

**Underlying supplement no. 18-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 April 13, 2023**  
**Rule 424(b)(2)**

**JPMORGAN CHASE & CO.**

***Notes Linked to the J.P. Morgan Tech+ Dynamic Blend<sup>SM</sup> 5 Index***

**JPMORGAN CHASE FINANCIAL COMPANY LLC**

***Notes, Fully and Unconditionally Guaranteed by JPMorgan Chase & Co., Linked to the J.P. Morgan Tech+ Dynamic Blend<sup>SM</sup> 5 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 Tech+ Dynamic Blend<sup>SM</sup> 5 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 0.50% 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-3 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**

April 13, 2023

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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.

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 Tech+ Dynamic Blend<sup>SM</sup> 5 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 its affiliates, and JPMS and its affiliates reserve all rights with respect to their ownership of the Index. The Index is reported by Bloomberg L.P. under the ticker symbol “JPUSNDB5 Index.”

The Index attempts to provide a dynamic rules-based allocation to the J.P. Morgan US Q Equities Futures Index (the “**Equity Constituent**”) and the J.P. Morgan 2Y US Treasury Futures Index (the “**Bond Constituent**”) and, together with the Equity Constituent, the “**Portfolio Constituents**”) while targeting a level volatility of 5.0% (the “**Target Volatility**”). The Index tracks the return of (a) a notional dynamic portfolio consisting of the Equity Constituent and the Bond Constituent, less (b) the daily deduction of 0.50% per annum (the “**Index Deduction**”). Each futures contract underlying a Portfolio Constituent as of a particular time is referred to in this underlying supplement as an “**Underlying Futures Contract**.”

- The Equity Constituent is an excess return index that tracks the return of a notional rolling futures position in futures contracts on the Nasdaq-100 Index<sup>®</sup>. For additional information about the Equity Constituent, see “Background on the J.P. Morgan Futures Indices” below.
- The Bond Constituent is an excess return index that tracks the return of a notional rolling futures position in futures contracts on 2-Year U.S. treasury notes. For additional information about the Bond Constituent, see “Background on the J.P. Morgan Futures Indices” below.

The Index provides a diversified exposure that rebalances daily based on measures of market risk and diversification to attempt to deliver stable volatility over time.

*Considerations Relating to the Volatility of the Portfolio Constituents.* Under normal market conditions, the Equity Constituent’s realized volatility has tended to be relatively more variable than the Bond Constituent’s realized volatility. Consequently, and because the Index seeks to maintain an annualized realized volatility approximately equal to the Target Volatility, the Index methodology may be more likely to shift exposure from the Equity Constituent to the Bond Constituent during periods of relatively higher market volatility and to shift exposure from the Bond Constituent to the Equity Constituent under normal market conditions exhibiting relatively lower market volatility.

In general, equity markets have historically been more likely to outperform fixed-income markets during periods of relatively lower market volatility and to underperform fixed-income markets during periods of relatively higher market volatility. However, there can be no assurance that the Index allocation strategy will achieve its intended results or that the Index will outperform any alternative index or strategy that might reference the Portfolio Constituents. Past performance should not be considered indicative of future performance.

In any initial selection between two eligible notional portfolios, the Index will select the portfolio that has the higher allocation to the Portfolio Constituent with a higher realized volatility, as described below, which generally will cause the Equity Constituent to receive a higher allocation than if the portfolio that has the higher allocation to the Portfolio Constituent with a lower realized volatility were selected.

Furthermore, under normal market conditions, the Equity Constituent’s realized volatility tends to be significantly higher than the Bond Constituent’s realized volatility. Under such circumstances and because the Target Volatility is 5.0%, the Index is generally expected to be more heavily weighted towards the Bond Constituent. Past performance should not be considered indicative of future performance. Under circumstances where the Equity Constituent’s realized volatility is significantly higher than that of the Bond Constituent, the performance of the Index is expected to be influenced to a greater extent by the performance of the Equity Constituent than by the performance of the Bond Constituent,

unless the weight of the Bond Constituent is significantly greater than the weight of the Equity Constituent.

Consequently, even in cases where the allocation to the Bond Constituent is greater than the allocation to the Equity Constituent, the Index may be influenced to a greater extent by the performance of the Equity Constituent than by the performance of the Bond Constituent because, under some conditions, the greater allocation to the Bond Constituent will not be sufficiently large to offset the greater realized volatility of the Equity Constituent.

*Calculating the level of the Index.* On any given day, the closing level of the Index (the “**Index Level**”) reflects (a) the weighted return performance of the Portfolio Constituents less (b) the 0.50% per annum daily Index Deduction. The Index Level was set equal to 100.00 on May 9, 1996, the base date of the Index. The Index Calculation Agent (as defined below) began calculating the Index on a live basis on March 2, 2022. The Index is an “excess return” index because, through the Portfolio Constituents, it provides notional exposure to futures contract returns that reflect changes in the price of those futures contracts, as well as their “roll” returns described below. The 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.

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 Tech+ Dynamic Blend<sup>SM</sup> 5 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 achieve its intended results or that the Index will be successful or will outperform any alternative index or strategy that might reference the Portfolio Constituents. Furthermore, no assurance can be given that the realized volatility of the Index will approximate the Target Volatility. The actual realized volatility of the Index may be greater or less than the Target Volatility.**

**If the aggregate weight of the Portfolio Constituents in the Index is less than 100%, the Index will not be fully invested, and any uninvested portion will earn no return. The Index Deduction is deducted daily at a rate of 0.50% per annum, even when the Index is not fully invested.**

**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 Portfolio Constituent or any of the futures contracts underlying any Portfolio 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 Portfolio Constituent with a substitute or successor upon the occurrence of certain events affecting that Portfolio 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 Portfolio Constituent in the Index is not an investment recommendation by us or JPMS of that Portfolio Constituent or any of the futures contracts underlying that Portfolio Constituent. See “The J.P. Morgan Tech+ Dynamic Blend<sup>SM</sup> 5 Index.”

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

The Index follows a notional rules-based proprietary strategy that operates on the basis of pre-determined rules. Under this strategy, the Index seeks to maintain an annualized realized volatility approximately equal to the Target Volatility of 5.0% by rebalancing its exposures to the Portfolio Constituents on each day based on two measures of realized portfolio volatility: a shorter-term volatility measure and a longer-term volatility measure. By seeking to maintain an annualized realized volatility approximately equal to the Target Volatility, the Index may underperform an alternative strategy that seeks to maintain a higher annualized realized volatility or an alternative strategy that does not seek to maintain a level volatility.

In addition, on each day, the Index generally selects the notional portfolio identified for the volatility measure that has the lower allocation to the Equity Constituent as the notional portfolio to be tracked by the Index. The Index's selection of the notional portfolio with the lower allocation to the Equity Constituent may be more likely to result in the Index tracking a notional portfolio with a lower realized

volatility than if the Index were to select the notional portfolio with the higher allocation to the Equity Constituent.

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 Portfolio Constituents.

**The Index may not approximate the Target Volatility.**

No assurance can be given that the Index will maintain an annualized realized volatility that approximates the Target Volatility. The actual realized volatility of the Index may be greater or less than the Target Volatility. The Index seeks to maintain an annualized realized volatility approximately equal to the Target Volatility of 5.0% by rebalancing its exposures to the Portfolio Constituents on each day based on two measures of realized portfolio volatility. However, there is no guarantee that trends exhibited by either measure of realized portfolio volatility will continue in the future. The volatility of a 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 Target Volatility, which may adversely affect the level of the Index and the value of the notes.

**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.

**The Index may be significantly uninvested.**

For each volatility measure on each day, the Index seeks to identify a notional portfolio composed of the Portfolio Constituents that has an annualized realized volatility determined for that volatility measure approximately equal to the Target Volatility of 5.0% and an aggregate weight of 100%. If the Index identifies and selects such a notional portfolio for a volatility measure, but the weight of either Portfolio Constituent is greater than 100%, the weight of that Portfolio Constituent in the notional portfolio selected for that volatility measure on that day will be 100% and, if the weight of either Portfolio Constituent is less than 0%, the weight of that Portfolio Constituent in the notional portfolio selected for that volatility measure on that day will be 0%. In addition, if there is no such notional portfolio for a volatility measure, the Index selects for that volatility measure on that day the notional portfolio with the lowest realized volatility.

As a result of applying a cap and floor and in the case of selecting the notional portfolio with the lowest realized volatility, the resulting notional portfolio may be greater than or less than 5.0% for the relevant volatility measure. If the annualized realized volatility of the notional portfolio selected for a volatility measure on any day is greater than 5.0%, that notional portfolio will be adjusted so that the weight of each Portfolio Constituent in that notional portfolio will be reduced proportionately to achieve a notional portfolio that has an annualized realized volatility for the relevant volatility measure of 5.0%. Under these circumstances, the aggregate weight of the Portfolio Constituents in that notional portfolio will be less than 100%.

If the Index tracks a notional portfolio with an aggregate weight that is less than 100%, the Index will not be fully invested, and any uninvested portion will earn no return. The Index may be significantly uninvested on any given day, and will realize only a portion of any gains due to appreciation of the Portfolio Constituents on any such day. The Index Deduction is deducted daily at a rate of 0.50% per annum, even when the Index is not fully invested.



**The Index may be more heavily influenced by the performance of the Equity Constituent than the performance of the Bond Constituent in general over time.**

In any initial selection between two eligible notional portfolios, the Index will select the portfolio that has the higher allocation to the Portfolio Constituent with a higher realized volatility, as described under “The J.P. Morgan Tech+ Dynamic Blend<sup>SM</sup> 5 Index” below, which generally will cause the Equity Constituent to receive a higher allocation than if the portfolio that has the higher allocation to the Portfolio Constituent with a lower realized volatility were selected.

Furthermore, under normal market conditions, the Equity Constituent’s realized volatility tends to be significantly higher than the Bond Constituent’s realized volatility. Under such circumstances and because the Target Volatility is 5.0%, the Index is generally expected to be more heavily weighted towards the Bond Constituent. However, under circumstances where the Equity Constituent’s realized volatility is significantly higher than that of the Bond Constituent, the performance of the Index is expected to be influenced to a greater extent by the performance of the Equity Constituent than by the performance of the Bond Constituent, unless the weight of the Bond Constituent is significantly greater than the weight of the Equity Constituent.

Consequently, even in cases where the allocation to the Bond Constituent is greater than the allocation to the Equity Constituent, the Index may be influenced to a greater extent by the performance of the Equity Constituent than by the performance of the Bond Constituent because, under some conditions, the greater allocation to the Bond Constituent will not be sufficiently large to offset the greater realized volatility of the Equity Constituent.

Accordingly, the level of the Index may decline if the value of the Equity Constituent declines, even if the value of the Bond Constituent increases at the same time. See also “— Changes in the values of the Portfolio Constituents may offset each other” below.

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

Under normal market conditions, the Equity Constituent has tended to exhibit a realized volatility that is higher than the Target Volatility and that is higher than the realized volatility of the Bond Constituent in general over time. As a result, the Index will generally need to reduce its exposure to the Equity Constituent in order to approximate the Target Volatility. Therefore, the Index may have significant exposure for an extended period of time to the Bond Constituent, and that exposure may be greater, perhaps significantly greater, than its exposure to the Equity Constituent. Moreover, under certain circumstances, the Index may have no exposure to the Equity Constituent. However, the returns of the Bond Constituent may be significantly lower than the returns of the Equity Constituent, and possibly even negative while the returns of the Equity Constituent are positive, which will adversely affect the level of the Index and any payment on, and the value of, the notes.

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

Performances of the Portfolio 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 and bond exposures represented by the Portfolio Constituents. High correlation during periods of negative returns between Portfolio Constituents could have an adverse effect on any payment on, and the value of, your notes.

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

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

**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 modelling 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 value of a Portfolio Constituent changes, 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 any Portfolio Constituent. Accordingly, changes in the value of any Portfolio Constituent may not result in a comparable change in the level of the Index or the market value of your notes.

**The Index comprises notional assets and liabilities.**

The exposure of the Index to its Portfolio Constituents and of its Portfolio Constituents to their respective Underlying Futures Contracts 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 or financial instruments 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 March 2, 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 total return performance of its Portfolio Constituents. As a consequence, your investment in the notes is exposed to the total return performance of the Portfolio Constituents.

**The investment strategy used to construct the Index involves daily adjustments to its notional exposure to its Portfolio Constituents.**

The Index is subject to daily adjustments to its notional exposure to its Portfolio Constituents. By contrast, a notional portfolio that is not subject to daily exposure adjustments in this manner could see greater compounded gains over time through exposure to a consistently and rapidly appreciating portfolio consisting of the relevant Portfolio Constituents. Therefore, your return on the notes may be less than the return you could realize on an alternative investment in the relevant Portfolio Constituents that is not subject to daily exposure adjustments. No assurance can be given that the investment strategy used to construct the Index will outperform any alternative investment in the Portfolio Constituents of the Index.

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

As described under “The J.P. Morgan Tech+ Dynamic Blend<sup>SM</sup> 5 Index — Succession and Extraordinary Events” below, following the occurrence of certain extraordinary events with respect to a Portfolio Constituent, the affected Portfolio Constituent may be replaced by a substitute index or ETF 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 Portfolio Constituent or any



reference index or Underlying Futures Contract, where that material interference or change is not acceptable to the Index Calculation Agent. See “The J.P. Morgan Tech+ Dynamic Blend<sup>SM</sup> 5 Index — Extraordinary Events” below for a summary of events that could trigger an extraordinary event.

You should realize that the changing of a Portfolio Constituent may affect the performance of the Index, and therefore, the return on the notes, as the replacement Portfolio Constituent may perform significantly better or worse than the original Portfolio Constituent. For example, the substitute or successor Portfolio Constituent may have higher fees or worse performance than the original Portfolio Constituent. Moreover, the policies of the sponsor of the substitute index or ETF concerning the methodology and calculation of the substitute index or ETF, including decisions regarding additions, deletions or substitutions of the assets underlying the substitute index or ETF, could affect the level or price of the substitute index or ETF 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 of a substitute ETF 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 or ETF will have no obligation to consider your interests in calculating or revising such substitute index or ETF.

### **Risks Relating to the Portfolio Constituents Generally**

**JPMS, the sponsor and calculation agent of each Portfolio Constituent, may adjust each Portfolio 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 Portfolio Constituents and is responsible for calculating and maintaining the Portfolio 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 Portfolio Constituents, is entitled to exercise discretion. The rules governing the Portfolio Constituents may be amended at any time by the calculation agent of the Portfolio Constituents, in its sole discretion. The rules also permit the use of discretion by the sponsor and the determination of whether to replace an Underlying Futures Contract with a substitute or successor upon the occurrence of certain events affecting that Underlying 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 Portfolio Constituents and the interpretation of the rules governing the Portfolio Constituents. Although JPMS, acting as the sponsor and calculation agent of the Portfolio Constituents, will make all determinations and take all action in relation to the Portfolio 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 Portfolio Constituents and the value of your notes.

Although judgments, policies and determinations concerning the Portfolio 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 Underlying Futures Contract in a Portfolio Constituent is not an investment recommendation by us or JPMS of that Underlying Futures Contract. See “The J.P. Morgan Futures Indices.”

**Each Portfolio Constituent is subject to significant risks associated with the Underlying Futures Contracts.**

The Portfolio Constituents each track the returns of the Underlying Futures Contracts. The price of an Underlying Futures Contract depends not only on the price of the underlying asset referenced by the Underlying 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 Underlying 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 the Underlying Futures Contracts to be volatile and could adversely affect the level of each Portfolio Constituent and the Index and any payments on, and the value of, your notes.

**Suspension or disruptions of market trading in the Underlying 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 the Underlying 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 level of each Portfolio Constituent and could adversely affect the level of each Portfolio Constituent and the Index and any payments on, and the value of, your notes.

**An increase in the margin requirements for the Underlying Futures Contracts included in the Portfolio Constituents may adversely affect the level of that Portfolio Constituent.**

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

**The Index may in the future include Underlying Futures Contracts that are not traded on regulated futures exchanges.**

The Index, through its exposure to the Portfolio Constituents, is 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 Portfolio Constituents substitutes an Underlying Futures Contract in certain circumstances, the Index may in the future include futures contract 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 Portfolio Constituents, may be subject to certain risks not presented by the Underlying Futures Contracts, including risks related to the liquidity and price histories of the relevant contracts.

**Negative roll returns associated with the Underlying Futures Contracts constituting the Portfolio Constituents may adversely affect the performance of the Portfolio Constituents and the value of the notes.**

The Portfolio Constituents each reference Underlying Futures Contracts. Unlike common equity securities, Underlying Futures Contracts, by their terms, have stated expirations. As the exchange-traded Underlying Futures Contracts that compose the Portfolio Constituents approach expiration, they are replaced by similar contracts that have a later expiration. For example, an Underlying Futures Contract

notionally purchased and held in June may specify a September expiration date. As time passes, the contract expiring in September is replaced by a contract for delivery in December. This is accomplished by notionally selling the September contract and notionally purchasing the December contract. This process is referred to as “rolling.” Excluding other considerations, if prices are higher in the distant delivery months than in the nearer delivery months, the notional purchase of the December contract would take place at a price that is higher than the price of the September contract, thereby creating a *negative* “roll return.” Negative roll returns adversely affect the returns of the Portfolio Constituents and, therefore, the level of the Index and any payments on, and the value of, the notes. Because of the potential effects of negative roll returns, it is possible for the value of a Portfolio Constituent to decrease significantly over time, even when the near-term or spot prices of the underlying assets or instruments are stable or increasing. In addition, interest rates have been historically low for an extended period and, if interest rates revert to their historical means, the likelihood that a roll return related to any Portfolio Constituent will be negative, as well as the adverse effect of negative roll returns on any Portfolio Constituent, will increase.

**The Portfolio Constituents comprise notional assets and liabilities.**

The exposures to the Portfolio 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 Portfolio 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 Portfolio Constituents.

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

The Portfolio Constituents were established on December 22, 2020 and therefore have a limited operating history. Past performance should not be considered indicative of future performance.

**The Underlying Futures Contracts composing the Portfolio 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 an Underlying Futures Contract, the affected Underlying Futures Contract may be replaced by a substitute futures contract or the calculation agent of a Portfolio Constituent may cease calculation and publication of that Portfolio Constituent on a date determined by the calculation agent of that Portfolio 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 Portfolio Constituent, any Underlying Futures Contract or any reference index, where that material interference or change is not acceptable to the calculation agent of the Portfolio 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 an Underlying Futures Contract may affect the performance of a Portfolio Constituent, and therefore, the return on the notes, as the replacement Underlying Futures Contract may perform significantly better or worse than the original Underlying Futures Contract.

**Risks Relating to the Equity Constituent**

**An investment in the notes is subject to risks associated with non-U.S. securities markets with respect to the Nasdaq-100 Index®, the reference index underlying the Underlying Futures Contracts of the Equity Constituent.**

Some of the equity securities included in the reference index underlying the Underlying Futures Contracts of the Equity Constituent have been issued by non-U.S. companies. An investment in the notes, therefore, involves risks associated with the home countries of the issuers of those non-U.S. equity securities. The prices of non-U.S. equity securities may be adversely affected by political, economic,

financial and social factors in the home countries of the issuers of the non-U.S. companies, including changes in those countries' government, economic and fiscal policies, currency exchange laws or other laws or restrictions.

Some or all of these factors may influence the value of the Equity Constituent, 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 the Equity Constituent based on its historical performance. The value of the Equity Constituent may decrease, which may adversely affect any payments on, and the value of, the notes.

### **Risks Relating to the Bond Constituent**

**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 level of the Bond Constituent.**

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 level of the Bond Constituent and the level of the Bond Constituent. 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.**

Investing in the notes, which provide exposure in part to the Bond Constituent, differs significantly from investing directly in bonds to be held to maturity, as the values of the Bond Constituent change, at times significantly, during each trading day based upon the current market prices of the government bonds referenced by the Underlying Futures Contracts of the Bond Constituent (such government bonds, the “**underlying bonds**”). The market prices of the underlying bonds are volatile and significantly influenced by a number of factors, particularly the duration of the underlying bonds, the yields on the underlying bonds as compared to current market interest rates and the actual or perceived credit quality of the governmental issuers of the underlying bonds.

