3 (<i>Definitions related to market disruption</i>). |
| “Fixing Time” | means the Fixing Time specified in the applicable Module. If the Series Denomination Currency is the Currency of the Index, the applicable Module shall list the Fixing Time as being “Not applicable”. |
| “FX Material Event” | has the meaning given to such term in Section 10.3 (<i>Definitions related to Extraordinary Events</i>). |
| “FX Price Source” | means the FX Price Source specified in the applicable Module. If the Series Denomination Currency is the Currency of the Index, the applicable Module shall list the FX Price Source as being “Not applicable”. |
| “FX Rate” | has the meaning given to such term in Section 8 (<i>Calculation of the Index Level</i>). |
| “Index” | has the meaning given to such term in Section 1 (<i>Introduction</i>). |
| “Index Business Day” | means (i) if the Series Currency Denomination is the Currency of the Index, a day on which the Exchange is scheduled to be open for its regular trading session in Contracts of the Series; or (ii) if the Series Currency Denomination is not the Currency of the Index, a day on which (a) the FX Rate is scheduled to be calculated and published by the FX Price Source (or any successor or assign) and (b) the Exchange is scheduled to be open for its regular trading session in Contracts of the Series. |
| “Index Calculation Agent” | has the meaning given to such term in Section 2.1 (<i>Identity and responsibilities</i>). |
| “Index Level” | has the meaning given to such term in Section 5 (<i>Publication of the Index Level</i>). |
| “Index Rules” | has the meaning given to such term in Section 1 (<i>Introduction</i>). |
| “Index Sponsor” | has the meaning given to such term in Section 2.1 (<i>Identity and responsibilities</i>). |
| “Initial Contract” | means, in respect of an Index, the initial futures contract associated with such Index, as specified in the applicable Module. |
| “JPMS” | has the meaning given to such term in Section 2.1 (<i>Identity and responsibilities</i>). |
| “Later Expiry Contract” | has the meaning given to such term in Section 7 (<i>Earlier Expiry Contract; Later Expiry Contract</i>). |
| “Live Date” | means the Live Date for a particular Index as specified in the applicable Module. |
| “Market Disruption Event” | has the meaning given to such term in Section 9.3 (<i>Definitions related to market disruption</i>). |
| “Module” | has the meaning given to such term in Section 1 (<i>Introduction</i>). |
| “Referenced Contract” | has the meaning given to such term in Section 9.3 (<i>Definitions related to market disruption</i>). |

- “Reference Index”** means, in respect of a Series, the underlying equity reference index specified in the applicable Module. If the Series does not have a Reference Index the applicable Module shall list the Reference Index as being “Not applicable”.
- “Reference Index Disruption Event”** has the meaning given to such term in Section 9.3 (*Definitions related to market disruption*).
- “Relevant Contract Expiries”** means, in respect of a Series, the contract expiries specified in the applicable Module, on the basis of which Index exposure is periodically rolled in accordance with the provisions of Section 6 (*Scheduled Roll Period; Actual Roll Period*). Where “All expiries” are specified as the Relevant Contract Expiries for a Series, exposure will be rolled in advance of the contract expiry of each available Contract in such Series. Where a series of calendar months is specified, exposure will be rolled in advance of each Contract within the Series whose expiry falls in one of the listed calendar months.
- “Relevant Country”** has the meaning given to such term in Section 10.3 (*Definitions related to Extraordinary Events*).
- “Relevant Person”** has the meaning given to such term in Section 2.1 (*Identity and responsibilities*).
- “Relevant Underlying”** has the meaning given to such term in Section 10.3 (*Definitions related to Extraordinary Events*).
- “Scheduled Roll Day”** has the meaning given to such term in Section 6 (*Scheduled Roll Period; Actual Roll Period*).
- “Scheduled Roll Initiation Day”** has the meaning given to such term in Section 6 (*Scheduled Roll Period; Actual Roll Period*) and is as specified in the applicable Module.
- “Scheduled Roll Period”** has the meaning given to such term in Section 6 (*Scheduled Roll Period; Actual Roll Period*).
- “Series”** means, in respect of an Index and as described in Section 4 (*General notes on the Index*), the futures contract series specified in the applicable Module.
- “Series Denomination Currency”** means , with respect to a Series, the currency in which Contracts in such Series are quoted on the Exchange. The Series Denomination Currency for a particular Series as of the Live Date is provided in the applicable Module.
- “Substitute Futures Contract Series”** has the meaning given to such term in Section 10.2 (*Extraordinary Events*).
- “Trading Day”** means a day an Index Business Day that is (i) not a Disrupted Day; or (ii) a Final Disruption Determination Date.

