

**Underlying supplement no. 4-II**  
*To the prospectus dated April 8, 2020 and  
the prospectus supplement dated April 8, 2020*

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**Dated November 4, 2020**  
**Rule 424(b)(2)**

**JPMORGAN CHASE & CO.**

***Notes Linked to the J.P. Morgan Mojave Index***

**JPMORGAN CHASE FINANCIAL COMPANY LLC**

***Notes, Fully and Unconditionally Guaranteed by JPMorgan Chase & Co., Linked to the J.P. Morgan Mojave 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 Mojave 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 and 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. 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 the deduction of a fee of 0.50% per annum deducted daily and a notional financing cost deducted daily.

**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-6 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**

November 4, 2020

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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 Mojave Index (the “**Index**”) was developed and is maintained and calculated by J.P. Morgan Securities LLC (“**JPMS**”). The description of the Index and methodology included in this underlying supplement is based on rules formulated by JPMS (the “**Rules**”). The Rules, and not this description, will govern the calculation and constitution of the Index and other decisions and actions related to its maintenance. The Rules in effect as of the date of this underlying supplement are attached as Annex A to this underlying supplement. The Index is the intellectual property of JPMS, and JPMS reserves all rights with respect to its ownership of the Index. The Index is reported by Bloomberg L.P. under the ticker symbol “JPUSMOJ5 Index.”

The Index attempts to provide a dynamic rules-based allocation to the iShares® MSCI USA Momentum Factor ETF (the “**Equity Constituent**”) and the J.P. Morgan Total Return 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, with distributions, if any, reinvested, and the Bond Constituent, in each case with a notional financing cost deducted, less (b) the daily deduction of a fee of 0.50% per annum (the “**Index Fee**”).

- The Equity Constituent is an exchange-traded fund (“**ETF**”) that seeks to track the investment results, before fees and expenses, of an index composed of U.S. large- and mid-capitalization stocks exhibiting relatively higher price momentum, which is currently the MSCI USA Momentum Index. The MSCI USA Momentum Index is designed to reflect the performance of an equity momentum strategy by emphasizing stocks with high price momentum, while maintaining reasonably high trading liquidity, investment capacity and moderate index turnover. In September 2020, iShares® Trust announced that beginning on or around December 1, 2020, the Equity Constituent will seek to track a new reference index, the MSCI Momentum SR Variant Index, and will cease to track the MSCI USA Momentum Index. The MSCI Momentum SR Variant Index is a variation of the MSCI USA Momentum Index wherein all the changes driven by the index rebalances of the MSCI USA Momentum Index are distributed over three days leading into the rebalancing effective date. For additional information about the Equity Constituent, see “Background on the iShares® ETFs” below.
- The Bond Constituent is an index that applies a rules-based methodology to evaluate recent market conditions and allocate exposure dynamically across up to 12 ETFs that each track a U.S. dollar fixed income sector. For additional information about the Bond Constituent, see “Background on the J.P. Morgan Total Return Index” 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, because the Bond Constituent generally attempts to allocate to a portfolio with a realized volatility less than or equal to 5.0%, the Equity Constituent's realized volatility has tended to be significantly higher than the Bond Constituent's realized volatility. 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 excess return performance of the Portfolio Constituents (i.e., the total return performance less the notional financing cost) less (b) the daily deduction of the Index Fee of 0.50% per annum. The Index Level was set equal to 100.00 on June 2, 2004, the base date of the Index. The Index Calculation Agent (as defined below) began calculating the Index on a live basis on January 27, 2020.

The notional financing cost is intended to approximate the cost of maintaining a position in the Portfolio Constituents using borrowed funds and is currently calculated as a composite rate of interest that is intended to track the overnight rate of return of a notional position in a 3-month time deposit in U.S. dollars, which is currently calculated by referencing 2-month and 3-month USD LIBOR rates. LIBOR, which stands for “London Interbank Offered Rate,” is the average interest rate estimated by leading banks in London that they would be charged if borrowing from other banks without pledging any collateral or security. The Index is an “excess return” index and not a “total return” index because, as part of the calculation of the Index Level, the performance of each Portfolio Constituent is reduced by the notional financing cost.

On July 27, 2017, the Chief Executive of the U.K. Financial Conduct Authority (the “**FCA**”), which regulates LIBOR, announced that the FCA intends to stop persuading or compelling banks to submit rates for the calculation of LIBOR rates to the LIBOR administrator after 2021. It is impossible to predict the impact of this announcement on LIBOR rates, whether LIBOR rates will cease to be published or supported before or after 2021, the impact of any alternative reference rates or whether any additional reforms to LIBOR may be enacted in the United Kingdom or elsewhere. Uncertainty as to the nature of alternative reference rates and as to potential changes or other reforms to LIBOR may affect the 2-month and 3-month USD LIBOR rates used to determine the notional financing cost during the term of the notes, which may adversely affect the Index and therefore the return on and market value of the notes. Any successor or replacement interest rates may perform differently from the 2-month and 3-month USD LIBOR rates, which may adversely affect the Index and therefore the return on and the market value of the notes. See “Risk Factors — Risks Relating to the Notional Financing Cost” below.

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 Mojave 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 Fee 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 FACTOR SUMMARY

*Your investment in the notes will involve certain risks. Set forth below is only a summary of the principal risks associated with an investment in notes linked to the Index. **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 appropriate 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.
- Our affiliate, JPMorgan Chase Bank, N.A., London branch, submits information used to calculate USD LIBOR.
- The level of the Index will include the deduction of a fee and notional financing cost.
- The Index may not be successful or outperform any alternative strategy that might be employed in respect of the Portfolio Constituents.
- The Index may not approximate the Target Volatility.
- The Index may be significantly uninvested.
- 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.
- A significant portion of the Index’s exposure may be allocated to the Bond Constituent.
- Correlation of performances between the Portfolio Constituents may reduce the performance of the notes.
- Changes in the values of the Portfolio Constituents may offset each other.
- Hypothetical back-tested data relating to the Index do not represent actual historical data and are subject to inherent limitations.
- The Index comprises notional assets and liabilities.
- The Index has a limited operating history and may perform in unanticipated ways.
- The investment strategy used to construct the Index involves daily adjustments to its notional exposure to its Portfolio Constituents.
- A Portfolio Constituent may be replaced by a substitute index or ETF upon the occurrence of certain extraordinary events.

### Risks Relating to the Equity Constituent

- There is no assurance that the strategy employed by the Equity Constituent will be successful.
- The securities of JPMorgan Chase & Co. may be held by the Equity Constituent.

### Risks Relating to the Bond Constituent

- JPMS, the sponsor and calculation agent of the Bond Constituent, may adjust the Bond Constituent in a way that affects its level, and JPMS has no obligation to consider your interests.
- The securities of JPMorgan Chase & Co. are currently held by some of the Bond Constituent ETFs.
- We are affiliated with the sponsor of the reference index of one of the Bond Constituent ETFs.
- The Bond Constituent may not be successful or outperform any alternative strategy that might be employed in respect of the Bond Constituent ETFs.
- An investment in the notes carries the risks associated with the Bond Constituent’s momentum allocation strategy.
- The Bond Constituent may perform poorly during periods characterized by short-term volatility.
- The Bond Constituent may not approximate its initial volatility threshold of 5%.
- Correlation of performances among the Bond Constituent ETFs may reduce the performance of the notes.
- Changes in the values of the Bond Constituent ETFs may offset each other.

- The Bond Constituent comprises notional assets and liabilities.
- The Bond Constituent has a limited operating history and may perform in unanticipated ways.
- The investment strategy used to construct the Bond Constituent involves monthly rebalancing and weighting constraints that are applied to the Bond Constituent ETFs.
- The Bond Constituent ETFs composing the Bond Constituent may be replaced by a substitute upon the occurrence of certain extraordinary events.

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

- The notes are subject to significant risks associated with fixed-income securities, including interest rate-related risks and credit risk.
- The value of the notes may be influenced by unpredictable changes in the markets and economies of the local governments of the issuers of the bonds held by the Bond Constituent ETFs.
- The notes may be affected by changes in the perceived creditworthiness of the governments that issue the bonds held by several of the Bond Constituent ETFs.
- An investment in the notes is subject to risks associated with non-U.S. securities markets, including emerging markets; floating rate notes; mortgage-backed securities; preferred stock; and hybrid securities.

#### **Risks Relating to Exchange-Traded Funds**

- There are risks associated with ETFs, including management risks.
- The policies of the investment adviser for an ETF, and the sponsor of its reference index, if any, could affect the value of, and the amount payable on, the notes.
- The performance and market value of an ETF that is designed to track a reference index, particularly during periods of market volatility, may not correlate with the performance of its reference index as well as the net asset value per share of that ETF.

#### **Risks Relating to the Notional Financing Cost**

- The interest rates referenced in determining the notional financing cost will be affected by a number of factors.
- The interest rates referenced in determining the notional financing cost and the manner in which they are calculated may change in the future.
- The interest rates referenced in determining the notional financing cost may be volatile.
- Regulatory developments may result in changes to the rules or methodology used to determine the value of LIBOR, which may adversely affect any payment on the notes.
- Uncertainty about the future of LIBOR may affect 2-month and 3-month USD LIBOR rates, which may adversely affect the Index and therefore the return on and the market value of the notes.

## 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 securities 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 appropriate 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. 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 securities underlying that Portfolio Constituent. See “The J.P. Morgan Mojave Index.”

**Our affiliate, JPMorgan Chase Bank, N.A., London branch, submits information used to calculate USD LIBOR.**

ICE Benchmark Administration Ltd. calculates USD LIBOR using submissions from contributing banks, including our affiliate, JPMorgan Chase Bank, N.A., London branch. We and our affiliates will have no obligation to consider your interests as a holder of the notes in taking any actions in connection with acting as a USD LIBOR contributing bank that might affect USD LIBOR or the notes.

**The level of the Index will include the deduction of a fee and notional financing cost.**

One way in which the Index may differ from a typical index is that its level will include the deduction of a 0.50% per annum fee and the deduction from the performance of each Portfolio Constituent of a notional financing cost calculated based on a composite rate of interest that is intended to track the overnight rate of return of a notional position in a 3-month time deposit in U.S. dollars, which is currently calculated by referencing the 2-month and 3-month USD LIBOR rates. The per annum fee and the notional financing cost will be deducted daily. As a result of the deduction of the per annum fee and the notional financing cost, the level of the Index will trail the value of a hypothetical identically constituted



notional portfolio from which no such fee or cost is deducted, assuming that the rates underlying the notional financing cost remain positive.

LIBOR, which stands for “London Interbank Offered Rate,” is the average interest rate estimated by leading banks in London that they would be charged if borrowing from other banks without pledging any collateral or security. USD LIBOR will be affected by many factors, including, among others described under “— Risks Relating to the Notional Financing Cost” below, the monetary policy of the Federal Reserve. USD LIBOR has fluctuated significantly over time. For example, on August 31, 2007, the 3-month USD LIBOR rate was 5.62125% and, on December 31, 2019, the 3-month USD LIBOR rate was 1.90838%. The Federal Reserve raised its federal funds target rate from 2015 to 2018 and may do so again in the future. Any increase in the 2-month and 3-month USD LIBOR rates, whether due to the Federal Reserve decisions to raise interest rates (specifically, its federal funds target rate) or otherwise, will increase the adverse effect of the notional financing cost on performance of the Index.

The deduction of the per annum fee and the notional financing cost will place a significant drag on the performance of the Index, assuming that the rates underlying the notional financing cost remain positive, potentially offsetting positive returns of the Portfolio Constituents, exacerbating negative returns of the Portfolio Constituents and causing the level of the Index to decline steadily if the total returns of the Portfolio Constituents are relatively flat. In particular, under market conditions where the yield curve is relatively flat (meaning that there is little difference between longer-term and shorter-term interest rates), the notional financing cost alone may be expected to largely or entirely offset the yields on the securities held by the ETFs included in the Bond Constituent (each, a “**Bond Constituent ETF**”). The Index will not appreciate unless the total returns of the Portfolio Constituents are sufficient to offset the negative effects of the per annum fee and the notional financing cost, and then only to the extent that the total returns of the Portfolio Constituents are greater than the deducted amounts. As a result of these deductions, the level of the Index may decline even if the total returns of the Portfolio Constituents are positive.

**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. The Bond Constituent generally attempts to allocate to a portfolio with a realized volatility less than or equal to 5%.

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 Fee 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 Mojave 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, because the Bond Constituent generally attempts to allocate to a portfolio with a realized volatility less than or equal to 5%, the Equity Constituent’s realized volatility has been relatively more variable and has tended to be significantly higher than the Bond Constituent’s realized volatility. 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 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 other the 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. The use of alternative “proxy” performance information in the calculation of hypothetical back-tested weights and levels may have resulted in different, perhaps significantly different, weights and higher levels than would have resulted from the use of actual performance information of the Portfolio Constituents. 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. See also “The J.P. Morgan Mojave Index — Additional Information about Hypothetical Back-tested Performance Data” below.

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

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

The Index was established on January 27, 2020 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 Mojave 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, where that material interference or change is not acceptable to the Index Calculation Agent. See “The J.P. Morgan Mojave 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 Equity Constituent**

### **The Equity Constituent is subject to the risks associated with ETFs.**

The Equity Constituent is an ETF and will be subject to the risks associated with ETFs. See “— Risks Relating to Exchange-Traded Funds” below.

### **There is no assurance that the strategy employed by the Equity Constituent will be successful.**

The Equity Constituent seeks to track the investment results, before fees and expenses, of an index composed of U.S. large- and mid-capitalization stocks exhibiting relatively higher price momentum, which is currently the MSCI USA Momentum Index. The MSCI USA Momentum Index is designed to reflect the performance of an equity momentum strategy by emphasizing stocks with high price momentum, while maintaining reasonably high trading liquidity, investment capacity and moderate index turnover. There is, however, no assurance that the Equity Constituent will outperform any other exchange-traded fund, any index or strategy that tracks U.S. stocks selected using other criteria. Stocks that have previously exhibited high momentum characteristics may not experience positive momentum in the future or may experience more volatility than the market as a whole. The reference index provider may be unsuccessful in creating an index that emphasizes momentum securities. In addition, there may be periods when the momentum style of investing is out of favor and the investment performance of the Equity Constituent may suffer. In addition, the MSCI USA Momentum Index is constructed pursuant to a modified market capitalization-weighting methodology. It is possible that the stock selection and weighting methodology of the MSCI USA Momentum Index will adversely affect the return of the Equity Constituent and, consequently, the value of the Index and of the notes.

### **Changes to the reference index for the Equity Constituent expected in early December 2020 may adversely affect the value of, or any payment on, the notes.**

In September 2020, iShares® Trust announced that beginning on or around December 1, 2020, the Equity Constituent will seek to track a new reference index, the MSCI Momentum SR Variant Index, and will cease to track the MSCI USA Momentum Index. Changes to the reference index may adversely affect the Equity Constituent, the Index and the return on the notes. The principal difference between the two reference indices is that the rebalancing by the new reference index will be distributed over three days leading into the rebalancing effective date instead of rebalancing on a single day, the rebalancing effective date, under the existing reference index. Moreover, the historical performance of the Equity Constituent and the Index prior to December 1, 2020 would not reflect the effect of the staggered rebalancing on the Equity Constituent and investors in the notes should bear this difference in mind when evaluating the historical data.

### **The securities of JPMorgan Chase & Co. may be held by the Equity Constituent.**

The securities of JPMorgan Chase & Co. are included in the MSCI USA Index and may be included in the MSCI USA Momentum Index and held by the Equity Constituent. We have no obligation to consider your interests as a holder of the notes in taking any action that might affect the value of those securities, including those that might affect the value of your notes. We will have no ability to control the actions of the other issuers of the securities held by the Equity Constituent, including actions that could affect the value of the securities held by the Equity Constituent or your notes. None of those issuers will have any obligation to consider your interests as a holder of the notes in taking any actions that might affect the value of your notes.

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

**JPMS, the sponsor and calculation agent of the Bond Constituent, may adjust the Bond 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 Bond Constituent and is responsible for calculating and maintaining the Bond Constituent 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 sponsor and calculation agent of the Bond Constituent, is entitled to exercise discretion. The rules governing the Bond Constituent may be amended at any time by the calculation agent of the Bond Constituent, in its sole discretion. The rules also permit the use of discretion by the sponsor and the determination of whether to replace a Bond Constituent ETF with a substitute or successor upon the occurrence of certain events affecting that Bond Constituent ETF, the selection of any substitute or successor and calculation agent of the Bond Constituent in relation to the Bond Constituent in specific instances, including, but not limited to, the determination of the levels to be used in the event of market disruptions that affect the ability of the calculation agent of the Bond Constituent to calculate and publish the levels of the Bond Constituent and the interpretation of the rules governing the Bond Constituent. Although JPMS, acting as the sponsor and calculation agent of the Bond Constituent, will make all determinations and take all action in relation to the Bond Constituent 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 Bond Constituent 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 Bond Constituent ETF in the Bond Constituent is not an investment recommendation by us or JPMS of that Bond Constituent ETF or any of the securities or other assets held by that Bond Constituent ETF. See “The J.P. Morgan Mojave Index.”

**The securities of JPMorgan Chase & Co. are currently held by the iShares® Short-Term Corporate Bond ETF, the iShares® Intermediate-Term Corporate Bond ETF, the iShares® Long-Term Corporate Bond ETF, the iShares® Floating Rate Bond ETF and the iShares® Preferred and Income Securities ETF, but, to our knowledge, the securities of JPMorgan Chase & Co. are not currently held by any other Bond Constituent ETF.**

We will have no ability to control the actions of the issuers of those securities, including actions that could affect the value of the securities held by any Bond Constituent ETF or your notes. None of JPMorgan Chase & Co. and those issuers will have any obligation to consider your interests as a holder of the notes in taking any actions that might affect the value of your notes. In the event that our securities are held by any Bond Constituent ETF, we will have no obligation to consider your interests as a holder of the notes in taking any action that might affect the value of your notes.

**We are affiliated with the sponsor of the reference index of one of the Bond Constituent ETFs.**

One of our affiliates developed and maintains and calculates the J.P. Morgan Emerging Markets Bond Index Global CORE, which is the reference index of the iShares® J.P. Morgan USD Emerging Markets Bond ETF, one of the Bond Constituent ETFs. Accordingly, conflicts of interest exist between our affiliate and you. Our affiliate will have no obligation to consider your interests as a holder of the notes in taking any actions that might affect the value of your notes.

In addition, the J.P. Morgan Emerging Markets Bond Index Global CORE makes use of certain weights, prices, values, levels or dates that are determined by PricingDirect Inc. (“**PricingDirect**”). PricingDirect is JPMorgan Chase & Co.’s wholly owned subsidiary and provides valuation and other metrics data for fixed-income securities and derivatives. PricingDirect determines these prices through a proprietary evaluation process that takes into account market-based evaluations (such as market intelligence for traded, quoted securities). In addition, under some circumstances, the pricing information

provided by PricingDirect on the bonds held by the J.P. Morgan Emerging Markets Bond Index Global CORE may be derived solely from price quotations or internal valuations made by one or more of our affiliates. Accordingly, conflicts of interest exist between PricingDirect and you. PricingDirect will have no any obligation to consider your interests as a holder of the notes in taking any actions that might affect the value of your notes.

**The Bond Constituent may not be successful or outperform any alternative strategy that might be employed in respect of the Bond Constituent ETFs.**

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

**An investment in the notes carries the risks associated with the Bond Constituent's momentum allocation strategy.**

The Bond Constituent is constructed using what is generally known as a momentum allocation strategy. A momentum strategy generally seeks to capitalize on positive trends in the returns of financial instruments. As such, the weights of the Bond Constituent ETFs in the Bond Constituent are based on the performance of the Bond Constituent ETFs from the immediately preceding six-month period. However, there is no guarantee that trends existing in the preceding six-month period will continue in the future. A momentum strategy is different from a strategy that seeks long-term exposure to a notional portfolio consisting of constant components with fixed weights. The Bond Constituent may fail to realize gains that could occur as a result of obtaining exposures to financial instruments that have experienced negative returns, but which subsequently experience a recovery or a sudden spike in positive returns. As a result, if market conditions do not represent a continuation of prior observed trends, the level of the Bond Constituent, which is rebalanced based on prior trends, may decline.

Due to the "long-only" construction of the Bond Constituent, Bond Constituent ETFs with negative performance over the relevant lookback period may be selected for inclusion in the Bond Constituent, and the weight of each Bond Constituent ETF will not be less than zero at any time. Additionally, the Bond Constituent is rebalanced only once each month. As a result, the composition of the Bond Constituent will not change between re-weightings even if the Bond Constituent ETFs tracked by the Bond Constituent during a given month decline significantly. No assurance can be given that the investment strategy used to construct the Bond Constituent will cause it to outperform any alternative index that might be constructed from the Bond Constituent ETFs.

**The Bond Constituent may perform poorly during periods characterized by short-term volatility.**

The Bond Constituent's strategy is based on momentum investing. Momentum investing strategies are effective at identifying the current market direction in trending markets. However, in non-trending, sideways markets, momentum investment strategies are subject to "whipsaws." A whipsaw occurs when the market reverses and does the opposite of what is indicated by the trend indicator, resulting in a trading loss during the particular period. Consequently, the Bond Constituent may perform poorly in non-trending, "choppy" markets characterized by short-term volatility.