In general, fixed-income securities are significantly affected by changes in current market interest rates. As interest rates rise, the prices of fixed-income securities, such as the underlying bonds, are likely to decrease. As a result, rising interest rates may cause the value of the bonds underlying the Bond Constituent 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 economies of the United States and global economies;
- expectations regarding the level of price inflation;
- sentiment regarding credit quality of the United States and global credit markets;
- central bank policies regarding interest rates; and
- the performance of global 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 Bond Constituent may be affected by changes in the perceived creditworthiness of the U.S. government.**

The prices of each underlying bond and the related Underlying Futures Contracts are significantly influenced by the creditworthiness of the U.S. government. U.S. rating agencies have downgraded the credit ratings and/or assigned negative outlooks to many governments worldwide, including the United States, and may continue to do so in the future. Any perceived decline in the creditworthiness of the U.S. government, 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 U.S. government 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 Underlying Futures Contracts and could have a negative impact on the level of the Bond Constituent and the value of the notes.

**The value of the notes may be influenced by unpredictable changes in the markets and the U.S. economy is subject to unpredictable changes.**

The market prices of the Underlying Futures Contracts of the Bond Constituent generally increase or decrease in connection with, among other factors, the market's expectations about increases or decreases in the market price of the underlying bonds. Accordingly, the value of the notes may be affected by unpredictable changes, or expectations of changes, in the markets for the underlying bonds. Changes in the U.S. government that may influence the value of the notes include changes in:

- 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 underlying bonds, and therefore on the Underlying Futures Contracts that reference the underlying bonds, may offset or enhance the effect of another factor, which could have a negative impact on the performance of the notes.

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



## THE J.P. MORGAN TECH+ DYNAMIC BLEND<sup>SM</sup> 5 INDEX

*Terms defined within this “The J.P. Morgan Tech+ Dynamic Blend<sup>SM</sup> 5 Index” section are defined only with respect to this “The J.P. Morgan Tech+ Dynamic Blend<sup>SM</sup> 5 Index” section.*

The J.P. Morgan Tech+ Dynamic Blend<sup>SM</sup> 5 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 its affiliates, and JPMS and its affiliates reserve all rights with respect to their ownership of the Index. The Index is reported by Bloomberg L.P. under the ticker symbol “JPUSNDB5 Index.”

The Index attempts to provide a dynamic rules-based allocation to the J.P. Morgan US Q Equities Futures Index (the “**Equity Constituent**”) and the J.P. Morgan 2Y US Treasury Futures Index (the “**Bond Constituent**”) and, together with the Equity Constituent, the “**Portfolio Constituents**”) while targeting a level volatility of 5.0% (the “**Target Volatility**”). The Index tracks the return of (a) a notional dynamic portfolio consisting of the Equity Constituent and the Bond Constituent, less (b) the daily deduction of 0.50% per annum (the “**Index Deduction**”).

- The Equity Constituent is an excess return index that tracks the return of a notional rolling futures position in futures contracts on the Nasdaq-100 Index<sup>®</sup>. For additional information about the Equity Constituent, see “Background on the J.P. Morgan Futures Indices” below.
- The Bond Constituent is an excess return index that tracks the return of a notional rolling futures position in futures contracts on 2-Year U.S. treasury notes. For additional information about the Bond Constituent, see “Background on the J.P. Morgan Futures Indices” below.

The Index provides a diversified exposure that rebalances daily based on measures of market risk and diversification to attempt to deliver stable volatility over time.

*Considerations Relating to the Volatility of the Portfolio Constituents.* Under normal market conditions, the Equity Constituent’s realized volatility has tended to be relatively more variable than the Bond Constituent’s realized volatility. Consequently, and because the Index seeks to maintain an annualized realized volatility approximately equal to the Target Volatility, the Index methodology may be more likely to shift exposure from the Equity Constituent to the Bond Constituent during periods of relatively higher market volatility and to shift exposure from the Bond Constituent to the Equity Constituent under normal market conditions exhibiting relatively lower market volatility.

In general, equity markets have historically been more likely to outperform fixed-income markets during periods of relatively lower market volatility and to underperform fixed-income markets during periods of relatively higher market volatility. However, there can be no assurance that the Index allocation strategy will achieve its intended results or that the Index will outperform any alternative index or strategy that might reference the Portfolio Constituents. Past performance should not be considered indicative of future performance.

In any initial selection between two eligible notional portfolios, the Index will select the portfolio that has the higher allocation to the Portfolio Constituent with a higher realized volatility, as described below, which generally will cause the Equity Constituent to receive a higher allocation than if the portfolio that has the higher allocation to the Portfolio Constituent with a lower realized volatility were selected.

Furthermore, under normal market conditions, the Equity Constituent’s realized volatility tends to be significantly higher than the Bond Constituent’s realized volatility. Under such circumstances and because the Target Volatility is 5.0%, the Index is generally expected to be more heavily weighted towards the Bond Constituent. Past performance should not be considered indicative of future performance. Under circumstances where the Equity Constituent’s realized volatility is significantly higher than that of the Bond Constituent, the performance of the Index is expected to be influenced to a greater



extent by the performance of the Equity Constituent than by the performance of the Bond Constituent, unless the weight of the Bond Constituent is significantly greater than the weight of the Equity Constituent.

Consequently, even in cases where the allocation to the Bond Constituent is greater than the allocation to the Equity Constituent, the Index may be influenced to a greater extent by the performance of the Equity Constituent than by the performance of the Bond Constituent because, under some conditions, the greater allocation to the Bond Constituent will not be sufficiently large to offset the greater realized volatility of the Equity Constituent.

*Calculating the level of the Index.* On any given day, the closing level of the Index (the “**Index Level**”) reflects (a) the weighted return performance of the Portfolio Constituents less (b) the 0.50% per annum daily Index Deduction. The Index Level was set equal to 100.00 on May 9, 1996, the base date of the Index. The Index Calculation Agent (as defined below) began calculating the Index on a live basis on March 2, 2022. The Index is an “excess return” index because, through the Portfolio Constituents, it provides notional exposure to futures contract returns that reflect changes in the price of those futures contracts, as well as their “roll” returns described below. The 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.

**No assurance can be given that the investment strategy used to construct the Index will achieve its intended results or that the Index will be successful or will outperform any alternative index or strategy that might reference the Portfolio Constituents. Furthermore, no assurance can be given that the realized volatility of the Index will approximate the Target Volatility. The actual realized volatility of the Index may be greater or less than the Target Volatility.**

**If the aggregate weight of the Portfolio Constituents in the Index is less than 100%, the Index will not be fully invested, and any uninvested portion will earn no return. The Index Deduction is deducted daily at a rate of 0.50% per annum, even when the Index is not fully invested.**

**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.**

### **Determination of the Daily Portfolio**

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. The Index seeks to maintain an annualized realized volatility approximately equal to the Target Volatility of 5.0% by rebalancing its exposures to the Portfolio Constituents on each Index Calculation Day (as defined below) based on two measures of realized portfolio volatility: a shorter-term volatility measure and a longer-term volatility measure. For additional information about how the Index determines the volatility of a notional portfolio, see “Determining the Volatility of a Notional Portfolio” below.

For each volatility measure on each Index Calculation Day, the Index identifies, if possible, a notional portfolio composed of the Portfolio Constituents that has an annualized realized volatility of 5.0%, an aggregate weight of 100% and the highest possible allocation to the Portfolio Constituent with a higher realized volatility.<sup>1</sup> If the weight of either Portfolio Constituent is greater than 100%, that weight will be deemed to be 100% and, if the weight of either Portfolio Constituent is less than 0%, that weight will be deemed to be 0%. Applying this cap and floor may cause the annualized realized volatility of the resulting notional portfolio to be greater than or less than 5.0% for that volatility measure. In any circumstance where the annualized realized volatility of the notional portfolio selected above is greater than 5.0%, the

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<sup>1</sup> If there is no such notional portfolio for a volatility measure, subject to adjustment as described below, the Index selects for that volatility measure on that Index Calculation Day the notional portfolio with the lowest realized volatility.

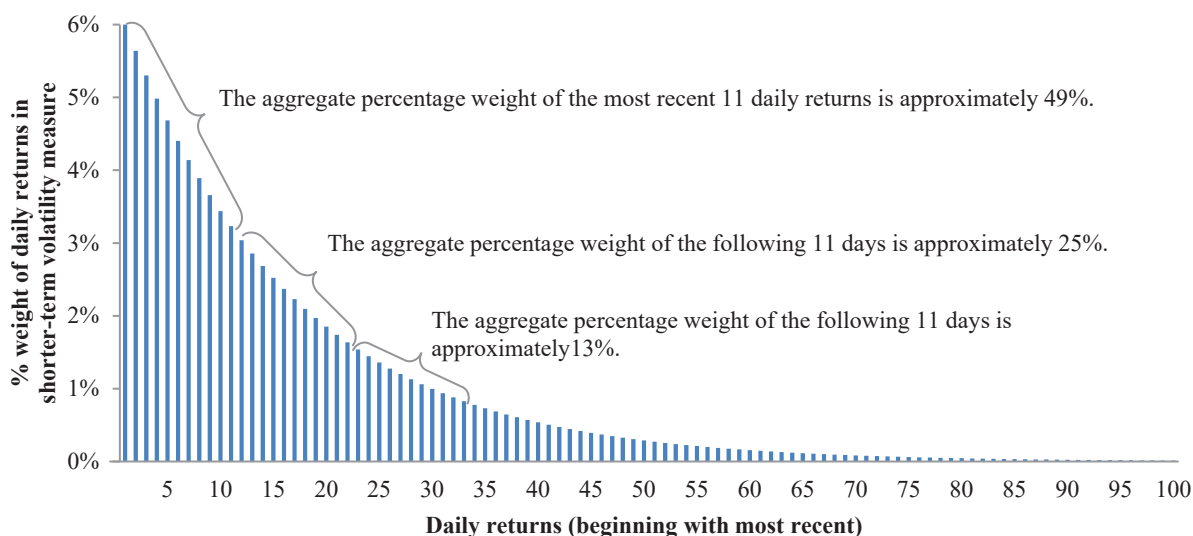
weights of the Portfolio Constituents in that notional portfolio will be reduced proportionately so that the annualized realized volatility of that notional portfolio is 5.0%. Under these circumstances, the aggregate weight of the Portfolio Constituents in that notional portfolio will be less than 100%.

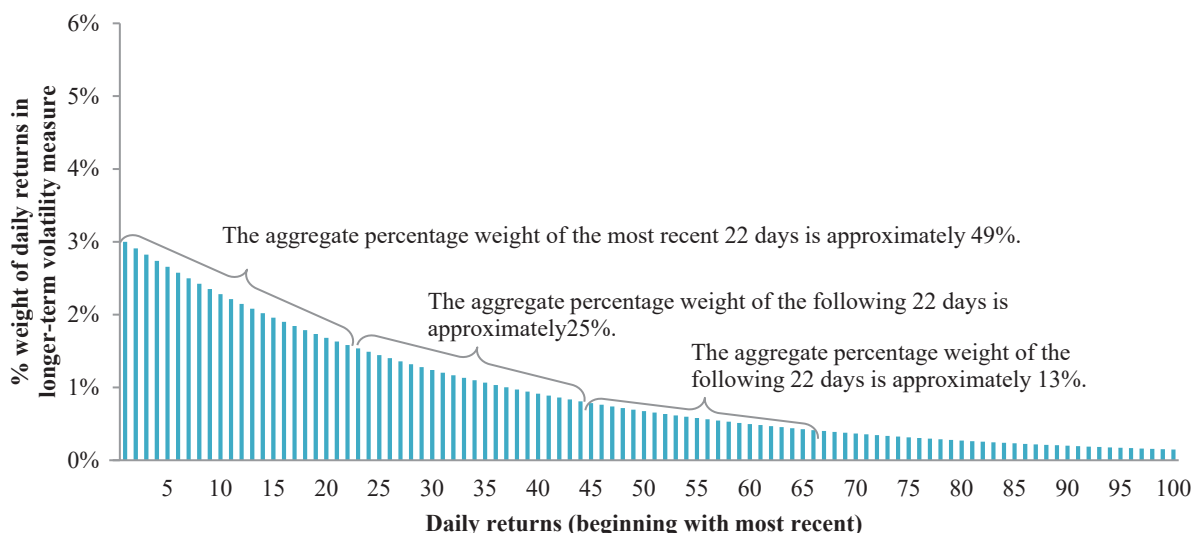
Once a notional portfolio has been identified for each of the shorter-term and the longer-term volatility measure, the Index will then select the notional portfolio that has the lower allocation to the Equity Constituent as the “**Daily Portfolio**” as of that Index Calculation Day. See the Rules for additional information about the mathematical methods used to calculate the realized volatility of the notional portfolios and to identify the notional portfolio for each volatility measure and for tiebreaker procedures.

### Determining the Volatility of a Notional Portfolio

The realized volatility of the notional portfolios composed of the Portfolio Constituents are calculated using two volatility measures: a shorter-term volatility measure and a longer-term volatility measure. Each volatility measure reflects an exponentially weighted moving average, meaning that greater weight is assigned to more recent performance and less weight is assigned to less recent performance; however, the shorter-term volatility measure assigns greater weight to more recent performance than does the longer-term volatility measure. For example, approximately 50% of the realized value for the shorter-term volatility measure is determined based on the most recent 11 daily returns, and approximately 75% of the realized value for the shorter-term volatility measure is determined based on the most recent 22 daily returns. In contrast, approximately 50% of the realized value for the longer-term volatility measure is determined based on the most recent 22 daily returns, and approximately 75% of the realized value for the shorter-term volatility measure is determined based on the most recent 44 daily returns.

The charts below further illustrate the effect of the exponential weighting described above for the shorter-term volatility measure and longer-term volatility measure for the most recent 100 daily returns. For each daily return shown, the charts indicate the percentage weight that will be given to that daily return in calculating the relevant exponentially weighted average. As the charts illustrate, the most recent daily returns have a significantly greater weight than less recent daily returns in determining the relevant exponentially weighted average.





See the Rules for additional information about how the realized volatility of the notional portfolios composed of the Portfolio Constituents is calculated. For mathematical convenience, the Rules calculate the realized volatility of the notional portfolios composed of the Portfolio Constituents using the variance of each Portfolio Constituent and their covariance, rather than the volatility of each Portfolio Constituent and their correlation. The variance of an asset is the square of its volatility, and the covariance of two assets is the product of the correlation of the assets and their respective volatilities.

### Calculation of the Index Level

The Index Calculation Agent will calculate the Index Level with respect to each Index Calculation Day and will publish the Index Level to an accuracy of two decimal places.

The Index Level on each Index Calculation Day is calculated by adjusting the Index Level as of the immediately preceding Index Calculation Day to reflect (a) the weighted performance of the closing level of each Portfolio Constituent since the immediately preceding Index Calculation Day, using the weight for each Portfolio Constituent in the Daily Portfolio as of the second immediately preceding Index Calculation Day, and (b) the deduction of the Index Deduction that has accrued since the immediately preceding Index Calculation Day.

The Index is an “excess return” index because, through the Portfolio Constituents, 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. The 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.

While the Index Calculation Agent will publish the Index Level with respect each Index Calculation Day 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 Calculation Day**” is defined in the Rules and means generally a Dealing Day for both of the Portfolio Constituents that is not subject to any market disruption or on which the Index Calculation Agent calculates the Index Level notwithstanding a market disruption as described under “Index Market Disruption Events” below.

**“Dealing Day”** is defined in the Rules and means generally a weekday on which the closing level of that Portfolio Constituent is scheduled to be calculated and published.

### **Index Market Disruption Events**

The calculation and publication of the Index Level will be affected by the occurrence of certain market disruptions relating to the Portfolio Constituents. 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 Portfolio Constituents, their reference indices (if applicable) or components 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 Index, the Portfolio Constituents, their reference indices (if applicable) or components or related futures or option contracts.

The Index Level will generally not be calculated or published if a market disruption affecting a Portfolio Constituent has occurred or is continuing. However, if that market disruption continues for a sustained period, the Index Calculation Agent may nevertheless rebalance the Index using good faith estimates, and those estimates may be subject to later correction. 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 Portfolio Constituent, the Index Calculation Agent will replace the affected Portfolio Constituent with a successor to that Portfolio 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 Portfolio Constituent with a successor to that Portfolio 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 Portfolio Constituent. If no such substitute is available, the Index Calculation Agent will replace the affected Portfolio Constituent with a substitute that the Index Calculation Agent determines to be an appropriate substitute, considering the context of 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) a material change to the calculation of, or a material modification to, a Portfolio Constituent, (b) the occurrence of a market disruption affecting a Portfolio Constituent that continues for a sustained period, (c) the termination or impairment of any relevant license or other right relied upon by the Index Calculation Agent in administering the Index, (d) the occurrence of certain changes in law and (e) certain other events affecting data relating to a Portfolio Constituent.

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 Sponsor is under no obligation to continue the calculation and publication of the Index.

### **Corrections**

If the closing level of any Portfolio 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 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.

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).

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



## 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”**) 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	Base Date
J.P. Morgan US Q Equities Futures Index	JPUSNQE	E-mini® Nasdaq-100® Futures	Nasdaq-100 Index®	April 10, 1996
J.P. Morgan 2Y US Treasury Futures Index	JPUS2YT	Short-Term U.S. Treasury Note Futures (2-Year)	N/A	June 25, 1990

The closing level of each Futures Index (the **“Futures Index Level”**) was set equal to 100 on the base date of that Futures Index. The Index Calculation Agent (as defined below) began calculating each Futures Index on a live basis on December 22, 2020. 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 Futures 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 beginning five (in the case of the J.P. Morgan 2Y US Treasury Futures Index) or six (in the case of the J.P. Morgan US Q Equities Futures Index) Index Business Days before the Cut-off Day for the front expiry futures contract in the relevant Series. 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**” 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 Futures Index Level**

The Index Calculation Agent will calculate the Futures Index Level with respect to each Index Trading Day and will publish the Futures 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 Futures 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 Futures Index Level.

While the Index Calculation Agent will publish the Futures Index Level of each Futures Index with respect 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 Futures Index Level.

### **Index Market Disruption Events**

The calculation and publication of each Futures 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 Futures 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 Futures 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 Futures 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 Futures 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 Portfolio 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 Portfolio 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 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.



## BACKGROUND ON THE NASDAQ-100 INDEX®

All information contained in this underlying supplement regarding the Nasdaq-100 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, Nasdaq, Inc. (“**Nasdaq**”). The Nasdaq-100 Index® is calculated, maintained and published by Nasdaq. Nasdaq has no obligation to continue to publish, and may discontinue publication of, the Nasdaq-100 Index®. The Nasdaq-100 Index® is reported by Bloomberg L.P. under the ticker symbol “NDX.”

The Nasdaq-100 Index® is a modified market capitalization-weighted index that is designed to measure the performance of 100 of the largest non-financial companies listed on The Nasdaq Stock Market. The Nasdaq-100 Index®, which includes companies across a variety of major industry groups, was launched on January 31, 1985, with a base index value of 125.00, as adjusted.

The index share weights of the component securities of the Nasdaq-100 Index® at any time are based upon the total shares outstanding (“**TSO**”) in each of those securities and are additionally subject, in certain cases, to rebalancing. Accordingly, each security’s influence on the level of the Nasdaq-100 Index® is directly proportional to the value of its index share weight.

### Calculation of the Nasdaq-100 Index®

At any moment in time, the value of the Nasdaq-100 Index® equals the aggregate value of the then-current index share weights of each of the Nasdaq-100 Index® component securities, which are based on the TSO of each Nasdaq-100 Index® component security, multiplied by each security’s respective last sale price on The Nasdaq Stock Market (which may be the official closing price published by The Nasdaq Stock Market) and divided by a scaling factor (the “**Divisor**”), which becomes the basis for the reported Nasdaq-100 Index® value. The Divisor serves the purpose of scaling the aggregate value to a lower order of magnitude which is more desirable for index reporting purposes.

### Security Eligibility Criteria

Eligible security types generally include American depositary receipts, common stocks, ordinary shares and tracking stocks. Companies organized as real estate investment trusts (“**REITs**”) are not eligible for index inclusion. If the security is a depositary receipt representing a security of a non-U.S. issuer, then references to the “**issuer**” are references to the underlying security and the TSO is the actual depositary shares outstanding as reported by the depositary banks.

If an issuer has listed multiple security classes, all security classes are eligible, subject to meeting all other security eligibility criteria.

The issuer of the security’s primary U.S. listing must exclusively be listed on the Nasdaq Global Select Market or the Nasdaq Global Market. If the issuer of the security is organized under the laws of a jurisdiction outside the United States, then that security must have listed options on a registered options market in the United States or be eligible for listed options trading on a registered options market in the United States.

The security must be classified as a non-financial company (any industry other than financials) according to the Industry Classification Benchmark.

There is no market capitalization eligibility criterion. Each security must have a minimum average daily trading volume of 200,000 shares (measured over the three calendar months ending with the month that includes the reconstitution reference date).