Part B

Index Parameters for the J.P. Morgan Futures Index Series

MODULE B1: J.P. MORGAN US LARGE CAP EQUITIES FUTURES INDEX

| | |
|--|---|
| Name | J.P. Morgan US Large Cap Equities Futures Index |
| Bloomberg ticker | JPUSLGEQ |
| Base Date | April 21, 1982 |
| Initial Contract | June 1982 expiry |
| Live Date | December 22, 2020 |
| Series | S&P 500® Futures |
| Exchange as of the Live Date | Chicago Mercantile Exchange |
| Series Denomination Currency as of the Live Date | U.S. dollars |
| Exchange Ticker from and including the Live Date, to but excluding September 17, 2021 | SP |
| Exchange Ticker as of September 17, 2021 | ES |
| Reference Index | S&P 500® Index |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is six (6) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | U.S. dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B2: J.P. MORGAN US Q EQUITIES FUTURES INDEX

| | |
|---|---|
| Name | J.P. Morgan US Q Equities Futures Index |
| Bloomberg ticker | JPUSNQEQ |
| Base Date | April 10, 1996 |
| Initial Contract | June 1996 expiry of the Nasdaq-100® Futures series |
| Live Date | December 22, 2020 |
| Series | E-mini® Nasdaq-100® Futures |
| Exchange as of the Live Date | Chicago Mercantile Exchange |
| Series Denomination Currency as of the Live Date | U.S. dollars |
| Exchange Ticker as of the Live Date | NQ |
| Reference Index | Nasdaq-100 Index® |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is six (6) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | U.S. dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B3: J.P. MORGAN US SMALL CAP EQUITIES FUTURES INDEX

| | |
|---|---|
| Name | J.P. Morgan US Small Cap Equities Futures Index |
| Bloomberg ticker | JPUSMEQ |
| Base Date | February 4, 1993 |
| Initial Contract | March 1993 expiry of the Russell 2000® Futures series |
| Live Date | November 29, 2021 |
| Series | E-mini® Russell 2000® Futures |
| Exchange as of the Live Date | Chicago Mercantile Exchange |
| Series Denomination Currency as of the Live Date | U.S. dollars |
| Exchange Ticker as of the Live Date | RTY |
| Reference Index | Russell 2000® Index |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is six (6) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | U.S. dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B4: J.P. MORGAN GERMAN EQUITIES FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan German Equities Futures Index |
| Bloomberg ticker | JPDEEQ |
| Base Date | November 23, 1990 |
| Initial Contract | December 1990 |
| Live Date | November 29, 2021 |
| Series | DAX® Futures |
| Exchange as of the Live Date | Eurex Deutschland |
| Series Denomination Currency as of the Live Date | Euros |
| Exchange Ticker as of the Live Date | FDAX |
| Reference Index | DAX® Index |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | Euros |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B5: J.P. MORGAN JAPANESE EQUITIES FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan Japanese Equities Futures Index |
| Bloomberg ticker | JPJPEQ |
| Base Date | May 16, 1990 |
| Initial Contract | June 1990 |
| Live Date | November 29, 2021 |
| Series | TOPIX Futures |
| Exchange as of the Live Date | Osaka Exchange |
| Series Denomination Currency as of the Live Date | Japanese yen |
| Exchange Ticker as of the Live Date | Not applicable |
| Reference Index | Tokyo Stock Price Index |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | Japanese yen |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B6: RESERVED