**The Bond Constituent may not approximate its initial volatility threshold of 5%.**

No assurance can be given that the Bond Constituent will maintain an annualized realized volatility that approximates its initial volatility threshold of 5%. The actual realized volatility of the Bond Constituent will depend on the performance of the Bond Constituent ETFs included in the monthly portfolio(s) from time to time, and, at any time or for extended periods, may be greater than 5%, perhaps significantly, or less than 5%. Furthermore, the volatility threshold is subject to upward adjustment and, thus, the realized volatility threshold used to determine any monthly portfolio may be greater than 5%, perhaps significantly. While the assigned weights of the notional portfolio(s) tracked by the Bond Constituent are based in part on the recent historical volatility of the relevant notional portfolio, there is no guarantee that trends existing in the relevant measurement periods will continue in the future. The volatility of the notional

portfolio on any day may change quickly and unexpectedly. Accordingly, the actual realized annualized volatility of the Bond Constituent on a daily basis may be greater than or less than the volatility threshold used to select to the relevant monthly portfolio(s), which may adversely affect the level of the Bond Constituent and the value of the notes.

**The Bond Constituent should not be compared to any other index or strategy sponsored by any of our affiliates and cannot necessarily be considered a revised, enhanced or modified version of any other J.P. Morgan Index.**

The Bond Constituent 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 Bond Constituent and any other J.P. Morgan Index, and no assurance can be given that the Bond Constituent would be more successful than or outperform any other J.P. Morgan Index. The Bond Constituent operates independently and does not necessarily revise, enhance, modify or seek to outperform any other J.P. Morgan Index.

**Correlation of performances among the Bond Constituent ETFs may reduce the performance of the notes.**

Performances of the Bond Constituent ETFs 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 sector or asset type represented by the Bond Constituent ETFs and which has a higher weighting in the Bond Constituent relative to any of the other sectors or asset types, as determined by the Bond Constituent's strategy. High correlation during periods of negative returns among Bond Constituent ETFs representing any one sector or asset type and which Bond Constituent ETFs have a substantial percentage weighting in the Bond Constituent could have an adverse effect on any payments on, and the value of, your notes.

**Changes in the values of the Bond Constituent ETFs may offset each other.**

The Bond Constituent ETFs collectively represent a diverse range of sectors of the U.S. dollar fixed-income market, and price movements between the Bond Constituent ETFs representing different sectors of the U.S. dollar fixed-income market may not correlate with each other. At a time when the value of a Bond Constituent ETF representing a particular sector of the U.S. dollar fixed-income market increases, the value of other Bond Constituent ETFs representing a different sector may not increase as much or may decline. Therefore, in calculating the level of the Bond Constituent, increases in the values of some of the Bond Constituent ETFs may be moderated, or more than offset, by lesser increases or declines in the values of other Bond Constituent ETFs.

**If the values of the Bond Constituent ETFs included in the Bond Constituent change, the level of the Bond Constituent and the market value of your notes may not change in the same manner.**

Owning the notes is not the same as owning the Bond Constituent ETFs. Accordingly, changes in the values of the Bond Constituent ETFs included in the Bond Constituent may not result in a comparable change in the level of the Bond Constituent or the market value of your notes.

**The Bond Constituent comprises notional assets and liabilities.**

The exposures to the Bond Constituent ETFs are purely notional and will exist solely in the records maintained by or on behalf of the index calculation agent of the Bond Constituent. 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 Bond Constituent.

**The Bond Constituent has a limited operating history and may perform in unanticipated ways.**

The Bond Constituent was established on July 13, 2017 and therefore has a limited operating history. Past performance should not be considered indicative of future performance.



**The Bond Constituent is subject to market risks.**

The performance of the Bond Constituent is dependent on the total return performance of the 12 Bond Constituent ETFs. As a consequence, your investment in the notes is exposed to the total return performance of the Bond Constituent ETFs.

**The investment strategy used to construct the Bond Constituent involves monthly rebalancing and weighting constraints that are applied to the Bond Constituent ETFs.**

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

**The Bond Constituent ETFs composing the Bond Constituent may be replaced by a substitute upon the occurrence of certain extraordinary events.**

As described under “Background on the J.P. Morgan Total Return Index — Succession and Extraordinary Events” below, following the occurrence of certain extraordinary events with respect to a Bond Constituent ETF, the affected Bond Constituent ETF may be replaced by a substitute ETF or the calculation agent of the Bond Constituent may cease calculation and publication of the Bond Constituent on a date determined by the calculation agent of the Bond 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 the Bond Constituent, any Bond Constituent ETF or any reference index, where that material interference or change is not acceptable to the calculation agent of the Bond Constituent. See “Background on the J.P. Morgan Total Return Index — Succession and Extraordinary Events” below for a summary of events that could trigger an extraordinary event.

You should realize that the changing of a Bond Constituent ETF may affect the performance of the Bond Constituent, and therefore, the return on the notes, as the replacement Bond Constituent ETF may perform significantly better or worse than the original Bond Constituent ETF. For example, the substitute or successor Bond Constituent ETF may have higher fees or worse performance than the original Bond Constituent ETF. 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 Bond Constituent ETFs****The Bond Constituent ETFs are subject to the risks associated with ETFs.**

The Bond Constituent ETFs are ETFs and will be subject to the risks associated with ETFs. See “— Risks Relating to Exchange-Traded Funds” below.

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

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

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

The bond prices used to calculate the levels of the reference index of the iShares® iBoxx \$ High Yield Corporate Bond ETF are determined, in part, by reference to the bid and ask quotations provided by contributing banks, including us or our affiliates. In addition, one of our affiliates developed and maintains and calculates the J.P. Morgan Emerging Markets Bond Index Global CORE, which is the reference index of the iShares® J.P. Morgan USD Emerging Markets Bond ETF, one of the Bond Constituent ETFs. The J.P. Morgan Emerging Markets Bond Index Global CORE makes use of certain weights, prices, values, levels or dates that are determined by PricingDirect. PricingDirect is JPMorgan Chase & Co.'s wholly owned subsidiary and provides valuation and other metrics data for fixed income securities and derivatives. PricingDirect determines these prices through a proprietary evaluation process that takes into account market-based evaluations (such as market intelligence for traded, quoted securities). In addition, under some circumstances, the pricing information provided by PricingDirect on the bonds underlying the J.P. Morgan Emerging Markets Bond Index Global CORE may be derived solely from price quotations or internal valuations made by one or more of our affiliates.

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

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

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

Prices of many fixed-income securities have recently been trading near historic high prices. If the prices of fixed-income securities revert to their historic means or otherwise fall as a result of a general increase in interest rates, Federal Reserve policies or actions, or perceptions of reduced credit quality or otherwise, the value of the bonds underlying Bond Constituent ETFs that provide exposure to these fixed-income securities will decline, which could have a negative impact on the performance of the notes.

In addition, inflation-protected bonds typically have lower yields than conventional fixed-rate bonds because of their inflation adjustment feature. For the iShares® TIPS Bond ETF, which tracks inflation-protected bonds, if inflation is low, the benefit received from the inflation-protected feature of the underlying bonds may not sufficiently compensate you for their reduced yield.

**The notes are subject to significant risks associated with fixed-income securities, including credit risk.**

The Bond Constituent ETFs attempt to track the performance of indices composed of fixed-income securities. The prices of the bonds held by those Bond Constituent ETFs are significantly influenced by the creditworthiness of the issuers of those bonds. The bonds held by those Bond Constituent ETFs may have their credit ratings downgraded, including, in the case of the investment-grade bonds, a downgrade

from investment grade to non-investment grade status, or their credit spreads may widen significantly. Following a ratings downgrade or the widening of credit spreads, some or all of the bonds held by those Bond Constituent ETFs may suffer significant and rapid price declines. These events may affect only a few or a large number of the bonds held by those Bond Constituent ETFs. For example, during the most recent credit crisis in the United States, credit spreads widened significantly as the market demanded very high yields on corporate bonds, and as a result, the prices of the bonds in the United States dropped significantly. There can be no assurance that some or all of the factors that contributed to that credit crisis will not depress the price, perhaps significantly, of the bonds held by those Bond Constituent ETFs, which would adversely affect the value of the notes.

Further, the Bond Constituent ETFs that provide exposure to the high yield corporate market are subject to high-yield securities risk. Securities that are rated below investment grade (commonly known as “junk bonds,” including those bonds rated at BB+ or lower by S&P or Fitch or Ba1 or lower by Moody’s) may be more volatile than higher-rated securities of similar maturity. High-yield securities may also be subject to greater levels of credit or default risk than higher-rated securities. The value of high-yield securities can be adversely affected by overall economic conditions, such as an economic downturn or a period of rising interest rates, and high-yield securities may be less liquid and more difficult to sell at an advantageous time or price or to value than higher-rated securities. In particular, high-yield securities are often issued by smaller, less creditworthy companies or by highly leveraged (indebted) firms, which are generally less able than more financially stable firms to make scheduled payments of interest and principal.

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

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

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

These factors interrelate in complex ways, and the effect of one factor on the market value of the bonds held by the Bond Constituent ETFs may offset or enhance the effect of another factor. Changes in the values of the Bond Constituent ETFs may adversely affect any payment on the notes.

**The notes may be affected by changes in the perceived creditworthiness of the governments that issue the bonds held by several of the Bond Constituent ETFs.**

Several of the Bond Constituent ETFs hold government bonds. The prices of government bond are significantly influenced by the creditworthiness of the government that issues those bond. U.S. rating agencies have downgraded the credit ratings and/or assigned negative outlooks to many governments worldwide and may continue to do so in the future. Any perceived decline in the creditworthiness of the governments that issue bonds held by Bond Constituent ETFs, as a result of a credit rating downgrade or otherwise, may cause the yield on those bonds to increase and the prices of those bonds to fall, perhaps

significantly, and may cause increased volatility in local or global credit markets. In addition, any perceived improvement in the creditworthiness of the governments that issue bonds held by Bond Constituent ETFs may result in an increase in the risk tolerance of market participants, which may cause the yield on those bonds to increase and the prices of those bonds to fall, which may adversely impact the prices of the relevant Bond Constituent ETFs and could have a negative impact on any payment on the notes.

**An investment in the notes is subject to risks associated with non-U.S. securities markets, including emerging markets.**

Some or all of the securities held by several of the Bond Constituent ETFs have been issued by non-U.S. companies. An investment in the notes therefore involves risks associated with the securities markets in those countries where the relevant non-U.S. securities are traded, including risks of volatility in those markets, governmental intervention in those markets and cross shareholdings in companies in certain countries. Also, there is generally less publicly available information about companies in some of these jurisdictions than about U.S. companies that are subject to the reporting requirements of the SEC, and generally non-U.S. companies are subject to accounting, auditing and financial reporting standards and requirements and securities trading rules different from those applicable to U.S. reporting companies. Moreover, some or all of the securities held by several of the Bond Constituent ETFs have been issued by emerging-markets countries. Investments in the notes, which are linked in part to the economic stability and development of such countries, involve risks associated with investments in, or the securities markets in, those countries.

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

The economies of emerging market countries in particular face several concerns, including relatively unstable governments that may present the risks of nationalization of businesses, restrictions on foreign ownership and prohibitions on the repatriation of assets, and which may have less protection of property rights than more developed countries. These economies may also be based on only a few industries, be highly vulnerable to changes in local and global trade conditions and may suffer from extreme and volatile debt burdens or inflation rates. In addition, local securities markets may trade a small number of securities and may be unable to respond effectively to increases in trading volume, potentially making prompt liquidation of holdings difficult or impossible at times.

Some or all of these factors may influence the value of the relevant Bond Constituent ETFs, 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. The value of any Bond Constituent ETF may, decrease, which may adversely affect any payment on the notes.

**The notes are subject to significant risks associated with floating rate notes.**

The iShares® Floating Rate Bond ETF invests in floating rate notes. Securities with floating or variable interest rates can be less sensitive to interest rate changes than securities with fixed interest rates, but may decline in value if their interest rates do not rise as much, or as quickly, as interest rates in general. Conversely, floating rate securities will not generally increase in value if interest rates decline. A decline in interest rates may result in a reduction in income received from floating rate securities held by the iShares® Floating Rate Bond ETF and may adversely affect the value of the iShares® Floating Rate Bond ETF's shares. Generally, floating rate securities carry lower yields than fixed notes of the same maturity. The interest rate for a floating rate note resets or adjusts periodically by reference to a benchmark interest rate, in some cases subject to a minimum or maximum rate. The impact of interest rate changes on floating rate investments is typically mitigated by the periodic interest rate reset of the investments. Floating rate notes in many instances are subject to legal or contractual restrictions on

resale, may trade infrequently, and their value may be impaired when the iShares® Floating Rate Bond ETF needs to liquidate these notes. Benchmark interest rates, such as the LIBOR, may not accurately track market interest rates.

There is no guarantee or assurance that: (i) the iShares® Floating Rate Bond ETF will be able to invest in a desired amount of floating rate notes, (ii) the iShares® Floating Rate Bond ETF will be able to buy floating rate notes at a desirable price or (iii) floating rate notes will be actively traded. Any or all of the foregoing, should they occur, would negatively impact the iShares® Floating Rate Bond ETF, which may adversely affect the value of, or any payment on, the notes.

**The notes are subject to significant risks associated with mortgage-backed securities.**

The iShares® MBS ETF invests in mortgage-backed securities issued or guaranteed by U.S. government agencies or government-sponsored entities. Mortgage-backed securities are subject to prepayment risk, which is the risk that during periods of falling interest rates, an issuer of mortgages and other fixed-income securities may be able to repay principal prior to the security's maturity causing the iShares® MBS ETF to have to reinvest in securities with a lower yield or higher risk of default, resulting in a decline in the iShares® MBS ETF's income or return potential. The iShares® MBS ETF may also have to reinvest in securities with a lower yield upon a default on underlying mortgages that triggers an acceleration of securities held by the iShares® MBS ETF. Mortgage-backed securities are also subject to extension risk, which is the risk that when interest rates rise, certain mortgage-backed securities will be paid off substantially more slowly than originally anticipated and the value of those securities may fall sharply, resulting in a decline in income and potentially in the value of the investment. Because of prepayment and extension risk, mortgage-backed securities react differently to changes in interest rates than other bonds. Small movements in interest rates (both increases and decreases) may quickly and significantly reduce the value of certain mortgage-backed securities.

Mortgage-backed securities issued or guaranteed by U.S. government agencies or government-sponsored entities (other than Ginnie Mae) are generally backed only by the general creditworthiness and reputation of the U.S. government agency or government-sponsored entity and are not guaranteed by the U.S. Department of the Treasury or backed by the full faith and credit of the U.S. government. If a U.S. government agency or government-sponsored entity that is the issuer or guarantor of securities held by the iShares® MBS ETF is unable to meet its obligations or ceases to exist and no plan is made for repayment of those securities, the performance of the iShares® MBS ETF will be adversely impacted, which may adversely affect the value of, or any payment on, the notes. In addition, government-sponsored entities that issue or guarantee mortgage-backed securities may be privatized in the future, which may adversely affect the value of, or any payment on, the notes.

**The notes are subject to significant risks associated with preferred stock.**

The iShares® Preferred and Income Securities ETF holds preferred stock. Unlike interest payments on debt securities, dividend payments on a preferred stock typically must be declared by the issuer's board of directors. An issuer's board of directors is generally not under any obligation to pay a dividend (even if such dividends have accrued) and may suspend payment of dividends on a preferred stock at any time. In the event an issuer of preferred stock experiences economic difficulties, the issuer's preferred stock may lose substantial value due to the reduced likelihood that the issuer's board of directors will declare a dividend and the fact that the preferred stock may be subordinated to other securities of the same issuer. Certain additional risks associated with preferred stock could adversely affect the value of the iShares® Preferred and Income Securities ETF.

Because many preferred stocks pay dividends at a fixed rate, their market price can be sensitive to changes in interest rates in a manner similar to bonds — that is, as interest rates rise, the value of any preferred stocks held by the iShares® Preferred and Income Securities ETF are likely to decline. To the extent that the iShares® Preferred and Income Securities ETF invests in fixed-rate preferred stocks, rising interest rates may cause the value of the iShares® Preferred and Income Securities ETF's investments to decline. In addition, because many preferred stocks allow holders to convert the preferred stock into common stock of the issuer, their market price can be sensitive to changes in the value of the issuer's common stock. To the extent that the iShares® Preferred and Income Securities ETF invests in

convertible preferred stocks, declining common stock values may also cause the value of the iShares® Preferred and Income Securities ETF's investments to decline.

There is a chance that the issuer of any preferred stock held by the iShares® Preferred and Income Securities ETF will have its ability to pay dividends deteriorate or will default (*i.e.*, fail to make scheduled dividend payments on the preferred stock or scheduled interest payments on other obligations of the issuer not held by the iShares® Preferred and Income Securities ETF), which would negatively affect the value of any such holding.

Preferred stocks are subject to market volatility and the prices of preferred stocks will fluctuate based on market demand. Preferred stocks often have call features which allow the issuer to redeem the security at its discretion. If a preferred stock is redeemed by the issuer, it will be removed from the relevant reference index. The redemption of preferred stocks having a higher than average yield may cause a decrease in the yield of the iShares® Preferred and Income Securities ETF and its reference index.

**The notes are subject to significant risks associated with hybrid securities.**

The iShares® Preferred and Income Securities ETF holds hybrid securities. Hybrid securities are securities that contain characteristics of both a debt security and an equity security. Therefore, hybrid securities are subject to the risks of equity securities and risks of debt securities. The terms of hybrid instruments may vary substantially, and certain hybrid securities may be subject to similar risks as preferred stocks, such as interest rate risk, issuer risk, dividend risk, call risk and extension risk. The claims of holders of hybrid securities of an issuer are generally subordinated to those of holders of traditional debt securities in bankruptcy, and thus hybrid securities may be more volatile and subject to greater risk than traditional debt securities, and may in certain circumstances even be more volatile than traditional equity securities. At the same time, hybrid securities may not fully participate in gains of their issuer and thus potential returns of such securities are generally more limited than traditional equity securities, which would participate in such gains. Hybrid securities may also be more limited in their rights to participate in management decisions of an issuer (such as voting for the board of directors). Certain hybrid securities may be more thinly traded and less liquid than either publicly issued equity securities or debt securities, especially hybrid securities that are “customized” to meet the needs of particular investors, potentially making it difficult for the Fund to sell such securities at a favorable price or at all. Any of these features could cause a loss in market value of hybrid securities held by the iShares® Preferred and Income Securities ETF or otherwise adversely affect the iShares® Preferred and Income Securities ETF and, therefore, the Index and the notes.

**Risks Relating to Exchange-Traded Funds**

**There are risks associated with ETFs.**

An ETF may have a limited operating history. Although the shares of an ETF may be listed for trading on a securities exchange and a number of similar products have been traded on securities exchanges for varying periods of time, there is no assurance that an active trading market will continue for the shares of any ETF or that there will be liquidity in the trading market.

In addition, ETFs are subject to management risk, which is the risk that the applicable investment adviser's investment strategy, the implementation of which is subject to a number of constraints, may not produce the intended results. These constraints could affect the market prices of the shares of an ETF and, consequently, could adversely affect the value of the notes. See the description of the relevant ETF in this underlying supplement for additional information.

**The policies of the investment adviser for an ETF, and the sponsor of its reference index, if any, could affect the value of, and the amount payable on, the notes.**

The policies of the investment adviser for any ETF concerning the calculation of the ETF's net asset value, additions, deletions or substitutions of securities underlying the ETF and the manner in which changes affecting the reference index, if any, of the ETF are reflected in the ETF could affect the market

price of shares of the ETF and, therefore, affect the value of the notes before maturity. Any payments on the notes could also be affected if the investment adviser changes these policies, for example, by changing the manner in which it calculates the ETF's net asset value or by changing the advisory management fee or making other changes that increase the expenses of the ETF, or if the investment adviser discontinues or suspends calculation or publication of the ETF's net asset value, in which case it may become difficult to determine the value of the notes.

In addition, the sponsor of the reference index, if any, of an ETF is responsible for the design and maintenance of that reference index. The policies of the sponsor concerning the calculation of that reference index, including decisions regarding the addition, deletion or substitution of the securities included in that reference index, could affect the value of the reference index and, consequently, could affect the market prices of the relevant ETF and, therefore, any payment on the notes and the value of the notes.

**The performance and market value of an ETF that is designed to track a reference index, particularly during periods of market volatility, may not correlate with the performance of its reference index as well as the net asset value per share of that ETF.**

Each ETF that is designed to track a reference index uses a representative sampling strategy or a replication or indexing strategy to attempt to track the performance of its reference index. Pursuant to a representative sampling strategy, an ETF invests in a representative sample of securities that collectively has an investment profile similar to its reference index; however, an ETF may not hold all or substantially all of the securities included in its reference index. Even if an ETF uses a replication or indexing strategy, that ETF may not hold all of the securities included in its reference index. In certain cases, an ETF may invest a significant portion of its portfolio in cash or money market instruments. While an ETF will principally hold the securities included in its reference index, its investment adviser generally may invest a portion of the ETF's assets in securities or other assets not included in the reference index and in other assets, including potentially shares of money market funds affiliated with or advised by the investment adviser. Consequently, the performance of an ETF is generally linked in part to assets other than the securities included in its reference index.