The security must have traded for at least three full calendar months, not including the month of initial listing, on an eligible exchange, which includes Nasdaq (Nasdaq Global Select Market, Nasdaq Global Market or Nasdaq Capital Market), NYSE, NYSE American or CBOE BZX. Eligibility is determined as of the constituent selection reference date and includes that month. A security that was added to the

Nasdaq-100 Index® as the result of a spin-off event will be exempt from the seasoning requirement. There is no float eligibility criterion.

The issuer of the security generally may not currently be in bankruptcy proceedings.

The issuer of the security generally may not have entered into a definitive agreement or other arrangement that would make it ineligible for index inclusion and where the transaction is imminent as determined by the Nasdaq Index Management Committee.

### **Reconstitution and Rebalancing of the Nasdaq-100 Index®**

Nasdaq selects constituents once annually in December. The security eligibility criteria are applied using market data as of the end of October and TSO as of the end of November. Index reconstitutions are announced in early December and become effective after the close of trading on the third Friday in December.

The Nasdaq-100 Index® is rebalanced on a quarterly basis in March, June, September and December. The Nasdaq-100 Index® rebalance uses the TSO and last sale price of all Nasdaq-100 Index® securities as of the prior month-end (February, May, August and November respectively). Index rebalance changes are announced in early March, June, September and December and become effective after the close of trading on the third Friday in March, June, September and December. A special rebalance may be conducted at any time based on the weighting restrictions described in the index rebalance procedure if it is determined to be necessary to maintain the integrity of the Nasdaq-100 Index®.

### **Constituent Selection**

A reconstitution is conducted on an annual basis, at which time all eligible issuers, ranked by market capitalization, are considered for index inclusion based on the following order of criteria:

1. The top 75 ranked issuers will be selected for inclusion in the Nasdaq-100 Index®.
2. Any other issuers that were already members of the Nasdaq-100 Index® as of the reconstitution reference date and are ranked within the top 100 are also selected for inclusion in the Nasdaq-100 Index®.
3. In the event that fewer than 100 issuers pass the first two criteria, the remaining positions will first be filled, in rank order, by issuers currently in the Nasdaq-100 Index® ranked in positions 101-125 that were ranked in the top 100 at the previous reconstitution or replacement- or spin-off-issuers added since the previous reconstitution.
4. In the event that fewer than 100 issuers pass the first three criteria, the remaining positions will be filled, in rank order, by any issuers ranked in the top 100 that were not already members of the Nasdaq-100 Index® as of the reference date.

### **Constituent Weighting**

The Nasdaq-100 Index® is a modified market capitalization-weighted index.

#### *Quarterly Weight Adjustment*

The Nasdaq-100 Index® quarterly weight adjustment employs a two-stage weight adjustment scheme according to issuer- level constraints.

Nasdaq-100 Index® securities' initial weights are determined using up to two calculations of market capitalization: TSO-derived market capitalization and index share-derived market capitalization. TSO-derived market capitalization is defined as a security's last sale price times its TSO. Nasdaq-100 Index® share-derived market capitalization is defined as a security's last sale price times its updated index shares as of the prior month end. Both TSO-derived and index share-derived market capitalizations can

be used to calculate TSO-derived and index share-derived initial index weights by dividing each index security's (TSO- or index share-derived) market capitalization by the aggregate (TSO- or index share-derived) market capitalization of all index securities.

When the rebalance coincides with the reconstitution, only TSO-derived initial weights are used. When the rebalance does not coincide with the reconstitution, index share-derived initial weights are used when doing so results in no weight adjustment; otherwise, TSO-derived weights are used in both stages of the weight adjustment procedure. Issuer weights are the aggregated weights of the issuers' respective index securities.

*Stage 1.* If no initial issuer weight exceeds 24%, initial weights are used as Stage 1 weights; otherwise, initial weights are adjusted so that no issuer weight may exceed 20% of the Nasdaq-100 Index®.

*Stage 2.* If the aggregate weight of the subset of issuers whose Stage 1 weights exceed 4.5% does not exceed 48%, Stage 1 weights are used as final weights; otherwise, Stage 1 weights are adjusted so that the aggregate weight of the subset of issuers whose Stage 1 weights exceed 4.5% is set to 40%.

#### *Annual Weight Adjustment*

The Nasdaq-100 Index® annual weight adjustment employs a two-stage weight adjustment scheme according to security-level constraints. Nasdaq-100 Index® securities' initial weights are determined via the quarterly weight adjustment procedure.

*Stage 1.* If no initial security weight exceeds 15%, initial weights are used as Stage 1 weights; otherwise, initial weights are adjusted so that no security weight may exceed 14% of the Nasdaq-100 Index®.

*Stage 2.* If the aggregate weight of the subset of index securities with the five largest market capitalizations is less than 40%, Stage 1 weights are used as final weights; otherwise, Stage 1 weights are adjusted so that (i) the aggregate weight of the subset of index securities with the five largest market capitalizations is set to 38.5% and (ii) no security with a market capitalization outside the largest five may have a final index weight exceeding the lesser of 4.4% or the final index weight of the index security ranked fifth by market capitalization.

### **Maintenance of the Nasdaq-100 Index®**

#### *Deletion Policy*

If, at any time other than an index reconstitution, Nasdaq determines that an index security is ineligible for index inclusion, the index security is removed as soon as practicable.

This may include:

- Listing on an ineligible index exchange.
- Merger, acquisition or other major corporate event that would adversely impact the integrity of the Nasdaq-100 Index®.
- If a company is organized as a REIT.
- If an index security is classified as a financial company (financials industry) according to the ICB.
- If the issuer has an adjusted market capitalization below 0.10% of the aggregate adjusted market capitalization of the Nasdaq-100 Index® for two consecutive month ends.
- If a security that was added to the Nasdaq-100 Index® as the result of a spin-off event has an adjusted market capitalization below 0.10% of the aggregate adjusted market capitalization of

the Nasdaq-100 Index® at the end of its second day of regular way trading as a Nasdaq-100 Index® member.

In the case of mergers and acquisitions, the effective date for the removal of an index issuer or security will be largely event-based, with the goal to remove the issuer or security as soon as completion of the acquisition or merger has been deemed highly probable. Notable events include, but are not limited to, completion of various regulatory reviews, the conclusion of material lawsuits and/or shareholder and board approvals.

If at the time of the removal of the index issuer or security there is not sufficient time to provide advance notification of the replacement issuer or security so that both the removal and replacement can be effective on the same day, the index issuer or security being removed will be retained and persisted in the index calculations at its last sale price until the effective date of the replacement issuer or security's entry to the Nasdaq-100 Index®.

Securities that are added as a result of a spin-off may be deleted as soon as practicable after being added to the Nasdaq-100 Index®. This may occur when Nasdaq determines that a security is ineligible for inclusion because of reasons such as ineligible exchange, security type, industry or adjusted market capitalization. Securities that are added as a result of a spin-off may be maintained in the Nasdaq-100 Index® until a later date and then removed, for example, if a spin-off security has liquidity characteristics that diverge materially from the security eligibility criteria and could affect the integrity of the Nasdaq-100 Index®.

#### *Replacement Policy*

Securities may be added to the Nasdaq-100 Index® outside of the index reconstitution when there is a deletion. The index security (or all index securities under the same issuer, if appropriate) is replaced as soon as practicable if the issuer in its entirety is being deleted from the Nasdaq-100 Index®. The issuer with the largest market capitalization as of the prior month end which is not in the Nasdaq-100 Index® will replace the deleted issuer. Issuers that are added as a result of a spin-off are not replaced until after they have been included in a reconstitution.

For pending deletions set to occur soon after an index reconstitution and/or index rebalance effective date, Nasdaq may decide to remove the index security from the Nasdaq-100 Index® in conjunction with the index reconstitution and/or index rebalance effective date.

#### *Corporate Actions*

In the periods between scheduled index reconstitution and rebalancing events, individual index securities may be subject to a variety of corporate actions and events that require maintenance and adjustments to the Nasdaq-100 Index®.

At the quarterly rebalancing, no changes are made to the Nasdaq-100 Index® from the previous month end until the quarterly share change effective date, with the exception of corporate actions with an ex-date.

#### **Governance of the Nasdaq-100 Index®**

The Nasdaq Index Management Committee approves all new index methodologies. This committee is comprised of full-time professional members of Nasdaq. The committee meets regularly and reviews items including, but not limited to, pending corporate actions that may affect Nasdaq-100 Index® constituents, statistics comparing the composition of the Nasdaq-100 Index® to the market, companies that are being considered as candidates for addition to the Nasdaq-100 Index® and any significant market events.

## 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 Tech+ Dynamic Blend<sup>SM</sup> 5 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 Portfolio Constituent (including any successor Portfolio Constituent), the official closing level of that Portfolio Constituent (or, if a market disruption event or a non-trading day that affected that Portfolio Constituent has occurred, the closing level of that Portfolio Constituent determined by the calculation agent in accordance with the formula for and method of calculating the closing level of that Portfolio 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 Portfolio 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 Portfolio Constituent (including any successor Portfolio Constituent), the official closing level of that Portfolio Constituent (or, if a market disruption event or a non-trading day that affected that Portfolio Constituent has occurred, the closing level of that Portfolio Constituent determined by the calculation agent in accordance with the formula for and method of calculating the closing level of that Portfolio 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 Portfolio 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 Portfolio 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 Portfolio Constituent is suspended for the entire day;
- (3) all trading in any futures contract referenced by a Portfolio 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 Portfolio 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).

### **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

# **The J.P. Morgan Balanced Index Series (Second Series) Index Rules**

**J.P.Morgan**

June 9, 2016 (as last amended and restated on February 24, 2023)

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## PART A

### THE J.P. MORGAN BALANCED INDEX SERIES (SECOND 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 Balanced Index Series (Second Series), a series of notional rules-based proprietary indices. These Index Rules are divided into Part A (which includes Schedule 1 and applies to every index comprised in the J.P. Morgan Balanced Index Series (Second Series)) and Part B (which contains individualized parameters for each index in the series).

Table A in Schedule 1 sets out each index in the J.P. Morgan Balanced Index Series (Second Series) (each, a “**Balanced Index**” and together the “**Balanced Indices**”). The relevant parameters for each Balanced Index are provided in the Applicable Module (as defined in “*Definitions*”) in Part B for such Balanced Index. The Index Sponsor may, in its discretion, publish or otherwise make available only the Index Rules applicable to one or more of the Balanced Indices by removing the Parts and Modules (each as specified herein) from this document that do not apply to such Balanced Indices and amending Schedule 1 of Part A of the Index Rules as necessary.

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 JPMS’s 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 JPMS, in respect of the Balanced Indices, are available upon request to the Index Sponsor. Copies of the Index Rules may be obtained by holders of investments linked to one or more Balanced Indices free of charge on request from the Index Sponsor.

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

**NOTHING IN THESE RULES CONSTITUTES AN OFFER TO BUY OR SELL ANY SECURITIES, PARTICIPATE IN ANY TRANSACTION OR ADOPT ANY INVESTMENT STRATEGY OR LEGAL, TAX, REGULATORY OR ACCOUNTING ADVICE.**

#### 2. Amendments

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 Index Rules are intended to be comprehensive and accurate, ambiguities may arise and errors or omissions may have been made. Under 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 errors or omissions, the Index Sponsor may amend the Index Rules to address such errors or omissions. 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. The amended version of the Index Rules will include the effective date of such amendment. However, the Index Sponsor is under no obligation to inform any person about any amendments to a Balanced Index (except as required by law or regulation).

#### 3. General Notes on the Balanced Indices

*Modular; Two (2)-Constituent Rebalancing Basket.* The J.P. Morgan Balanced Index Series (Second Series) is a modular rules-based index series. Certain of the parameters unique to each particular Balanced Index are set forth in the Applicable Module in Part B to the Index Rules. Each Balanced Index established under the series tracks the excess return of a notional dynamic basket consisting of varying proportions of its “**Equity Constituent**” and its “**Bond Constituent**”, each as identified in the Applicable Module in Part B for such



Balanced Index, less the daily deduction of the *per annum* Fee (as defined in “Definitions”) specified in the Applicable Module. The Equity Constituent and the Bond Constituent are each referred to as a “**Portfolio Constituent**”.

*Excess Return.* Each Balanced Index is described as an “excess return” index because it is intended to reflect the return on a notional investment in a portfolio consisting of the Portfolio Constituents where the investment is made through the use of borrowed funds. As a result, if either of the Portfolio Constituents within a particular Balanced Index is an exchange-traded fund or a total return index, the excess return performance of such Portfolio Constituent will be calculated by subtracting the performance of an equivalent notional cash position (the “**Cash Position**”), calculated as a cash level pursuant to Section 6.2 (*Calculating the Cash Level of the notional Cash Position*) and subject to the provisions of Section 11 (*Interest Rate Extraordinary Events*), from the total return of such Portfolio Constituent (with distributions notionally reinvested).

*Identifying the Constituent weights.* The weights of the two (2) Portfolio Constituents within each Balanced Index are rebalanced on each Index Calculation Day (as defined in “Definitions”). The Portfolio Constituents’ weights are calculated in seven (7) sequential steps.

- (1) Calculate the Short-Term Variance, Long-Term Variance, Short-Term Covariance and Long-Term Covariance (each as defined in Section 7.3 (*Calculating the Short-Term Variance, Long-Term Variance, Short-Term Covariance and Long-Term Covariance of the Portfolio Constituents*)) of the Portfolio Constituents. The variances and covariances are calculated by reference to an exponentially-weighted moving average of the Portfolio Constituents’ daily returns, meaning that greater weight is assigned to more recent performance and less weight is assigned to less recent performance. The weight of each daily return relative to the following day’s daily return when calculating the variances and covariances is determined by reference to a decay factor: a high decay factor has the effect of assigning greater weight to the past returns and lesser weight to the recent returns of the relevant Portfolio Constituent than a low decay factor. The Short-Term Variance and Short-Term Covariance of the Portfolio Constituents are determined by reference to the Short-Term Decay Factor (as defined in Section 7.2 (*The Short-Term Decay Factor and the Long-Term Decay Factor*)) of 0.94, while the Long-Term Variance and Long-Term Covariance are determined by reference to the Long-Term Decay Factor (as defined in Section 7.2) of 0.97.
- (2) Calculate the Short-Term Discriminant and Long-Term Discriminant (each as defined in Section 7.4 (*Calculating the Short-Term Discriminant and Long-Term Discriminant*)). The discriminants are used to determine whether any notional basket of the Portfolio Constituents has both (i) weights that sum to one hundred percent (100%) and (ii) a realized volatility that is equal to the volatility target specified for the applicable Balanced Index in the Applicable Module in Part B for such Balanced Index (the “**Volatility Target**”).
- (3) Calculate the Short-Term Preliminary Weight and the Long-Term Preliminary Weight of the Equity Constituent (each as defined in Section 7.5 (*Calculating the Short-Term Preliminary Weight and Long-Term Preliminary Weight of the Equity Constituent*)). The preliminary weight of the Equity Constituent is the weight of the Equity Constituent in a notional basket of the Portfolio Constituents (where the sum of such weights is one hundred percent (100%)) whose volatility is equal to the volatility target, capped at one hundred percent (100%) and floored at zero percent (0%); *provided that*, if no such notional basket exists, the preliminary weight of the Equity Constituent is its weight in the lowest-volatility notional basket of the Portfolio Constituents (where the sum of such weights is one hundred percent (100%)).
  - The Equity Constituent’s Short-Term Preliminary Weight is calculated using the Short-Term Variances of the Portfolio Constituents and the Short-Term Covariance between the Portfolio Constituents.
  - The Equity Constituent’s Long-Term Preliminary Weight is calculated using the Long-Term Variances of the Portfolio Constituents and the Long-Term Covariance between the Portfolio Constituents.

- (4) Calculate the Short-Term Portfolio Volatility and the Long-Term Portfolio Volatility (each as defined in Section 7.6 (*Calculating the Short-Term Portfolio Volatility and Long-Term Portfolio Volatility*)). The portfolio volatilities are the annualized historical volatilities of notional baskets for which the Equity Constituent's weights are equal to their respective preliminary weights calculated above, with the balance allocated to the Bond Constituent.
  - (5) Calculate the Short-Term Weight and Long-Term Weight of the Equity Constituent (each as defined in Section 7.7 (*Calculating the Short-Term Weight and Long-Term Weight of the Equity Constituent*)). Each interim weight is equal to the respective preliminary weight (calculated above) if the corresponding portfolio volatility (calculated above) is less than or equal to the Volatility Target. If the corresponding portfolio volatility is greater than the Volatility Target, each interim weight is calculated by proportionately scaling down the respective preliminary weight.
  - (6) Calculate the Short-Term Weight and Long-Term Weight of the Bond Constituent (each as defined in Section 7.8 (*Calculating the Short-Term Weight and Long-Term Weight of the Bond Constituent*)). Each interim weight is equal to one hundred percent (100%) minus the respective preliminary weight of the Equity Constituent (calculated above) if the corresponding portfolio volatility (calculated above) is less than or equal to the Volatility Target. If the corresponding portfolio volatility is greater than the Volatility Target, each interim weight is calculated by proportionately scaling down the respective preliminary weight.
  - (7) Calculate the Final Weight (as defined in Section 7.9 (*Calculating the Final Weights of the Portfolio Constituents*)) of the Portfolio Constituents. The Equity Constituent's Final Weight is the lesser of its Short-Term Weight and Long-Term Weight (calculated above) and the Bond Constituent's Final Weight will be set equal to its corresponding Short-Term Weight or Long Term Weight.
- Notwithstanding the foregoing;
- If both the interim Short-Term Weight and the interim Long-Term Weight of the Equity Constituent established in step (6) above are zero (0), the Final Weight of the Equity Constituent will be zero (0) and the Bond Constituent's Final Weight will be the lesser of its Short-Term Weight and its Long-Term Weight.
  - If the Final Weight of the Equity Constituent is equal to its interim Long-Term Weight (regardless of whether it is also equal to its Short-Term Weight), then the Final Weight of the Bond Constituent will be equal to its Long-Term Weight, established in step (6) above.
  - If the Final Weight of the Equity Constituent is equal to its interim Short-Term Weight (but not equal to its interim Long-Term Weight), the Final Weight of the Bond Constituent will be equal to its interim Short-Term Weight, established in step (6) above.

*Calculation and Publication of the Index Level.* The Index Calculation Agent will calculate and publish or otherwise make available (in a manner determined by the Index Calculation Agent from time to time) the level of each Balanced Index (the "**Index Level**") in respect of each Index Calculation Day in accordance with the methodology set out in Section 8 (*Calculation of the Index Level*) below. For purposes of publication only, the Index Calculation Agent will round all Index Levels to two (2) decimal places before publishing or otherwise making such levels available in U.S. dollars. The Index Calculation Agent may calculate a Balanced Index to a greater degree of 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 Index Levels. The Index Level for a Balanced Index in respect of a given Index Calculation Day may be obtained by reference to the Bloomberg ticker specified in the Applicable Module for such Balanced Index or from a successor or alternate source as may be identified by the Index Calculation Agent from time to time.

**No assurance can be given that the investment strategy used to construct any Balanced Index will achieve its intended results or that any Balanced Index will be successful or will outperform any alternative index or strategy that might reference the Portfolio Constituents. Furthermore, no**

**assurance can be given that the volatility of any Balanced Index will approximate its Volatility Target. The actual realized volatility of each Balanced Index may be greater or less than its Volatility Target.**

**Each Balanced Index is described as a notional 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. Each Balanced Index merely references certain assets, the performance of which will be used as a reference point for calculating the Index Level.**

#### **4. Index Sponsor and Index Calculation Agent**

##### *4.1 Identity and responsibilities*

As of the applicable Live Date (as defined in “Definitions” and specified in the Applicable Module in Part B) for a Balanced Index, JPMS is the sponsor of each Balanced 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 a Balanced 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 Balanced Index.

The initial Index Sponsor is responsible for, among other things, the creation and design of the Balanced Index and the documentation of the Index Rules. The Index Sponsor is responsible for the appointment of the calculation agent of the Balanced 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 applicable Live Date for the relevant Balanced Index, the Index Sponsor has appointed JPMS to be the initial Index Calculation Agent for each Balanced Index.

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 Index Calculation Day (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 Market Disruption Event, Extraordinary Event or Interest Rate Extraordinary Event (each as defined herein) has occurred, whether any input necessary to perform any calculations under the Index Rules is not published or otherwise made available to the Index Calculation Agent, 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 a Balanced 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 Balanced Index or any use to which any person may put the Balanced Index or the Index Levels.