MODULE B7: J.P. MORGAN UK GOVERNMENT BOND FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan UK Government Bond Futures Index |
| Bloomberg ticker | JPUKGILT |
| Base Date | November 18, 1982 |
| Initial Contract | March 1983 |
| Live Date | April 19, 2022 |
| Series | Long Gilt Futures |
| Exchange as of the Live Date | ICE Futures Europe |
| Series Denomination Currency as of the Live Date | British pound Sterling |
| Exchange Ticker as of the Live Date | R |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | British pound Sterling |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B8: J.P. MORGAN 2Y US TREASURY FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan 2Y US Treasury Futures Index |
| Bloomberg ticker | JPUS2YT |
| Base Date | June 25, 1990 |
| Initial Contract | September 1990 |
| Live Date | December 22, 2020 |
| Series | Short-Term U.S. Treasury Note Futures (2-Year) |
| Exchange as of the Live Date | Chicago Board of Trade |
| Series Denomination Currency as of the Live Date | U.S. dollars |
| Exchange Ticker as of the Live Date | ZT |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | U.S. dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B9: J.P. MORGAN 5Y US TREASURY FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan 5Y US Treasury Futures Index |
| Bloomberg ticker | JPUS5YT |
| Base Date | May 25, 1988 |
| Initial Contract | June 1988 |
| Live Date | November 29, 2021 |
| Series | 5-Year U.S. Treasury Note Futures |
| Exchange as of the Live Date | Chicago Board of Trade |
| Series Denomination Currency as of the Live Date | U.S. dollars |
| Exchange Ticker as of the Live Date | FV |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | U.S. dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE 10: J.P. MORGAN 10Y US TREASURY FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan 10Y US Treasury Futures Index |
| Bloomberg ticker | JPUS10YT |
| Base Date | May 3, 1982 |
| Initial Contract | June 1982 |
| Live Date | November 29, 2021 |
| Series | Long-Term U.S. Treasury Note Futures (6½ to 10-Year) |
| Exchange as of the Live Date | Chicago Board of Trade |
| Series Denomination Currency as of the Live Date | U.S. dollars |
| Exchange Ticker as of the Live Date | ZN |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | U.S. dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B11: J.P. MORGAN GERMAN GOVERNMENT BOND FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan German Government Bond Futures Index |
| Bloomberg ticker | JPDEBUND |
| Base Date | November 23, 1990 |
| Initial Contract | December 1990 |
| Live Date | November 29, 2021 |
| Series | Euro-Bund Futures |
| Exchange as of the Live Date | Eurex Deutschland |
| Series Denomination Currency as of the Live Date | Euros |
| Exchange Ticker as of the Live Date | FGBL |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | Euros |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B12: J.P. MORGAN 20Y US TREASURY FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan 20Y US Treasury Futures Index |
| Bloomberg ticker | JPUS20YT |
| Base Date | August 22, 1977 |
| Initial Contract | December 1977 |
| Live Date | April 19, 2022 |
| Series | U.S. Treasury Long Bond Futures |
| Exchange as of the Live Date | Chicago Board of Trade |
| Series Denomination Currency as of the Live Date | U.S. dollars |
| Exchange Ticker as of the Live Date | US |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | U.S. dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B13: J.P. MORGAN JAPANESE GOVERNMENT BOND FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan Japanese Government Bond Futures Index |
| Bloomberg ticker | JPJP10YB |
| Base Date | October 21, 1985 |
| Initial Contract | December 1985 |
| Live Date | November 29, 2021 |
| Series | 10-year JGB Futures |
| Exchange as of the Live Date | Osaka Exchange |
| Series Denomination Currency as of the Live Date | Japanese yen |
| Exchange Ticker as of the Live Date | Not applicable |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | Japanese yen |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B14: J.P. MORGAN GERMAN GOVERNMENT 2Y BOND FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan German Government 2Y Bond Futures Index |
| Bloomberg ticker | JPDE2YT |
| Base Date | March 7, 1997 |
| Initial Contract | June 1997 |
| Live Date | April 19, 2022 |
| Series | Euro-Schatz Futures |
| Exchange as of the Live Date | Eurex Deutschland |
| Series Denomination Currency as of the Live Date | Euros |
| Exchange Ticker as of the Live Date | FGBS |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | Euros |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B15: J.P. MORGAN GERMAN GOVERNMENT 5Y BOND FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan German Government 5Y Bond Futures Index |
| Bloomberg ticker | JPDE5YT |
| Base Date | October 4, 1991 |
| Initial Contract | December 1991 |
| Live Date | April 19, 2022 |
| Series | Euro-Bobl Futures |
| Exchange as of the Live Date | Eurex Deutschland |
| Series Denomination Currency as of the Live Date | Euros |
| Exchange Ticker as of the Live Date | FGBM |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | Euros |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B16: J.P. MORGAN GERMAN GOVERNMENT 30Y BOND FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan German Government 30Y Bond Futures Index |
| Bloomberg ticker | JPDE30YT |
| Base Date | October 2, 1998 |
| Initial Contract | June 1999 |
| Live Date | April 19, 2022 |
| Series | Euro-Buxl Futures |
| Exchange as of the Live Date | Eurex Deutschland |
| Series Denomination Currency as of the Live Date | Euros |
| Exchange Ticker as of the Live Date | FGBX |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | Euros |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B17: J.P. MORGAN CRUDE OIL FUTURES INDEX