In addition, the performance of an ETF will reflect additional transaction costs and fees that are not included in the calculation of its reference index. Also, the component securities of an ETF may be unavailable in the secondary market. Corporate actions with respect to any securities (such as mergers and spin-offs) also may impact the variance between an ETF and its reference index. Finally, because the shares of an ETF are traded on a securities exchange and are subject to market supply and investor demand, the market value of one share of an ETF may differ from the net asset value per share of that ETF.

During periods of market volatility, the securities held by an ETF may be unavailable in the secondary market, market participants may be unable to calculate accurately the net asset value per share of an ETF and the liquidity of an ETF may be adversely affected. This kind of market volatility may also disrupt the ability of market participants to create and redeem shares of an ETF. Further, market volatility may adversely affect, sometimes materially, the prices at which market participants are willing to buy and sell shares of an ETF. As a result, under these circumstances, the market value of shares of an ETF may vary substantially from the net asset value per share of that ETF.

For all of the foregoing reasons, the performance of an ETF that is designed to track a reference index may not correlate with the performance of its reference index as well as the net asset value per share of that ETF, which could materially and adversely affect the value of the notes in the secondary market and/or reduce any payments on the notes. Consequently, the return on the notes will not be the same as investing (or taking a short position) directly in any ETF or any relevant reference index or in the securities held by any ETF or included in any relevant reference index, and will not be the same as investing in a financial product linked to the performance of any relevant reference index.

Additionally, if market volatility or these events were to occur on any of the Determination Date(s) (as defined in the accompanying product supplement), in some circumstances, the Index Calculation Agent and the calculation agent would each maintain discretion to determine whether these market volatility or

events have caused a market disruption event to occur, and these determinations may affect payments on the notes. If the Index Calculation Agent and the calculation agent each determine that no market disruption event has occurred, payments on the notes would be based on the closing level of the Index on the Determination Date(s), which will reflect the closing price of one share of the applicable ETF on the Determination Date(s), even if the relevant ETF is underperforming its reference index or the component securities of its reference index and/or trading below the net asset value per share of that ETF.

**There can be no assurance that publicly available information provided about any ETF is accurate or complete.**

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

### **Risks Relating to the Notional Financing Cost**

**The interest rates referenced in determining the notional financing cost will be affected by a number of factors.**

The notional financing cost is currently determined by reference to 2-month and 3-month USD LIBOR. A number of factors can affect the levels of 2-month and 3-month USD LIBOR, including, but not limited to:

- *changes in, or perceptions about, future rates:* increased interest rate volatility is historically associated with an increased spread between long- and short-term interest rates and, conversely, decreased volatility is historically associated with tighter spreads;
- *general economic conditions:* the economic, financial, political, regulatory and judicial events that affect financial markets generally will affect 2-month and 3-month USD LIBOR;
- *prevailing interest rates:* 2-month and 3-month USD LIBOR are subject to daily fluctuations depending on the levels of prevailing interest rates in the market generally; in addition, lower overall interest rates are historically associated with an increased spread between long and short-term interest rates and, conversely, higher overall interest rates are historically associated with tighter spreads; and
- *policy of the Federal Reserve Board or central banks or other countries regarding interest rates:* an easing of monetary policy is historically associated with an increased spread between long and short-term interest rates and, conversely, a tightening of monetary policy is historically associated with tighter spreads.

These and other factors may have an impact on the performance of 2-month and 3-month USD LIBOR.



**The interest rates referenced in determining the notional financing cost and the manner in which they are calculated may change in the future.**

There can be no assurance that the method by which 2-month and 3-month USD LIBOR are calculated will not change. Such changes in the method of calculation could reduce or increase the level of the relevant interest rates.

**The interest rates referenced in determining the notional financing cost may be volatile.**

Two-month and 3-month USD LIBOR are subject to volatility due to a variety of factors affecting interest rates generally, including:

- sentiment regarding underlying strength in the U.S. and global economies;
- expectation regarding the level of price inflation;
- sentiment regarding credit quality in U.S. and global credit markets;
- central bank policy regarding interest rates; and
- performance of capital markets.

**Regulatory developments may result in changes to the rules or methodology used to determine the value of LIBOR, which may adversely affect any payment on the notes.**

The methodologies used to determine the value of certain “benchmarks,” including LIBOR, are the subject of recent national, international and other regulatory guidance, proposals for reform and investigations. These reforms or changes made in response to these investigations may cause those benchmarks to perform differently than in the past and may have other consequences that cannot be predicted. In addition, market participants may elect not to continue to participate in the administration of certain benchmarks if these reforms and investigations increase the costs and risks associated with those activities, which could cause changes in the rules or methodologies used in certain benchmarks or lead to the disappearance of certain benchmarks. Any of these changes could adversely affect the value of the notes and any payment on the notes.

**Uncertainty about the future of LIBOR may affect 2-month and 3-month USD LIBOR rates, which may adversely affect the Index and therefore the return on and the market value of the notes.**

On July 27, 2017, the Chief Executive of the U.K. Financial Conduct Authority (the “FCA”), which regulates LIBOR, announced that the FCA intends to stop persuading or compelling banks to submit rates for the calculation of LIBOR rates to the LIBOR administrator after 2021. The announcement indicates that the continuation of LIBOR on the current basis cannot and will not be guaranteed. It is impossible to predict whether and to what extent banks will continue to provide LIBOR submissions to the administrator of LIBOR, whether LIBOR rates will cease to be published or supported before or after 2021, whether LIBOR will continue to be published, but will cease to be a representative measure of market interest rates due to a reduction in the number of LIBOR submissions, or whether any additional reforms to LIBOR may be enacted in the United Kingdom or elsewhere. At this time, no consensus exists as to what rate or rates may become accepted alternatives to LIBOR and it is impossible to predict the effect of any such alternatives on the notes. Uncertainty as to the nature of alternative reference rates and as to potential changes or other reforms to LIBOR may affect the 2-month and 3-month USD LIBOR rates used to determine the notional financing cost during the term of the notes, which may adversely affect the Index and therefore the return on and market value of the notes. If the relevant LIBOR rates are no longer calculated and announced or are cancelled after 2021, or if the regulatory supervisor of the administrator of LIBOR makes a public statement or publishes information announcing that the LIBOR is no longer representative, the interest rates used to determine the notional financing cost will be determined in the manner set forth under “The J.P. Morgan Mojave Index — Interest Rate Extraordinary Events” below. Any successor or replacement interest rates may perform differently from the 2-month and 3-month USD LIBOR rates, which may adversely affect the Index and therefore the return on and the market value 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 MOJAVE INDEX

*Terms defined within this “The J.P. Morgan Mojave Index” section are defined only with respect to this “The J.P. Morgan Mojave Index” section.*

The J.P. Morgan Mojave Index (the “**Index**”) was developed and is maintained and calculated by J.P. Morgan Securities LLC (“**JPMS**”). The description of the Index and methodology included in this underlying supplement is based on rules formulated by JPMS (the “**Rules**”). The Rules, and not this description, will govern the calculation and constitution of the Index and other decisions and actions related to its maintenance. The Rules in effect as of the date of this underlying supplement are attached as Annex A to this underlying supplement. The Index is the intellectual property of JPMS, and JPMS reserves all rights with respect to its ownership of the Index. The Index is reported by Bloomberg L.P. under the ticker symbol “JPUSMOJ5 Index.”

The Index attempts to provide a dynamic rules-based allocation to the iShares® MSCI USA Momentum Factor ETF (the “**Equity Constituent**”) and the J.P. Morgan Total Return 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, with distributions, if any, reinvested, and the Bond Constituent, in each case with a notional financing cost deducted, less (b) the daily deduction of a fee of 0.50% per annum (the “**Index Fee**”).

- The Equity Constituent is an exchange-traded fund (“**ETF**”) that seeks to track the investment results, before fees and expenses, of an index composed of U.S. large- and mid-capitalization stocks exhibiting relatively higher price momentum, which is currently the MSCI USA Momentum Index. The MSCI USA Momentum Index is designed to reflect the performance of an equity momentum strategy by emphasizing stocks with high price momentum, while maintaining reasonably high trading liquidity, investment capacity and moderate index turnover. In September 2020, iShares® Trust announced that beginning on or around December 1, 2020, the Equity Constituent will seek to track a new reference index, the MSCI Momentum SR Variant Index, and will cease to track the MSCI USA Momentum Index. The MSCI Momentum SR Variant Index is a variation of the MSCI USA Momentum Index wherein all the changes driven by the index rebalances of the MSCI USA Momentum Index are distributed over three days leading into the rebalancing effective date. For additional information about the Equity Constituent, see “Background on the iShares® ETFs” below.
- The Bond Constituent is an index that applies a rules-based methodology to evaluate recent market conditions and allocate exposure dynamically across up to 12 ETFs that each track a U.S. dollar fixed income sector. For additional information about the Bond Constituent, see “Background on the J.P. Morgan Total Return Index” 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, because the Bond Constituent generally attempts to allocate to a portfolio with a realized volatility less than or equal to 5.0%, the Equity Constituent's realized volatility has tended to be significantly higher than the Bond Constituent's realized volatility. 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 excess return performance of the Portfolio Constituents (*i.e.*, the total return performance less the notional financing cost) less (b) the daily deduction of the Index Fee of 0.50% per annum. The Index Level was set equal to 100.00 on June 2, 2004, the base date of the Index. The Index Calculation Agent (as defined below) began calculating the Index on a live basis on January 27, 2020.

The notional financing cost is intended to approximate the cost of maintaining a position in the Portfolio Constituents using borrowed funds and is currently calculated as a composite rate of interest that is intended to track the overnight rate of return of a notional position in a 3-month time deposit in U.S. dollars, which is currently calculated by referencing 2-month and 3-month USD LIBOR rates. LIBOR, which stands for “London Interbank Offered Rate,” is the average interest rate estimated by leading banks in London that they would be charged if borrowing from other banks without pledging any collateral or security. The Index is an “excess return” index and not a “total return” index because, as part of the calculation of the Index Level, the performance of each Portfolio Constituent is reduced by the notional financing cost.

On July 27, 2017, the Chief Executive of the U.K. Financial Conduct Authority (the “**FCA**”), which regulates LIBOR, announced that the FCA intends to stop persuading or compelling banks to submit rates for the calculation of LIBOR rates to the LIBOR administrator after 2021. It is impossible to predict the impact of this announcement on LIBOR rates, whether LIBOR rates will cease to be published or supported before or after 2021, the impact of any alternative reference rates or whether any additional reforms to LIBOR may be enacted in the United Kingdom or elsewhere. Uncertainty as to the nature of alternative reference rates and as to potential changes or other reforms to LIBOR may affect the 2-month and 3-month USD LIBOR rates used to determine the notional financing cost during the term of the notes, which may adversely affect the Index and therefore the return on and market value of the notes. Any successor or replacement interest rates may perform differently from the 2-month and 3-month USD LIBOR rates, which may adversely affect the Index and therefore the return on and the market value of the notes. See “Risk Factors — Risks Relating to the Notional Financing Cost” above.

**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 Fee 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 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.

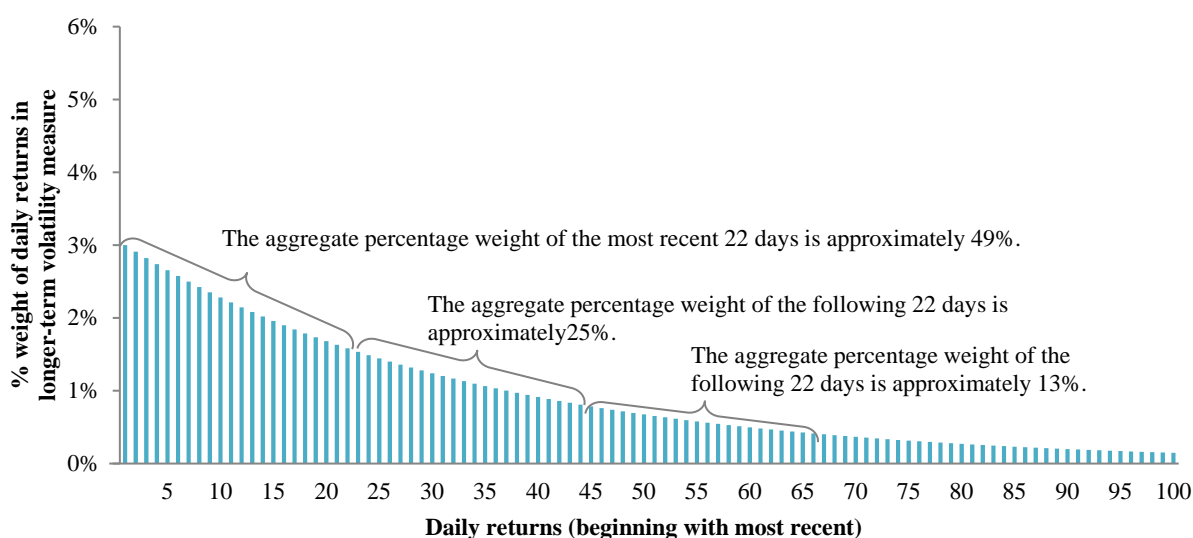
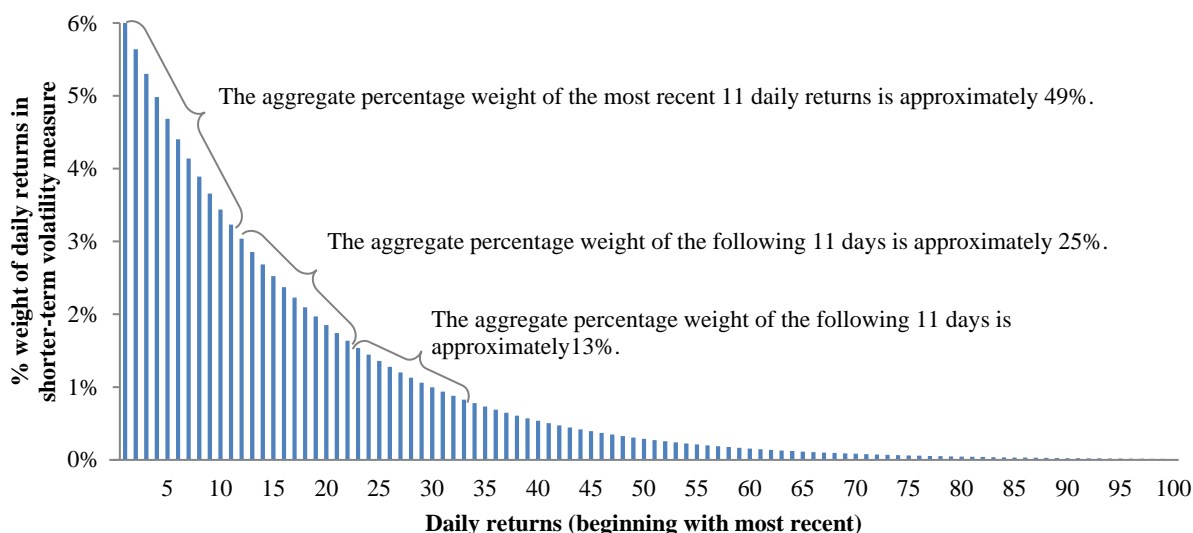
### **Determining the Volatility of a Notional Portfolio**

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.

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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.

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 excess return 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 Fee that has accrued since the immediately preceding Index Calculation Day.

The closing excess return level of each Portfolio Constituent reflects the total return performance (*i.e.*, the price performance plus the notional reinvestment of dividends) of that Portfolio Constituent, less a notional financing cost. The calculation of the closing excess return level of each Portfolio Constituent depends on whether a Portfolio Constituent is an ETF (an “**ETF Component**”) or an index (an “**Index Component**”). The Equity Constituent is currently an ETF Component and the Bond Constituent is currently an Index Component.

- The closing excess return level of each Portfolio Constituent that is an ETF Component (currently, only the Equity Constituent) is generally calculated by adjusting the closing excess return level of that Portfolio Constituent as of the immediately preceding Index Calculation Day to reflect (a) the change in the closing price of that Portfolio Constituent since the immediately preceding Index Calculation Day, (b) the notional reinvestment of any dividends or other distributions with an ex-date that has occurred since the immediately preceding Index Calculation Day and (c) a deduction of the notional financing cost accrued since the immediately preceding Index Calculation Day.
- The closing excess return level of each Portfolio Constituent that is an Index Component (currently, only the Bond Constituent) is generally calculated by adjusting the closing excess return level of that Portfolio Constituent as of the immediately preceding Index Calculation Day to reflect (a) the change in the closing level of that Portfolio Constituent since the immediately preceding Index Calculation Day (which will reflect the notional reinvestment of any dividends or other distributions by operation of the calculation of the closing level of that Portfolio Constituent) and (b) a deduction of the notional financing cost accrued since the immediately preceding Index Calculation Day.

The notional financing cost is intended to approximate the cost of maintaining a position in the Portfolio Constituents using borrowed funds and is currently calculated as a composite rate of interest that is intended to track the overnight rate of return of a notional position in a 3-month time deposit in U.S. dollars, which is currently calculated by referencing the 2-month and 3-month USD LIBOR rates. LIBOR, which stands for “London Interbank Offered Rate,” is the average interest rate estimated by leading banks in London that they would be charged if borrowing from other banks without pledging any collateral or security. The Index is an “excess return” index and not a “total return” index because the performance of each Portfolio Constituent is reduced by a notional financing cost.

The Index Calculation Agent will make anti-dilution adjustments to a Portfolio Constituent that is an ETF Component only upon a share split or reverse share split, an issuance of additional shares of that Portfolio Constituent that is given ratably to all or substantially all holders of shares of that Portfolio Constituent or a distribution of securities of that Portfolio Constituent as a result of the triggering of any provision of the corporate charter of that Portfolio Constituent.

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) for a Portfolio Constituent that is an Index Component, a weekday on which the closing level of that Portfolio Constituent is scheduled to be calculated and published; and (b) for a Portfolio Constituent that is an ETF Component, each weekday on which the primary listing exchange for that Portfolio Constituent is scheduled to be open for trading for its regular trading session.

### **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 that is an Index Component or to the reference index of a Portfolio Constituent that is an ETF Component, (b) the delisting, termination, liquidation, bankruptcy, insolvency, dissolution or winding-up of a Portfolio Constituent that is an ETF Component, (c) nationalization or expropriation of a Portfolio Constituent that is an ETF Component or its securities or all or substantially all of its assets, (d) the occurrence of a market disruption affecting a Portfolio Constituent that continues for a sustained period, (e) the termination or impairment of any relevant license or other right relied upon by the Index Calculation Agent in administering the Index, (f) the occurrence of certain changes in law and (g) certain other events affecting the trading, value, redeemability, liquidity, market capitalization or listing of a Portfolio Constituent that is an ETF Component or 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.



## Interest Rate Extraordinary Events

If the sponsor of 2-month or 3-month USD LIBOR rates (each, an “**Interest Rate**”) is not calculated and announced by the relevant sponsor, but is calculated and announced by a successor sponsor acceptable to the Index Calculation Agent, or if an Interest Rate is replaced by a successor rate that, in the determination of the Index Calculation Agent, is the same or substantially similar to that Interest Rate, then that Interest Rate will be deemed to be the successor Interest Rate, with effect from a date determined by the Index Calculation Agent.

If an Interest Rate materially changes, is cancelled or is not published for a sustained period, then the Index Calculation Agent may determine to select a replacement Interest Rate that possesses substantially similar characteristics to the Interest Rate that is being replaced or, if the Index Calculation Agent determines that there is no replacement Interest rate that possesses substantially similar characteristics to the original Interest Rate, then the Index Calculation Agent may select a replacement Interest Rate that it determines will be an appropriate replacement Interest Rate or, in the case of a material change or sustain non-publication, continue to reference the original Interest Rate. In connection with any replacement, the Index Calculation Agent may make adjustments to the Rules that it determines are appropriate to account for such changes. Such adjustments to the Rules could include, without limitation, the addition of a spread adjustment to such successor Interest Rate or replacement Interest Rate. The inclusion of a spread adjustment could adversely affect the Index and therefore the return on and market value of the notes.

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 event described above affecting an Interest Rate. The Index Sponsor is under no obligation to continue the calculation and publication of the Index.

## Corrections

If the closing price or closing level, as applicable, of any Portfolio Constituent or any Interest Rate 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.

## **Additional Information about Hypothetical Back-tested Performance Data**

For time periods prior to the launch of the Equity Constituent, and prior to the Equity Constituent's satisfaction of a minimum liquidity standard, any hypothetical back-tested performance of the Index set forth in any terms supplement will reflect alternative performance derived from the reference index tracked by the Equity Constituent as of the live date of the Index, after deducting hypothetical fund

expenses equal to the Equity Constituent's expense ratio as of the live date of the Index, rather than actual performance of the Equity Constituent for that period.