#### 4.2 *Index Sponsor determinations and Index Calculation Agent determinations*

The Index Calculation Agent's exercise of discretion, or failure to exercise discretion, in relation to a Balanced Index may have a detrimental effect on the Index Level and the volatility of a Balanced 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 a Balanced 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 a Balanced Index and all calculations performed by the Index Calculation Agent related to a Balanced 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 case, as agreed in advance by the Index Sponsor) in relation to a Balanced Index, or a calculation is performed by the Index Calculation Agent in relation to a Balanced 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.

#### 4.3 *Termination of a Balanced Index*

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

### 5. **The Constituents**

Each Balanced Index is a notional dynamic basket that tracks the excess return of each of the two (2) Portfolio Constituents, where necessary by subtracting the return of the Cash Position from the total return of such Portfolio Constituent (with distributions notionally reinvested where applicable). Each Portfolio Constituent is set out in Table 1 of the Applicable Module in Part B. Table 1 also contains the ticker for each Portfolio Constituent, provided for ease of identification, in addition to the Primary Listing Exchange as of the Live Date and Related Exchange (each as defined in "*Definitions*") for each such Portfolio Constituent. The level of the notional Cash Position is calculated as described in Section 6.2 (*Calculating the Cash Level of the notional Cash Position*) and is subject to Section 11 (*Interest Rate Extraordinary Events*).

### 6. **Closing Levels of the Portfolio Constituents and the Cash Level**

#### 6.1 *Calculating the Closing TR Level for an ETF Component*

With respect to each Balanced Index and each Index Calculation Day  $t$ , the Index Calculation Agent will first calculate the closing total return level (the "**Closing TR Level**" or " $TR_t^I$ ") of each of the Portfolio Constituents of the relevant Balanced Index that are exchange-traded funds (each, an "**ETF Component**"), subject to the provisions of Section 9 (*Market Disruption*), by notionally reinvesting any dividend payment declared by that ETF Component whose Ex-Dividend Date (as defined below in this Section 6.1) falls on any day from, but excluding, the Index Calculation Day immediately preceding such Index Calculation Day  $t$  to and including such Index Calculation Day  $t$ , in the Closing Level of such ETF Component. In respect of the Index Calculation Day immediately preceding the Base Date (as defined in "*Definitions*" and specified in the Applicable Module in Part B) of such Balanced Index, the Closing TR Level for each ETF Component was set equal to one hundred (100.00). In respect of each subsequent Index Calculation Day  $t$ , the Closing TR Level for each ETF Component will be calculated in accordance with the following formula:

$$TR_t^i = TR_{t-1}^i \times \frac{\text{Closing Level}_t^i + d_t^i}{\text{Closing Level}_{t-1}^i}$$

where:

- $TR_t^i$  means, for an ETF Component i, the Closing TR Level of such ETF Component i as of Index Calculation Day t.
- $TR_{t-1}^i$  means, for an ETF Component i, the Closing TR Level of such ETF Component i as of the Index Calculation Day immediately prior to Index Calculation Day t.
- $d_t^i$  means, for an ETF Component i, (a) if any day from but excluding the Index Calculation Day immediately prior to Index Calculation Day t to and including Index Calculation Day t is an Ex-Dividend Date for such ETF Component, the sum of the Gross Dividend Amounts (as defined below in this Section 6.1) of such ETF Component i in respect of each such Ex-Dividend Date; and (b) if otherwise, 0.
- $\text{Closing Level}_t^i$  means, for an ETF Component i, the Closing Level of such ETF Component i as of Index Calculation Day t.
- $\text{Closing Level}_{t-1}^i$  means, for an ETF Component i, the Closing Level of such ETF Component i as of the Index Calculation Day immediately prior to Index Calculation Day t.

where:

**“Ex-Dividend Date”** means, with respect to a dividend or other distribution for an ETF Component, the first Dealing Day (as defined in “*Definitions*”) on which transactions in the shares of such ETF Component trade on the relevant Primary Listing Exchange without the right to receive that dividend or other distribution.

**“Gross Dividend Amount”** means, in respect of an ETF Component and an Ex-Dividend Date for such ETF Component, one hundred percent (100%) of the amount of any dividend or other distribution per share of an ETF Component that a shareholder in that Portfolio Constituent on that Ex-Dividend Date would no longer have the right to receive due to the occurrence of such Ex-Dividend Date, as determined by the Index Calculation Agent in its discretion as the sum of (x) the amount of any cash dividend paid or other cash distribution made and (y) the fair market value of any distribution of shares of capital stock, evidences of indebtedness or other assets or property of such ETF Component (other than share dividends or distributions that are the subject of Section 10.4 (*Anti-dilution adjustments*)). If all or a portion of such distribution consists of property traded on the Ex-Dividend Date on a U.S. national securities exchange, the fair market value of such property will equal the closing price of such distributed property on such Ex-Dividend Date.

## 6.2 Calculating the Cash Level of the notional Cash Position

In respect of each Balanced Index and its respective Base Date, the level of the notional Cash Position (the “**Cash Level**” or “**Cash Level<sub>t</sub>**”) was set equal to 100.00. In respect of each Index Calculation Day t following but excluding the Base Date, the Index Calculation Agent will calculate the Cash Level in accordance with the following formula:

$$\text{Cash Level}_t = \text{Cash Level}_{t-1} \times (1 + \text{Carry}_t + \text{Mark-To-Market}_t + \text{Rolldown}_t)$$

where:



Cash Level<sub>t</sub> means, in respect of each Index Calculation Day t, the Cash Level for such Index Calculation Day t.

Cash Level<sub>t-1</sub> means, in respect of each Index Calculation Day t, the Cash Level for the Index Calculation Day immediately preceding such Index Calculation Day t.

Carry<sub>t</sub> means, in respect of each Index Calculation Day t, the interest that would have accrued from the Index Calculation Day immediately preceding such Index Calculation Day t to such Index Calculation Day t on a notional ninety (90)-day zero (0) coupon obligation that yields the 3M Interest Rate (as defined below), as calculated pursuant to the following formula:

$$\text{Carry}_t = \text{Rate}_{t-1}^{3M} \times \frac{\text{Daycount}_{t-1,t}}{360}$$

Mark-To-Market<sub>t</sub> means, in respect of each Index Calculation Day t, the mark-to-market impact on a notional ninety (90)-day zero (0) coupon obligation that yields the 3M Interest Rate from changes in such 3M Interest Rate from the Index Calculation Day that is two (2) Index Calculation Days prior to such Index Calculation Day t to the Index Calculation Day immediately preceding such Index Calculation Day t, as calculated pursuant to the following formula:

$$\text{Mark-To-Market}_t = \frac{-90}{360} \times (\text{Rate}_{t-1}^{3M} - \text{Rate}_{t-2}^{3M})$$

Rolldown<sub>t</sub> means, in respect of each Index Calculation Day t, the price impact on a notional ninety (90)-day zero (0) coupon obligation that initially yielded the 3M Interest Rate from the shortening in the remaining tenor of such obligation from the Index Calculation Day immediately preceding such Index Calculation Day t to such Index Calculation Day t and the associated change in yield, as calculated pursuant to the following formula:

$$\text{Rolldown}_t = \frac{-90}{360} \times (\text{Rate}_{t-1}^{2M} - \text{Rate}_{t-1}^{3M}) \times \frac{\text{Daycount}_{t-1,t}}{30}$$

Rate<sub>t-1</sub><sup>3M</sup> means, in respect of each Index Calculation Day t, the level of the 3M Interest Rate published by the Interest Rate Publisher (as defined below) in respect of the Index Calculation Day immediately preceding Index Calculation Day t, *provided that*, if such Interest Rate Publisher does not publish a level in respect of such Index Calculation Day, Rate<sub>t-1</sub><sup>3M</sup> shall be the level of the 3M Interest Rate in respect of the immediately preceding calendar day in respect of which the Interest Rate Publisher did publish a level.

Rate<sub>t-1</sub><sup>2M</sup> means, in respect of each Index Calculation Day t, the level of the 2M Interest Rate (as defined below) published by the Interest Rate Publisher in respect of the Index Calculation Day immediately preceding Index Calculation Day t, *provided that*, if such Interest Rate Publisher does not publish a level in respect of such Calculation Day, Rate<sub>t-1</sub><sup>2M</sup> shall be the level of the 2M Interest Rate in respect of the immediately preceding calendar day in respect of which the Interest Rate Publisher did publish a level.

Rate<sub>t-2</sub><sup>3M</sup> means, in respect of each Index Calculation Day t, the level of the 3M Interest Rate published by the Interest Rate Publisher in respect of the second Index Calculation Day preceding Index Calculation Day t, *provided that*, if such Interest Rate Publisher



does not publish a level in respect of such Calculation Day on such day,  $\text{Rate}_{t-2}^{3M}$  shall be the level of the 3M Interest Rate in respect of the immediately preceding calendar day in respect of which the Interest Rate Publisher did publish a level.

$\text{Daycount}_{t-1,t}$  means, in respect of each Index Calculation Day  $t$ , the number of calendar days from but excluding the Index Calculation Day immediately preceding Index Calculation Day  $t$  to and including Index Calculation Day  $t$ .

2M Interest Rate means the two (2)-month USD London Interbank Offered Rate (LIBOR) as administered and published by the Interest Rate Publisher (Bloomberg ticker US0002M Index).

3M Interest Rate means the three (3)-month USD London Interbank Offered Rate (LIBOR) as administered and published by the Interest Rate Publisher (Bloomberg ticker US0003M Index).

Interest Rate Publisher means ICE Benchmark Administration (or any authorized successor, alternate source or provider as may be identified by the Index Calculation Agent from time to time).

### 6.3 *Calculating the Closing ER Level for a Portfolio Constituent that is an ETF Component or an Index (TR) Component*

With respect to each Balanced Index and each Index Calculation Day  $t$ , the Index Calculation Agent will identify, or calculate, as applicable and subject to the provisions of Section 9 (*Market Disruption*), the closing excess return level (the “**Closing ER Level**” or “ $\text{ER}_t^i$ ”) of each of the Portfolio Constituents of such Balanced Index, either (i) in the case of an Index (ER) Component, by reference to the Closing Level of such Index (ER) Component (each as defined in “*Definitions*”) in respect of such Index Calculation Day or (ii) in the case of any Portfolio Constituent that is not an Index (ER) Component (*i.e.*, any Portfolio Constituent that is an ETF Component or an Index (TR) Component, as defined in “*Definitions*”) by subtracting the return of the notional Cash Position from the total return of such Portfolio Constituent (with distributions notionally reinvested).

In respect of each Index Calculation Day from and including the Index Calculation Day immediately preceding the Base Date, the Closing ER Level for each Portfolio Constituent that is an Index (ER) Component is equal to such Index (ER) Component’s Closing Level in respect of such Index Calculation Day.

In respect of the Index Calculation Day immediately preceding the Base Date, the Closing ER Level for each Portfolio Constituent (other than a Portfolio Constituent that is an Index (ER) Component) was set equal to one hundred (100.00). In respect of each Index Calculation Day  $t$  following and including the Base Date, the Index Calculation Agent will calculate the Closing ER Level for each Portfolio Constituent (other than a Portfolio Constituent that is an Index (ER) Component) in accordance with the following formula:

$$\text{ER}_t^i = \text{ER}_{t-1}^i \times \left[ 1 + \frac{\text{TR}_t^i}{\text{TR}_{t-1}^i} - \frac{\text{Cash Level}_t}{\text{Cash Level}_{t-1}} \right]$$

where:

$\text{ER}_t^i$  means, for a Portfolio Constituent  $i$ , the Closing ER Level of such Portfolio Constituent  $i$  as of Index Calculation Day  $t$ .

$\text{ER}_{t-1}^i$  means, for a Portfolio Constituent  $i$ , the Closing ER Level of such Portfolio Constituent  $i$  as of the Index Calculation Day immediately prior to Index Calculation Day  $t$ .

$\text{TR}_t^i$  means (i) for an ETF Component  $i$ , the Closing TR Level of such ETF Component  $i$  as of Index Calculation Day  $t$  and (ii) for an Index (TR) Component  $i$ , the Closing Level of such Index Component as of Index Calculation Day  $t$ .

$\text{TR}_{t-1}^i$  means (i) for an ETF Component  $i$ , the Closing TR Level of such ETF Component as of the Index Calculation Day immediately prior to Index Calculation Day  $t$  and (ii) for an Index (TR)

Component i, the Closing Level of such Index Component as of the Index Calculation Day immediately prior to Index Calculation Day t.  
Cash Level<sub>t</sub> means the Cash Level as of Index Calculation Day t.  
Cash Level<sub>t-1</sub> means the Cash Level as of the Calculation Day immediately preceding Index Calculation Day t.

## 7. Determining the Constituent Weights in respect of an Index Calculation Day

### 7.1 Overview of the methodology

As further described below in this Section 7, in respect of each Balanced Index and each Index Calculation Day, the Index Calculation Agent solves for an Equity Constituent weight that, when considered along with a corresponding Bond Constituent weight equal to one (1) minus the weight of the Equity Constituent, represents a notional basket whose volatility is equal to the Volatility Target for such Balanced Index, then caps each Portfolio Constituent's weight at one hundred percent (100%) and floors each Portfolio Constituent's weight at zero percent (0%). If there is no such notional portfolio, the Index Calculation Agent solves for the Portfolio Constituent weights that correspond to a notional portfolio with the lowest possible volatility, and scales these Portfolio Constituent weights down proportionately such that the resulting notional portfolio would have a volatility equal to the Volatility Target for such Balanced Index.

This process is done in parallel for a short-term and a long-term measure of volatility, and the Index Calculation Agent identifies one of the two sets of weights as the final weights, as described in Section 7.9 (*Calculating the Final Weights of the Portfolio Constituents*).

### 7.2 The Short-Term Decay Factor and the Long-Term Decay Factor

With respect of each Balanced Index and each Index Calculation Day t, the Index Calculation Agent will calculate the variance of each Portfolio Constituent and the covariance of the Portfolio Constituents by means of two measures. The short-term variance (the "**Short-Term Variance**" or "**ST Var<sub>t</sub><sup>i</sup>**") and short-term covariance (the "**Short-Term Covariance**" or "**ST Covar<sub>t</sub><sup>i</sup>**") are calculated based on an exponential decay with a decay factor of 0.94 (the "**Short-Term Decay Factor**"). The long-term variance (the "**Long-Term Variance**" or "**LT Var<sub>t</sub><sup>i</sup>**") and long-term covariance (the "**Long-Term Covariance**" or "**LT Covar<sub>t</sub><sup>i</sup>**") are calculated based on an exponential decay with a decay factor of 0.97 (the "**Long-Term Decay Factor**").

### 7.3 With respect to each Balanced Index and each Index Calculation Day t, *Calculating the Short-Term Variance, Long-Term Variance, Short-Term Covariance and Long-Term Covariance of the Portfolio Constituents*

With respect to each Balanced Index and its respective Variance Reference Date, the Short-Term Variance and Long-Term Variance of each Portfolio Constituent and the Short-Term Covariance and Long-Term Covariance of the Portfolio Constituents are set forth in the Applicable Module in Part B. The "**Variance Reference Date**" means, for a Balanced Index, the Index Calculation Day immediately preceding the Base Date of such Balanced Index.

In respect of each Index Calculation Day t following the Variance Reference Date for a Balanced Index, the Index Calculation Agent will determine the Short-Term Variance and the Long-Term Variance of each Portfolio Constituent i and the Short-Term Covariance and the Long-Term Covariance of the Portfolio Constituents in respect of such Index Calculation Day t in accordance with the following formulas:

$$\begin{aligned} \text{ST Var}_t^i &= \lambda_{ST} \times \text{ST Var}_{t-1}^i + (1 - \lambda_{ST}) \times \ln \left( \frac{\text{ER}_t^i}{\text{ER}_{t-1}^i} \right)^2 \\ \text{LT Var}_t^i &= \lambda_{LT} \times \text{LT Var}_{t-1}^i + (1 - \lambda_{LT}) \times \ln \left( \frac{\text{ER}_t^i}{\text{ER}_{t-1}^i} \right)^2 \end{aligned}$$

$$ST\ Covar_t = \lambda_{ST} \times ST\ Covar_{t-1} + (1 - \lambda_{ST}) \times \ln\left(\frac{ER_t^E}{ER_{t-1}^E}\right) \times \ln\left(\frac{ER_t^B}{ER_{t-1}^B}\right)$$

$$LT\ Covar_t = \lambda_{LT} \times LT\ Covar_{t-1} + (1 - \lambda_{LT}) \times \ln\left(\frac{ER_t^E}{ER_{t-1}^E}\right) \times \ln\left(\frac{ER_t^B}{ER_{t-1}^B}\right)$$

where:

ST Var <sub>t</sub> <sup>i</sup>	means the Short-Term Variance of Portfolio Constituent i calculated as of Index Calculation Day t.
ST Var <sub>t-1</sub> <sup>i</sup>	means the Short-Term Variance of Portfolio Constituent i calculated as of the Index Calculation Day immediately prior to Index Calculation Day t.
LT Var <sub>t</sub> <sup>i</sup>	means the Long-Term Variance of Portfolio Constituent i calculated as of Index Calculation Day t.
LT Var <sub>t-1</sub> <sup>i</sup>	means the Long-Term Variance of Portfolio Constituent i calculated as of the Index Calculation Day immediately prior to Index Calculation Day t.
ST Covar <sub>t</sub>	means the Short-Term Covariance of the Portfolio Constituents calculated as of Index Calculation Day t.
ST Covar <sub>t-1</sub>	means the Short-Term Covariance of the Portfolio Constituents calculated as of the Index Calculation Day immediately prior to Index Calculation Day t.
LT Covar <sub>t</sub>	means the Long-Term Covariance of the Portfolio Constituents calculated as of Index Calculation Day t.
LT Covar <sub>t-1</sub>	means the Long-Term Covariance of the Portfolio Constituents calculated as of the Index Calculation Day immediately prior to Index Calculation Day t.
λ <sub>ST</sub>	means the Short-Term Decay Factor.
λ <sub>LT</sub>	means the Long-Term Decay Factor.
ER <sub>t</sub> <sup>i</sup>	means, for a Portfolio Constituent i, the Closing ER Level of such Portfolio Constituent i as of Index Calculation Day t.
ER <sub>t-1</sub> <sup>i</sup>	means, for a Portfolio Constituent i, the Closing ER Level of such Portfolio Constituent i as of the Index Calculation Day immediately prior to Index Calculation Day t.
ER <sub>t</sub> <sup>E</sup>	means the Closing ER Level of the Equity Constituent as of Index Calculation Day t.
ER <sub>t-1</sub> <sup>E</sup>	means the Closing ER Level of the Equity Constituent as of the Index Calculation Day immediately prior to Index Calculation Day t.
ER <sub>t</sub> <sup>B</sup>	means the Closing ER Level of the Bond Constituent as of Index Calculation Day t.
ER <sub>t-1</sub> <sup>B</sup>	means the Closing ER Level of the Bond Constituent as of the Index Calculation Day immediately prior to Index Calculation Day t.
ln( )	means the natural logarithm function.

#### 7.4 Calculating the Short-Term Discriminant and Long-Term Discriminant

In respect of each Balanced Index and each Index Calculation Day t, the Index Calculation Agent will calculate the Short-Term Discriminant (the “**Short-Term Discriminant**”) and the Long-Term Discriminant (the “**Long-Term Discriminant**”), which are used to determine whether any notional basket of the Portfolio Constituents has weights that sum to one hundred percent (100%) and a realized volatility that is equal to the Volatility Target, in accordance with the following formulas:

$$ST\ \Delta_t = (ST\ Var_t^B - ST\ Covar_t)^2 - (ST\ Var_t^E + ST\ Var_t^B - 2 \times ST\ Covar_t) \times \left( ST\ Var_t^B - \frac{Vol\ Target^2}{252} \right)$$

$$LT\ \Delta_t = (LT\ Var_t^B - LT\ Covar_t)^2 - (LT\ Var_t^E + LT\ Var_t^B - 2 \times LT\ Covar_t) \times \left( LT\ Var_t^B - \frac{Vol\ Target^2}{252} \right)$$

where:

ST Δ <sub>t</sub>	means the Short-Term Discriminant calculated as of Index Calculation Day t.
LT Δ <sub>t</sub>	means the Long-Term Discriminant calculated as of Index Calculation Day t.