| | |
|---|---|
| Name | J.P. Morgan Crude Oil Futures Index |
| Bloomberg ticker | JPCRUDE |
| Base Date | March 30, 1983 |
| Initial Contract | August 1983 |
| Live Date | November 29, 2021 |
| Series | Light Sweet Crude Oil Futures |
| Exchange as of the Live Date | Commodity Exchange ("COMEX") |
| Series Denomination Currency as of the Live Date | U.S. dollars |
| Exchange Ticker as of the Live Date | CL |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The fifth (5 th) Index Business Day of the month that is four (4) months prior to the Contract's. |
| Currency of the Index | U.S. dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B18: J.P. MORGAN GOLD FUTURES INDEX

| | |
|---|---|
| Name | J.P. Morgan Gold Futures Index |
| Bloomberg ticker | JPMGOLD |
| Base Date | Jan 2, 1975 |
| Initial Contract | June 1975 |
| Live Date | November 29, 2021 |
| Series | Gold Futures |
| Exchange as of the Live Date | New York Mercantile Exchange (“NYMEX”) |
| Series Denomination Currency as of the Live Date | U.S. dollars |
| Exchange Ticker as of the Live Date | GC |
| Reference Index | Not applicable |
| Relevant Contract Expiries | February, April, June, August, December |
| Scheduled Roll Initiation Date | The fifth (5 th) Index Business Day of the month that is four (4) months prior to the Contract’s. |
| Currency of the Index | U.S. dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

MODULE B19: J.P. MORGAN AUSTRALIAN GOVERNMENT 3Y BOND FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan Australian Government 3Y Bond Futures Index |
| Bloomberg ticker | JPAU3YT |
| Base Date | December 14, 1989 |
| Initial Contract | March 1990 |
| Live Date | April 19, 2022 |
| Series | 3 Year Commonwealth Treasury Bond Futures |
| Exchange as of the Live Date | Australian Securities Exchange |
| Series Denomination Currency as of the Live Date | Australian dollars |
| Exchange Ticker as of the Live Date | YT |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | Australian dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

In Definitions, the definition of “**Closing Level**” is hereby deleted in its entirety and replaced with:

“**Closing Level**” means, for a Contract and with respect to an Index Business Day, the official settlement price of such Contract on such Index Business Day as calculated by the Index Calculation Agent according to the formula specified by, and by reference to the yield and any other relevant inputs calculated and published by the Futures Exchange on such Index Business Day for such Contract.

MODULE B21: J.P. MORGAN AUSTRALIAN GOVERNMENT 10Y BOND FUTURES INDEX

| | |
|---|--|
| Name | J.P. Morgan Australian Government 10Y Bond Futures Index |
| Bloomberg ticker | JPAU10YT |
| Base Date | May 31, 1988 |
| Initial Contract | June 1988 |
| Live Date | April 19, 2022 |
| Series | 10 Year Commonwealth Treasury Bond Futures |
| Exchange as of the Live Date | Australian Securities Exchange |
| Series Denomination Currency as of the Live Date | Australian dollars |
| Exchange Ticker as of the Live Date | XT |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The day that is five (5) Index Business Days prior to the Cut-off Day. |
| Currency of the Index | Australian dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

In Definitions, the definition of “**Closing Level**” is hereby deleted in its entirety and replaced with:

“**Closing Level**” means, for a Contract and with respect to an Index Business Day, the official settlement price of such Contract on such Index Business Day as calculated by the Index Calculation Agent according to the formula specified by, and by reference to the yield and any other relevant inputs calculated and published by the Futures Exchange on such Index Business Day for such Contract.