For time periods prior to the launch of each of the Bond Constituent's underlying ETFs, and prior to that underlying ETF's satisfaction of a minimum liquidity standard, any hypothetical back-tested performance of the Index set forth in any terms supplement will reflect alternative performance derived from the reference index tracked by that underlying ETF as of the live date of the Bond Constituent (except in the case of each of the iShares® 7-10 Year Treasury Bond ETF and the iShares® 20+ Year Treasury Bond ETF, where each proxy was the reference index tracked by the relevant underlying ETF prior to April 1, 2016), after deducting hypothetical fund expenses equal to that underlying ETF's expense ratio as of the Bond Constituent's live date, rather than actual performance of that underlying ETF for that period. See the following table for more information.

| ETF  | Proxy   | Expenses<br>Subtracted<br>from Proxy's<br>Returns | Last Date<br>Proxy Used |
|--|---|---|-------------------------|
| iShares® MSCI USA Momentum Factor ETF              | MSCI USA Momentum Index   | 0.15%   | 9/2/2015                |
| iShares® 1-3 Year Treasury Bond ETF                | n/a   | n/a   | n/a                     |
| iShares® 7-10 Year Treasury Bond ETF               | Barclays U.S. 7-10 Year Treasury Bond Index   | 0.15%   | 4/23/2004               |
| iShares® 20+ Year Treasury Bond ETF                | Barclays U.S. 20+ Year Treasury Bond Index  | 0.15%   | 4/16/2004               |
| iShares® Short-Term Corporate Bond ETF             | Bloomberg Barclays US 1-3 Year Credit Bond Index                                      | 0.20%   | 1/13/2009               |
| iShares® Intermediate-Term Corporate Bond ETF      | Bloomberg Barclays US Intermediate Credit Bond Index                                  | 0.20%   | 4/6/2009                |
| iShares® Long-Term Corporate Bond ETF              | Bloomberg Barclays US Long Credit Index   | 0.20%   | 6/25/2014               |
| iShares® MBS ETF                                   | Bloomberg Barclays US Mortgage Backed Securities (MBS) Index                          | 0.29%   | 9/11/2008               |
| iShares® TIPS Bond ETF                             | Bloomberg Barclays US Treasury Inflation Protected Securities (TIPS) Index (Series-L) | 0.20%   | 5/27/2004               |
| iShares® J.P. Morgan USD Emerging Markets Bond ETF | J.P. Morgan EMBI <sup>SM</sup> Global Core Index                                      | 0.40%   | 11/17/2009              |
| iShares® iBoxx \$ High Yield Corporate Bond ETF    | Markit iBoxx® USD Liquid High Yield Index   | 0.50%   | 5/23/2008               |
| iShares® Floating Rate Bond ETF                    | Bloomberg Barclays US Floating Rate Note < 5 Years Index                              | 0.20%   | 1/15/2013               |
| iShares® Preferred and Income Securities ETF       | S&P U.S. Preferred Stock Index  | 0.47%   | 10/20/2008              |

## BACKGROUND ON THE J.P. MORGAN TOTAL RETURN INDEX

*Terms defined within this “Background on the J.P. Morgan Total Return Index” section are defined only with respect to this “Background on the J.P. Morgan Total Return Index” section.*

The J.P. Morgan Total Return 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 B to this underlying supplement. The Index is the intellectual property of JPMS, and JPMS reserves all rights with respect to its ownership of the Index. The Index is reported by Bloomberg L.P. under the ticker symbol “JPUSTRI Index.”

The Index seeks to provide a dynamic asset allocation to the U.S. dollar fixed income sector based on a momentum allocation strategy. The Index tracks the return of a notional dynamic portfolio consisting of up to 12 U.S. dollar fixed-income exchange-traded funds (each a “**Constituent**,” and collectively, the “**Constituents**”), in each case with distributions, if any, notionally reinvested.

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

- (i) maintain a diversified allocation within the U.S. dollar fixed income sector at all times; and
- (ii) allocate dynamically based on recent performance.

*Maintaining a diversified allocation within the U.S. dollar fixed income sector.* A diversified portfolio's return is the weighted average of its constituents' returns, but its volatility is less than the weighted average of its constituents' volatilities, because different assets don't always move in the same direction — in this sense, a diversified portfolio can be said to deliver average returns with below-average volatility. In order to ensure diversification, the Index selects its monthly portfolio from a universe of 12 Constituents, and imposes caps and floors on the Constituent weights at the individual and sector levels. Each Constituent's assigned weight must also be an increment of 5%, and the assigned weights must sum to 100%. The following table sets forth the current Constituents, the exchange ticker for each Constituent, the maximum assigned weight for each Constituent and the maximum aggregate assigned weight for each sector. For additional information about the Constituents, see “Background on the Constituents” below.

|   | Constituent  | Ticker | Maximum Assigned Weight | Maximum Aggregate Assigned Weight       |
|---|--|--------|-------------------------|---|
| 1 | iShares® 1-3 Year Treasury Bond ETF                | SHY    | 20%                     | U.S. Treasury Bond Sector: 50%          |
| 2 | iShares® 7-10 Year Treasury Bond ETF               | IEF    | 20%                     |   |
| 3 | iShares® 20+ Year Treasury Bond ETF                | TLT    | 20%                     |   |
| 4 | iShares® Short-Term Corporate Bond ETF             | IGSB   | 20%                     | Investment Grade Credit Sector: 50%     |
| 5 | iShares® Intermediate-Term Corporate Bond ETF      | IGIB   | 20%                     |   |
| 6 | iShares® Long-Term Corporate Bond ETF              | IGLB   | 20%                     |   |
| 7 | iShares® MBS ETF                                   | MBB    | 20%                     | Other Government and Agency Sector: 50% |
| 8 | iShares® TIPS Bond ETF                             | TIP    | 20%                     |   |
| 9 | iShares® J.P. Morgan USD Emerging Markets Bond ETF | EMB    | 10%                     |   |

|    | Constituent                                     | Ticker | Maximum Assigned Weight | Maximum Aggregate Assigned Weight |
|----|---|--------|-------------------------|-----------------------------------|
| 10 | iShares® iBoxx \$ High Yield Corporate Bond ETF | HYG    | 20%                     | Other Credit Sector: 25%          |
| 11 | iShares® Floating Rate Bond ETF                 | FLOT   | 10%                     |                                   |
| 12 | iShares® Preferred and Income Securities ETF    | PFF    | 10%                     |                                   |

*Allocating dynamically based on recent performance.* Academic research has shown that, historically, asset classes exhibiting strong recent returns have been more likely to continue to exhibit positive returns. The Index attempts to take advantage of this dynamic by selecting a monthly portfolio that reflects the strongest recent returns from among the possible portfolios that meet the weight constraints set forth above and the volatility threshold described below.

*Selecting a monthly portfolio.* Each month, the Index identifies every notional portfolio that meets the individual Constituent and sector weight constraints set forth above with weights in increments of 5% and a total weight of 100% and that has a recent historical volatility at or below a volatility threshold of 5%. The Index then selects and rebalances into the notional portfolio from that set with the strongest recent performance. If no such notional portfolio exists, then the volatility threshold is increased by 1% (e.g., from 5% to 6%), and the procedure described in this paragraph is repeated, including the increase to the volatility threshold, until a notional portfolio has been selected.

*Calculating the level of the Index.* On any given day, the closing level of the Index (the “**Index Level**”) reflects the weighted performance of the Constituents, in each case with distributions, if any, notionally reinvested. The Index Level was set equal to 100.00 on May 3, 2004, the base date of the Index. The Index Calculation Agent (as defined below) began calculating the Index on a live basis on July 13, 2017.

**No assurance can be given that the investment strategy used to construct the Index will be successful or that the Index will outperform any alternative portfolio or strategy that might be constructed from the Constituents. There is no guarantee that past performance trends referenced in selecting a monthly portfolio will continue during the subsequent period when the Index provides exposure to that monthly portfolio. In addition, no assurance can be given that the actual realized volatility of the Index will approximate 5%. The actual realized volatility of the Index will depend on the performance of the Constituents included in the monthly portfolio(s) from time to time, and, at any time or for extended periods, may be greater than 5%, perhaps significantly, or less than 5%. Furthermore, the volatility threshold is subject to upward adjustment and, thus, the realized volatility threshold used to determine any monthly portfolio may be greater than 5%, perhaps significantly.**

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

### **Identifying the Monthly Portfolio**

Each calendar month, on the Index Trading Day immediately preceding the commencement of a Monthly Rebalancing Period (as defined below), the Index Calculation Agent identifies a single portfolio composed of the Constituents (the “**Monthly Portfolio**”) from among the set of hypothetical portfolios that meet the weight constraints, based on an evaluation of the historical performance and volatility of each of those hypothetical portfolios.

**“Index Business Day”** is defined in the Rules and means generally a day on which each of the NYSE Arca, Inc. and the primary listing exchange for each Constituent is scheduled to open for trading for its regular trading session.

**“Index Trading Day”** is defined in the Rules as “Trading Day” and means generally an Index Business Day for which all of the Constituents tracked by the Index are not subject to any market disruption or on which the Index rebalances a portion of its exposure from one Monthly Portfolio to the next.

*Step 1: Identify All Eligible Portfolios*

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

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

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

On each monthly selection date, the Index Calculation Agent selects the Eligible Portfolio with the highest performance that has a volatility less than or equal to a volatility threshold of 5% as the Monthly Portfolio; *provided that*, if there is more than one Eligible Portfolio with the same highest performance, the Eligible Portfolio that has the lowest volatility will be selected. If none of the Eligible Portfolios has a volatility equal to or less than 5%, the Index Calculation Agent will increase the volatility threshold by 1% and will repeat the procedure described in this paragraph, including the increase to the volatility threshold, until a portfolio has been selected.

For purposes of selecting a Monthly Portfolio:

- (i) the performance of an Eligible Portfolio is the return of that Eligible Portfolio over the immediately preceding six-month period; and
- (ii) the volatility of an Eligible Portfolio is the annualized realized volatility of that Eligible Portfolio over the immediately preceding six-month period.

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

## **Monthly Rebalancing of the Index**

Each calendar month, the Index exits its notional position in of the Monthly Portfolio associated with the prior month’s selection date and enters a notional position in the Monthly Portfolio associated with the current month’s selection date. This rebalancing of the Index is effected in equal increments over five rebalancing days, occurring over the last five consecutive Index Business Days of that calendar month (the **“Monthly Rebalancing Period”**). Rebalancing days are subject to postponement or adjustment if a market disruption affecting an incoming or outgoing Constituent has occurred or is continuing, as described under “Index Market Disruption Events” below.

## Calculation and Publication of the Index Level

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

The Index Level on each Index Trading Day is generally calculated by adjusting the Index Level as of the immediately preceding Index Trading Day to reflect the performance of the Monthly Portfolio since the immediately preceding Index Trading Day. However, the Index Level on the final four rebalancing days of each Monthly Rebalancing Period is calculated by adjusting the Index Level as of the immediately preceding rebalancing day to reflect the weighted performances of the incoming and outgoing Monthly Portfolios since the immediately preceding rebalancing day, using the assigned weights set out in the following table.

| <b>Rebalancing Day</b> | <b>Assigned Weight of Outgoing Monthly Portfolio</b> | <b>Assigned Weight of Incoming Monthly Portfolio</b> |
|------------------------|--|--|
| Second                 | 80%  | 20%  |
| Third                  | 60%  | 40%  |
| Fourth                 | 40%  | 60%  |
| Final                  | 20%  | 80%  |

The performance of a Monthly Portfolio from one Index Trading Day to the next reflects the change in the value of that Monthly Portfolio over that period, where the value of a Monthly Portfolio on each Index Trading Day is equal to the weighted average of the closing total return levels of its Constituents on that Index Trading Day.

The closing total return level of each Constituent is generally calculated by adjusting the closing total return level of that Constituent as of the immediately preceding Index Trading Day to reflect (a) the change in the closing price of that Constituent since the immediately preceding Index Trading Day and (b) the notional reinvestment of any dividends or other distributions with an ex-date that has occurred since the immediately preceding Index Trading Day.

The Index Calculation Agent will make anti-dilution adjustments to a Constituent only upon a share split or reverse share split, an issuance of additional shares of that Constituent that is given ratably to all or substantially all holders of shares of that Constituent or a distribution of securities of that Constituent as a result of the triggering of any provision of the corporate charter of that Constituent.

While the Index Calculation Agent will publish the Index Level with respect each Index Trading 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 Market Disruption Events

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

If a market disruption affecting an incoming or outgoing Constituent has occurred or is continuing on a scheduled rebalancing day, that rebalancing day will generally be postponed until no such market

disruption is occurring. 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. The Index Level will not be calculated and published on any day on which a Constituent included in a relevant Monthly Portfolio is affected by a market disruption, except for a rebalancing day on which the Index Calculation Agent rebalances the Index notwithstanding the occurrence of a market disruption.

The five rebalancing days in each Monthly Rebalancing Period will occur on five separate calendar days, notwithstanding the postponement of one or more days due to a market disruption. If a rebalancing day is postponed, any subsequent rebalancing days in the same rebalancing period will also be postponed so as to prevent multiple rebalancing days from occurring on the same day.

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

### **Succession and Extraordinary Events**

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

The extraordinary events are set out in full in the Rules and include, without limitation, (a) the delisting, termination, liquidation, bankruptcy, insolvency, dissolution or winding-up of a Constituent, (b) nationalization or expropriation of a Constituent or its securities or all or substantially all of its assets, (c) the occurrence of a market disruption affecting a Constituent that continues for a sustained period, (d) the termination or impairment of any relevant license or other right relied upon by the Index Calculation Agent in administering the Index, (e) the occurrence of certain changes in law and (f) certain other events affecting the trading, value, redeemability, liquidity, market capitalization or listing of a Constituent or affecting data relating to a 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 price of any Constituent is publicly corrected after its initial dissemination or if the Index Calculation Agent identifies an error or omission in respect of the Index, and if the Index Calculation Agent determines that the correction, error or omission is material, then the Index Calculation Agent may make an adjustment or correction to the Index Level.

### **The Index Sponsor and the Index Calculation Agent**

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



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

### **Index Sponsor and Index Calculation Agent Determinations**

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

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

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

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

### **Amendment of the Rules; Termination of the Index**

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

Although the Rules are intended to be comprehensive and accurate, ambiguities may arise and errors or omissions may have been made. In those circumstances, the Index Sponsor will resolve those ambiguities and, if necessary, amend the Rules to reflect their resolution. In the case of any inaccuracy,

the Index Sponsor may amend the Rules to address errors or omissions. The Index Sponsor is under no obligation to inform any person of any amendments to the Index (except as may be required by law).

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

#### **Additional Information About Hypothetical Back-tested Performance Data**

For time periods prior to the launch of each of the Constituents, and prior to that Constituent’s satisfaction of a minimum liquidity standard, any hypothetical back-tested performance of the Index set forth in any terms supplement will reflect alternative performance derived from the reference index tracked by that Constituent as of the live date of the Index (except in the case of each of the iShares® 7-10 Year Treasury Bond ETF and the iShares® 20+ Year Treasury Bond ETF, where each proxy was the reference index tracked by the relevant Constituent prior to April 1, 2016), after deducting hypothetical fund expenses equal to that Constituent’s expense ratio as of the live date of the Index, rather than actual performance of that Constituent for that period. See the following table for more information.

| <b>Constituent</b>                                 | <b>Proxy</b>  | <b>Expenses Subtracted from Proxy’s Returns</b> | <b>Last Date Proxy Used</b> |
|--|---|---|-----------------------------|
| iShares® 1-3 Year Treasury Bond ETF                | n/a   | n/a   | n/a                         |
| iShares® 7-10 Year Treasury Bond ETF               | Barclays U.S. 7-10 Year Treasury Bond Index   | 0.15%   | 4/23/2004                   |
| iShares® 20+ Year Treasury Bond ETF                | Barclays U.S. 20+ Year Treasury Bond Index  | 0.15%   | 4/16/2004                   |
| iShares® Short-Term Corporate Bond ETF             | Bloomberg Barclays US 1-3 Year Credit Bond Index                                      | 0.20%   | 1/13/2009                   |
| iShares® Intermediate-Term Corporate Bond ETF      | Bloomberg Barclays US Intermediate Credit Bond Index                                  | 0.20%   | 4/6/2009                    |
| iShares® Long-Term Corporate Bond ETF              | Bloomberg Barclays US Long Credit Index   | 0.20%   | 6/25/2014                   |
| iShares® MBS ETF                                   | Bloomberg Barclays US Mortgage Backed Securities (MBS) Index                          | 0.29%   | 9/11/2008                   |
| iShares® TIPS Bond ETF                             | Bloomberg Barclays US Treasury Inflation Protected Securities (TIPS) Index (Series-L) | 0.20%   | 5/27/2004                   |
| iShares® J.P. Morgan USD Emerging Markets Bond ETF | J.P. Morgan EMBI <sup>SM</sup> Global Core Index                                      | 0.40%   | 11/17/2009                  |

| <b>Constituent</b>                                 | <b>Proxy</b>  | <b>Expenses<br/>Subtracted<br/>from Proxy's<br/>Returns</b> | <b>Last Date<br/>Proxy Used</b> |
|--|---|---|---------------------------------|
| iShares® iBoxx \$ High Yield<br>Corporate Bond ETF | Markit iBoxx® USD Liquid High<br>Yield Index                | 0.50%   | 5/23/2008                       |
| iShares® Floating Rate Bond ETF                    | Bloomberg Barclays US Floating<br>Rate Note < 5 Years Index | 0.20%   | 1/15/2013                       |
| iShares® Preferred and Income<br>Securities ETF    | S&P U.S. Preferred Stock Index                              | 0.47%   | 10/20/2008                      |

## BACKGROUND ON THE iSHARES® ETFS

All information contained in this underlying supplement regarding the iShares® MSCI USA Momentum Factor ETF, the iShares® 1-3 Year Treasury Bond ETF, the iShares® 7-10 Year Treasury Bond ETF, the iShares® 20+ Year Treasury Bond ETF, the iShares® Short-Term Corporate Bond ETF, the iShares® Intermediate-Term Corporate Bond ETF and the iShares® Long-Term Corporate Bond ETF, the iShares® MBS ETF, the iShares® TIPS Bond ETF, the iShares® J.P. Morgan USD Emerging Markets Bond ETF, the iShares® iBoxx \$ High Yield Corporate Bond ETF, the iShares® Floating Rate Bond ETF and the iShares® Preferred and Income Securities ETF (each, an “iShares ETF” and collectively, the “iShares ETFs”), including, without limitation, their make-up, method of calculation and changes in their components, has been derived from publicly available information, without independent verification. This information reflects the policies of, and is subject to change by, the fund manager of each iShares ETF and BlackRock Fund Advisors (“BFA”). The iShares ETFs are investment portfolios of iShares® Trust and are maintained and managed by their respective fund managers. BFA is currently the investment adviser to the iShares ETFs.

BFA uses a representative sampling indexing strategy to manage each iShares ETF. “Representative sampling” is an indexing strategy that involves investing in a representative sample of securities that collectively has an investment profile similar to that of an applicable reference index. The securities selected are expected to have, in the aggregate, investment characteristics (based on factors such as market capitalization and industry weightings), fundamental characteristics (such as return variability, duration, maturity, credit ratings and yield) and liquidity measures similar to those of an applicable reference index. An iShares ETF may or may not hold all of the securities in its reference index.

Each iShares ETF's reference index is a financial calculation, based on a grouping of financial instruments, and is not an investment product, while each iShares ETF is an actual investment portfolio. The performance of each iShares ETF and its reference index may vary for a number of reasons, including transaction costs, non-U.S. currency valuations, asset valuations, corporate actions (such as mergers and spin-offs), timing variances and differences between that iShares ETF's portfolio and its reference index resulting from that iShares ETF's use of representative sampling or from legal restrictions (such as diversification requirements) that apply to that iShares ETF but not to its reference index. “Tracking error” is the divergence of the performance (return) of an iShares ETF's portfolio from that of its reference index. Because each iShares ETF uses a representative sampling indexing strategy, it can be expected to have a larger tracking error than if it used a replication indexing strategy. “Replication” is an indexing strategy in which a fund invests in substantially all of the securities in its reference index in approximately the same proportions as in the reference index.

iShares® Trust is a registered investment company that consists of numerous separate investment portfolios, including the iShares ETFs. Information provided to or filed with the SEC by iShares® Trust pursuant to the Securities Act of 1933, as amended, and the Investment Company Act of 1940, as amended, can be located by reference to SEC file numbers 333-92935 and 811-09729 through the SEC's website at <http://www.sec.gov>.

### The iShares® MSCI USA Momentum Factor ETF

The iShares® MSCI USA Momentum Factor ETF seeks to track the investment results, before fees and expenses, of an index composed of U.S. large- and mid-capitalization stocks exhibiting relatively higher price momentum, which is currently the MSCI USA Momentum Index. The MSCI USA Momentum Index is designed to reflect the performance of an equity momentum strategy by emphasizing stocks with high price momentum, while maintaining reasonably high trading liquidity, investment capacity and moderate index turnover. In September 2020, iShares® Trust announced that beginning on or around December 1, 2020, the Equity Constituent will seek to track a new reference index, the MSCI Momentum SR Variant Index, and will cease to track the MSCI USA Momentum Index. The MSCI Momentum SR Variant Index is a variation of the MSCI USA Momentum Index wherein all the changes driven by the index rebalances of the MSCI USA Momentum Index are distributed over three days leading into the rebalancing effective date. The iShares® MSCI USA Momentum Factor ETF trades on Cboe BZX Exchange, Inc. under the ticker symbol “MTUM.”