ST Var <sub>t</sub> <sup>E</sup>	means the Short-Term Variance of the Equity Constituent calculated as of Index Calculation Day t.
ST Var <sub>t</sub> <sup>B</sup>	means the Short-Term Variance of the Bond Constituent calculated as of Index Calculation Day t.
ST Covar <sub>t</sub>	means the Short-Term Covariance of the Portfolio Constituents calculated as of Index Calculation Day t.
LT Var <sub>t</sub> <sup>E</sup>	means the Long-Term Variance of the Equity Constituent calculated as of Index Calculation Day t.
LT Var <sub>t</sub> <sup>B</sup>	means the Long-Term Variance of the Bond Constituent calculated as of Index Calculation Day t;
LT Covar <sub>t</sub>	means the Long-Term Covariance of the Portfolio Constituents calculated as of Index Calculation Day t.
Vol Target	means the Volatility Target specified in the Applicable Module in Part B.

## 7.5 Calculating the Short-Term Preliminary Weight and Long-Term Preliminary Weight of the Equity Constituent

### 7.5.1 Calculating the Short-Term Preliminary Weight of the Equity Constituent

In respect of each Balanced Index and each Index Calculation Day t, the Index Calculation Agent will calculate the Short-Term Preliminary Weight for the Equity Constituent (the “**Short-Term Preliminary Weight**” or “**ST Prelim Wt<sub>t</sub>**”), which is calculated using the Short-Term Variance of each of the Portfolio Constituents and the Short-Term Covariance between the Portfolio Constituents in accordance with the following:

(a) If the Short-Term Discriminant, calculated in accordance with Section 7.4 (*Calculating the Short-Term Discriminant and Long-Term Discriminant*), is greater than or equal to zero (0), and:

(i) If the Short-Term Variance of the Equity Constituent is greater than or equal to the Short-Term Variance of the Bond Constituent (*provided that* the Short-Term Variances of each Portfolio Constituent and the Short-Term Covariance between the Portfolio Constituents are not (all three) equal to each other):

$$\text{ST Prelim Wt}_t = \max \left( 0\%, \min \left( 100\%, \frac{\text{ST Var}_t^B - \text{ST Covar}_t + \sqrt{\text{ST } \Delta_t}}{\text{ST Var}_t^E + \text{ST Var}_t^B - 2 \times \text{ST Covar}_t} \right) \right); \text{ or}$$

(ii) If the Short-Term Variance of the Bond Constituent is greater than but not equal to the Short-Term Variance of the Equity Constituent:

$$\text{ST Prelim Wt}_t = \max \left( 0\%, \min \left( 100\%, \frac{\text{ST Var}_t^B - \text{ST Covar}_t - \sqrt{\text{ST } \Delta_t}}{\text{ST Var}_t^E + \text{ST Var}_t^B - 2 \times \text{ST Covar}_t} \right) \right).$$

(iii) If the Short-Term Variances of each Portfolio Constituent and the Short-Term Covariance between the Portfolio Constituents are (all three) equal to each other, then ST Prelim Wt<sub>t</sub> = 100%;

(b) If the Short-Term Discriminant is negative (*i.e.*, less than zero (0)):

$$\text{ST Prelim Wt}_t = \max \left( 0\%, \min \left( 100\%, \frac{\text{ST Var}_t^B - \text{ST Covar}_t}{\text{ST Var}_t^E + \text{ST Var}_t^B - 2 \times \text{ST Covar}_t} \right) \right)$$

where:

ST Prelim Wt<sub>t</sub> means the Short-Term Preliminary Weight of the Equity Constituent calculated as of Index Calculation Day t.

ST Var <sub>t</sub> <sup>E</sup>	means the Short-Term Variance of the Equity Constituent calculated as of Index Calculation Day t.
ST Var <sub>t</sub> <sup>B</sup>	means the Short-Term Variance of the Bond Constituent calculated as of Index Calculation Day t.
ST Covar <sub>t</sub>	means the Short-Term Covariance of the Portfolio Constituents calculated as of Index Calculation Day t.
ST Δ <sub>t</sub>	means the Short-Term Discriminant calculated as of Index Calculation Day t.

### 7.5.2 Calculating the Long-Term Preliminary Weight of the Equity Constituent

In respect of each Balanced Index and each Index Calculation Day t, the Index Calculation Agent will calculate the Long-Term Preliminary Weight for the Equity Constituent (the “**Long-Term Preliminary Weight**” or “**LT Prelim Wt<sub>t</sub>**”), which is calculated using the Long-Term Variance of each of the Portfolio Constituents and the Long-Term Covariance between the Portfolio Constituents, in accordance with the following:

(a) If the Long-Term Discriminant, calculated in accordance with Section 7.4 (*Calculating the Short-Term Discriminant and Long-Term Discriminant*), is greater than or equal to zero (0), and:

(i) If the Long-Term Variance of the Equity Constituent is greater than or equal to the Long-Term Variance of the Bond Constituent (*provided that* the Long-Term Variances of each Portfolio Constituent and the Long-Term Covariance between the Portfolio Constituents are not (all three) equal to each other):

$$\text{LT Prelim Wt}_t = \max\left(0\%, \min\left(100\%, \frac{\text{LT Var}_t^B - \text{LT Covar}_t + \sqrt{\text{LT } \Delta_t}}{\text{LT Var}_t^E + \text{LT Var}_t^B - 2 \times \text{LT Covar}_t}\right)\right); \text{ or}$$

(ii) If the Long-Term Variance of the Bond Constituent is greater than (and not equal to) the Long-Term Variance of the Equity Constituent:

$$\text{LT Prelim Wt}_t = \max\left(0\%, \min\left(100\%, \frac{\text{LT Var}_t^B - \text{LT Covar}_t - \sqrt{\text{LT } \Delta_t}}{\text{LT Var}_t^E + \text{LT Var}_t^B - 2 \times \text{LT Covar}_t}\right)\right).$$

(iii) If the Long-Term Variances of each Portfolio Constituent and the Long-Term Covariance between the Portfolio Constituents are (all three) equal to each other, then LT Prelim Wt<sub>t</sub> = 100%.

(b) If the Long-Term Discriminant is negative (*i.e.*, less than zero (0)):

$$\text{LT Prelim Wt}_t = \max\left(0\%, \min\left(100\%, \frac{\text{LT Var}_t^B - \text{LT Covar}_t}{\text{LT Var}_t^E + \text{LT Var}_t^B - 2 \times \text{LT Covar}_t}\right)\right)$$

where:

LT Prelim Wt <sub>t</sub>	means the Long-Term Preliminary Weight of the Equity Constituent calculated as of Index Calculation Day t.
LT Var <sub>t</sub> <sup>E</sup>	means the Long-Term Variance of the Equity Constituent calculated as of Index Calculation Day t.
LT Var <sub>t</sub> <sup>B</sup>	means the Long-Term Variance of the Bond Constituent calculated as of Index Calculation Day t.
LT Covar <sub>t</sub>	means the Long-Term Covariance of the Portfolio Constituents calculated as of Index Calculation Day t.

LT  $\Delta_t$  means the Long-Term Discriminant calculated as of Index Calculation Day t.

#### 7.6 Calculating the Short-Term Portfolio Volatility and Long-Term Portfolio Volatility

In respect of each Balanced Index and each Index Calculation Day t, the Index Calculation Agent will calculate the Short-Term Portfolio Volatility (the “**Short-Term Portfolio Volatility**”) and the Long-Term Portfolio Volatility (the “**Long-Term Portfolio Volatility**”), which are the annualized volatilities of notional baskets with the Short Term Preliminary Weight and Long-Term Preliminary Weight, respectively, for the Equity Constituent (each as calculated in accordance with the following Section 7.7 (*Calculating the Short-Term Weight and Long-Term Weight of the Equity Constituent*), and weights of one (1) minus the Short-Term Preliminary Weight or Long-Term Preliminary Weight, respectively, for the Bond Constituent, in accordance with the following formulas:

$$\text{ST Vol}_t^P = \sqrt{252} \times \sqrt{\text{ST Wt}_t^2 \times \text{ST Var}_t^E + (1 - \text{ST Wt}_t)^2 \times \text{ST Var}_t^B + 2 \times \text{ST Wt}_t \times (1 - \text{ST Wt}_t) \times \text{ST Covar}_t}$$

$$\text{LT Vol}_t^P = \sqrt{252} \times \sqrt{\text{LT Wt}_t^2 \times \text{LT Var}_t^E + (1 - \text{LT Wt}_t)^2 \times \text{LT Var}_t^B + 2 \times \text{LT Wt}_t \times (1 - \text{LT Wt}_t) \times \text{LT Covar}_t}$$

where:

ST Vol <sub>t</sub> <sup>P</sup>	means the Short-Term Portfolio Volatility calculated as of Index Calculation Day t.
ST Wt <sub>t</sub>	means the Short-Term Preliminary Weight of the Equity Constituent calculated as of Index Calculation Day t.
ST Var <sub>t</sub> <sup>E</sup>	means the Short-Term Variance of the Equity Constituent calculated as of Index Calculation Day t.
ST Var <sub>t</sub> <sup>B</sup>	means the Short-Term Variance of the Bond Constituent calculated as of Index Calculation Day t.
ST Covar <sub>t</sub>	means the Short-Term Covariance of the Portfolio Constituents calculated as of Index Calculation Day t.
LT Vol <sub>t</sub> <sup>P</sup>	means the Long-Term Portfolio Volatility calculated as of Index Calculation Day t.
LT Wt <sub>t</sub>	means the Long-Term Preliminary Weight of the Equity Constituent calculated as of Index Calculation Day t.
LT Var <sub>t</sub> <sup>E</sup>	means the Long-Term Variance of the Equity Constituent calculated as of Index Calculation Day t.
LT Var <sub>t</sub> <sup>B</sup>	means the Long-Term Variance of the Bond Constituent calculated as of Index Calculation Day t.
LT Covar <sub>t</sub>	means the Long-Term Covariance of the Portfolio Constituents calculated as of Index Calculation Day t.

#### 7.7 Calculating the Short-Term Weight and Long-Term Weight of the Equity Constituent

In respect of each Balanced Index and each Index Calculation Day t, the Index Calculation Agent will calculate the short-term interim weight (the “**Short-Term Weight**” or “**ST Weight<sub>t</sub>**”) and long-term interim weight (the “**Long-Term Weight**” or “**LT Weight<sub>t</sub>**”) of the Equity Constituent in accordance with the following formulas:

$$\text{ST Weight}_t^E = \frac{\text{Vol Target}}{\max(\text{Vol Target}, \text{ST Vol}_t^P)} \times \text{ST Prelim Wt}_t$$

$$\text{LT Weight}_t^E = \frac{\text{Vol Target}}{\max(\text{Vol Target}, \text{LT Vol}_t^P)} \times \text{LT Prelim Wt}_t$$

by operation of which, if (and only if) the Short-Term Portfolio Volatility (in the case of the Short-Term Weight) or the Long-Term Portfolio Volatility (in the case of the Long-Term Weight) in respect of a given Index Calculation Day is greater than the Volatility Target, the Short-Term Preliminary Weight or Long-Term



Preliminary Weight, as applicable, of the Equity Constituent is scaled down, such that the short-term volatility or long-term volatility, as applicable, of the scaled notional basket is reduced to be equal to the Volatility Target.

where:

ST Weight <sub>t</sub> <sup>E</sup>	means the Short-Term Weight of the Equity Constituent as of Index Calculation Day t.
ST Prelim Wt <sub>t</sub>	means the Short-Term Preliminary Weight of the Equity Constituent calculated as of Index Calculation Day t.
ST Vol <sub>t</sub> <sup>P</sup>	means the Short-Term Portfolio Volatility calculated as of Index Calculation Day t.
LT Weight <sub>t</sub> <sup>E</sup>	means the Long-Term Weight of the Equity Constituent as of Index Calculation Day t.
LT Prelim Wt <sub>t</sub>	means the Long-Term Preliminary Weight of the Equity Constituent calculated as of Index Calculation Day t.
LT Vol <sub>t</sub> <sup>P</sup>	means the Long-Term Portfolio Volatility calculated as of Index Calculation Day t.
Vol Target	means the Volatility Target specified in the Applicable Module in Part B.

#### 7.8 Calculating the Short-Term Weight and Long-Term Weight of the Bond Constituent

In respect of each Balanced Index and each Index Calculation Day t, the Index Calculation Agent will calculate the short-term interim weight (the “**Short-Term Weight**” or “**ST Wt<sub>t</sub>**” and long-term interim weight (the “**Long-Term Weight**” or “**LT Wt<sub>t</sub>**” of the Bond Constituent in accordance with the following formulas:

$$\text{ST Weight}_t^B = \frac{\text{Vol Target}}{\max(\text{Vol Target}, \text{ST Vol}_t^P)} \times (1 - \text{ST Prelim Wt}_t)$$

$$\text{LT Weight}_t^B = \frac{\text{Vol Target}}{\max(\text{Vol Target}, \text{LT Vol}_t^P)} \times (1 - \text{LT Prelim Wt}_t)$$

by operation of which, if (and only if) the Short-Term Portfolio Volatility (in the case of the Short-Term Weight) or the Long-Term Portfolio Volatility (in the case of the Long-Term Weight) in respect of a given Index Calculation Day is greater than the Volatility Target, the preliminary weight of the Bond Constituent (which is one (1) minus the Short-Term Preliminary Weight or Long-Term Preliminary Weight, respectively, of the Equity Constituent) is scaled down, such that the short-term volatility or long-term volatility, as applicable, of the scaled notional basket is reduced to be equal to the Volatility Target.

where:

ST Weight <sub>t</sub> <sup>B</sup>	means the Short-Term Weight of the Bond Constituent as of Index Calculation Day t.
ST Prelim Wt <sub>t</sub>	means the Short-Term Preliminary Weight of the Equity Constituent calculated as of Index Calculation Day t.
ST Vol <sub>t</sub> <sup>P</sup>	means the Short-Term Portfolio Volatility calculated as of Index Calculation Day t.
LT Weight <sub>t</sub> <sup>B</sup>	means the Long-Term Weight of the Bond Constituent as of Index Calculation Day t.
LT Prelim Wt <sub>t</sub>	means the Long-Term Preliminary Weight of the Equity Constituent calculated as of Index Calculation Day t.
LT Vol <sub>t</sub> <sup>P</sup>	means the Long-Term Portfolio Volatility calculated as of Index Calculation Day t.
Vol Target	means the Volatility Target specified in the Applicable Module in Part B.

#### 7.9 Calculating the Final Weights of the Portfolio Constituents

In respect of each Balanced Index and each Index Calculation Day t, the Index Calculation Agent will identify the final weight of the Equity Constituent (the “**Final Weight**” or “**Weight<sub>t</sub><sup>E</sup>**”) to be used in calculating the Index Level as the lesser of the Short-Term Weight and the Long-Term Weight of the Equity Constituent, in accordance with the following formula:

$$\text{Weight}_t^E = \min(\text{ST Weight}_t^E, \text{LT Weight}_t^E)$$

The Index Calculation Agent will then calculate the final weight of the Bond Constituent (the “**Final Weight**” or “**Weight<sub>t</sub><sup>B</sup>**” to be used in calculating the Index Level by reference to the Final Weight of the Equity Constituent, in accordance with the following:

- (a) If both the Short-Term Weight and the Long-Term Weight of the Equity Constituent are zero (0):

$$\text{Weight}_t^B = \min(\text{ST Weight}_t^B, \text{LT Weight}_t^B)$$

- (b) If either (or both) of the Short-Term Weight and the Long-Term Weight of the Equity Constituent is greater than zero (0):

- (i) If the Final Weight of the Equity Constituent is equal to the Long-Term Weight of the Equity Constituent (regardless of whether it is also equal to the Short-Term Weight of the Equity Constituent), then the Final Weight of the Bond Constituent shall be equal to the Long-Term Weight of the Bond Constituent; or
- (ii) If the Final Weight of the Equity Constituent is equal to the Short-Term Weight of the Equity Constituent (but not equal to the Long-Term Weight of the Equity Constituent) the Final Weight of the Bond Constituent shall be equal to the Short-Term Weight of the Bond Constituent.

where:

Weight <sub>t</sub> <sup>E</sup>	means the Final Weight of the Equity Constituent as of Index Calculation Day t.
ST Weight <sub>t</sub> <sup>E</sup>	means the Short-Term Weight to the Equity Constituent as of Index Calculation Day t.
LT Weight <sub>t</sub> <sup>E</sup>	means the Long-Term Weight to the Equity Constituent as of Index Calculation Day t.
Weight <sub>t</sub> <sup>B</sup>	means the Final Weight of the Bond Constituent as of Index Calculation Day t.
ST Weight <sub>t</sub> <sup>B</sup>	means the Short-Term Weight to the Bond Constituent as of Index Calculation Day t.
LT Weight <sub>t</sub> <sup>B</sup>	means the Long-Term Weight to the Bond Constituent as of Index Calculation Day t.

## 8. Calculation of the Index Level

Subject to Section 9.1 (*Weight determination and calculation of Index Levels*) below, the Index Level of each Balanced Index will be calculated by the Index Calculation Agent in respect of each Index Calculation Day in accordance with the following.

With respect to the Base Date, the Index Level was set equal to 100.00 for each Balanced Index. With respect to each Index Calculation Day t following but excluding the Base Date, the level of each Balanced Index will be calculated in accordance with the following formula:

$$\text{Index}_t = \text{Index}_{t-1} \times \left( 1 + \text{Weight}_{t-2}^E \times \left( \frac{\text{ER}_t^E}{\text{ER}_{t-1}^E} - 1 \right) + \text{Weight}_{t-2}^B \times \left( \frac{\text{ER}_t^B}{\text{ER}_{t-1}^B} - 1 \right) - \text{Fee} \times \frac{\text{Daycount}_{t-1,t}}{360} \right)$$

where:

Index <sub>t</sub>	means the Index Level as of Index Calculation Day t;
Index <sub>t-1</sub>	means the Index Level as of the Index Calculation Day immediately prior to Index Calculation Day t.
Weight <sub>t-2</sub> <sup>E</sup>	means the Final Weight of the Equity Constituent as of the second Index Calculation Day immediately preceding Index Calculation Day t.
ER <sub>t</sub> <sup>E</sup>	means the Closing ER Level of the Equity Constituent as of Index Calculation Day t.
ER <sub>t-1</sub> <sup>E</sup>	means the Closing ER Level of the Equity Constituent as of the Index Calculation Day immediately preceding Index Calculation Day t.
Weight <sub>t-2</sub> <sup>B</sup>	means the Final Weight of the Bond Constituent as of the second Index Calculation Day immediately preceding Index Calculation Day t.

$ER_t^B$	means the Closing ER Level of the Bond Constituent as of Index Calculation Day t.
$ER_{t-1}^B$	means the Closing ER Level of the Bond Constituent as of the Index Calculation Day immediately preceding Index Calculation Day t.
Fee	means the Fee specified in the Applicable Module in Part B.
Daycount $_{t-1,t}$	means, in respect of each Index Calculation Day t, the number of calendar days from but excluding the Index Calculation Day immediately preceding Index Calculation Day t to and including Index Calculation Day t.

## 9. Market Disruption

### 9.1 Weight determination and calculation of Index Levels

If each of six (6) consecutive Scheduled Trading Days (as defined in “Definitions”) is a Disrupted Day (as defined in the following Section 9.2 (*Definitions related to market disruption*)), the Index Calculation Agent will calculate its good faith estimate of the Final Weights of the Portfolio Constituents and the corresponding Index Level as of such sixth Scheduled Trading Day (the “**Disruption Determination Date**”) (notwithstanding the fact that such sixth Scheduled Trading Day may be a Disrupted Day for a Portfolio Constituent), using its good faith estimate of the Closing Level and Gross Dividend Amounts (where applicable) for the relevant Portfolio Constituent. Any such estimated levels may be subject to correction on the first succeeding Scheduled Trading Day that is not a Disrupted Day in respect of the relevant Portfolio Constituent.

Such Disruption Determination Date shall be an Index Calculation Day for the purposes of the Index Rules, notwithstanding the fact that it is a Disrupted Day for a Portfolio Constituent.

### 9.2 Definitions related to market disruption

- (a) “**Disrupted Day**” means, in respect of a Portfolio Constituent, a Scheduled Trading Day on which a Market Disruption Event occurs or is continuing in respect of such Portfolio Constituent.
- (b) A “**Market Disruption Event**” occurs if the Index Calculation Agent determines in its sole discretion that on any Scheduled Trading Day there has been:
  - (i) in respect of an Index Component or any Reference Index (each as defined in “Definitions”) of an ETF Component, a failure by the relevant sponsor to calculate and publish the official closing level for such index on such Dealing Day, or any event that, in the determination of the Index Calculation Agent, disrupts or impairs the ability of market participants generally to effect transactions in or obtain market values for any securities or components that compose the relevant index, any options on instruments related to such securities or components, or relevant futures contracts related to such securities or components, if such disruption or impairment relates to securities or components that compose the relevant index or related options or futures contracts on the same or additional securities or components that compose the relevant index, which securities or components in the aggregate compose 20 percent (20%) or more of the level of the relevant index; or
  - (ii) in respect of an ETF Component, an ETF Disruption Event (as defined below in this Section 9.2); and

the Index Calculation Agent determines in its sole discretion that the applicable event described above could materially interfere with the ability of market participants to transact in positions with respect to the relevant Balanced Index, a Portfolio Constituent or the Reference Index of any ETF Component.