MODULE B22: J.P. MORGAN BRENT CRUDE OIL FUTURES INDEX

| | |
|---|---|
| Name | J.P. Morgan Brent Crude Oil Futures Index |
| Bloomberg ticker | JPBRENT |
| Base Date | October 2, 1989 |
| Initial Contract | March 1990 |
| Live Date | October 24, 2022 |
| Series | Light Sweet Crude Oil Futures |
| Exchange as of the Live Date | Intercontinental Exchange (“ICE”) |
| Series Denomination Currency as of the Live Date | U.S. dollars |
| Exchange Ticker as of the Live Date | CO |
| Reference Index | Not applicable |
| Relevant Contract Expiries | All expiries |
| Scheduled Roll Initiation Date | The fifth (5 th) Index Business Day of the month that is four (4) months prior to the Contract’s. |
| Currency of the Index | U.S. dollars |
| FX Price Source | Not applicable |
| Fixing Time | Not applicable |

The definition of Index Business Day is hereby deleted in its entirety and replaced with:

“**Index Business Day**” means a day on which (a) the New York Mercantile Exchange (or any successor to such exchange or any substitute exchange or quotation system to which trading has temporarily relocated, so long as the Index Calculation Agent has determined that

there is comparable liquidity on such temporary substitute exchange or quotation system as on the original exchange) is scheduled to be open for its regular trading session, and (b) the Exchange is scheduled to be open for its regular trading session in Contracts of the Series.

Notices, Disclaimers and Conflicts of Interest

The Index Rules have been prepared solely for informational purposes and nothing in the Index Rules constitutes (i) an offer to buy or sell any securities, participate in any transaction or adopt any investment linked to the Index (each, a “**Product**”) or (ii) legal, tax, regulatory, financial or accounting advice. The Index Rules may change at any time without prior notice. As of the Live Date, all relevant internal approvals had been obtained by the Index Sponsor in respect of the Index Rules.

None of the Relevant Persons makes any representation or warranty, whatsoever, express or implied, as to the results that may be obtained through the use of this document or the Index. Each Relevant Person hereby expressly disclaims, to the fullest extent permitted by law, all warranties of accuracy, completeness, merchantability, or fitness for a particular purpose with respect to any information contained in this document. No Relevant Person shall have any liability or responsibility to any person or entity (including, without limitation, any investor in any Product or investment referencing the Index) for any loss, damages, costs, charges, expenses or other liabilities howsoever arising, including, without limitation, liability for any special, punitive, indirect, consequential or other damages (including loss of business or loss of profit, loss of time and loss of goodwill), even if notified of the possibility of any such damages.

Except as provided in the following paragraph, neither the Index Sponsor nor the Index Calculation Agent gives any representation, warranty or undertaking, of any type (whether express or implied, statutory or otherwise) in relation to an Index, as to (i) the condition, satisfactory quality, performance or fitness for purpose of the Index, (ii) the results to be achieved by an investment in any Product, (iii) any data included in or omissions from the Index, (iv) the use of the Index in connection with a Product, (v) the Index Level at any time on any day, (vi) the veracity, currency, completeness or accuracy of the information on which the Index is based (and without limitation, the Index Sponsor and the Index Calculation Agent accept no liability to any investor in a Product for any errors or omissions in that information or the results of any interruption to it and the Index Sponsor and the Index Calculation Agent shall be under no obligation to advise any person of any such error, omission or interruption), or (vii) any other matter. To the extent any such representation, warranty or undertaking could be deemed to have been given by the Index Sponsor or the Index Calculation Agent, it is excluded save to the extent that such exclusion is prohibited by law.