### **The iShares® 1-3 Year Treasury Bond ETF**

The iShares® 1-3 Year Treasury Bond ETF seeks to track the investment results, before fees and expenses, of an index composed of U.S. Treasury bonds with remaining maturities between one and three years, which is currently the ICE U.S. Treasury 1-3 Year Bond Index. The ICE U.S. Treasury 1-3 Year Bond Index measures the performance of public obligations of the U.S. Treasury that have a remaining maturity of greater than or equal to one year and less than three years. The iShares® 1-3 Year Treasury Bond ETF trades on The NASDAQ Stock Market under the ticker symbol “SHY.”

### **The iShares® 7-10 Year Treasury Bond ETF**

The iShares® 7-10 Year Treasury Bond ETF seeks to track the investment results, before fees and expenses, of an index composed of U.S. Treasury bonds with remaining maturities between seven and ten years, which is currently the ICE U.S. Treasury 7-10 Year Bond Index. The ICE U.S. Treasury 7-10 Year Bond Index measures the performance of public obligations of the U.S. Treasury that have a remaining maturity of greater than or equal to seven years and less than ten years. The iShares® 7-10 Year Treasury Bond ETF trades on The NASDAQ Stock Market under the ticker symbol “IEF.”

### **The iShares® 20+ Year Treasury Bond ETF**

The iShares® 20+ Year Treasury Bond ETF seeks to track the investment results, before fees and expenses, of an index composed of U.S. Treasury bonds with remaining maturities greater than twenty years, which is currently the ICE U.S. Treasury 20+ Year Bond Index. The ICE U.S. Treasury 20+ Year Bond Index measures the performance of public obligations of the U.S. Treasury that have a remaining maturity greater than or equal to twenty years. The iShares® 20+ Year Treasury Bond ETF trades on The NASDAQ Stock Market under the ticker symbol “TLT.”

### **The iShares® Short-Term Corporate Bond ETF**

The iShares® Short-Term Corporate Bond ETF seeks to track the investment results, before fees and expenses, of an index composed of U.S. dollar-denominated, investment-grade corporate bonds with remaining maturities between one and five years, which is currently the ICE BofAML 1-5 Year US Corporate Index. The ICE BofAML 1-5 Year US Corporate Index measures the performance of investment-grade corporate bonds of both U.S. and non- U.S. issuers that are U.S. dollar- denominated and publicly issued in the U.S. domestic market and have a remaining maturity of greater than or equal to one year and less than five years. The iShares® Short-Term Corporate Bond ETF trades on The NASDAQ Stock Market under the ticker symbol “IGSB.”

### **The iShares® Intermediate-Term Corporate Bond ETF**

The iShares® Intermediate-Term Corporate Bond ETF seeks to track the investment results, before fees and expenses, of an index composed of U.S. dollar-denominated, investment-grade corporate bonds with remaining maturities between five and ten years, which is currently the ICE BofAML 5-10 Year US Corporate Index. The ICE BofAML 5-10 Year US Corporate Index measures the performance of investment-grade corporate bonds of both U.S. and non-U.S. issuers that are U.S. dollar- denominated and publicly issued in the U.S. domestic market and have a remaining maturity of greater than or equal to five years and less than ten years. The iShares® Intermediate-Term Corporate Bond ETF trades on The NASDAQ Stock Market under the ticker symbol “IGIB.”

### **The iShares® Long-Term Corporate Bond ETF**

The iShares® Long-Term Corporate Bond ETF seeks to track the investment results, before fees and expenses, of an index composed of U.S. dollar-denominated, investment-grade corporate bonds with remaining maturities greater than ten years, which is currently the ICE BofAML 10+ Year US Corporate Index. The ICE BofAML 10+ Year US Corporate Index measures the performance of investment-grade corporate bonds of both U.S. and non-U.S. issuers that are U.S. dollar- denominated and publicly issued in the U.S. domestic market and have a remaining maturity of greater than or equal to ten years. The iShares® Long-Term Corporate Bond ETF trades on NYSE Arca, Inc. under the ticker symbol “IGLB.”

### **The iShares® MBS ETF**

The iShares® MBS ETF seeks to track the investment results, before fees and expenses, of an index composed of investment-grade mortgage-backed pass-through securities issued and/or guaranteed by U.S. government agencies, which is currently the Bloomberg Barclays US Mortgage Backed Securities (MBS) Index. The Bloomberg Barclays US Mortgage Backed Securities (MBS) Index measures the performance of investment-grade (as determined by Bloomberg Index Services Limited) mortgage-backed pass-through securities (“MBS”) issued or guaranteed by U.S. government agencies. The Bloomberg Barclays US Mortgage Backed Securities (MBS) Index includes fixed-rate MBS issued by the Government National Mortgage Association (“GNMA” or “Ginnie Mae”), Federal National Mortgage Association (“Fannie Mae”) and Federal Home Loan Mortgage Corporation (“Freddie Mac”) that have 30-, 20-, 15-year maturities. The iShares® MBS ETF trades on The NASDAQ Stock Market under the ticker symbol “MBB.”

### **The iShares® TIPS Bond ETF**

The iShares® TIPS Bond ETF seeks to track the investment results, before fees and expenses, of an index composed of inflation-protected U.S. Treasury bonds, which is currently the Bloomberg Barclays US Treasury Inflation Protected Securities (TIPS) Index (Series-L). The Bloomberg Barclays US Treasury Inflation Protected Securities (TIPS) Index (Series-L) measures the performance of the inflation-protected public obligations of the U.S. Treasury, commonly known as “TIPS.” The iShares® TIPS Bond ETF trades on NYSE Arca, Inc. under the ticker symbol “TIP.”

### **The iShares® J.P. Morgan USD Emerging Markets Bond ETF**

The iShares® J.P. Morgan USD Emerging Markets Bond ETF seeks to track the investment results, before fees and expenses, of an index composed of U.S. dollar-denominated, emerging market bonds, which is currently the J.P. Morgan EMBI® Global Core Index. The J.P. Morgan EMBI® Global Core Index is a broad, diverse U.S. dollar-denominated emerging markets debt benchmark that tracks the total return of actively traded external debt instruments in emerging market countries. The iShares® J.P. Morgan USD Emerging Markets Bond ETF trades on The NASDAQ Stock Market under the ticker symbol “EMB.”

### **The iShares® iBoxx \$ High Yield Corporate Bond ETF**

The iShares® iBoxx \$ High Yield Corporate Bond ETF seeks to track the investment results, before fees and expenses, of an index composed of U.S. dollar-denominated, high-yield corporate bonds, which is currently the Markit iBoxx® USD Liquid High Yield Index. The Markit iBoxx® USD Liquid High Yield Index is a rules-based index consisting of U.S. dollar-denominated, high yield (as determined by Markit Indices Limited) corporate bonds for sale in the U.S. The iShares® iBoxx \$ High Yield Corporate Bond ETF trades on NYSE Arca, Inc. under the ticker symbol “HYG.”

### **The iShares® Floating Rate Bond ETF**

The iShares® Floating Rate Bond ETF seeks to track the investment results, before fees and expenses, of an index composed of U.S. dollar-denominated, investment-grade floating rate bonds with remaining maturities between one month and five years, which is currently the Bloomberg Barclays US Floating Rate Note < 5 Years Index. The Bloomberg Barclays US Floating Rate Note < 5 Years Index measures the performance of U.S. dollar-denominated, investment-grade (as determined by Bloomberg Index Services Limited) floating rate notes. Securities in the Bloomberg Barclays US Floating Rate Note < 5 Years Index have a remaining maturity of greater than or equal to one month and less than five years, and have \$300 million or more of outstanding face value. The iShares® Floating Rate Bond ETF trades on Cboe BZX Exchange, Inc. under the ticker symbol “FLOT.”

### **The iShares® Preferred and Income Securities ETF**

The iShares® Preferred and Income Securities ETF seeks to track the investment results, before fees and expenses, of an index composed of U.S. dollar-denominated preferred and hybrid securities, which is currently the ICE Exchange-Listed Preferred & Hybrid Securities Index. The ICE Exchange-Listed Preferred & Hybrid Securities Index measures the performance of a select group of exchange-listed, U.S.

dollar- denominated preferred securities, hybrid securities and convertible preferred securities listed on the New York Stock Exchange or NASDAQ Stock Market. The iShares® Preferred and Income Securities ETF trades on The NASDAQ Stock Market under the ticker symbol “PFF.”

## 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 Mojave 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:

- (a) for any Portfolio Constituent (including any successor Portfolio Constituent) that is an ETF (an **"ETF Component"**), the closing price of one share of that ETF Component (or, if a market disruption event or a non-trading day that affected that ETF Component has occurred, the calculation agent's good faith estimate of the closing price of one share of that ETF Component 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;
- (b) for any Portfolio Constituent (including any successor Portfolio Constituent) that is an index (an **"Index Component"**), the official closing level of that Index Component (or, if a market disruption event or a non-trading day that affected that Index Component has occurred, the closing level of that Index Component determined by the calculation agent in accordance with the formula for and method of calculating the closing level of that Index Component 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 security most recently composing that Index Component that would have prevailed but for that suspension or limitation or non-trading day and the amount of any dividend or other distribution per share on each of those securities) on the scheduled trading day immediately preceding that Final Disrupted Determination Date; and
- (c) the relevant interest rates associated with the notional financing cost (or, if such interest rates are not published on that day, the calculation agent's good faith estimate of such interest rates) 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:

- (a) for any ETF Component, the closing price of one share of that ETF Component (or, if a market disruption event or a non-trading day that affected that ETF Component has occurred, the calculation agent's good faith estimate of the closing price of one share of that ETF Component 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;
- (b) for any Index Component, the official closing level of that Index Component (or, if a market disruption event or a non-trading day that affected that Index Component has occurred, the closing level of that Index Component determined by the calculation agent in accordance with the formula for and method of calculating the closing level of that Index Component 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 security most recently composing that Index Component that would have prevailed but for that suspension or limitation or non-trading day and the amount of any dividend or other distribution per share on each of those securities) on the scheduled trading day immediately preceding that Final Disrupted Determination Date; and
- (c) the relevant interest rates associated with the notional financing cost (or, if such interest rates are not published on that day, the calculation agent's good faith estimate of such interest rates) 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 (a) each of the following exchanges is scheduled to be open for trading for their respective regular trading sessions: the relevant exchanges for the Portfolio Constituents and the principal options and futures exchanges relating to the Portfolio Constituents, and (b) banking institutions in the City of New York are not scheduled to be authorized or required by law, regulation or executive order to close.

Notwithstanding anything to the contrary 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 (a) trading is generally conducted on the relevant exchanges for the Portfolio Constituents and the principal options and futures exchanges relating to the Portfolio Constituents and (b) banking institutions in the City of New York are not otherwise authorized or required by law, regulation or executive order to close.

Notwithstanding any contrary definition in the accompanying product supplement, “**relevant exchange**” means, (i) with respect to an ETF Component, (1) the primary exchange or market of trading for that ETF Component, (2) the primary exchange or market of trading for any security (or any combination thereof) included in the reference index, if any, for that ETF Component or (3) if the ETF Component does not have a reference index, the primary exchange or market of trading for any security (or any combination thereof) included in that ETF Component, and (ii) with respect to an Index Component, the primary exchange or market of trading for any security (or any combination thereof) included in that Index Component.

#### **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 on, trading imposed by the relevant exchange for any Portfolio Constituent;
- (2) any other event has occurred that disrupts or impairs the ability of market participants in general to effect transactions in, or obtain market values for any Portfolio Constituent or any securities that compose 20% or more of (a) for an ETF Component, the level of the relevant reference index or, if the ETF Component does not have a reference index, the value of the ETF Component or (b) for an Index Component, the level of the Index Component;
- (3) the closure of any relevant exchange for any Portfolio Constituent prior to its scheduled closing time unless that earlier closing time is announced at least one hour prior to the actual closing time;
- (4) the failure of the relevant exchange with respect to any Portfolio Constituent to open;
- (5) the closure of a material number of leading commercial banks in the City of New York prior to their scheduled weekday closing time;
- (6) the failure of the administrator or publisher of the relevant interest rates associated with the notional financing cost (or any other relevant entity) to report those interest rates; or
- (7) 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) or (3) 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.

A limitation on the hours or number of days of trading will not constitute a market disruption event with respect to the Index or any relevant successor index if the limitation results from an announced change in the regular business hours of the relevant exchange or market.

#### **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 amended and restated January 27, 2020)

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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:

$\text{Cash Level}_t$  means, in respect of each Index Calculation Day  $t$ , the Cash Level for such Index Calculation Day  $t$ .

$\text{Cash Level}_{t-1}$  means, in respect of each Index Calculation Day  $t$ , the Cash Level for the Index Calculation Day immediately preceding such Index Calculation Day  $t$ .

$\text{Carry}_t$  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:

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

$\text{Mark-To-Market}_t$  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:

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

$\text{Rolldown}_t$  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:

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

$\text{Rate}_{t-1}^{3M}$  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,  $\text{Rate}_{t-1}^{3M}$  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.

$\text{Rate}_{t-1}^{2M}$  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,  $\text{Rate}_{t-1}^{2M}$  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, <i>provided that</i> , if such Interest Rate Publisher does not publish a level in respect of such Calculation Day on such day, Rate <sub>t-2</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. |
| Daycount <sub>t-1,t</sub>         | 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 “**ER<sub>t</sub><sup>i</sup>**”) 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:

$$ER_t^i = ER_{t-1}^i \times \left[ 1 + \frac{TR_t^i}{TR_{t-1}^i} - \frac{\text{Cash Level}_t}{\text{Cash Level}_{t-1}} \right]$$

where:

|                                |  |
|--------------------------------|--|
| 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. |



|                           |   |
|---------------------------|---|
| $TR_t^i$                  | 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.   |
| $TR_{t-1}^i$              | 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>**") 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>**") 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:

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

where:

|                          |  |
|--------------------------|--|
| $ST \text{ Var}_t^i$     | means the Short-Term Variance of Portfolio Constituent i calculated as of Index Calculation Day t.   |
| $ST \text{ Var}_{t-1}^i$ | means the Short-Term Variance of Portfolio Constituent i calculated as of the Index Calculation Day immediately prior to Index Calculation Day t.                        |
| $LT \text{ Var}_t^i$     | means the Long-Term Variance of Portfolio Constituent i calculated as of Index Calculation Day t.  |
| $LT \text{ Var}_{t-1}^i$ | means the Long-Term Variance of Portfolio Constituent i calculated as of the Index Calculation Day immediately prior to Index Calculation Day t.                         |
| $ST \text{ Covar}_t$     | means the Short-Term Covariance of the Portfolio Constituents calculated as of Index Calculation Day t.  |
| $ST \text{ Covar}_{t-1}$ | means the Short-Term Covariance of the Portfolio Constituents calculated as of the Index Calculation Day immediately prior to Index Calculation Day t.                   |
| $LT \text{ Covar}_t$     | means the Long-Term Covariance of the Portfolio Constituents calculated as of Index Calculation Day t.   |
| $LT \text{ Covar}_{t-1}$ | means the Long-Term Covariance of the Portfolio Constituents calculated as of the Index Calculation Day immediately prior to Index Calculation Day t.                    |
| $\lambda_{ST}$           | means the Short-Term Decay Factor.   |
| $\lambda_{LT}$           | means the Long-Term Decay Factor.  |
| $ER_t^i$                 | means, for a Portfolio Constituent i, the Closing ER Level of such Portfolio Constituent i as of Index Calculation Day t.  |
| $ER_{t-1}^i$             | 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. |
| $ER_t^E$                 | means the Closing ER Level of the Equity Constituent as of Index Calculation Day t.  |
| $ER_{t-1}^E$             | means the Closing ER Level of the Equity Constituent as of the Index Calculation Day immediately prior to 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 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:

$$\begin{aligned}
ST \Delta_t &= (ST \text{ Var}_t^B - ST \text{ Covar}_t)^2 - (ST \text{ Var}_t^E + ST \text{ Var}_t^B - 2 \times ST \text{ Covar}_t) \times \left( ST \text{ Var}_t^B - \frac{\text{Vol Target}^2}{252} \right) \\
LT \Delta_t &= (LT \text{ Var}_t^B - LT \text{ Covar}_t)^2 - (LT \text{ Var}_t^E + LT \text{ Var}_t^B - 2 \times LT \text{ Covar}_t) \times \left( LT \text{ Var}_t^B - \frac{\text{Vol Target}^2}{252} \right)
\end{aligned}$$



where:

|                                  |   |
|----------------------------------|---|
| ST $\Delta_t$                    | means the Short-Term Discriminant calculated as of Index Calculation Day t.                             |
| LT $\Delta_t$                    | 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 Δ <sub>t</sub>                | 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:

$$ST Vol_t^P = \sqrt{252} \times \sqrt{ST Wt_t^2 \times ST Var_t^E + (1 - ST Wt_t)^2 \times ST Var_t^B + 2 \times ST Wt_t \times (1 - ST Wt_t) \times ST Covar_t}$$

$$LT Vol_t^P = \sqrt{252} \times \sqrt{LT Wt_t^2 \times LT Var_t^E + (1 - LT Wt_t)^2 \times LT Var_t^B + 2 \times LT Wt_t \times (1 - LT Wt_t) \times LT Covar_t}$$

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:

$$ST Weight_t^E = \frac{Vol Target}{\max(Vol Target, ST Vol_t^P)} \times ST Prelim Wt_t$$

$$LT Weight_t^E = \frac{Vol Target}{\max(Vol Target, LT Vol_t^P)} \times LT Prelim Wt_t$$

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. |

|                    |   |
|--------------------|---|
| $ER_t^E$           | means the Closing ER Level of the Equity Constituent as of Index Calculation Day t.   |
| $ER_{t-1}^E$       | means the Closing ER Level of the Equity Constituent as of the Index Calculation Day immediately preceding Index Calculation Day t.   |
| $Weight_{t-2}^B$   | 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 |

|   |  |
|---|--|
| <b>"Closing TR Level" or "TR<sub>t</sub><sup>i</sup>"</b> | Day, the official closing price of the regular trading session on such Dealing Day on the relevant Primary Listing Exchange.<br>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:<br>(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<br>(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.                           |
| <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:<br>(i) a Scheduled Trading Day that is not a Disrupted Day for either of the Portfolio Constituents, or<br>(ii) a Scheduled Trading Day that is a Disruption Determination Date for either of the Portfolio Constituents.  |
| <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> ).  |

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| <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.  |



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| <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> ).  |

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| <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**

| <b>Name</b>                                       |
|---|
| 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                        |

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*).

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                         |

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.

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                         |



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 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    | 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                         |

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 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    | 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                         |

MODULE B9: J.P. MORGAN MOJAVE 8 INDEX

|  |                            |
|--|----------------------------|
| Index Name   | J.P. Morgan Mojave 8 Index |
| Bloomberg Ticker of Index  | JPUSMOJ8                   |
| Live Date  | January 27, 2020           |
| Base Date  | June 2, 2004               |
| Volatility Target  | 8.0%                       |
| 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 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    | 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                         |

## 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.

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## ANNEX B

# **J.P. Morgan Total Return Index Index Rules**

**J.P.Morgan**

June 7, 2017 (as amended and restated on July 13, 2017)

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# J.P. Morgan Total Return Index

## Index Rules

### 1. Introduction

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

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

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

This document is published by the Index Sponsor, J.P. Morgan Securities LLC of 383 Madison Avenue, 5th Floor, New York, New York 10179, United States, in its capacity as such. Further information relating to: (i) the internal governance framework; and (ii) the identity and role of third parties that are non-affiliates of JPMorgan, in respect of this Index are available on request to the Index Sponsor.

### 2. Index Sponsor and Index Calculation Agent

#### 2.1 Identity and responsibilities

As of the Live Date (as defined and specified in Section 7 (*Initial Composition of the Index*)), J.P. Morgan Securities LLC (“**JPMS**”) is the sponsor of the Index (the “**Index Sponsor**”, which term shall include any successor or assign of the Index Sponsor). The Index Sponsor may appoint a successor sponsor or assign, delegate or transfer any or all of its rights, obligations or responsibilities in its capacity as Index Sponsor in connection with the Index to one or more entities (including an unrelated third party) that the Index Sponsor determines appropriate. The Index Calculation Agent (unless the Index Calculation Agent is the same entity as the Index Sponsor) must obtain written permission from the Index Sponsor prior to any delegation or transfer of the Index Calculation Agent’s responsibilities or obligations in connection with the Index.

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

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

The Index Calculation Agent is responsible for (i) calculating the Index Level in respect of each Trading 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 or Extraordinary Event (each as defined herein) has occurred or whether an anti-dilution adjustment shall be made in respect of any Constituent (as defined herein), 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 Constituent or Reference Index (as defined herein), other input sponsor or

exchange 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 all 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 discretion, at any time and without notice, terminate the calculation or publication of the Index, including, without limitation, subsequent to the occurrence of one of the events described in Section 12 (*Extraordinary Events and Anti-Dilution Events*).

## 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 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 case, as agreed in advance by the Index Sponsor) in relation to the Index, or a calculation is performed by the Index Calculation Agent in relation to the Index, none of the Index Sponsor, the Index Calculation Agent or any Relevant Person shall be under any obligation to revise any such determination, adjustment, amendment, interpretation or calculation made or anything done (or omitted to be determined, adjusted, amended, interpreted, calculated or done) for any reason.