For the purpose of determining whether a Market Disruption Event with respect to an index and a Dealing Day exists at any time, if trading in a security or component included in the applicable index is materially suspended or materially limited at that time, then the relevant percentage contribution of that security to the level of the applicable index will be based on a comparison of (x) the portion of the level of the applicable index attributable to that security relative to (y) the overall level of the applicable index, in each case immediately before that suspension or limitation.

- (c) **"ETF Disruption Event"** means, 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 the shares of an ETF Component on the relevant Primary Listing Exchange for such shares for more than two (2) hours of trading during, or during the last one-half ( $\frac{1}{2}$ ) hour period preceding the close of, the principal trading session on such relevant Primary Listing Exchange;
  - (ii) a breakdown or failure in the price and trade reporting systems of the relevant Primary Listing Exchange for the shares of an ETF Component as a result of which the reported trading prices for such shares are materially inaccurate for more than two (2) hours of trading during, or during the last one-half ( $\frac{1}{2}$ ) hour period preceding the close of, the principal trading session on such relevant Primary Listing Exchange;
  - (iii) 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 the shares of an ETF Component or on any Related Exchange for such ETF Component for more than two (2) hours of trading during, or during the last one-half ( $\frac{1}{2}$ ) hour period preceding the close of, the principal trading session on the applicable exchange or market;
  - (iv) the net asset value of an ETF Component is not calculated or is not announced by the Portfolio Constituent Sponsor; or
  - (v) the Portfolio Constituent Sponsor of an ETF Component suspends creations or redemptions of shares of such ETF Component.

For the purpose of determining whether an ETF Disruption Event has occurred:

- (i) a limitation on the hours or number of days of trading will not constitute an ETF Disruption Event if it results from an announced change in the regular business hours of the relevant primary exchange or market for trading in futures or options contracts related to the relevant shares or the Related Exchange;
- (ii) limitations pursuant to the rules of any relevant Primary Listing 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 the shares of an ETF Component by the primary exchange or market for trading in such contracts or shares 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 shares or (c) a disparity in bid and ask quotes relating to such contracts, will constitute a suspension, absence or material limitation of trading in futures or options contracts related to the shares of such ETF Component; and
- (iv) a suspension, absence or material limitation of trading on any relevant Primary Listing Exchange or, if applicable, on the primary exchange or market on which futures or options contracts related to the shares of an ETF Component are traded will not include any time when such exchange or market is itself closed for trading under ordinary circumstances.

## **10. Extraordinary Events and Anti-Dilution Adjustments**

### **10.1 Succession events for Portfolio Constituents**

- (a) For a Portfolio Constituent that is an ETF Component, (x) if any of the following is calculated or announced in the ordinary course, but is not calculated or is not announced by or on behalf of the relevant sponsor or issuer for the Portfolio Constituent or the relevant calculation agent or information provider that such sponsor or issuer designates: its intraday or closing net asset value or another value or level that indicates or affects the approximate intrinsic economic value of the Portfolio Constituent or the amount of any payment in respect of the Portfolio Constituent, (y) yet such value or level is calculated and announced by or on behalf of a successor sponsor or issuer acceptable to the Index

Calculation Agent or a calculation agent or information agent (in either case, that such successor sponsor or issuer designates) acceptable to the Index Calculation Agent;

- (b) for a Portfolio Constituent that is an Index Component or for the Reference Index of a Portfolio Constituent that is an ETF Component, (x) if the relevant 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;
- (c) for a Portfolio Constituent that is an Index Component or for the Reference Index of a Portfolio Constituent that is an ETF Component, (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;
- (d) for any Portfolio Constituent, (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 or an agent or information provider acceptable to the Index Calculation Agent; or
- (e) for a Portfolio Constituent that is an ETF Component, (x) if it is replaced by a successor Portfolio Constituent, (y) yet (1) such successor Portfolio Constituent or the Reference Index of such successor Portfolio Constituent is either the same as that of the replaced Portfolio Constituent, is the Reference Index of such replaced Portfolio Constituent or is an index using, 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 replaced Portfolio Constituent's Reference Index or (2) such successor Portfolio Constituent is otherwise acceptable to the Index Calculation Agent,

then, in each case, that Portfolio Constituent, that Reference Index, that currency or the relevant sponsor, issuer, calculation agent or information provider, as applicable, will thereafter be deemed to be the successor Portfolio Constituent, successor Reference Index, successor currency or the successor sponsor, issuer, calculation agent or information provider described in the relevant clause above, with effect from a date determined by the Index Calculation Agent, who may make such adjustments to the Index Rules of the relevant Balanced Index 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 or loans).

For the avoidance of doubt, the Index Calculation Agent shall not accept a particular successor exchange-traded fund, successor index or successor currency 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 exchange-traded fund or successor index, such successor shall take the place of the relevant Portfolio Constituent and shall be the Portfolio Constituent. For the avoidance of doubt, the prior performance of such successor shall be used for determining the Short-Term Variance, the Long-Term Variance, the Short-Term Covariance and the Long-Term Covariance pursuant to Section 7.3 (*Calculating the Short-Term Variance, Long-Term Variance, Short-Term Covariance and Long-Term Covariance of the Portfolio Constituents*) and for determining the Final Weights of the Portfolio Constituents pursuant to Section 7.9 (*Calculating the Final Weights of the Portfolio Constituents*) with such adjustments as the Index Calculation Agent determines in good faith are appropriate to account for the use of such prior performance of both such successor and such replaced exchange-traded fund or index.

## 10.2 Extraordinary Events for Portfolio Constituents

If an Extraordinary Event (as defined below in Section 10.3 (*Definitions related to Extraordinary Events*)) occurs in respect of a Portfolio Constituent, the Index Calculation Agent, acting in good faith and a commercially reasonable manner, shall either (i) select as a substitute for such Portfolio Constituent:



- (a) an exchange-traded fund that has a Reference Index; or
- (b) an index,

(such substitute exchange-traded fund or index being referred to herein as a “substitute exchange-traded fund” or “substitute index,” respectively) 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, with the understanding that a substitute exchange-traded fund or a substitute index can be substantially similar to a Portfolio Constituent that is an exchange-traded fund or an index) as compared to the Portfolio Constituent that is being replaced, *provided that*, if the Index Calculation Agent determines that no such substitute is available, the Index Calculation Agent shall instead select an appropriate substitute by considering the context of the relevant Balanced Index or (ii) cease calculation or publication of the affected Balanced Index on such date as is determined by the Calculation Agent.

In case (i) above, 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 relevant Balanced Index to account for such substitution (including, without limitation, adjustments to market disruption provisions in respect of an index that includes securities or components that are bonds or loans).

The Index Calculation Agent shall not select a particular substitute exchange-traded fund or 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 exchange-traded fund or index, such substitute shall take the place of the relevant Portfolio Constituent. For the avoidance of doubt, the prior performance of such successor shall be used for determining the Short-Term Variance, the Long-Term Variance, the Short-Term Covariance and the Long-Term Covariance pursuant to Section 7.3 (*Calculating the Short-Term Variance, Long-Term Variance, Short-Term Covariance and Long-Term Covariance of the Portfolio Constituents*) and for determining the Final Weights of the Portfolio Constituents pursuant to Section 7.9 (*Calculating the Final Weights of the Portfolio Constituents*) with such adjustments as the Index Calculation Agent determines in good faith are appropriate to account for the use of such prior performance of both such successor and such replaced exchange-traded fund or index.

### 10.3 Definitions related to Extraordinary Events

An “**Extraordinary Event**” occurs if the Index Calculation Agent determines in its sole discretion that (i) on any Index Calculation Day in respect of a Portfolio 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 relevant Balanced Index (including, without limitation, positions with respect to any Portfolio Constituent or the Reference Index of any Portfolio Constituent):

- (1) for a Portfolio Constituent that is an Index Component, the 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);
- (2) for a Portfolio Constituent that is an ETF Component that has a Reference Index, the sponsor of the relevant Reference Index of the ETF Component makes a material change in the formula for or the method of calculating that Reference Index of the ETF Component or in any other way materially modifies that Reference Index of the ETF Component (other than a modification prescribed in that formula or method to maintain that Reference Index of the ETF Component in routine circumstances);
- (3) for a Portfolio Constituent that is an ETF Component, the issuer or sponsor of the ETF Component replaces the Reference Index of the ETF Component with a successor index that does not, in the determination of the Index Calculation Agent, use the same or a substantially similar formula for and method of calculation as used in the calculation of the replaced Reference Index of the ETF Component;
- (4) for a Portfolio Constituent that is an ETF Component, including one for which the securities of the relevant exchange-traded fund are issued by a trust (such issuer trust, the “**Trust Issuer**”), the trust



- agreement or any similar governing document of the Trust Issuer is terminated, or the issuer or Trust Issuer becomes, for any reason, subject to voluntary or involuntary termination, liquidation, bankruptcy, insolvency, dissolution or winding-up or any other analogous proceeding;
- (5) for a Portfolio Constituent, the relevant issuer or sponsor permanently cancels such Portfolio Constituent, and no successor exists, or the level, net asset value or indicative value, as applicable, of such Portfolio Constituent is not calculated and is not announced by or on behalf of the relevant issuer or sponsor for such Portfolio Constituent, and is not calculated and announced by or on behalf of a successor issuer or sponsor acceptable to the Index Calculation Agent;
  - (6) for a relevant Portfolio Constituent, the event specified in clause (x) of subsection (a), (b), (c), (d) or (e) of Section 10.1 (*Succession events for Portfolio Constituents*) above occurs, but the relevant event specified in clause (y) of such subsection of such Section 10.1 does not occur;
  - (7) for a Portfolio Constituent that is an Index Component, a failure by the relevant sponsor to calculate and publish the Closing Level for such Index Component for five (5) consecutive Dealing Days;
  - (8) for a Portfolio Constituent that is an ETF Component, such ETF Component is de-listed from the relevant Primary Listing Exchange and is not concurrently listed on a U.S. securities exchange acceptable to the Index Calculation Agent;
  - (9) for a Portfolio Constituent that is an ETF Component, such ETF Component becomes, for any reason, subject to voluntary or involuntary termination, liquidation, bankruptcy, insolvency, dissolution or winding-up or any other analogous proceeding;
  - (10) for a Portfolio Constituent that is an ETF Component or its issuer, all the securities of such Portfolio Constituent or its issuer or all or substantially all of the assets of such Portfolio Constituent or its issuer are nationalized, expropriated or otherwise required to be transferred to any governmental agency, authority, entity or instrumentality thereof;
  - (11) an ETF Material Event (as defined below) occurs in respect of an ETF Component;
  - (12) a Market Disruption Event occurs in respect of a Portfolio Constituent for ten (10) consecutive Dealing Days and the Index Calculation Agent determines that such Market Disruption Event is reasonably likely to continue for a period of an indeterminate duration;
  - (13) for a Portfolio Constituent, (x) a suspension or limitation on trading in respect of (1) a Portfolio Constituent or (2) any component of an Index Component or (3) any component of a Reference Index of an ETF Component (each such underlying described in any of the immediately preceding clauses (1), (2) and (3), being a “**Relevant Underlying**”) is announced or imposed for ten (10) consecutive Dealing Days for such Portfolio 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 Portfolio Constituent or (y) any other event occurs or condition exists that causes trading to cease in respect of a Relevant Underlying for ten (10) consecutive Dealing Days for the relevant Portfolio Constituent;
  - (14) for a Portfolio Constituent or any substitute index or exchange-traded fund, at any time (1) the licence granted (if required) by a non-affiliate of the Index Calculation Agent to the Index Calculation Agent (or its affiliates) to use such Portfolio Constituent or any substitute index or exchange-traded fund for the purposes of the relevant Balanced Index or (2) 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 Portfolio Constituent, underlying reference input or relevant data or information or to refer to the level or price or other information in respect of any Portfolio Constituent, underlying reference input or relevant data or information (or other component or input of the relevant Balanced Index or other matter that could affect a Balanced 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 Portfolio Constituent for the purposes of a Balanced Index or (ii) such Balanced 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 the Index Calculation Agent’s rights to use the Portfolio Constituent or any substitute Index Component or ETF Component for the purpose of calculating the relevant Balanced Index is otherwise disputed by a non-affiliate of the Index Calculation Agent, becomes impaired or ceases (for any reason); or
  - (15) the occurrence or continuation of a Change in Law.

An “**ETF Material Event**” occurs in respect of an ETF Component when one or more of the following events occurs, and the Index Calculation Agent determines in its sole discretion that such event or combination of events is material (although, for the avoidance of doubt, the Index Calculation Agent has no obligation to monitor actively whether or not any of the following events has occurred):

- (1) there is an amendment, variation or modification to the constitutional documents or offering documents of the ETF Component that the Index Calculation Agent determines has or is reasonably likely to have an adverse impact on the ability of market participants to trade in securities of the ETF Component;
- (2) there is an amendment, variation or modification to the terms of the ETF Component or the obligations of the issuer or sponsor of the ETF Component, in any case and by any means, that the Index Calculation Agent determines has or is reasonably likely to have an adverse impact on the value, redeemability or liquidity of the securities of the ETF Component;
- (3) an ETF Regulatory Action occurs in respect of the ETF Component; “**ETF Regulatory Action**” means (i) any cancellation, suspension or revocation of the registration or approval of the ETF Component or the securities of the ETF Component by any governmental, legal or regulatory entity with authority over the ETF Component or the securities of the ETF Component, (ii) any change in the legal, tax, accounting, or regulatory treatments of the ETF Component, any sponsor, issuer or adviser of the ETF Component or the securities of the ETF Component that the Index Calculation Agent determines has or is reasonably likely to have an adverse impact on the holders of the securities of the ETF Component or on the value of the securities of the ETF Component, (iii) the ETF Component or any sponsor, issuer or adviser of the ETF Component becoming subject to any investigation, proceeding or litigation by any relevant governmental, legal or regulatory authority involving any activities relating to or resulting from the operation of the ETF Component (including, without limitation, any future, announced or implemented material change to any one or more exemptive orders, no action letters or interpretative guidance of the U.S. Securities and Exchange Commission (the “**SEC**”), including guidance issued by the SEC’s staff, relating to the ETF Component or to exchange-traded funds generally that affects holders of the securities of the ETF Component, whether occurring through action of the SEC or otherwise, including as a result of a court order or executive order) that the Index Calculation Agent determines has or is reasonably likely to have a material adverse effect on the value, redeemability or liquidity of the securities of the ETF Component, or the operation of the ETF Component in accordance with the terms of the ETF Component or the ETF Component’s offering documents or (iv) the issuance by the SEC of an order to suspend redemption obligations of the ETF Component, to freeze assets of the ETF Component or to take any other action that the Index Calculation Agent determines is reasonably likely to have a material effect on the value, redeemability or liquidity of the securities of the ETF Component;
- (4) the Market Capitalization of an ETF Component declines below (x) an amount equal to twenty percent (20%) of its Market Capitalization as of the Live Date or (y) \$1 billion;
- (5) the Average Daily Trading Volume of an ETF Component declines or remains below (x) an amount equal to twenty percent (20%) of its Average Daily Trading Volume as of the Live Date or (y) \$10 million;
- (6) the relevant Primary Listing Exchange for the ETF Component announces that such ETF Component will be de-listed from such exchange;
- (7) if any of the following is calculated or announced in the ordinary course, but, for a period of five (5) consecutive Dealing Days, is not calculated or is not announced by or on behalf of the relevant issuer or sponsor of the ETF Component or the relevant calculation agent or information provider that the relevant issuer or sponsor of the ETF Component designates: the intraday net asset value of the ETF Component, the intraday indicative value of a Reference Index of the ETF Component, or any intraday value or level that indicates or affects the approximate intrinsic economic value of the ETF Component or the amount of any payment in respect of the ETF Component;
- (8) if any of the following is calculated or announced in the ordinary course, but, for a period of five (5) consecutive Dealing Days, is not calculated or is not announced by or on behalf of the relevant sponsor or issuer of the ETF Component or the relevant calculation agent or information provider that the relevant sponsor or issuer of the ETF Component designates: the closing net asset value of the ETF Component, the closing indicative value of a Reference Index of the ETF Component, or any closing

value or level or other value or level that indicates or affects the approximate intrinsic economic value of the ETF Component or the amount of any payment in respect of the ETF Component;

- (9) if any of the following is calculated or announced in the ordinary course, but, for a period of five (5) consecutive Dealing Days, the Closing Level of the ETF Component reflects a premium greater than five percent (5%) or a discount greater than five percent (5%) as compared to the closing net asset value of the ETF Component, the closing indicative value of a Reference Index of the ETF Component, or any closing value or level or other value or level that indicates or affects the approximate intrinsic economic value of the ETF Component or the amount of any payment in respect of the ETF Component;
- (10) the relevant sponsor of the Reference Index of an ETF Component fails to calculate and publish the Closing Level for such index for five (5) consecutive Dealing Days; or
- (11) the relevant sponsor of the ETF Component suspends new issuances, creations or redemptions of securities of such ETF Component for five (5) consecutive Dealing Days or announces a suspension of unlimited duration of such creations or redemptions.

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 or any successor, the SEC or any exchange, market or other 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 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, market or other trading facility.

#### *10.4 Anti-dilution adjustments*

With respect to an ETF Component (or the relevant successor or substitute ETF), the Index Calculation Agent will make anti-dilution adjustments to the Closing Level of such ETF Component only (a) if the shares of such ETF Component are subject to a share split or reverse share split, once such split has become effective, and (b) if such ETF Component is subject to (i) an issuance of additional shares of such ETF Component that is given ratably to all or substantially all holders of shares of such ETF Component or (ii) a distribution of shares of such ETF Component as a result of the triggering of any provision of the corporate charter or other organizational documents of such ETF Component, once the dividend or distribution has become effective and the shares of such ETF Component are trading ex-dividend. The Index Calculation Agent will be solely responsible for the determination and calculation of any such anti-dilution adjustments and any related determinations and calculations, and its determinations and calculations with respect thereto will be conclusive in the absence of manifest error.

### **11. Interest Rate Extraordinary Events**

If any either the 2M Interest Rate or the 3M Interest Rate (or both) (each, an “**Interest Rate**”) is (a) not calculated and announced by the relevant sponsor, but is calculated and announced by a successor sponsor acceptable to the Index Calculation Agent, or (b) replaced by a successor rate that, in the determination of the Index Calculation Agent, is the same or substantially similar to that relevant rate, then the Interest Rate will be deemed to be the successor Interest Rate so calculated and announced by that successor sponsor or that successor rate, as the case may be, with effect from a date determined by the Index Calculation Agent, who may make such adjustments to the Index Rules that it determines are appropriate to account for such change.

If on or prior to any Index Calculation Day, the Interest Rate Publisher (x) makes a material change in the formula for or the method of calculating an Interest Rate or in any other way materially modifies an Interest Rate (other than a modification prescribed in the formula or method for determining the Interest Rate in the event of routine events), (y) fails to calculate and publish the Interest Rate for ten (10) consecutive scheduled publication days for such Interest Rate or (z) permanently cancels the Interest Rate, and no successor rate exists, then, the Index Calculation Agent shall (i) in the case of (x) or (y), continue to use that Interest Rate in determining the Index Level, (ii) in the case of (x), (y) or (z), select a replacement Interest Rate that it determines possesses substantially similar characteristics to the Interest Rate that is being replaced, with effect from a date determined by the Index Calculation Agent; in such a case, the Index Calculation Agent shall make such adjustments to the Index Rules as it determines are appropriate to account for such change or (iii) in the case of (x), (y) or (z), cease calculation or publication of the Balanced Indices on such dates as is determined by the Index Calculation Agent.

## **12. Corrections**

If (i) the Closing Level of (a) any Portfolio Constituent or (b) the Interest Rate as of any date which is published or otherwise made available in respect of the relevant Portfolio Constituent or Interest Rate is subsequently corrected and such correction is published or otherwise made available in respect of such Portfolio Constituent or Interest Rate; or (ii) the Index Calculation Agent identifies an error or omission in any of its calculations, determinations or interpretations in respect of a Balanced 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 and/or the Index Level as of any Index Calculation Day to take into account such correction.