To the fullest extent permitted by law, the Index Sponsor and the Index Calculation Agent has no liability or responsibility to any person or entity (including, without limitation, any investor in any Product) for any loss, damages, costs, charges, expenses or other liabilities howsoever arising, including, without limitation, liability for any special, punitive, indirect or consequential damages (including loss of business or loss of profit, loss of time and loss of goodwill), even if notified of the possibility of the same, arising in connection with the design, compilation, calculation, maintenance or sponsoring of an Index or in connection with any Product.

Nothing in these Index Rules shall be taken to exclude any liability for fraud on the part of the Index Sponsor or Index Calculation Agent.

No Relevant Person is under any obligation to continue the calculation, publication and dissemination of the Index or the Index Level. The Index Sponsor may at any time and without notice terminate the calculation, publication or dissemination of the Index. The Index Sponsor may delegate or transfer to a third party some or all of its functions in relation to the Index. Further information relating to: (i) the internal governance framework; and (ii) the identity and role of third parties that are non-affiliates of J.P. Morgan, in respect of the Index is available upon request from the Index Sponsor.

Potential conflicts of interest may exist between the structure and operation of the Index, roles and responsibilities of the Index Sponsor and Index Calculation Agent and the normal business activities of the Index Sponsor, the Index Calculation Agent or any other Relevant Person. During the course of their normal business, the Index Sponsor or any of the other Relevant Persons may (i) enter into or promote, offer or sell transactions or investments (structured or otherwise) linked to the Index or any of the Series or (ii) act as an investment manager, investment advisor, administrator, custodian, prime broker or other service provider to entities connected to the Series. In addition, any Relevant Person may have, or may have had, interests

(including general commercial interests related to the Index, any Series, associated Reference Index or any constituent or sponsor of such Reference Index) or positions, or may buy, sell or otherwise trade positions in or relating to the Index or any of the Contracts or the underlying assets referenced thereby, or may invest or engage in transactions with other persons, or on behalf of such persons relating to any of these items. Such activity may or may not have an impact on the Index Level but all persons reading this document should be aware that a conflict of interest could arise where anyone is acting in more than one capacity, and such conflict may have an impact, positive or negative, on the Index Level. Neither the Index Calculation Agent nor any other Relevant Person has any duty to consider the circumstances of any person when participating in such transactions or to conduct themselves in a manner that is favorable to anyone with exposure to the Index. Furthermore, neither the Index Sponsor nor any other Relevant Person has any obligation or liability in connection with the administration, marketing or trading of any instrument or investment that references the Index and is not obliged to enter into or promote any such instrument or investment.

The Index Rules have been developed with the possibility of the Index Sponsor or any of the other Relevant Persons entering into or promoting, offering or selling transactions or investments (structured or otherwise) linked to the Index and hedging such transactions or investments in any manner that they see fit. Accordingly it should be assumed that the Index Rules have and will be analyzed from this point of view.

The Index Sponsor or the Index Calculation Agent may make certain calculations based on information obtained from publicly available sources without independently verifying such information and accepts no responsibility or liability in respect of such calculations or information.

As mentioned above, the Index is described as a notional basket because there is no actual portfolio of assets to which any person is entitled or in which any person has any ownership interest. The Index merely identifies certain reference assets, the performance of which will be used as a reference point for calculating the Index Level.

Notwithstanding anything to the contrary herein, nothing in these Index Rules should be construed to be investment advice or a recommendation to purchase a specific instrument or make a specific investment. Nothing in these Index Rules or any other communication between you and J.P. Morgan Chase & Co. (together with its affiliates, "**J.P. Morgan**") should be deemed to or be construed as creating a "fiduciary relationship". J.P. Morgan and its subsidiaries, officers, directors, employees and agents, are not your fiduciary. You should make your own investment decision based on your own judgment and on your own examination of the specific Product that you are purchasing or investment that you are entering into, and you should consult your own legal, regulatory, investment, tax, accounting and other professional advisers as you deem necessary in connection with any purchase of a financial product or undertaking any investment.

The Index is the exclusive property of the Index Sponsor and the Index Sponsor retains all proprietary rights in the Index.