## 3. **Amendments**

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

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

#### 4. General Notes on the Index

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

**Objective.** The Index is designed to track the total return of a notional portfolio of U.S. dollar fixed-income exchange-traded funds selected from a pre-set universe and rebalanced monthly to weights determined pursuant to these Index Rules, which implement a momentum-driven allocation strategy, subject to a historical volatility constraint and portfolio concentration limits.

The Index tracks the return of a notional, dynamic basket. During the course of each month, the basket will consist of one (1) Monthly Reference Portfolio (as defined in Section 9.1 (*The Monthly Reference Portfolio*)), except during a Monthly Rebalancing Period in which the basket will consist of the exiting Monthly Reference Portfolio (in a declining proportion) and the entering Monthly Reference Portfolio (in an increasing proportion). Each Monthly Reference Portfolio is made up of up to twelve (12) exchange-traded funds (or such successors or substitutes as may be applicable pursuant to Section 12 (*Extraordinary Events and Anti-Dilution Events*)), each, a “**Constituent**”) with distributions (if any) notionally reinvested. The Constituents represent a broad range of sectors of the U.S. dollar fixed income market, comprising debt obligations of both U.S. and non-U.S. obligors. The Constituents are each listed on a U.S. securities exchange.

Each month, a new Monthly Reference Portfolio is constituted, as provided in Section 8 (*Determining the Monthly Weights for the Constituents in the Monthly Reference Portfolio*), by identifying the portfolio that would have achieved the best hypothetical total return during an approximately six (6)-month look-back period, subject to a volatility constraint and to various portfolio concentration limits. On each Monthly Rebalancing Selection Date (as defined in in “*Definitions*”), the Index Calculation Agent will determine the Monthly Weight (as defined in Section 8) to be assigned to each Constituent in the Monthly Reference Portfolio. Each Monthly Reference Portfolio is identified from among the universe of all possible Eligible Portfolios, which are the portfolios that satisfy the Weight Constraints (each as defined in Section 8.2 (*Identifying the Unique Portfolio for each Lookback Period*))), as provided in Section 8.

The Weight Constraints apply to each Constituent, to groups of Constituents, and to all of the Constituents in aggregate:

- the minimum Monthly Weight for each Constituent is zero (0%) (i.e., the Index is long-only),
- the maximum Monthly Weight is specified for each Constituent as either ten percent (10%) or twenty percent (20%)
- the Monthly Weight for each Constituent must be a percentage divisible by five percent (5%) (i.e., the Monthly Weights are determined in 5% increments),
- the total Monthly Weight for specified groups of broadly similar Constituents are capped at either twenty-five percent (25%) or fifty percent (50%), and
- the total Monthly Weight for all of the Constituents must be one hundred percent (100%) (i.e., the Index is always fully invested without leverage).

The Index Calculation Agent will identify the Eligible Portfolios and calculate the Performance (as defined in Section 8.2) of each Eligible Portfolio over the Lookback Period consisting of the one hundred twenty-six (126) Weekday period ending on and including the Monthly Rebalancing Selection Date. The Index Calculation Agent will calculate the Realized Volatility (as defined in Section 8.2) of each Eligible Portfolio. The Index Calculation Agent will then identify the Eligible Portfolio with the highest Performance over the relevant Lookback Period that had Realized Volatility equal to or less than the Realized Volatility Constraint (as defined in “*Definitions*”) of five percent (5%) (*provided that*, if there is more than one (1) Eligible Portfolio that has the same highest Performance over the relevant Lookback Period, the Index Calculation Agent will identify the Eligible Portfolio that has the lowest annualized Realized Volatility from among such Eligible Portfolios).

If none of the Eligible Portfolios had Realized Volatility equal to or less than the Realized Volatility Constraint, the Index Calculation Agent shall increase the Realized Volatility Constraint by one percent (1%) and repeat

the calculations described above until an Eligible Portfolio meeting the adjusted Realized Volatility Constraint is identified. The Realized Volatility Constraint may continue to be increased in one percent (1%) increments to the extent necessary for there to be at least one (1) Eligible Portfolio that satisfies the adjusted Realized Volatility Constraint. As a result, the Realized Volatility Constraint is not capped and could deviate substantially from five percent (5%) in the event that the Constituents experience high volatility during any Lookback Period.

The relative weights of the Constituents within each Monthly Reference Portfolio will change from the Monthly Weights as the total return performances of the Constituents vary over the period in which the Monthly Reference Portfolio is included in the Index.

The Index will rebalance each month from the prior to the new Monthly Reference Portfolio during a five (5)-day Monthly Rebalancing Period (as defined in Section 9 (*Monthly Rebalancing*)) consisting of the first five (5) consecutive Index Business Days of each month, subject to postponement upon the occurrence of a Market Disruption Event (as defined in Section 11.4 (*Definitions related to market disruption*)). The proportion of the basket that tracks the prior Monthly Reference Portfolio will decline from one hundred percent (100%) in twenty percent (20%) daily increments over the five (5)-day period, and the proportion of the basket that tracks the new Monthly Reference Portfolio will correspondingly increase from zero percent (0%) to one hundred percent (100%) in twenty percent (20%) daily increments. At the conclusion of the Monthly Rebalancing Period, the Index will track the new Monthly Reference Portfolio only until the beginning of the next Monthly Rebalancing Period.

The Monthly Rebalancing Selection Dates and Monthly Rebalancing Dates (as defined in Section 9) are subject to Market Disruption provisions, as provided in Section 11 (*Market Disruption*). The Closing TR Levels (*i.e.*, 'total return' levels) (as defined in Section 6 (*The Constituents; Closing TR Levels*)) of the Constituents used to calculate historical performance are subject to market disruption provisions, including those set forth in Section 11.

The Constituents are subject to the provisions of Section 12 (*Extraordinary Events and Anti-Dilution Events*).

**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 Constituents. Furthermore, no assurance can be given that the volatility experienced by the Index will be less than or equal to the Realized Volatility Constraint. The actual volatility of the Index will depend on the performance of the Monthly Reference Portfolios. The Index may thus experience volatility that is greater or less than the Realized Volatility Constraint. The Realized Volatility Constraint is itself subject to upward adjustment when constructing any particular Monthly Reference Portfolio, and thus the Realized Volatility Constraint used to constitute any Monthly Reference Portfolio may itself exceed five percent (5%).**

**The Index is described as a notional basket 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.**

## **5. Publication of the Index Level**

The level of the Index (the "**Index Level**") will be calculated by the Index Calculation Agent in respect of each Trading Day (as defined in "*Definitions*") in U.S. dollars in accordance with the methodology set out in Section 10 (*Calculation of the Index Level*) below. The Index Calculation Agent will publish the Index Level in respect of each Trading Day. The Index Level in respect of each Trading Day may be obtained by reference to Bloomberg ticker "JPUSTRI Index" or from a successor or alternate source as may be identified by the Index Calculation Agent from time to time.

By operation of the definition of Trading Day, the level of Index Level will be published on each Index Business Day that is not a Disrupted Day (as defined in Section 11.3 (*Definitions related to market disruption*)) for any Constituent with a non-zero Monthly Weight with respect to the relevant Monthly Reference Portfolio, and on each Effective Monthly Rebalancing Date, regardless of whether any market disruption causes a Disrupted Day.

The Index Calculation Agent may, at any time and without notice, change the frequency of publication of the Index Level, the means or place of publication of the Index Level or cease the calculation, publication or dissemination of the Index Level. The published level will be initially to an accuracy of two decimal places; however, 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.

## 6. The Constituents; Closing TR Levels

The Index tracks the total return of a notional, dynamic basket composed by selecting from among twelve (12) Constituents with distributions notionally reinvested. Each of the Constituents is an exchange-traded fund.

Each Constituent is set out in Table 1 below. For ease of identification, Table 1 contains, for each Constituent, its current ticker symbol (provided solely for ease of identification) as well as its current Primary Listing Exchange and applicable Related Exchange(s) (each as defined in "*Definitions*") for each Constituent.

Table 1

| i  | Constituents                                      | Ticker | Current Primary Listing Exchange for each Constituent on June 7, 2017 |
|----|---|--------|---|
| 1  | iShares 1-3 Year Treasury Bond ETF                | SHY    | NYSE Arca   |
| 2  | iShares 7-10 Year Treasury Bond ETF               | IEF    | NYSE Arca   |
| 3  | iShares 20+ Year Treasury Bond ETF                | TLT    | NASDAQ Global Market  |
| 4  | iShares 1-3 Year Credit Bond ETF                  | CSJ    | NYSE Arca   |
| 5  | iShares Intermediate Credit Bond ETF              | CIU    | NYSE Arca   |
| 6  | iShares 10+ Year Credit Bond ETF                  | CLY    | NYSE Arca   |
| 7  | iShares MBS ETF                                   | MBB    | NYSE Arca   |
| 8  | iShares TIPS Bond ETF                             | TIP    | NYSE Arca   |
| 9  | iShares J.P. Morgan USD Emerging Markets Bond ETF | EMB    | NYSE Arca   |
| 10 | iShares iBoxx \$ High Yield Corporate Bond ETF    | HYG    | NYSE Arca   |
| 11 | iShares Floating Rate Bond ETF                    | FLOT   | NYSE Arca   |
| 12 | iShares U.S. Preferred Stock ETF                  | PFF    | NYSE Arca   |

For each Weekday (as defined in "*Definitions*"), the Index Calculation Agent shall calculate the Closing TR Level of each Constituent. If any Weekday is not a Dealing Day (as defined in "*Definitions*") with respect to the relevant Constituent, or if the Index Calculation Agent cannot obtain reliable information from any third party source as of such Weekday for such Constituent, the Closing TR Level for that Constituent in respect of such Weekday shall be deemed to be the Closing TR Level for that Constituent as of the immediately preceding

Dealing Day for that Constituent for which the Index Calculation Agent can obtain reliable information from any third party source.

**"Closing TR Level"** means, subject to the provisions of Section 11 (*Market Disruption*) and Section 12 (*Extraordinary Events and Anti-Dilution Events*), with respect to a Constituent and a Dealing Day  $t$ , the Closing Level (as defined in "Definitions") of such Constituent with distributions reinvested, which will be determined as follows:

$$\text{Closing TR Level}_t = \text{Closing TR Level}_{t-1} \times \left( \frac{\text{Closing Level}_t + d_t}{\text{Closing Level}_{t-1}} \right)$$

Where:

$\text{Closing TR Level}_{t-1}$  means the Closing TR Level of the relevant Constituent as of the Dealing Day immediately preceding Dealing Day  $t$ .

$\text{Closing Level}_t$  means the Closing Level of the relevant Constituent as of Dealing Day  $t$ .

$\text{Closing Level}_{t-1}$  means the Closing Level of the relevant Constituent as of the Dealing Day immediately preceding Dealing Day  $t$ .

$d_t$  means, in respect of a Constituent and a Dealing Day  $t$ :

- (a) If such Dealing Day  $t$  is not an Ex-Distribution Date (as defined below) for the relevant Constituent, zero.
- (b) If such Dealing Day  $t$  is an Ex-Distribution Date for the relevant Constituent, the Gross Distribution Amount (as defined below) in respect of such Constituent for such Ex-Distribution Date.

Where:

**"Ex-Distribution Date"** means, with respect to a distribution for a Constituent, the first Dealing Day on which transactions in the securities of such Constituent trade on the relevant Primary Listing Exchange without the right to receive that distribution.

**"Gross Distribution Amount"** means, in respect of a Constituent and an Ex-Distribution Date for such Constituent, one hundred percent (100%) of the amount of any distribution per share or security of the Constituent that a shareholder or security-holder in that Constituent on that Ex-Distribution Date would no longer have the right to receive due to the occurrence of such Ex-Distribution Date, as determined by the Index Calculation Agent in its sole discretion as the sum of (x) the amount of any 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 Constituent or its issuer (other than share dividends or distributions for which an adjustment is made pursuant to Section 12.4 (*Anti-dilution adjustments*)). If a portion of such distribution consists of property traded on the Ex-Distribution Date on a U.S. national securities exchange, the fair market value of such portion will equal the closing price of such distributed property on such Ex-Distribution Date.

For purposes of determining the Closing TR Level for any Constituent for any Dealing Day, if the immediately preceding Dealing Day (the **"Prior Dealing Day"**) for such Constituent was a Disrupted Day, then in the formula for determining the Closing TR Level in respect of such Dealing Day, (i) the Closing TR Level for that Prior Dealing Day shall be replaced with the Closing TR Level for the first Dealing Day preceding such Prior Dealing Day that was not a Disrupted Day (the **"Prior Non-Disrupted Dealing Day"**) for such Constituent, (ii) the Closing Level for that Prior Dealing Day shall be replaced with the Closing Level for such Prior Non-Disrupted Dealing Day for such Constituent and (iii) the Gross Distribution Amount in respect of such Constituent in respect of such Dealing Day shall be replaced with the sum of each of the Gross Distribution



Amounts in respect of such Constituent in respect of each day from but excluding the Prior Non-Disrupted Dealing Day to and including such Dealing Day.

## 7. Initial Composition of the Index

At the Closing Time on July 13, 2017 (the “**Live Date**”), the Index was composed of notional holdings in a single Monthly Reference Portfolio, as determined by operation of Section 9 (*Monthly Rebalancing*). The Index was composed of the Monthly Reference Portfolio determined as of the Monthly Rebalancing Selection Date immediately preceding the Live Date (the “**Starting Selection Date**”). References in the Index Rules to “Monthly Rebalancing Selection Date” shall be deemed to include references to the Starting Selection Date.

The composition of the Index will be adjusted in accordance with the methodology described in these Index Rules. As of the Base Date (as defined in “*Definitions*”), the Index Level was set equal to one hundred (100.00).

## 8. Determining the Monthly Weights for the Constituents in the Monthly Reference Portfolio

On the Starting Selection Date and thereafter on a monthly basis on each subsequent Monthly Rebalancing Selection Date, the Index Calculation Agent will determine the weight (the “**Monthly Weight**”) to be assigned to each Constituent in the Monthly Reference Portfolio, whether zero (0) or a positive number, for the relevant Monthly Reference Portfolio determined as of such Monthly Rebalancing Selection Date, in accordance with the methodology described in Section 8.3 (*Identifying the Unique Portfolio for each Lookback Period*) below.

Each Constituent is set to the relevant Monthly Weight, determined as of the relevant Monthly Rebalancing Selection Date, only once per month in order to create the relevant Monthly Reference Portfolio. The actual weight of each of the Constituents within a Monthly Reference Portfolio determined on the relevant Monthly Rebalancing Selection Date is expected to fluctuate, during the period from the Closing Time on the first Effective Monthly Rebalancing Date (each as defined in “*Definitions*”) in the Monthly Rebalancing Period immediately following such Monthly Rebalancing Selection Date to the Closing Time on the final Effective Monthly Rebalancing Date in the next Monthly Rebalancing Period, due to movements in the levels of the Constituents.

### 8.1 Identifying the Lookback Periods

On each Monthly Rebalancing Selection Date *k*, the Index Calculation Agent will identify the applicable Lookback Period *k* (being the period of one hundred twenty-six (126) Weekdays composed of (i) the one hundred twenty-five (125) Weekdays immediately prior to Monthly Rebalancing Selection Date *k* and (ii) the Weekday that is Monthly Rebalancing Selection Date *k*) (the “**Lookback Period**”).

### 8.2 Identifying the Unique Portfolio for each Lookback Period

With respect to the applicable Lookback Period identified by the Index Calculation Agent with respect to a Monthly Rebalancing Selection Date, the Index Calculation Agent will:

- (a) Identify all hypothetical portfolios of Constituents (the “**Eligible Portfolios**” and each individually an “**Eligible Portfolio**”) that satisfy the weight constraints below (the “**Weight Constraints**”):
  - (i) The Monthly Weight assigned to each Constituent numbered: one (1) through eight (8) or ten (10) in Table 1 in Section 6 (*The Constituents; Closing TR Levels*) above shall be equal to one (1) of: zero percent (0%), five percent (5%), ten percent (10%), fifteen percent (15%) or twenty percent (20%).
  - (ii) The Monthly Weight assigned to each Constituent numbered: nine (9), eleven (11) or twelve (12) in Table 1 in Section 6 above shall be equal to one (1) of: zero percent (0%), five percent (5%) or ten percent (10%).

- (iii) The sum of the Monthly Weights assigned to all the Constituents shall be equal to one hundred per cent (100%).
  - (iv) The sum of the Monthly Weights assigned to the Constituents numbered: one (1) through three (3) in Table 1 in Section 6 above shall be less than or equal to fifty percent (50%).
  - (v) The sum of the Monthly Weights assigned to the Constituents numbered: four (4) through six (6) in Table 1 in Section 6 above shall be less than or equal to fifty percent (50%).
  - (vi) The sum of the Monthly Weights assigned to the Constituents numbered: ten (10) through twelve (12) in Table 1 in Section 6 above shall be less than or equal to twenty-five percent (25%).
- (b) Calculate the performance of each Eligible Portfolio over the relevant Lookback Period (the “**Performance**”) in accordance with the following formula:

$$\text{Performance}_k^j = \sum_i \left[ \text{Weight}_j^i \times \left( \frac{\text{Closing TR Level}_k^i}{\text{Closing TR Level}_{k-125}^i} - 1 \right) \right]$$

where:

$\text{Performance}_k^j$  means the Performance of Eligible Portfolio j as of Monthly Rebalancing Selection Date k;

$\text{Closing TR Level}_k^i$  means the Closing TR Level of Constituent i as of Monthly Rebalancing Selection Date k.

$\text{Closing TR Level}_{k-125}^i$  means the Closing TR Level of Constituent i as of the first Weekday of Lookback Period k (being the Weekday that is one hundred twenty-five (125) Weekdays prior to Monthly Rebalancing Selection Date k).

$\text{Weight}_j^i$  means the weight of Constituent i within Eligible Portfolio j.

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

$$\text{Realized Volatility}_k^j = \sqrt{260 \times \frac{125 \times \sum_{n=1}^{125} (\text{Return}_{k,n}^j)^2 - (\sum_{n=1}^{125} \text{Return}_{k,n}^j)^2}{125^2}}$$

where:

$\text{Realized Volatility}_k^j$  means the Realized Volatility of Eligible Portfolio j as of Monthly Rebalancing Selection Date k.

$\text{Return}_{k,n}^j$  means the weighted sum of the natural logarithms of daily returns of each Constituent from Weekday n-1 to Weekday n of Lookback Period k, calculated in accordance with the following formula:

$$\text{Return}_{k,n}^j = \sum_i \left[ \text{Weight}_j^i \times \ln \left( \frac{\text{Closing TR Level}_{k,n}^i}{\text{Closing TR Level}_{k,n-1}^i} \right) \right]$$



where:

Closing TR Level $_{k,n}^i$  means the Closing TR Level of Constituent i in respect of Weekday n of Lookback Period k.

Closing TR Level $_{k,n-1}^i$  means the Closing TR Level of Constituent i as of Weekday n-1 of Lookback Period k.

n denotes a Weekday within Lookback Period k that is not the first Weekday of Lookback Period k (for the avoidance of doubt, the first Weekday n of Lookback Period k shall be the Weekday that is one hundred twenty-four (124) Weekdays prior to Monthly Rebalancing Selection Date k and the last Weekday n of Lookback Period k shall be Monthly Rebalancing Selection Date k).

n - 1 denotes the Weekday that is immediately prior to Weekday n (for the avoidance of doubt, the first Weekday n-1 in respect of Lookback Period k shall be the Weekday that is one hundred twenty-five (125) Weekdays prior to Monthly Rebalancing Selection Date k and the last Weekday n-1 of Lookback Period k shall be the Weekday that is immediately prior to Monthly Rebalancing Selection Date k).

Weight $_j^i$  means the weight of Constituent i within Eligible Portfolio j.

- (d) Identify the Eligible Portfolio with the highest Performance over the relevant Lookback Period that has Realized Volatility equal to or less than the Realized Volatility Constraint; *provided that*, if there is more than one such Eligible Portfolio with the same highest Performance over the relevant Lookback Period, the Eligible Portfolio that has the lowest annualized Realized Volatility shall be selected. The single Eligible Portfolio that satisfies these criteria is referred to herein as the “**Unique Portfolio**” for a particular Lookback Period.
- (e) If none of the Eligible Portfolios has Realized Volatility equal to or less than the Realized Volatility Constraint, the Index Calculation Agent shall increase the Realized Volatility Constraint by one percent (1%) and repeat the step set forth in Section 8.2(d) above until a Unique Portfolio is selected. This step, of increasing the Realized Volatility Constraint, may be repeated until a Unique Portfolio is selected.

### 8.3 *Determining the Monthly Weight to be assigned to each Constituent in the relevant Monthly Reference Portfolio*

The Monthly Weight to be assigned to each Constituent within a Monthly Reference Portfolio will be determined by the Index Calculation Agent as the weight assigned to such Constituent in the Unique Portfolio identified with respect to the relevant Monthly Rebalancing Selection Date in accordance with Section 8.2 above.