## Definitions

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

<b>"2M Interest Rate"</b>	has the meaning given to such term in Section 6.2 ( <i>Calculating the Cash Level of the notional Cash Position</i> ).
<b>"3M Interest Rate"</b>	has the meaning given to such term in Section 6.2 ( <i>Calculating the Cash Level of the notional Cash Position</i> ).
<b>"Applicable Module"</b>	means the module in Part B applicable to each Balanced Index.
<b>"Average Daily Trading Volume"</b>	means, with respect to an ETF Component and a Dealing Day, the product of (a) the ratio of (i) the total volume of trading in the securities of such ETF Component from but excluding the calendar day that is six (6) months prior to such Dealing Day, to and including such Dealing Day, as reported to the consolidated tape, divided by (ii) the total number of Dealing Days from but excluding the calendar day six (6) months prior to such Dealing Day, to and including such Dealing Day, multiplied by (b) the Closing Level of such ETF Component on such Dealing Day.
<b>"Balanced Index"</b>	has the meaning given to such term in Section 1 ( <i>Introduction</i> ).
<b>"Base Date"</b>	means the date specified in the Applicable Module in Part B with respect to each Balanced Index.
<b>"Bond Constituent"</b>	means, for a Balanced Index and as specified in Section 3 ( <i>General Notes on the Balanced Indices</i> ), the bond constituent of such Balanced Index as set forth in the Applicable Module in Part B for such Balanced Index.
<b>"Cash Position"</b>	has the meaning given to such term in Section 3 ( <i>General Notes on the Balanced Indices</i> ).
<b>"Cash Level"</b>	means, in respect of Index Calculation Day t, the level of the notional Cash Position as calculated pursuant to Section 6.2 ( <i>Calculating the Cash Level of the notional Cash Position</i> ).
<b>"Change in Law"</b>	has the meaning given to such term in Section 10.3 ( <i>Definitions related to Extraordinary Events</i> ).
<b>"Closing ER Level"</b>	has the meaning given to such term in Section 6.3 ( <i>Calculating the Closing ER Level for a Portfolio Constituent that is an ETF Component or an Index (TR) Component</i> ).
<b>"Closing Level"</b>	means, subject to the provisions of Section 9 ( <i>Market Disruption</i> ) and Section 10 ( <i>Extraordinary Events and Anti-Dilution Adjustments</i> ), (a) in respect of a Portfolio Constituent that is an Index Component (whether an Index (ER) Component or an Index (TR) Component) and a Dealing Day, the official closing level of such Index Component published by the relevant Portfolio Constituent Sponsor for such Dealing Day; <i>provided, however that</i> if the Index Calculation Agent determines that such official closing level reflects manifest error on the part of the relevant Portfolio Constituent Sponsor, the Index Calculation Agent shall determine the closing level of the Index Component and (b) in respect of an ETF Component and a Dealing Day, the official closing price of the regular trading session on such Dealing Day on the relevant Primary Listing Exchange.

<b>“Closing TR Level” or “TR<sub>t</sub><sup>i</sup>”</b>	means, in respect of (a) an ETF Component and Index Calculation Day t, the Closing Level of such ETF Component with dividends reinvested in respect of Index Calculation Day t as calculated pursuant to Section 6.1 ( <i>Calculating the Closing TR Level for an ETF Component</i> ) and (b) an Index (TR) Component and Index Calculation Day t, the Closing Level of such Index Component in respect of such Index Calculation Day.
<b>“Dealing Day”</b>	means: <ul style="list-style-type: none"> <li>(a) for a Portfolio Constituent that is an Index Component, a weekday as of which the Closing Level for such Index Component is (or, but for the occurrence or continuation of a Market Disruption Event, would have been) scheduled to be calculated and published by the relevant Portfolio Constituent Sponsor; and</li> <li>(b) for a Portfolio Constituent that is an ETF Component, each weekday on which the Primary Listing Exchange for such ETF Component is scheduled to be open for trading for its regular trading session.</li> </ul>
<b>“Disrupted Day”</b>	has the meaning given to such term in Section 9.2 ( <i>Definitions related to market disruption</i> ).
<b>“Disruption Determination Date”</b>	has the meaning given to such term in Section 9.1 ( <i>Weight determination and calculation of Index Levels</i> ).
<b>“Equity Constituent”</b>	means, for a Balanced Index and as specified in Section 3 ( <i>General Notes on the Balanced Indices</i> ), the equity constituent of such Balanced Index as set forth in the Applicable Module in Part B for such Balanced Index.
<b>“ETF Component”</b>	has the meaning given to such term in Section 6.1 ( <i>Calculating the Closing TR Level for an ETF Component</i> ).
<b>“ETF Disruption Event”</b>	has the meaning given to such term in Section 9.2 ( <i>Definitions related to market disruption</i> ).
<b>“Ex-Dividend Date”</b>	has the meaning given to such term in Section 6.1 ( <i>Calculating the Closing TR Level for an ETF Component</i> ).
<b>“Extraordinary Event”</b>	has the meaning given to such term in Section 10.3 ( <i>Definitions related to Extraordinary Events</i> ).
<b>“Fee”</b>	means, for each Balanced Index, the <i>per annum</i> fee which represents a daily deduction from the Index Level and is specified in the Applicable Module in Part B.
<b>“Final Weight”</b>	with respect to the Equity Constituent or the Bond Constituent, as applicable, has the meaning given to such term in Section 7.9 ( <i>Calculating the Final Weights of the Portfolio Constituents</i> ).
<b>“Gross Dividend Amount”</b>	has the meaning given to such term in Section 6.1 ( <i>Calculating the Closing TR Level for an ETF Component</i> ).
<b>“Index Calculation Day”</b>	means a Scheduled Trading Day that is either: <ul style="list-style-type: none"> <li>(i) a Scheduled Trading Day that is not a Disrupted Day for either of the Portfolio Constituents, or</li> <li>(ii) a Scheduled Trading Day that is a Disruption Determination Date for either of the Portfolio Constituents.</li> </ul>
<b>“Index Calculation Agent”</b>	has the meaning given to such term in Section 4.1 ( <i>Identity and responsibilities</i> ).
<b>“Index Component”</b>	means a Portfolio Constituent that is either an Index (ER) Component or an Index (TR) Component, as applicable.
<b>“Index (ER) Component”</b>	means a Portfolio Constituent that is an excess return index.
<b>“Index Level”</b>	has the meaning given to such term in Section 3 ( <i>General Notes on the Balanced Indices</i> ).
<b>“Index Rules”</b>	as defined in Section 1 ( <i>Introduction</i> ), means the rules of the J.P. Morgan Balanced Index Series (Series 2) as set out in this document,



	as the same may be supplemented, amended or restated from time to time.
<b>“Index Sponsor”</b>	has the meaning given to such term in Section 4.1 ( <i>Identity and responsibilities</i> ).
<b>“Index (TR) Component”</b>	means a Portfolio Constituent that is a total return index.
<b>“Interest Rate”</b>	has the meaning given to such term in Section 11 ( <i>Interest Rate Extraordinary Events</i> ).
<b>“Interest Rate Publisher”</b>	has the meaning given to such term in Section 6.2 ( <i>Calculating the Cash Level of the notional Cash Position</i> ).
<b>“JPMS”</b>	as defined in Section 1 ( <i>Introduction</i> ), means J.P. Morgan Securities LLC.
<b>“Live Date”</b>	means, for each Balanced Index, the date specified in the Applicable Module in Part B.
<b>“Long-Term Covariance”</b>	has the meaning given to such term in Section 7.3 ( <i>Calculating the Short-Term Variance, Long-Term Variance, Short-Term Covariance and Long-Term Covariance of the Portfolio Constituents</i> ).
<b>“Long-Term Decay Factor”</b>	has the meaning given to such term in Section 7.2 ( <i>The Short-Term Decay Factor and the Long-Term Decay Factor</i> ).
<b>“Long-Term Discriminant”</b>	has the meaning given to such term in Section 7.4 ( <i>Calculating the Short-Term Discriminant and Long-Term Discriminant</i> ).
<b>“Long-Term Portfolio Volatility”</b>	has the meaning given to such term in Section 7.6 ( <i>Calculating the Short-Term Portfolio Volatility and Long-Term Portfolio Volatility</i> ).
<b>“Long-Term Preliminary Weight”</b>	has the meaning given to such term in Section 7.5.2 ( <i>Calculating the Long-Term Preliminary Weight of the Equity Constituent</i> ).
<b>“Long-Term Weight”</b>	with respect to (a) the Equity Constituent, has the meaning given to such term in Section 7.7 ( <i>Calculating the Short-Term Weight and Long-Term Weight of the Equity Constituent</i> ) and (b) the Bond Constituent, has the meaning given to such term in Section 7.8 ( <i>Calculating the Short-Term Weight and Long-Term Weight of the Bond Constituent</i> ).
<b>“Long-Term Variance”</b>	has the meaning given to such term in Section 7.3 ( <i>Calculating the Short-Term Variance, Long-Term Variance, Short-Term Covariance and Long-Term Covariance of the Portfolio Constituents</i> ).
<b>“Market Capitalization”</b>	means, with respect to an ETF Component and a Dealing Day, the product of (a) the shares outstanding of such ETF Component in respect of such Dealing Day, as reported to the Primary Listing Exchange, multiplied by (b) the Closing Level of such ETF Component in respect of such Dealing Day.
<b>“Market Disruption Event”</b>	has the meaning given to such term in Section 9.2 ( <i>Definitions related to market disruption</i> ).

<b>"Portfolio Constituent"</b>	has the meaning given to such term in Section 3 ( <i>General Notes on the Balanced Indices</i> ), subject to the provisions of Section 10 ( <i>Extraordinary Events and Anti-Dilution Adjustments</i> ).
<b>"Portfolio Constituent Sponsor"</b>	means with respect to each Portfolio Constituent, the sponsor or successor sponsor of such Portfolio Constituent.
<b>"Primary Listing Exchange"</b>	means, with respect to an ETF Component, the principal U.S. securities exchange registered under the Securities Exchange Act of 1934, as amended, on which such ETF Component is listed or admitted to trading.
<b>"Reference Index"</b>	means with respect to an ETF Component, the index underlying such ETF Component.
<b>"Related Exchange"</b>	means, in respect of a Portfolio Constituent, each exchange or quotation system, if any, specified as such in Table 1 of the Applicable Module in Part B, any successor to such exchange or quotation system or any substitute exchange or quotation system to which trading in futures or options contracts relating to such ETF Component has temporarily relocated ( <i>provided that</i> the Index Calculation Agent has determined that there is comparable liquidity relative to the futures or options contracts relating to such ETF Component on such temporary substitute exchange or quotation system as on the original Related Exchange), <i>provided, however, that</i> where "All Exchanges" is specified as the Related Exchange, "Related Exchange" shall mean, in respect of a Portfolio Constituent that is an ETF Component, each exchange or quotation system (as determined by the Index Calculation Agent) where trading has a material effect (as determined by the Index Calculation Agent) on the overall market for futures or options contracts relating to such ETF Component.
<b>"Relevant Person"</b>	has the meaning given to such term in Section 4.1 ( <i>Identity and responsibilities</i> ).
<b>"Relevant Underlying"</b>	has the meaning given to such term in Section 10.3 ( <i>Definitions related to Extraordinary Events</i> ).
<b>"Scheduled Trading Day"</b>	means a day that is a Dealing Day for both of the Portfolio Constituents.
<b>"SEC"</b>	has the meaning given to such term in Section 10.3 ( <i>Definitions related to Extraordinary Events</i> ).
<b>"Short-Term Covariance"</b>	has the meaning given to such term in Section 7.3 ( <i>Calculating the Short-Term Variance, Long-Term Variance, Short-Term Covariance and Long-Term Covariance of the Portfolio Constituents</i> ).
<b>"Short-Term Decay Factor"</b>	has the meaning given to such term in Section 7.2 ( <i>The Short-Term Decay Factor and the Long-Term Decay Factor</i> ).
<b>"Short-Term Discriminant"</b>	has the meaning given to such term in Section 7.4 ( <i>Calculating the Short-Term Discriminant and Long-Term Discriminant</i> ).
<b>"Short-Term Portfolio Volatility"</b>	has the meaning given to such term in Section 7.6 ( <i>Calculating the Short-Term Portfolio Volatility and Long-Term Portfolio Volatility</i> ).

<b>“Short-Term Preliminary Weight”</b>	has the meaning given to such term in Section 7.5.1 ( <i>Calculating the Short-Term Preliminary Weight of the Equity Constituent</i> ).
<b>“Short-Term Weight”</b>	with respect to (a) the Equity Constituent, has the meaning given to such term in Section 7.7 ( <i>Calculating the Short-Term Weight and Long-Term Weight of the Equity Constituent</i> ) and (b) the Bond Constituent, has the meaning given to such term in Section 7.8 ( <i>Calculating the Short-Term Weight and Long-Term Weight of the Bond Constituent</i> ).
<b>“Short-Term Variance”</b>	has the meaning given to such term in Section 7.3 ( <i>Calculating the Short-Term Variance, Long-Term Variance, Short-Term Covariance and Long-Term Covariance of the Portfolio Constituents</i> ).
<b>“Portfolio Constituents”</b>	has the meaning given to such term in Section 3 ( <i>General Notes on the Balanced Indices</i> ).
<b>“Variance Reference Date”</b>	has the meaning given to such term in Section 7.3 ( <i>Calculating the Short-Term Variance, Long-Term Variance, Short-Term Covariance and Long-Term Covariance of the Portfolio Constituents</i> ).
<b>“Volatility Target”</b>	has the meaning given to such term in Section 3 ( <i>General Notes on the Balanced Indices</i> ) and is specified in the Applicable Module in Part B for each Balanced Index.

**Schedule 1:****The indices composing the J.P. Morgan Balanced Index Series (Second Series):**

Table A below of this Schedule 1 sets out the name of each index in the J.P. Morgan Balanced Index Series (Second Series). The relevant parameters for each Balanced Index are provided in the Applicable Module in Part B.

**Table A**

Name
J.P. Morgan Balanced Fundamental Index
J.P. Morgan Balanced International Dividend Index
J.P. Morgan Balanced Value Dividends Index
J.P. Morgan Strategic Balanced Index
Balanced Capital Strength 6 Index
J.P. Morgan Balanced Capital Strength 8 Index
J.P. Morgan Balanced Value Dividends 5 Index
J.P. Morgan Mojave Index
J.P. Morgan Mojave 8 Index
J.P. Morgan Large-Cap Dynamic Blend Index
J.P. Morgan Tech+ Dynamic Blend Index

This table may be amended from time to time to add additional Balanced Indices.

## **Part B**

### PARAMETERS FOR EACH OF THE J.P. MORGAN BALANCED INDICES

#### MODULE B1: J.P. MORGAN BALANCED FUNDAMENTAL INDEX

This index was terminated on January 11, 2018.

#### MODULE B2: J.P. MORGAN BALANCED INTERNATIONAL DIVIDEND INDEX

This index was terminated on January 11, 2018.

MODULE B3: J.P. MORGAN BALANCED VALUE DIVIDENDS INDEX

Index Name	J.P. Morgan Balanced Value Dividends Index
Bloomberg Ticker of Index	JPUSBLVD
Live Date	August 30, 2016
Base Date	September 25, 2003
Volatility Target	5.0%
Fee	0.005 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.001988%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.001988%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.001014%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.001014%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	-0.000087%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	-0.000087%

Table 3						
<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	First Trust Value Line® Dividend Index Fund	FVD	NYSE Arca	All Exchanges	ETF
2	Bond Constituent	PIMCO Total Return Active Exchange-Traded Fund	BOND	NYSE Arca	All Exchanges	ETF

In Section 9.1 (*Weight determination and calculation of Index Levels*) in Part A, the reference to “six (6) consecutive Scheduled Trading Days” is hereby deleted in its entirety and replaced with “four (4) consecutive Scheduled Trading Days”, and each instance of the word “sixth” therein is hereby deleted and replaced with “fourth”.

The following are hereby deleted in their entirety from the first paragraph of Section 10.2 (*Extraordinary Events for Portfolio Constituents*): “either (i)” and “or (ii) cease calculation or publication of the affected Balanced Index on such date as is determined by the Calculation Agent.”; and the following language in the second paragraph of Section 10.2: “In case (i) above”, is hereby deleted in its entirety and replaced with “In such case”.

The following clause is hereby deleted in its entirety from the second paragraph of Section 11 (*Interest Rate Extraordinary Events*): “or (iii) in the case of (x), (y) or (z), cease calculation or publication of the Balanced Indices on such dates as is determined by the Index Calculation Agent.”

Notwithstanding the contents of the preceding two (2) paragraphs, the Index Sponsor may at any time, for any reason and without notice, terminate or cease the calculation or publication of any Balanced Index as set forth in Section 4.3 (*Termination of a Balanced Index*) in Part A, including, without limitation, as the result of the occurrence of one or more of the events described in Section 10 (*Extraordinary Events and Anti-Dilution Adjustments*) or Section 11 (*Interest Rate Extraordinary Events*).



In Section 6.2, the definition of “Rolldown<sub>t</sub>” is hereby deleted in its entirety and replaced with:

Rolldown<sub>t</sub> means, in respect of each Index Calculation Day t, the price impact on a notional ninety (90)-day zero (0) coupon obligation that initially yielded the 3M Interest Rate from the shortening in the remaining tenor of such obligation from the Index Calculation Day immediately preceding such Index Calculation Day t to such Index Calculation Day t and the associated change in yield, as calculated as follows:

- (i) For each Index Calculation Day prior to but excluding January 3, 2022, pursuant to the following formula:

$$\text{Rolldown}_t = \frac{-90}{360} \times (\text{Rate}_{t-1}^{2M} - \text{Rate}_{t-1}^{3M}) \times \frac{\text{Daycount}_{t-1,t}}{30}$$

- (ii) For each Index Calculation Day from and including January 3, 2022, pursuant to the following formula:

$$\text{Rolldown}_t = \frac{-90}{360} \times (\text{Rate}_{t-1}^{1M} - \text{Rate}_{t-1}^{3M}) \times \frac{\text{Daycount}_{t-1,t}}{60}$$

Rate<sub>t-1</sub><sup>1M</sup> means, in respect of each Index Calculation Day t, the level of the 1M Interest Rate (as defined below) published by the Interest Rate Publisher in respect of the Index Calculation Day immediately preceding Index Calculation Day t, provided that, if such Interest Rate Publisher does not publish a level in respect of such Index Calculation Day, Rate<sub>t-1</sub><sup>1M</sup> shall be the level of the 1M Interest Rate in respect of the immediately preceding calendar day in respect of which the Interest Rate Publisher did publish a level.

1M Interest Rate means the one (1)-month USD London Interbank Offered Rate (LIBOR) as administered and published by the Interest Rate Publisher (Bloomberg ticker “US0001M Index”).

MODULE B4: J.P. MORGAN STRATEGIC BALANCED INDEX

Index Name	J.P. Morgan Strategic Balanced Index
Bloomberg Ticker of Index	JPUSSTBL
Live Date	July 17, 2017
Base Date	June 2, 2004
Volatility Target	6.0%
Fee	0.005 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.006096%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.006096%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.001497%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.001497%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.001932%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.001932%

Table 4						
<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	PowerShares S&P 500® High Dividend Low Volatility Portfolio	SPHD	NYSE Arca	All Exchanges	ETF
2	Bond Constituent	J.P. Morgan Total Return Index	JPUSTRI	N/A	N/A	Index

In Section 6.2, the definitions of “2M Interest Rate”, “3M Interest Rate” and “Interest Rate Publisher” are hereby deleted in their entirety and replaced with:

2M Interest Rate means (i) prior to but excluding January 3, 2022, the two (2)-month USD London Interbank Offered Rate (LIBOR) (Bloomberg ticker “US0002M Index”), and (ii) from and including January 3, 2022, the J.P. Morgan 2M Spread-Adjusted SOFR Index (Bloomberg ticker “JPUS002M Index”), in each case as administered and published by the Interest Rate Publisher.

3M Interest Rate means (i) prior to but excluding January 3, 2022, the three (3)-month USD London Interbank Offered Rate (LIBOR) (Bloomberg ticker “US0003M Index”), and (ii) from and including January 3, 2022, the J.P. Morgan 3M Spread-Adjusted SOFR Index (Bloomberg ticker “JPUS003M Index”), in each case as administered and published by the Interest Rate Publisher.

Interest Rate Publisher means (i) prior to but excluding January 3, 2022, ICE Benchmark Administration, and (ii) from and including January 3, 2022, J.P. Morgan Securities LLC (or its

authorized successor, or if no such authorized successor is announced, an alternate source or provider as may be identified by the Index Calculation Agent).