The Index is protected by copyright and trade secret rights and is and will always remain the sole property of J.P. Morgan, all rights, title and full ownership in and to the Index are expressly reserved to and will remain with J.P. Morgan, the Index was developed, compiled, prepared and arranged by J.P. Morgan through the expenditure of substantial time, effort and money and constitutes valuable intellectual property and trade secrets of J.P. Morgan and all proprietary and intellectual property rights of any nature, including patents, copyrights, trademarks and trade secrets regarding the Index and the Index Rules, and any and all copies, modifications, enhancements and derivative works thereof are owned by and will remain the property of J.P. Morgan.

Third parties shall not use the Index Sponsor's intellectual property without the prior written consent of the Index Sponsor (including in situations where a third party performs certain functions in relation to the Index) and may not (directly or indirectly) (a) share, reproduce, distribute or otherwise disseminate the Index, Index Rules or any related data in any form without the express prior written consent of J.P. Morgan (b) alter, remove or conceal any copyright, trademark or other proprietary notice or disclaimer regarding the Index, (c) modify, copy, translate, distribute, recompile, decompile, disassemble or reverse engineer the Index; (d) make or

distribute any other form of or any derivative work from, the Index or (e) grant any rights in, permit or provide access to the Index or the Index Rules in a manner that could infringe the intellectual property rights of J.P. Morgan or any third party or violate any applicable laws, tariffs, rules or regulations.

Any third party who enters into a transaction or investment or purchases a Product that references the Index is thereby deemed to acknowledge that (i) THE INDEX, INDEX RULES AND RELATED DATA ARE PROVIDED "AS IS" WITH ALL FAULTS, (ii) ALL WARRANTIES AND REPRESENTATIONS OF ANY KIND WITH REGARD TO THE INDEX ARE DISCLAIMED BY J.P. MORGAN, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY, QUALITY, ACCURACY, FITNESS FOR A PARTICULAR PURPOSE OR AGAINST INFRINGEMENT AND WARRANTIES AS TO ANY RESULTS TO BE OBTAINED BY OR FROM THE USE OF THE INDEX, (iii) J.P. MORGAN DOES NOT GUARANTEE THE AVAILABILITY, SEQUENCE, TIMELINESS, ACCURACY OR COMPLETENESS OF THE INDEX, (iv) J.P. MORGAN MAY DISCONTINUE CALCULATION OF THE INDEX AT ANY TIME WITHOUT PRIOR NOTICE AND, (v) TO THE FULLEST EXTENT PERMITTED BY APPLICABLE LAW, J.P. MORGAN WILL NOT BE LIABLE (IN CONTRACT, TORT OR OTHERWISE) FOR ANY ORDINARY, DIRECT, INDIRECT, CONSEQUENTIAL, SPECIAL, PUNITIVE OR EXEMPLARY DAMAGES IN CONNECTION WITH ANY USE OF THE INDEX, THE INDEX RULES OR ANY ASSOCIATED DATA, EVEN IF J.P. MORGAN HAS BEEN APPRISED OF THE LIKELIHOOD OF SUCH DAMAGES OCCURRING, and agrees to release, indemnify, defend and hold J.P. Morgan harmless from and against any claim, liability, loss, injury, damage, cost, or expense of any kind (including reasonable attorney's fees), as incurred, relating to or arising out of such third party's use of the Index, the Index Rules or any associated data.

No one may reproduce or disseminate the information contained in this document or the Index Level of the Index without the prior written consent of the Index Sponsor. This document is not intended for distribution to, or use by any person in, a jurisdiction where such distribution is prohibited by law or regulation.

The foregoing notices, disclaimers and conflicts disclosure is not intended to be exhaustive. Anyone reading these Index Rules should seek such advice as they consider necessary from their professional advisors, legal, tax or otherwise, without reliance on the Index Sponsor, Index Calculation Agent or any Relevant Person to satisfy them that they fully understand these Index Rules and the risks associated with an Index.

Copyright JPMorgan Chase & Co. 2022. All rights reserved. J.P. Morgan is the marketing name for JPMorgan Chase & Co. and its subsidiaries and affiliates worldwide. The Index Sponsor owns all intellectual property rights in: (i) the development of and methodology for producing the Index, (ii) the Index Levels and (iii) these Index Rules. Third parties shall not use the Index Sponsor's intellectual property without the prior written consent of the Index Sponsor (including in situations where a third party performs certain functions in relation to the Index).