Each Constituent is set to the relevant Monthly Weight, determined as of the relevant Monthly Rebalancing Selection Date, only once per month in order to create a new relevant Monthly Reference Portfolio.

## 9. **Monthly Rebalancing**

Unless a Market Disruption Event (as defined in Section 11.4 (*Definitions related to market disruption*)) has occurred and is continuing, on a monthly basis, the Index will be rebalanced over the “**Monthly Rebalancing Period**”, which is a the period composed of the first five (5) consecutive Index Business Days in such month (each a “**Monthly Rebalancing Date**”), subject to postponement pursuant to Section 11.2 (*Market disruption on a Monthly Rebalancing Date*). Such rebalancing over the Monthly Rebalancing Period will transition the Index from the prior Monthly Reference Portfolio selected on the Monthly Rebalancing Selection Date prior to

such most recent Monthly Rebalancing Selection Date (the “**Prior Monthly Reference Portfolio**”) to the next Monthly Reference Portfolio selected on the most recent Monthly Rebalancing Selection Date (the “**Next Monthly Reference Portfolio**”).

### 9.1 *The Monthly Reference Portfolio*

Each Monthly Rebalancing Selection Date  $k$  will be associated with a reference portfolio composed of the Constituents with weights set equal to the Monthly Weights determined as of such Monthly Rebalancing Selection Date  $k$  (the “**Monthly Reference Portfolio**”). During Monthly Rebalancing Period  $k$ , the Index progressively rolls out of the Monthly Reference Portfolio associated with the previous Monthly Rebalancing Selection Date (*i.e.*, Monthly Rebalancing Selection Date  $k-1$ ), which is the Prior Monthly Reference Portfolio, and rolls into the Monthly Reference Portfolio associated with Monthly Rebalancing Selection Date  $k$ , which is the Next Monthly Reference Portfolio. After the Closing Time on the final Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k$ , the Index will be exposed only to the Monthly Reference Portfolio associated with Monthly Rebalancing Selection Date  $k$  and will continue to remain exposed only to such Monthly Reference Portfolio until the Closing Time on the first Effective Monthly Rebalancing Date occurring in the next Monthly Rebalancing Period (*i.e.*, Monthly Rebalancing Period  $k+1$ ).

### 9.2 *Level of the Monthly Reference Portfolio*

On each Index Business Day  $t$  from and including the first Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k$  to and including the last Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k+1$ , the level of the Monthly Reference Portfolio determined as of Monthly Rebalancing Selection Date  $k$  is determined as follows:

$$\text{Monthly Reference Portfolio}_{k,t} = \sum_i \left( \text{Monthly Weight}_k^i \times \frac{\text{Closing TR Level}_t^i}{\text{Closing TR Level}_{k,f}^i} \right)$$

where:

$t$  means an Index Business Day from and including the first Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k$  to and including the final Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k+1$ .

$f$  denotes the first Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k$ .

$\text{Monthly Reference Portfolio}_{k,t}$  means the level of the Monthly Reference Portfolio associated with Monthly Rebalancing Selection Date  $k$  in respect of Index Business Day  $t$ .

$\text{Closing TR Level}_t^i$  means the Closing TR Level of Constituent  $i$  in respect of Index Business Day  $t$ .

$\text{Closing TR Level}_{k,f}^i$  means the Closing TR Level of Constituent  $i$  in respect of the first Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k$ .

$\text{Monthly Weight}_k^i$  means the Monthly Weight set for Constituent  $i$  in the Monthly Reference Portfolio associated with Monthly Rebalancing Selection Date  $k$ .

## 10. **Calculation of the Index Level**

As of the Base Date, the Index Level was set equal to one hundred (100.00). Thereafter, subject to the provisions of Section 11.3 (*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 U.S. dollars in respect of each Trading Day as follows:

- (a) For each Trading Day  $t$  from but excluding the last Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k$  to and including the first Effective Monthly Rebalancing Date in the immediately following Monthly Rebalancing Period  $k+1$ , the Index Level will be calculated in accordance with the following formula:

$$\text{Index}_t = \text{Index}_{k,l} \times \frac{\text{Monthly Reference Portfolio}_{k,t}}{\text{Monthly Reference Portfolio}_{k,l}}$$

where:

$t$  denotes the relevant Trading Day  $t$ .

$l$  denotes the last Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k$ .

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

$\text{Index}_{k,l}$  means the Index Level for the last Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k$ .

$\text{Monthly Reference Portfolio}_{k,t}$  means the level of the Monthly Reference Portfolio with respect to Monthly Rebalancing Selection Date  $k$  for Trading Day  $t$ .

$\text{Monthly Reference Portfolio}_{k,l}$  means the level of the Monthly Reference Portfolio with respect to Monthly Rebalancing Selection Date  $k$  for the last Effective Monthly Rebalancing Date in such Monthly Rebalancing Period  $k$ .

- (b) Subject to the provisions of Section 11.2 (*Market disruption on a Monthly Rebalancing Date*), for each Trading Day  $t$  from but excluding the first Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k$  to and including the last Effective Monthly Rebalancing Date in Monthly Rebalancing Period  $k$ , the Index Level will be calculated according to the following formula:

$$\text{Index}_t = \text{Index}_{t-1} \times \left( \frac{5-n}{5} \times \frac{\text{Monthly Reference Portfolio}_{k-1,t}}{\text{Monthly Reference Portfolio}_{k-1,t-1}} + \frac{n}{5} \times \frac{\text{Monthly Reference Portfolio}_{k,t}}{\text{Monthly Reference Portfolio}_{k,t-1}} \right)$$

where:

$t$  denotes the relevant Trading Day  $t$  (which in the case of this Section 10(b) will always also be an Effective Monthly Rebalancing Date).

$t-1$  denotes the Trading Day that immediately precedes Trading Day  $t$  (which in the case of this Section 10(b) will always also be an Effective Monthly Rebalancing Date).

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

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

$\text{Monthly Reference Portfolio}_{k,t}$  means the level of the Monthly Reference Portfolio with respect to Monthly Rebalancing Selection Date  $k$  for Trading Day  $t$ .

$\text{Monthly Reference Portfolio}_{k,t-1}$  means the level of the Monthly Reference Portfolio with respect to Monthly Rebalancing Selection Date  $k$  for Trading Day  $t-1$ .

$\text{Monthly Reference Portfolio}_{k-1,t}$  means the level of the Monthly Reference Portfolio with respect to Monthly Rebalancing Selection Date  $k-1$  for Trading Day  $t$ .

Monthly Reference Portfolio<sub>k-1,t-1</sub> means the level of the Monthly Reference Portfolio with respect to Monthly Rebalancing Selection Date k-1 for Trading Day t-1.

n is the number of Effective Monthly Rebalancing Dates that have occurred in Monthly Rebalancing Period k prior to but excluding Trading Day t, such that:

- (i) If Trading Day t is the second Effective Monthly Rebalancing Date in Monthly Rebalancing Period k, n=1.
- (ii) If Trading Day t is the third Effective Monthly Rebalancing Date in Monthly Rebalancing Period k, n=2.
- (iii) If Trading Day t is the fourth Effective Monthly Rebalancing Date in Monthly Rebalancing Period k, n=3.
- (iv) If Trading Day t is the fifth Effective Monthly Rebalancing Date in Monthly Rebalancing Period k, n=4.

For the avoidance of doubt:

| <b>For the Trading Day that is the...</b> | <b>The Index Level calculated for such day will reflect...</b>  | <b>The Index Level calculated for the next Trading Day will reflect...</b>   |
|---|---|--|
| First Effective Monthly Rebalancing Date  | One hundred percent (100%) of the Performance of Monthly Reference Portfolio k-1 (which is the Prior Monthly Reference Portfolio)                       | Eighty percent (80%) of the Performance of Monthly Reference Portfolio k-1 (which is the Prior Monthly Reference Portfolio) and twenty percent (20%) of the Performance of Monthly Reference Portfolio k (which is the Next Monthly Reference Portfolio) |
| Second Effective Monthly Rebalancing Date | Eighty percent (80%) of the Performance of Monthly Reference Portfolio k-1 and twenty percent (20%) of the Performance of Monthly Reference Portfolio k | Sixty percent (60%) of the Performance of Monthly Reference Portfolio k-1 and forty percent (40%) of the Performance of Monthly Reference Portfolio k  |
| Third Effective Monthly Rebalancing Date  | Sixty percent (60%) of the Performance of Monthly Reference Portfolio k-1 and forty percent (40%) of the Performance of Monthly Reference Portfolio k   | Forty percent (40%) of the Performance of Monthly Reference Portfolio k-1 and sixty percent (60%) of the Performance of Monthly Reference Portfolio k  |
| Fourth Effective Monthly Rebalancing Date | Forty percent (40%) of the Performance of Monthly Reference Portfolio k-1 and sixty percent (60%) of the Performance of Monthly Reference Portfolio k   | Twenty percent (20%) of the Performance of Monthly Reference Portfolio k-1 and eighty percent (80%) of the Performance of Monthly Reference Portfolio k  |
| Fifth Effective Monthly Rebalancing Date  | Twenty percent (20%) of the Performance of Monthly Reference Portfolio k-1 and eighty percent (80%) of the Performance of Monthly Reference Portfolio k | One hundred percent (100%) of the Performance of Monthly Reference Portfolio k   |

## 11. Market Disruption

The Index is generally constructed so that the Index Calculation Agent will typically not calculate or publish the Index Level on a Disrupted Day for any Constituent whose Closing Level would affect the level of the Index; and so that the Index shall not rebalance on a Disrupted Day for any Constituent whose Closing Level

would affect the rebalancing of the Index. However, the occurrence of a Disrupted Day for any Constituent shall not affect the timing of the Monthly Rebalancing Selection Date.

If any originally scheduled Monthly Rebalancing Date is a Disrupted Day for any Constituent whose Closing Level would affect the rebalancing of the Index, then such Monthly Rebalancing Date and all following Monthly Rebalancing Dates in the relevant Monthly Rebalancing Period shall be postponed. This shall not cause any Monthly Rebalancing Date to be skipped, or cause more than one (1) Monthly Rebalancing Date to effectively occur on the same date. Instead, the rebalancing originally scheduled to occur on each Monthly Rebalancing Date on or after such affected Monthly Rebalancing Date shall also be postponed for up to five (5) Index Business Days.

Consequently, the effective Monthly Rebalancing Dates for the relevant Monthly Rebalancing Period will occur in the originally scheduled order and on different Index Business Days. As a result, a Monthly Rebalancing Period will effectively be extended, but will nevertheless occur over five (5) potentially non-consecutive days.

#### *11.1 Market disruption on a Monthly Rebalancing Selection Date*

If a Monthly Rebalancing Selection Date is a Disrupted Day (as defined in Section 11.4 below) for any Constituent, then the relevant Monthly Rebalancing Selection Date shall remain the originally scheduled Monthly Rebalancing Selection Date and the Closing TR Level for each such affected Constituent in respect of such Disrupted Day shall be deemed to be the Closing TR Level for each such affected Constituent as of the immediately preceding day that was both (x) a Dealing Day for such affected Constituent and (y) not a Disrupted Day for such affected Constituent.

#### *11.2 Market disruption on a Monthly Rebalancing Date*

The rebalancing originally scheduled to occur on a Monthly Rebalancing Date shall be postponed (such postponed Monthly Rebalancing Date, an “**Affected Monthly Rebalancing Date**”) if any Monthly Rebalancing Date occurring on or before such Monthly Rebalancing Date in the relevant Monthly Rebalancing Period is a Disrupted Day for any Constituent included in either the Prior Monthly Reference Portfolio or the Next Monthly Reference Portfolio.

In the event that a Monthly Rebalancing Date is an Affected Monthly Rebalancing Date, such Affected Monthly Rebalancing Date will be postponed to the date (the “**Postponed Monthly Rebalancing Date**”) that is the first day to occur of:

- (i) the first following Index Business Day that is neither (x) a Disrupted Day for any Constituent included in either the Prior Monthly Reference Portfolio or the Next Monthly Reference Portfolio, nor (y) the Postponed Monthly Rebalancing Date for any Affected Monthly Rebalancing Date that was originally scheduled to occur prior to the date on which such Affected Monthly Rebalancing Date was originally scheduled to occur; and
- (ii) the fifth (5<sup>th</sup>) Index Business Day following the date on which such Affected Monthly Rebalancing Date was originally scheduled to occur.

#### *11.3 Calculation of the Index Level in respect of a Final Disruption Determination Date*

If a Postponed Monthly Rebalancing Date is a Disrupted Day for any Constituent included in either the Prior Monthly Reference Portfolio or the Next Monthly Reference Portfolio, then such Postponed Monthly Rebalancing Date shall be a “**Final Disruption Determination Date**”.

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 for at least one Constituent included in a Monthly Reference Portfolio) using its good faith estimate of (i) the Closing TR Level for any Constituent, if

such Final Disruption Determination Date is a Disrupted Day for such Constituent, and (ii) the level of any Monthly Reference Portfolio that affects the calculation of the Index Level. Any such estimated levels may be subject to correction on any of (x) the first succeeding Index Business Day that is not a Final Disruption Determination Date for the Index, (y) the first succeeding Index Business Day that is not a Disrupted Day in respect of any Constituent and (z) the first succeeding Index Business Day that is not a Disrupted Day for a Constituent with respect to which such an estimated level was determined pursuant to this Section 11.3.

For the avoidance of doubt, on each Final Disruption Determination Date, the Index Calculation Agent will re-weight the portion of the Index to be rebalanced on such day in accordance with Section 10 (*Calculation of the Index Level*) using its good faith estimates determined pursuant to this Section 11.3. For purposes of determining the Closing TR Level for any Constituent for any Dealing Day, if the Prior Dealing Day for such Constituent was a Disrupted Day then, in the formula for determining the Closing TR Level for such Dealing Day, (i) the Closing TR Level for that Prior Dealing Day shall be replaced with the Closing TR Level for the Prior Non-Disrupted Dealing Day for such Constituent, (ii) the Closing Level for that Prior Dealing Day shall be replaced with the Closing Level for such Prior Non-Disrupted Dealing Day for such Constituent, and (iii) the Gross Distribution Amount of such Constituent in respect of such Dealing Day shall be replaced with the sum of each of the Gross Distribution Amounts for such Constituent in respect of each day from but excluding the Prior Non-Disrupted Dealing Day to and including such Dealing Day. Such Final Disruption Determination Date shall be a Trading Day for the purposes of the Index Rules, notwithstanding the fact that it is a Disrupted Day for at least one (one) Constituent.

#### 11.4 Definitions related to market disruption

- (a) **“Disrupted Day”** means, in respect of a Constituent, a Dealing Day on which a Market Disruption Event occurs or is continuing in respect of such Constituent.
- (b) A **“Market Disruption Event”** occurs if the Index Calculation Agent determines in its sole discretion that on any Dealing Day there has been, subject to the provisions of paragraph (c), below:
  - (i) in respect of any Reference Index (as defined in “Definitions”) of any Constituent included in the relevant Monthly Reference Portfolio or Monthly Reference Portfolios, a failure by the relevant sponsor or its agent to calculate and publish the 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 to effect transactions in or obtain levels or market values for (a) the relevant Reference Index, (b) any securities or components that in the aggregate comprise 20 percent (20%) or more of the level of the relevant Reference Index, (c) any futures or options contracts or other financial contracts relating to the relevant Reference Index, or (d) any futures or options contracts or other financial contracts relating to securities or components that in the aggregate comprise 20 percent (20%) or more of the level of the relevant Reference Index; or
  - (ii) the occurrence or existence of a suspension, absence or material limitation of trading of the securities of a Constituent on the relevant Primary Listing Exchange for such securities for more than two 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; or
  - (iii) a breakdown or failure in the price and trade reporting systems of the relevant Primary Listing Exchange for the securities of a Constituent as a result of which the reported trading prices for such securities are materially inaccurate for more than two hours of trading during, or during the last one-half hour period preceding the close of, the principal trading session on such relevant Primary Listing Exchange; or



- (iv) if applicable, the occurrence or existence of a suspension, absence or material limitation of trading on the Primary Listing Exchange or market for trading in futures or options contracts related to the securities of a Constituent or on any Related Exchange for such Constituent for more than two hours of trading during, or during the last one-half hour period preceding the close of, the principal trading session on the applicable exchange or market; or
- (v) as applicable, 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 of the Constituent or the relevant calculation agent or information provider that the relevant sponsor of such Constituent designates: the intraday net asset value or the intraday indicative value of such Constituent, the intraday indicative value of a Reference Index of such Constituent, or any intraday value or level that indicates or affects the approximate intrinsic economic value of such Constituent or the amount of any payment in respect of such Constituent; or
- (vi) as applicable, 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 of a Constituent or the relevant calculation agent or information provider that the relevant sponsor of such Constituent designates: the closing net asset value or the closing indicative value of a Constituent, the closing indicative value of the Reference Index of such Constituent, or any closing value or level or other value or level that indicates or affects the approximate intrinsic economic value of such Constituent or the amount of any payment in respect of such Constituent; or
- (vii) the relevant sponsor of a Constituent suspends creations, issuances or redemptions of securities of such Constituent; 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 Index (including, without limitation, positions with respect to any Constituent or the Reference Index of any Constituent).

- (c) For the purpose of determining whether a Market Disruption Event has occurred:
  - (i) at any time with respect to a Reference Index and a Dealing Day, 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;
  - (ii) a limitation on the hours or number of days of trading will not constitute a Market Disruption Event if it results from an announced change in the regular business hours of the relevant Primary Listing Exchange or the exchange or market for trading in futures or options contracts related to the relevant securities;
  - (iii) 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;
  - (iv) a suspension of trading in futures or options contracts on the Reference Index or securities of a Constituent by the exchange or market for trading in such contracts or securities of such

Constituent 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 of such Constituent or (c) a disparity in bid and ask quotes relating to such contracts or securities of such Constituent, will constitute a suspension, absence or material limitation of trading in futures or options contracts related to such equity index or the securities of such Constituent; and

- (v) a suspension, absence or material limitation of trading on any relevant Primary Listing Exchange or, if applicable, on the exchange or market on which futures or options contracts related to the Reference Index or the securities of a Constituent are traded will not include any time when such exchange or market is itself closed for trading under ordinary circumstances.

## **12. Extraordinary Events and Anti-Dilution Events**

### *12.1 Successors to a Constituent*

- (a) (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 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 Constituent or the amount of any payment in respect of the 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) (x) If a Constituent is replaced by a successor Constituent, (y) yet (1) the Reference Index of such successor Constituent is either the same as that of the replaced 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 Constituent's Reference Index or (2) such successor Constituent is otherwise acceptable to the Index Calculation Agent;

then, in each case, that Constituent, that Reference Index or the relevant sponsor, issuer, calculation agent or information provider will thereafter be deemed to be the successor Constituent, successor Reference Index 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, which may make such adjustments to the Index Rules as it determines in good faith are appropriate to account for such change (including, without limitation, adjustments to market disruption provisions in respect of an index that includes securities or components that are bonds or loans).

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

### *12.2 Substitutes for a Constituent*

If an Extraordinary Event occurs in respect of a Constituent, the Index Calculation Agent, acting in good faith and a commercially reasonable manner, shall select as a substitute for such Constituent an ETF that has a Reference Index (such substitute ETF being referred to herein as a "substitute ETF") that, in any case, the



Index Calculation Agent determines, in its sole discretion, possesses substantially similar characteristics or provides a substantially similar exposure (as considered prior to the occurrence of such Extraordinary Event) as compared to the Constituent that is being replaced, *provided that*, if the Index Calculation Agent determines that no such substitute (that the Index Calculation Agent determines, in its sole discretion, possesses substantially similar characteristics or provides a substantially similar exposure) is available, the Index Calculation Agent shall instead select an appropriate substitute by considering the context of the Index and its Weight Constraints; *provided further that*, if the Index Calculation Agent determines, in its sole discretion, that neither a substantially similar nor an appropriate substitute ETF is available, then the Index Calculation Agent will, in its sole discretion, (x) determine its good faith estimate of the closing price of such Constituent as of a date on or prior to the occurrence of such Extraordinary Event and use such estimate of the closing price (without modification over time) in respect of such Constituent in subsequent calculations of the Index Level until the final Effective Monthly Rebalancing Date in the immediately following Monthly Rebalancing Period, (y) remove such Constituent from the Index.

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

The Index Calculation Agent shall not select a particular substitute ETF 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 ETF, such substitute shall take the place of the relevant Constituent. For the avoidance of doubt, the prior performance of such substitute ETF shall be used in the identification of the Unique Portfolio for future Lookback Periods if the relevant prior performance of such substitute is available; *provided that*, if some portion of the relevant prior performance of such substitute is not available, the prior performance of the replaced ETF shall be used (in place of such portion of the relevant prior performance of such substitute that is not available) in the identification of the Unique Portfolio for future Lookback Periods with such adjustments as the Index Calculation Agent determines in good faith are appropriate to account for the use of prior Performance of both such substitute and such replaced ETF.