MODULE B5: BALANCED CAPITAL STRENGTH 6 INDEX

Index Name	Balanced Capital Strength 6 Index
Bloomberg Ticker of Index	FTBLCS6
Live Date	December 5, 2017
Base Date	February 20, 2007
Volatility Target	6.0%
Fee	0.005 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.002270%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.002270%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.000457%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.000457%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000420%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000420%

Table 5						
<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	Capital Strength Total Return Index <sup>SM</sup>	NQCAPSTT	N/A	N/A	Index
2	Bond Constituent	J.P. Morgan Total Return Index	JPUSTRI	N/A	N/A	Index

Prior to May 8, 2018, the Bloomberg Ticker of the Index was JPUSBCS6.

In Section 6.2, the definitions of “2M Interest Rate”, “3M Interest Rate” and “Interest Rate Publisher” are hereby deleted in their entirety and replaced with:

2M Interest Rate means (i) prior to but excluding January 3, 2022, the two (2)-month USD London Interbank Offered Rate (LIBOR) (Bloomberg ticker “US0002M Index”), and (ii) from and including January 3, 2022, the J.P. Morgan 2M Spread-Adjusted SOFR Index (Bloomberg ticker “JPUS002M Index”), in each case as administered and published by the Interest Rate Publisher.

3M Interest Rate means (i) prior to but excluding January 3, 2022, the three (3)-month USD London Interbank Offered Rate (LIBOR) (Bloomberg ticker “US0003M Index”), and (ii) from and including January 3, 2022, the J.P. Morgan 3M Spread-Adjusted SOFR Index (Bloomberg ticker “JPUS003M Index”), in each case as administered and published by the Interest Rate Publisher.

Interest Rate Publisher means (i) prior to but excluding January 3, 2022, ICE Benchmark Administration, (ii) from and including January 3, 2022, J.P. Morgan Securities LLC (or its authorized successor, or if no such authorized successor is announced, an alternate source or provider as may be identified by the Index Calculation Agent).

MODULE B6: J.P. MORGAN BALANCED CAPITAL STRENGTH 8 INDEX

Index Name	J.P. Morgan Balanced Capital Strength 8 Index
Bloomberg Ticker of Index	JPUSBCS8
Live Date	December 5, 2017
Base Date	February 20, 2007
Volatility Target	8.0%
Fee	0.005 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.002270%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.002270%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.000457%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.000457%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000420%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000420%

Table 6						
<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	Capital Strength Total Return Index <sup>SM</sup>	NQCAPSTT	N/A	N/A	Index
2	Bond Constituent	J.P. Morgan Total Return Index	JPUSTRI	N/A	N/A	Index

In Section 6.2, the definition of “Rolldown<sub>t</sub>” is hereby deleted in its entirety and replaced with:

Rolldown<sub>t</sub> means, in respect of each Index Calculation Day *t*, the price impact on a notional ninety (90)-day zero (0) coupon obligation that initially yielded the 3M Interest Rate from the shortening in the remaining tenor of such obligation from the Index Calculation Day immediately preceding such Index Calculation Day *t* to such Index Calculation Day *t* and the associated change in yield, as calculated as follows:

- (iii) For each Index Calculation Day prior to but excluding January 3, 2022, pursuant to the following formula:

$$\text{Rolldown}_t = \frac{-90}{360} \times (\text{Rate}_{t-1}^{2M} - \text{Rate}_{t-1}^{3M}) \times \frac{\text{Daycount}_{t-1,t}}{30}$$

- (iv) For each Index Calculation Day from and including January 3, 2022, pursuant to the following formula:

$$\text{Rolldown}_t = \frac{-90}{360} \times (\text{Rate}_{t-1}^{1M} - \text{Rate}_{t-1}^{3M}) \times \frac{\text{Daycount}_{t-1,t}}{60}$$

$\text{Rate}_{t-1}^{1M}$  means, in respect of each Index Calculation Day  $t$ , the level of the 1M Interest Rate (as defined below) published by the Interest Rate Publisher in respect of the Index Calculation Day immediately preceding Index Calculation Day  $t$ , provided that, if such Interest Rate Publisher does not publish a level in respect of such Index Calculation Day,  $\text{Rate}_{t-1}^{1M}$  shall be the level of the 1M Interest Rate in respect of the immediately preceding calendar day in respect of which the Interest Rate Publisher did publish a level.

1M Interest Rate means the one (1)-month USD London Interbank Offered Rate (LIBOR) as administered and published by the Interest Rate Publisher (Bloomberg ticker "US0001M Index").



MODULE B7: J.P. MORGAN BALANCED VALUE DIVIDENDS 5 INDEX

Index Name	J.P. Morgan Balanced Value Dividends 5 Index
Bloomberg Ticker of Index	JPUSBFVD
Live Date	January 27, 2020
Base Date	June 2, 2004
Volatility Target	5.0%
Fee	0.005 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.012598%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.012598%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.001495%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.001495%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.001687%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.001687%

Table 7						
<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	First Trust Value Line® Dividend Index Fund	FVD	NYSE Arca	N/A	ETF
2	Bond Constituent	J.P. Morgan Total Return Index	JPUSTRI	N/A	N/A	Index

In Section 6.2, the definitions of “2M Interest Rate”, “3M Interest Rate” and “Interest Rate Publisher” are hereby deleted in their entirety and replaced with:

2M Interest Rate means (i) prior to but excluding January 3, 2022, the two (2)-month USD London Interbank Offered Rate (LIBOR) (Bloomberg ticker “US0002M Index”), and (ii) from and including January 3, 2022, the J.P. Morgan 2M Spread-Adjusted SOFR Index (Bloomberg ticker “JPUS002M Index”), in each case as administered and published by the Interest Rate Publisher.

3M Interest Rate means (i) prior to but excluding January 3, 2022, the three (3)-month USD London Interbank Offered Rate (LIBOR) (Bloomberg ticker “US0003M Index”) , (ii) from and including January 3, 2022, the J.P. Morgan 3M Spread-Adjusted SOFR Index (Bloomberg ticker “JPUS003M Index”), in each case as administered and published by the Interest Rate Publisher.

Interest Rate Publisher means (i) prior to but excluding January 3, 2022, ICE Benchmark Administration, and (ii) from and including January 3, 2022, J.P. Morgan Securities LLC (or its

authorized successor, or if no such authorized successor is announced, an alternate source or provider as may be identified by the Index Calculation Agent).

MODULE B8: J.P. MORGAN MOJAVE INDEX

Index Name	J.P. Morgan Mojave Index
Bloomberg Ticker of Index	JPUSMOJ5
Live Date	January 27, 2020
Base Date	June 2, 2004
Volatility Target	5.0%
Fee	0.005 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.009617%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.009617%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.001495%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.001495%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.001469%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.001469%

Table 8						
<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	iShares® Edge MSCI USA Momentum Factor ETF	MTUM	CBOE BZX	N/A	ETF
2	Bond Constituent	J.P. Morgan Total Return Index	JPUSTRI	N/A	N/A	Index

In Section 6.2, the definitions of “2M Interest Rate”, “3M Interest Rate” and “Interest Rate Publisher” are hereby deleted in their entirety and replaced with:

2M Interest Rate means (i) prior to but excluding January 3, 2022, the two (2)-month USD London Interbank Offered Rate (LIBOR) (Bloomberg ticker “US0002M Index”), and (ii) from and including January 3, 2022, the J.P. Morgan 2M Spread-Adjusted SOFR Index (Bloomberg ticker “JPUS002M Index”), in each case as administered and published by the Interest Rate Publisher.

3M Interest Rate means (i) prior to but excluding January 3, 2022, the three (3)-month USD London Interbank Offered Rate (LIBOR) (Bloomberg ticker “US0003M Index”), and (ii) from and including January 3, 2022, the J.P. Morgan 3M Spread-Adjusted SOFR Index (Bloomberg ticker “JPUS003M Index”), in each case as administered and published by the Interest Rate Publisher.

Interest Rate Publisher means (i) prior to but excluding January 3, 2022, ICE Benchmark Administration, and (ii) from and including January 3, 2022, J.P. Morgan Securities LLC (or its

authorized successor, or if no such authorized successor is announced, an alternate source or provider as may be identified by the Index Calculation Agent).

MODULE B9: J.P. MORGAN MOJAVE 8 INDEX

This index was terminated on December 3, 2021.

MODULE B10: J.P. MORGAN LARGE-CAP DYNAMIC BLEND 3 INDEX

Index Name	J.P. Morgan Large-Cap Dynamic Blend 3 Index
Bloomberg Ticker of Index	JPUSSPDB
Live Date	December 23, 2020
Base Date	July 25, 1990
Volatility Target	3.0%
Fee	0.01 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.007203%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.007203%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.000110%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.000110%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000181%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000181%

Table 10						
<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	J.P. Morgan US Large Cap Equities Futures Index	JPUSLGEQ	N/A	N/A	Index (ER)
2	Bond Constituent	J.P. Morgan 2Y US Treasury Futures Index	JPUS2YT	N/A	N/A	Index (ER)

MODULE B11: J.P. MORGAN TECH+ DYNAMIC BLEND INDEX

Index Name	J.P. Morgan Tech+ Dynamic Blend 3 Index
Bloomberg Ticker of Index	JPUSNQDB
Live Date	December 23, 2020
Base Date	May 9, 1996
Volatility Target	3.0%
Fee	0.01 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.010760%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.010760%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.000152%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.000152%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000429%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000429%

Table 11						
<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	J.P. Morgan US Q Equities Futures Index	JPUSNQEQ	N/A	N/A	Index (ER)
2	Bond Constituent	J.P. Morgan 2Y US Treasury Futures Index	JPUS2YT	N/A	N/A	Index (ER)



MODULE B12: J.P. MORGAN FACTOR FOCUS LEGACY INDEX

Index Name*	J.P. Morgan Factor Focus Legacy Index
Bloomberg Ticker of Index	JPUSFCTR
Live Date	March 19, 2021
Base Date	July 1, 2004
Volatility Target	5.0%
Fee	0.005 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.002165%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.002165%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.000588%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.000588%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000575%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000575%

Table 12						
<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	JPMorgan US Minimum Volatility ETF	JMIN	NYSE Arca	N/A	ETF
2	Bond Constituent	J.P. Morgan Core Bond Index	JPUSCORE	N/A	N/A	Index

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

**“Closing Level”** means, subject to the provisions of Section 9 (*Market Disruption*) and Section 10 (*Extraordinary Events and Anti-Dilution Adjustments*), (a) in respect of a Portfolio Constituent that is an Index Component (whether an Index (ER) Component or an Index (TR) Component) and a Dealing Day, the official closing level of such Index Component published by the relevant Portfolio Constituent Sponsor for 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 relevant Portfolio Constituent Sponsor, the Index Calculation Agent shall determine the closing level of the Index Component; (b) in respect of an ETF Component that is not the JPMorgan US Minimum Volatility ETF and a Dealing Day, the official closing price of the regular trading session on such Dealing Day on the relevant Primary Listing Exchange; and (c) in respect of the JPMorgan US Minimum Volatility ETF and a Dealing Day, the net asset value on such Dealing Day.

In Section 6.2, the definitions of “2M Interest Rate”, “3M Interest Rate” and “Interest Rate Publisher” are hereby deleted in their entirety and replaced with:

2M Interest Rate means (i) prior to but excluding January 3, 2022, the two (2)-month USD London Interbank Offered Rate (LIBOR) (Bloomberg ticker “US0002M Index”), and (ii) from and including January 3, 2022, the J.P. Morgan 2M Spread-Adjusted SOFR Index (Bloomberg ticker “JPUS002M Index”), in each case as administered and published by the Interest Rate Publisher.

3M Interest Rate means (i) prior to but excluding January 3, 2022, the three (3)-month USD London Interbank Offered Rate (LIBOR) (Bloomberg ticker “US0003M Index”), and (ii) from and including January 3, 2022, the J.P. Morgan 3M Spread-Adjusted SOFR Index (Bloomberg ticker “JPUS003M Index”), in each case as administered and published by the Interest Rate Publisher.

Interest Rate Publisher means (i) prior to but excluding January 3, 2022, ICE Benchmark Administration, and (ii) from and including January 3, 2022, J.P. Morgan Securities LLC (or its authorized successor, or if no such authorized successor is announced, an alternate source or provider as may be identified by the Index Calculation Agent).

\*Prior to February 24, 2023, the Index Name was J.P. Morgan Factor Focus Index.

MODULE B13: J.P. MORGAN DYNAMIC BLEND INDEX

Index Name	J.P. Morgan Dynamic Blend Index
Bloomberg Ticker of Index	JPUSDYBL
Live Date	March 23, 2021
Base Date	July 25, 1990
Volatility Target	3.0%
Fee	0.0095 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.007203%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.007203%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.000110%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.000110%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000181%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000181%

Table 13						
<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	J.P. Morgan US Large Cap Equities Futures Index	JPUSLGEQ	N/A	N/A	Index (ER)
2	Bond Constituent	J.P. Morgan 2Y US Treasury Futures Index	JPUS2YT	N/A	N/A	Index (ER)

MODULE B14: J.P. MORGAN LARGE-CAP DYNAMIC BLEND 5 INDEX

Index Name	J.P. Morgan Large-Cap Dynamic Blend 5 Index
Bloomberg Ticker of Index	JPUSSDB5
Live Date	March 2, 2022
Base Date	July 25, 1990
Volatility Target	5.0%
Fee	0.0050 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.007203%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.007203%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.000110%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.000110%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000181%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000181%

**Table 14**

<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	J.P. Morgan US Large Cap Equities Futures Index	JPUSLGEQ	N/A	N/A	Index (ER)
2	Bond Constituent	J.P. Morgan 2Y US Treasury Futures Index	JPUS2YT	N/A	N/A	Index (ER)

MODULE B15: J.P. MORGAN TECH+ DYNAMIC BLEND 5 INDEX

Index Name	J.P. Morgan Tech+ Dynamic Blend 5 Index
Bloomberg Ticker of Index	JPUSNDB5
Live Date	March 2, 2022
Base Date	May 9, 1996
Volatility Target	5.0%
Fee	0.0050 <i>per annum</i>
Short-Term Variance of the Equity Constituent on the Variance Reference Date	0.010760%
Long-Term Variance of the Equity Constituent on the Variance Reference Date	0.010760%
Short-Term Variance of the Bond Constituent on the Variance Reference Date	0.000152%
Long-Term Variance of the Bond Constituent on the Variance Reference Date	0.000152%
Short-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000429%
Long-Term Covariance of the Portfolio Constituents on the Variance Reference Date	0.000429%

**Table 15**

<i>i</i>	Portfolio Constituent	Portfolio Constituent Name	Ticker	Primary Listing Exchange as of the Live Date	Related Exchange	Type of Portfolio Constituent
1	Equity Constituent	J.P. Morgan US Q Equities Futures Index	JPUSNQEQ	N/A	N/A	Index (ER)
2	Bond Constituent	J.P. Morgan 2Y US Treasury Futures Index	JPUS2YT	N/A	N/A	Index (ER)

### **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 Balanced Indices or (ii) legal, tax, regulatory, financial or accounting advice. The Index Rules may change at any time without prior notice.

Neither the Index Calculation Agent nor any of its affiliates or subsidiaries or their respective directors, officers, employees, representatives, delegates or agents (each a **"Relevant Person"**) make any representation or warranty, whatsoever, express or implied, as to the results that may be obtained through the use of this document or the Balanced Indices. 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 and no Relevant Person shall have any liability (direct or indirect, special, punitive, consequential or otherwise) to any person even if notified of the possibility of any such damages.

The Index Calculation Agent is under no obligation to continue the calculation, publication and dissemination of the Balanced Indices or the Index Levels.

During the course of their normal business, the Index Calculation Agent 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 Balanced Indices or any of the Portfolio Constituents or (ii) act as an investment manager, investment advisor, administrator, custodian, prime broker or other service provider to any Portfolio Constituent. In addition, any Relevant Person may have, or may have had, interests or positions, or may buy, sell or otherwise trade positions in or relating to the Balanced Indices or any of the Portfolio 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 Levels 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 Levels. 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 any Balanced Index.

The Index Rules have been developed with the possibility of the Index Calculation Agent or any of the other Relevant Persons entering into or promoting, offering or selling transactions or investments (structured or otherwise) linked to the Balanced Indices 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.

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

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 Balanced Indices are the exclusive property of the Index Sponsor and the Index Sponsor retains all proprietary rights in the Balanced Indices.



The Balanced Indices are 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 Balanced Indices are expressly reserved to and will remain with J.P. Morgan, the Balanced Indices were developed, compiled, prepared and arranged by J.P. Morgan through the expenditure of substantial time, effort and money and constitute 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 Balanced Indices 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 Balanced Indices) and may not (directly or indirectly) (a) share, reproduce, distribute or otherwise disseminate the Balanced Indices, 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 Balanced Indices, (c) modify, copy, translate, distribute, recompile, decompile, disassemble or reverse engineer the Balanced Indices; (d) make or distribute any other form of or any derivative work from, the Balanced Indices or (e) grant any rights in, permit or provide access to the Balanced Indices 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 BALANCED INDICES, INDEX RULES AND RELATED DATA ARE PROVIDED "AS IS" WITH ALL FAULTS, (ii) ALL WARRANTIES AND REPRESENTATIONS OF ANY KIND WITH REGARD TO THE BALANCED INDICES 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 BALANCED INDICES, (iii) J.P. MORGAN DOES NOT GUARANTEE THE AVAILABILITY, SEQUENCE, TIMELINESS, ACCURACY OR COMPLETENESS OF THE BALANCED INDICES, (iv) J.P. MORGAN MAY DISCONTINUE CALCULATION OF THE BALANCED INDICES 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 Balanced Indices, 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 Balanced Indices, the Index Rules or any associated data.

No one may reproduce or disseminate the information contained in this document or the Index Levels of the Balanced Indices 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.

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## ANNEX B

# **J.P. Morgan Futures Index Series Index Rules**

**J.P.Morgan**

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

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# 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:

$\text{Index}_t$  means the Index Level for Trading Day t.

$\text{Index}_{t-1}$  means the Index Level for the Trading Day immediately preceding Trading Day t.

$\text{Earlier}_t^i$  means the Closing Level (as defined in “Definitions”) of the Earlier Expiry Contract for Trading Day t.

$\text{Earlier}_{t-1}^i$  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.

$\text{Later}_t^i$  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 ( $\frac{1}{2}$ ) 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 ( $\frac{1}{2}$ ) 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 ( $\frac{1}{2}$ ) hour period preceding or during the first one-half ( $\frac{1}{2}$ ) 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.

<b>“Extraordinary Event”</b>	has the meaning given to such term in Section 10.3 ( <i>Definitions related to Extraordinary Events</i> ).
<b>“Final Disruption Determination Date”</b>	has the meaning given to such term in Section 9.3 ( <i>Definitions related to market disruption</i> ).
<b>“Fixing Time”</b>	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”.
<b>“FX Material Event”</b>	has the meaning given to such term in Section 10.3 ( <i>Definitions related to Extraordinary Events</i> ).
<b>“FX Price Source”</b>	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”.
<b>“FX Rate”</b>	has the meaning given to such term in Section 8 ( <i>Calculation of the Index Level</i> ).
<b>“Index”</b>	has the meaning given to such term in Section 1 ( <i>Introduction</i> ).
<b>“Index Business Day”</b>	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.
<b>“Index Calculation Agent”</b>	has the meaning given to such term in Section 2.1 ( <i>Identity and responsibilities</i> ).
<b>“Index Level”</b>	has the meaning given to such term in Section 5 ( <i>Publication of the Index Level</i> ).
<b>“Index Rules”</b>	has the meaning given to such term in Section 1 ( <i>Introduction</i> ).
<b>“Index Sponsor”</b>	has the meaning given to such term in Section 2.1 ( <i>Identity and responsibilities</i> ).
<b>“Initial Contract”</b>	means, in respect of an Index, the initial futures contract associated with such Index, as specified in the applicable Module.
<b>“JPMS”</b>	has the meaning given to such term in Section 2.1 ( <i>Identity and responsibilities</i> ).
<b>“Later Expiry Contract”</b>	has the meaning given to such term in Section 7 ( <i>Earlier Expiry Contract; Later Expiry Contract</i> ).
<b>“Live Date”</b>	means the Live Date for a particular Index as specified in the applicable Module.
<b>“Market Disruption Event”</b>	has the meaning given to such term in Section 9.3 ( <i>Definitions related to market disruption</i> ).
<b>“Module”</b>	has the meaning given to such term in Section 1 ( <i>Introduction</i> ).
<b>“Referenced Contract”</b>	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

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

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

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



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

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

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

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

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

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

## MODULE B6: RESERVED

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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



## MODULE B18: J.P. MORGAN GOLD FUTURES INDEX

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

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

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

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

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

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