### *12.3 Definitions related to Extraordinary Events*

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

- (i) for any Constituent 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 Trust Issuer becomes, for any reason, subject to voluntary or involuntary termination, liquidation, bankruptcy, insolvency, dissolution or winding-up or any other analogous proceeding;
- (ii) for any Constituent, the issuer becomes, for any reason, subject to voluntary or involuntary termination, liquidation, bankruptcy, insolvency, dissolution or winding-up or any other analogous proceeding;
- (iii) for any Constituent, all the securities of the Constituent or all or substantially all of the assets of the Constituent are nationalized, expropriated or otherwise required to be transferred to any governmental agency, authority, entity or instrumentality thereof;

- (iv) for any Constituent, the sponsor of the Constituent permanently cancels the Constituent, and no successor exists, or the Constituent's level, net asset value or indicative value is not calculated and is not announced by or on behalf of the relevant sponsor or issuer of the Constituent, and is not calculated and announced by or on behalf of a successor sponsor or issuer acceptable to the Index Calculation Agent;
- (v) for a Constituent, the event specified in clause (x) of subsection (a) or (b) of Section 12.1 above occurs, but the relevant event specified in clause (y) of such subsection of Section 12.1 above does not occur;
- (vi) for any Constituent, such Constituent is de-listed from the relevant Primary Listing Exchange for such Constituent and is not concurrently listed on a U.S. securities exchange acceptable to the Index Calculation Agent;
- (vii) in respect of any Constituent, an ETF Material Event (as defined below in this Section 12.3) occurs in respect of such Constituent;
- (viii) in respect of a Constituent, a Market Disruption Event occurs 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;
- (ix) in respect of a Constituent, (x) a suspension or limitation on trading in respect of a Relevant Underlying (as defined below) is announced or imposed for ten (10) consecutive Dealing Days for such Constituent or for a period of indeterminate duration that the Index Calculation Agent determines is reasonably likely to include ten (10) consecutive Dealing Days for such Constituent 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 such Constituent;
- (x) if, at any time, any relevant license or other right or ability of the Index Calculation Agent or the Index Sponsor (or any of their affiliates) to use any Constituent, underlying reference input or relevant data or information or to refer to the level or price or other information in respect of any Constituent, underlying reference input or relevant data or information (or other component or input of the Index or other matter that could affect the Index) terminates, becomes impaired, ceases or cannot be obtained or will cease to be available on commercially reasonable terms or the Index Calculation Agent's right or ability to use (i) any Constituent for the purposes of the Index or (ii) the Index in connection with the grant or receipt of any other inbound or outbound licensing or sub-licensing rights is otherwise impaired, ceases or cannot be obtained or will cease to be available on commercially reasonable terms (for any reason); or
- (xi) the occurrence or continuation of a Change in Law (as defined below in this Section 12.3).

An **"ETF Material Event"** occurs in respect of a Constituent 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):

- (a) there is an amendment, variation or modification to the constitutional documents or offering documents of the Constituent, 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 Constituent;
- (b) there is an amendment, variation or modification to the terms of the Constituent or the obligations of the issuer in respect of the Constituent, 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 Constituent;

- (c) an ETF Regulatory Action occurs in respect of the Constituent; **"ETF Regulatory Action"** means (i) any cancellation, suspension or revocation of the registration or approval of the Constituent or the securities of the Constituent by any governmental, legal or regulatory entity with authority over the Constituent or the securities of the Constituent, (ii) any change in the legal, tax, accounting, or regulatory treatments of the Constituent, any sponsor, issuer or adviser of the Constituent or the securities of the Constituent that the Index Calculation Agent determines has or is reasonably likely to have an adverse impact on the holders of the securities of the Constituent or on the value of the securities of the Constituent, (iii) the Constituent or any sponsor, issuer or adviser of the Constituent 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 Constituent (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 Constituent or to exchange-traded funds generally that affects holders of the securities of the Constituent, 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 Constituent, or the operation of the Constituent in accordance with the terms of the Constituent or the Constituent's offering documents or (iv) the issuance by the SEC of an order to suspend redemption obligations of the Constituent, to freeze assets of the Constituent 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 Constituent;
- (d) the Average Daily Trading Volume (as defined in *"Definitions"*) of any Constituent declines below (x) an amount equal to 20 percent (20%) of its Average Daily Trading Volume as of June 7, 2017 or (y) five million U.S. dollars (\$5,000,000);
- (e) the Market Capitalization of any Constituent declines below (x) an amount equal to 20 percent (20%) of its Market Capitalization as of June 7, 2017 or (y) five hundred million U.S. dollars (\$500,000,000);
- (f) the relevant Primary Listing Exchange for the Constituent announces that such Constituent will be de-listed from such exchange;
- (g) 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 Constituent or the relevant calculation agent or information provider that the relevant sponsor or issuer of the Constituent designates: the intraday net asset value of the Constituent, the intraday indicative value of a Reference Index of the Constituent, or any intraday value or level that indicates or affects the approximate intrinsic economic value of the Constituent or the amount of any payment in respect of the Constituent;
- (h) 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 Constituent or the relevant calculation agent or information provider that the relevant sponsor or issuer of the Constituent designates: the closing net asset value of the Constituent, the closing indicative value of a Reference Index of the Constituent, or any closing value or level or other value or level that indicates or affects the approximate intrinsic economic value of the Constituent or the amount of any payment in respect of the Constituent;
- (i) 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 Constituent 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 Constituent, the closing indicative value of a Reference Index of the Constituent, or any closing value or level or other value or level that indicates or affects the approximate intrinsic economic value of the Constituent or the amount of any payment in respect of the Constituent;

- (j) the relevant sponsor of the Reference Index of the Constituent fails to calculate and publish the Closing Level for such index for five (5) consecutive Dealing Days; or
- (k) the relevant sponsor of the Constituent suspends new issuances, creations or redemptions of securities of such Constituent 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, the U.S. Securities and Exchange Commission or any exchange or trading facility), and

the Index Calculation Agent determines in good faith that (x) it is contrary to such law, rule, regulation or order for any market participants that are brokers or financial intermediaries (individually or collectively) to hold, acquire or dispose of (in whole or in part) a position in or a transaction referencing or relating to (1) a Constituent, (2) a component of a Constituent that is an index or (3) a component of a Reference Index of a Constituent (each such underlying described in any of the immediately preceding clauses (1), (2) and (3), being a “**Relevant Underlying**”) or (y) holding a position in or a transaction referencing or relating to a Relevant Underlying is (or, but for the consequent disposal or termination thereof, would otherwise be) in excess of any allowable position limit(s) applicable to any market participants that are brokers or financial intermediaries (individually or collectively) under any such law, rule or regulation in relation to a Relevant Underlying, including in any case traded on any exchange(s), market or other trading facility.

#### *12.4 Anti-dilution adjustments*

With respect to each Constituent (or the relevant successor or substitute Constituent), the Index Calculation Agent will make anti-dilution adjustments to the Closing Level of such Constituent only (a) if the securities of such Constituent are subject to a split or reverse split, once such split has become effective, and (b) if such Constituent is subject to (i) an issuance of additional securities of such Constituent that is given ratably to all or substantially all holders of securities of such Constituent or (ii) a distribution of securities of such Constituent as a result of the triggering of any provision of the corporate charter of such Constituent or its issuer, as applicable, once the dividend or distribution has become effective and the securities of such Constituent are trading ex-distribution. 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.

### **13. Corrections**

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

## Definitions

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

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| <b>“Affected Monthly Rebalancing Date”</b>  | has the meaning given to such term in Section 11.2 ( <i>Market disruption on a Monthly Rebalancing Date</i> ).  |
| <b>“Average Daily Trading Volume”</b>       | means, with respect to a Constituent and an Index Business Day, the product of (a) the ratio of (i) the total volume of trading in the securities of such Constituent from but excluding the calendar day that is six months prior to such Index Business Day, to and including such Index Business Day, as reported to the consolidated tape, 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, times (b) the Closing Level of such Constituent on such Index Business Day. The Average Daily Trading Volume for each Constituent as of June 7, 2017 is provided in Schedule 1. |
| <b>“Base Date”</b>                          | means May 3, 2004.  |
| <b>“Change in Law”</b>                      | has the meaning given to such term in Section 12.3 ( <i>Definitions related to Extraordinary Events</i> ).  |
| <b>“Closing Level”</b>                      | means, subject to the provisions of Section 11 ( <i>Market Disruption</i> ) and Section 12 ( <i>Extraordinary Events and Anti-Dilution Events</i> ), in respect of a Constituent and a Dealing Day, the official closing price for such Constituent on the Primary Listing Exchange for such Constituent, as of the closing time of the regular trading session of such Primary Listing Exchange on such Dealing Day.   |
| <b>“Closing Time”</b>                       | means, for an Index Business Day, the scheduled closing time of the regular trading session for NYSE Arca.  |
| <b>“Closing TR Level”</b>                   | has the meaning, in respect of a Constituent and a Dealing Day, given to such term in Section 6 ( <i>The Constituents; Closing TR Levels</i> ).   |
| <b>“Constituent”</b>                        | has the meaning given to such term in Section 4 ( <i>General Notes on the Index</i> ).  |
| <b>“Dealing Day”</b>                        | means, for each Constituent, a day on which the Primary Listing Exchange for such Constituent is scheduled to be open for trading for its regular trading session.  |
| <b>“Disrupted Day”</b>                      | has the meaning given to such term in Section 11.4 ( <i>Definitions related to market disruption</i> ).   |
| <b>“Effective Monthly Rebalancing Date”</b> | means, with respect to any Monthly Rebalancing Date, (i) if such Monthly Rebalancing Date occurs on the date originally scheduled (and is not postponed pursuant to Section 11.2 ( <i>Market disruption on a Monthly Rebalancing Date</i> )), such originally scheduled date or (ii) if such Monthly Rebalancing Date is postponed pursuant to Section 11.2, the Postponed Monthly Rebalancing Date in respect of such Monthly Rebalancing Date.  |
| <b>“Eligible Portfolio”</b>                 | has the meaning given to such term in Section 8.2 ( <i>Identifying the Unique Portfolio for each Lookback Period</i> ).   |

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| <b>"ETF Material Event"</b>                  | has the meaning given to such term in Section 12.3 ( <i>Definitions related to Extraordinary Events</i> ).   |
| <b>"ETF Regulatory Action"</b>               | has the meaning given to such term in Section 12.3 ( <i>Definitions related to Extraordinary Events</i> ).   |
| <b>"Exchange Act"</b>                        | means the United States Securities Exchange Act of 1934, as amended.   |
| <b>"Ex-Distribution Date"</b>                | has the meaning given to such term in Section 6 ( <i>The Constituents; Closing TR Levels</i> ).  |
| <b>"Extraordinary Event"</b>                 | has the meaning given to such term in Section 12.3 ( <i>Definitions related to Extraordinary Events</i> ).   |
| <b>"Final Disruption Determination Date"</b> | has the meaning given to such term in Section 11.3 ( <i>Calculation of the Index Level in respect of a Final Disruption Determination Date</i> ).  |
| <b>"Gross Distribution Amount"</b>           | has the meaning given to such term in Section 6 ( <i>The Constituents; Closing TR Levels</i> ).  |
| <b>"Index"</b>                               | means the J.P. Morgan Total Return Index, as provided in Section 1 ( <i>Introduction</i> ).  |
| <b>"Index Business Day"</b>                  | means a day (i) on which NYSE Arca is scheduled to open for trading for its regular trading session and (ii) that is a Dealing Day for all of the Constituents.  |
| <b>"Index Calculation Agent"</b>             | has the meaning given to such term in Section 2.1 ( <i>Index Sponsor and Index Calculation Agent; 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>                         | means, as provided in Section 1 ( <i>Introduction</i> ), the rules of the J.P. Morgan Total Return Index 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 2.1 ( <i>Index Sponsor and Index Calculation Agent; Identity and responsibilities</i> ).   |
| <b>"Initial Rebalancing Period"</b>          | has the meaning provided in Section 7 ( <i>Initial Composition of the Index</i> ).   |
| <b>"JPMS"</b>                                | has the meaning provided in Section 2.1 ( <i>Index Sponsor and Index calculation Agent; Identity and responsibilities</i> ).   |
| <b>"Live Date"</b>                           | has the meaning given to such term in Section 7 ( <i>Initial Composition of the Index</i> ).   |
| <b>"Lookback Period"</b>                     | has the meaning given to such term in Section 8.1 ( <i>Identifying the Lookback Periods</i> ).   |
| <b>"Market Capitalization"</b>               | means, with respect to a Constituent and a Dealing Day, the product of (a) the shares outstanding of such Constituent in respect of such Dealing Day, as reported to the Primary Listing Exchange, times (b) the Closing Level of such Constituent in respect of such Dealing Day. The Market Capitalization for each Constituent on June 7, 2017 is provided in Schedule 1. |



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| <b>"Market Disruption Event"</b>            | has the meaning given to such term in Section 11.4 ( <i>Definitions related to market disruption</i> ).  |
| <b>"Monthly Reference Portfolio"</b>        | has the meaning given to such term in Section 9.1 ( <i>The Monthly Reference Portfolios</i> ).   |
| <b>"Monthly Rebalancing Date"</b>           | has the meaning given to such term in Section 9 ( <i>Monthly Rebalancing</i> ) and is subject to the provisions of Section 11.2 ( <i>Market disruption on a Monthly Rebalancing Date</i> ).                      |
| <b>"Monthly Rebalancing Period"</b>         | has the meaning given to such term in Section 9 ( <b>Monthly Rebalancing</b> ) and is subject to the provisions of Section 11.2 ( <i>Market disruption on a Monthly Rebalancing Date</i> ).                      |
| <b>"Monthly Rebalancing Selection Date"</b> | means Index Business Day immediately preceding the last Index Business Day of each calendar month.   |
| <b>"Monthly Weight"</b>                     | has the meaning given to such term in Section 8 ( <i>Determining the Monthly Weights for the Constituents in the Monthly Reference Portfolio</i> ).  |
| <b>"Next Monthly Reference Portfolio"</b>   | has the meaning given to such term in Section 9 ( <i>Monthly Rebalancing</i> ).  |
| <b>"Performance"</b>                        | has the meaning given to such term in Section 8.2 ( <i>Identifying the Unique Portfolio for each Lookback Period</i> ).  |
| <b>"Postponed Monthly Rebalancing Date"</b> | has the meaning given to such term in Section 11.2 ( <i>Market disruption on a Monthly Rebalancing Date</i> ).   |
| <b>"Primary Listing Exchange"</b>           | with respect to a Constituent and a date, the U.S. securities exchange registered under the Exchange Act, on which the shares or other interests of such Constituent have their primary listing as of such date. |
| <b>"Prior Dealing Day"</b>                  | has the meaning given to such term in Section 6 ( <i>The Constituents; Closing TR Levels</i> ).  |
| <b>"Prior Monthly Reference Portfolio"</b>  | has the meaning given to such term in Section 9 ( <i>Monthly Rebalancing</i> ).  |
| <b>"Prior Non-Disrupted Dealing Day"</b>    | has the meaning given to such term in Section 6 ( <i>The Constituents; Closing TR Levels</i> ).  |
| <b>"Realized Volatility"</b>                | has the meaning given to such term in Section 8.2 ( <i>Identifying the Unique Portfolio for each Lookback Period</i> ).  |

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| <b>“Realized Volatility Constraint”</b>            | means five percent (5%); provided that, such percentage is subject to increase for any Rebalancing Selection Date in accordance with the terms of Section 8.2(e).   |
| <b>“Reference Index”</b>                           | means with respect to a Constituent, the index, if applicable, whose performance such Constituent attempts to track. The Reference Index for each Constituent, as of June 7, 2017 is provided in Schedule 1.  |
| <b>“Related Exchange”</b>                          | means, in respect of any Constituent, 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 the Constituent.   |
| <b>“Relevant Person”</b>                           | has the meaning given to such term in Section 2.1 ( <i>Index Sponsor and Index Calculation Agent; Identity and Responsibilities</i> ).  |
| <b>“Relevant Underlying”</b>                       | has the meaning given to such term in Section 12.3 ( <i>Definitions related to Extraordinary Events</i> ).  |
| <b>“Rebalancing Disruption Determination Date”</b> | has the meaning given to such term in Section 11.2 ( <i>Market disruption on a Monthly Rebalancing Date</i> ).  |
| <b>“SEC”</b>                                       | has the meaning given to such term in Section 12.3 ( <i>Definitions related to Extraordinary Events</i> ).  |
| <b>“Starting Rebalancing Period”</b>               | has the meaning given to such term in Section 7 ( <i>Initial Composition of the Index</i> ).  |
| <b>“Starting Selection Date”</b>                   | has the meaning given to such term in Section 7 ( <i>Initial Composition of the Index</i> ).  |
| <b>“Trading Day”</b>                               | means a day that is:<br>(i) an Index Business Day that (x) occurs during the period from but excluding the final Effective Monthly Rebalancing Date in a given Monthly Rebalancing Period to but excluding the first Effective Monthly Rebalancing Date in the immediately following Monthly Rebalancing Period and (y) is not a Disrupted Day for any Constituent with a non-zero Monthly Weight with respect to the relevant Monthly Reference Portfolio, or<br>(ii) an Index Business Day that is an Effective Monthly Rebalancing Date. |
| <b>“Trust Issuer”</b>                              | has the meaning given to such term in Section 12.3 ( <i>Definitions related to Extraordinary Events</i> ).  |
| <b>“Unique Portfolio”</b>                          | has the meaning given to such term in Section 8.2 ( <i>Identifying the Unique Portfolio for each Lookback Period</i> ).   |
| <b>“Weekday”</b>                                   | means a calendar day that is a Monday, Tuesday, Wednesday, Thursday or Friday.  |
| <b>“Weight Constraints”</b>                        | has the meaning given to such term in Section 8.2 ( <i>Identifying the Unique Portfolio for each Lookback Period</i> ).   |



**Schedule 1:****Constituent Name, Ticker, Reference Index, Average Daily Trading Volume and Market Capitalization  
as of June 7, 2017**

| <b>i</b> | <b>Constituent Name</b>                           | <b>Ticker</b> | <b>Reference Index</b>  | <b>Average Daily Trading Volume*</b> | <b>Market Capitalization*</b> |
|----------|---|---------------|---|--------------------------------------|-------------------------------|
| 1        | iShares 1-3 Year Treasury Bond ETF                | SHY           | ICE U.S. Treasury 1-3 Year Bond Index   | 92                                   | 11,014                        |
| 2        | iShares 7-10 Year Treasury Bond ETF               | IEF           | ICE U.S. Treasury 7-10 Year Bond Index  | 216                                  | 7,291                         |
| 3        | iShares 20+ Year Treasury Bond ETF                | TLT           | ICE U.S. Treasury 20+ Years Bond Index  | 1,124                                | 7,533                         |
| 4        | iShares 1-3 Year Credit Bond ETF                  | CSJ           | Bloomberg Barclays U.S. 1-3 Year Credit Bond Index                                      | 55                                   | 11,718                        |
| 5        | iShares Intermediate Credit Bond ETF              | CIU           | Bloomberg Barclays U.S. Intermediate Credit Bond Index                                  | 48                                   | 7,129                         |
| 6        | iShares 10+ Year Credit Bond ETF                  | CLY           | Bloomberg Barclays U.S. Long Credit Index   | 8                                    | 839                           |
| 7        | iShares MBS ETF                                   | MBB           | Bloomberg Barclays U.S. Mortgage Backed Securities Index                                | 72                                   | 10,594                        |
| 8        | iShares TIPS Bond ETF                             | TIP           | Bloomberg Barclays U.S. Treasury Inflation Protected Securities (TIPS) Index (Series-L) | 182                                  | 23,358                        |
| 9        | iShares J.P. Morgan USD Emerging Markets Bond ETF | EMB           | J.P. Morgan EMBI Global Core Index  | 254                                  | 12,812                        |
| 10       | iShares iBoxx \$ High Yield Corporate Bond ETF    | HYG           | Markit iBoxx USD Liquid High Yield Index  | 942                                  | 17,980                        |
| 11       | iShares Floating Rate Bond ETF                    | FLOT          | Bloomberg Barclays US Floating Rate Note < 5 Years Index                                | 51                                   | 5,714                         |
| 12       | iShares U.S. Preferred Stock ETF                  | PFF           | S&P U.S. Preferred Stock Index  | 112                                  | 17,971                        |

\* In millions of U.S.\$, to the nearest U.S.\$1 million.

### **Notices, Disclaimers and Conflicts of Interest**

The Index Rules have been prepared solely for informational purposes and nothing in the Index Rules constitutes (i) an offer to buy or sell any securities, participate in any transaction or adopt any investment linked to the Index 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 Index. Each Relevant Person hereby expressly disclaims, to the fullest extent permitted by law, all warranties of accuracy, completeness, merchantability, or fitness for a particular purpose with respect to any information contained in this document 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 Index or the Index Level.

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 Index or any of the Constituents or (ii) act as an investment manager, investment advisor, administrator, custodian, prime broker or other service provider to any 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 Index or any of the Constituents, or may invest or engage in transactions with other persons, or on behalf of such persons relating to any of these items. Such activity may or may not have an impact on the Index Level but all persons reading this document should be aware that a conflict of interest could arise where anyone is acting in more than one capacity, and such conflict may have an impact, positive or negative, on the Index Level. Neither the Index Calculation Agent nor any other Relevant Person has any duty to consider the circumstances of any person when participating in such transactions or to conduct themselves in a manner that is favorable to anyone with exposure to the Index.

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 Index and hedging such transactions or investments in any manner that they see fit. Accordingly it should be assumed that the Index Rules have and will be analyzed from this point of view.

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