

Underlying supplement no. 2-I
*To the prospectus dated April 13, 2023 and
the prospectus supplement dated April 13, 2023*

**Registration Statement Nos. 333-270004
and 333-270004-01**
Dated April 13, 2023
Rule 424(b)(2)

JPMORGAN CHASE & CO.

Notes Linked to the S&P Risk Control Index Series

JPMORGAN CHASE FINANCIAL COMPANY LLC

Notes, Fully and Unconditionally Guaranteed by JPMorgan Chase & Co., Linked to the S&P Risk Control Index Series

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 an index in the S&P Risk Control Index Series listed below (each, an “**Index**” and collectively the “**Indices**”):

- S&P 500® Daily Risk Control 5% Excess Return Index
- S&P 500® Daily Risk Control 10% Excess Return Index
- S&P 500® Dividend Aristocrats Risk Control 8% Excess Return 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**.”

Each Index is subject to the daily deduction of a notional financing cost.

This underlying supplement describes each Index, the relationship between JPMorgan Chase & Co., JPMorgan Chase Financial Company LLC and the sponsor of each Index and terms that will apply generally to notes linked in whole or in part to an Index and provides 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 same Index to which the notes are linked, the information contained in the document with the most recent date will control.

Investing in the notes involves a number of risks. See “Risk Factors” beginning on page S-2 of the prospectus supplement, “Risk Factors” in the accompanying product supplement and “Risk Factors” beginning on page US-3 of this underlying supplement.

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

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

J.P.Morgan

April 13, 2023

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

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

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

SUMMARY

All information contained in this underlying supplement regarding each of the indices in the S&P Risk Control Index Series set forth in the table below (each, an “**Index**” and collectively the “**Indices**”), including, without limitation, their make-up, method of calculation and changes in their components, has been derived from publicly available information and other information provided by S&P Dow Jones Indices LLC (the “**Index Sponsor**” and “**Index Calculation Agent**”), without independent verification. This information reflects the policies of, and is subject to change by, the Index Sponsor. Each Index was developed by the Index Sponsor, in coordination with J.P. Morgan Securities LLC. Each Index is maintained by the Index Sponsor and is calculated and published by the Index Calculation Agent. The Index Sponsor has no obligation to continue to publish, and may discontinue the publication of, any Index.

Index	Bloomberg Ticker	Underlying Index	Target Volatility
The S&P 500® Daily Risk Control 5% Excess Return Index	SPXT5UE	S&P 500® Total Return Index	5%
The S&P 500® Daily Risk Control 10% Excess Return Index	SPXT10UE	S&P 500® Total Return Index	10%
The S&P 500® Dividend Aristocrats Risk Control 8% Excess Return Index	SPXD8UE	S&P 500® Dividend Aristocrats Total Return Index	8%

Each Index is reported by the Bloomberg Professional® service (“**Bloomberg**”) under the applicable ticker symbol set forth in the table above.

Each Index attempts to provide variable notional exposure to its underlying index set forth in the table above (each, an “**Underlying Index**” and collectively the “**Underlying Indices**”), while targeting an annualized volatility equal to the target volatility set forth in the table above, subject to the deduction on a daily basis of the notional financing cost described below:

- The S&P 500® Total Return Index consists of stocks of 500 companies selected to provide a performance benchmark for the U.S. equity markets and is calculated on a total-return basis (*i.e.*, dividends and other distributions are notionally reinvested). For additional information about the S&P 500® Total Return Index, see “Background on the S&P 500® Total Return Index” below.
- The S&P 500® Dividend Aristocrats Total Return Index measures the performance of companies within the S&P 500® Index that have followed a policy of consistently increasing dividends every year for at least 25 years and is calculated on a total-return basis (*i.e.*, dividends and other distributions are notionally reinvested). For additional information about the S&P 500® Dividend Aristocrats Total Return Index, see “S&P 500® Dividend Aristocrats Total Return Index” below.

Each Index will adjust its notional exposure to its Underlying Index daily in an attempt to maintain an annualized volatility for that Index approximately equal to its target volatility, subject to a maximum exposure of 150% and a minimum exposure of 0%. We refer to the notional exposure that an Index has to the performance of its Underlying Index on any day as the “leverage factor” of that Index on that day. The leverage factor of an Index on any day is equal to its target volatility divided by the annualized volatility of its Underlying Index as of the second immediately preceding Index trading day, subject to the maximum and minimum exposures. Accordingly, as the volatility of an Underlying Index increases, the exposure provided by the relevant Index to that Underlying Index decreases, and, as the volatility of that Underlying Index decreases, the exposure provided by that Index to that Underlying Index increases. If the leverage factor of an Index is greater than 100% on any day, that Index will provide leveraged exposure to its Underlying Index. If the leverage factor of an Index is less than 100% on any day, the difference will be notionally uninvested and will earn no return. Under normal market conditions, each Index is expected to be significantly uninvested.

For example, assuming a volatility target of 5%, if the annualized volatility of the relevant Underlying Index used to calculate the leverage factor on a given day is equal to 20%, the leverage factor will equal 25% (5% divided by 20%). This means that, subject to the notional financing cost described below, the relevant Index would appreciate only 1% in response to an appreciation of 4% in its Underlying Index, and that Index would depreciate only by 1% in response to a depreciation of 4% in its Underlying Index.

Each Index is an excess return index that tracks the return of its Underlying Index, subject to its leverage factor, over and above a short-term money market investment. In other words, each Index provides a return based on the performance of a notional investment in its Underlying Index, subject to its leverage factor, where the investment was made using borrowed funds. The notional financing cost for each Index is calculated as a daily SOFR rate plus a fixed spread. The S&P 500® Daily Risk Control 5% Index and the S&P 500® Daily Risk Control 10% Excess Return Index have a fixed spread of 0.02963%, and the S&P 500® Dividend Aristocrats Risk Control 8% Excess Return has a fixed spread of 0.13088%. S&P Dow Jones may use other successor interest rates if the daily SOFR rate cannot be obtained. SOFR, the Secured Overnight Financing Rate, is intended to be a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities. See “Background on the Secured Overnight Financing Rate” below for additional information about SOFR.

Prior to December 20, 2021, the notional financing cost for the S&P 500® Daily Risk Control 5% Index and the S&P 500® Daily Risk Control 10% Excess Return Index was calculated based on overnight USD LIBOR rates. Prior to December 20, 2021, the notional financing cost for the S&P 500® Dividend Aristocrats Risk Control 8% Excess Return was calculated as a composite rate of interest intended to track the overnight rate of return of a notional position in a 3-month time deposit in U.S. dollars, calculated by reference to 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 notional financing cost is applied to each Index’s notional exposure to its Underlying Index, so it increases as the leverage factor increases and decreases as the leverage factor decreases. For example, if leverage factor of an Index is 80%, no notional financing costs will be deducted from the remaining 20%. If the leverage factor of an Index is 150%, notional financing costs will be deducted from the entire 150% exposure to its Underlying Index.

For additional information about the Indices, see “The S&P Risk Control Index Series” below.

No assurance can be given that an Index will approximate its target volatility. The actual realized volatility of an Index may be greater or less than its target volatility.

RISK FACTORS

*Your investment in the notes will involve certain risks. Investing in the notes is not equivalent to investing directly in any Index, Underlying Index, any of the equity securities composing any Underlying Index 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, in the accompanying product supplement and in any other accompanying underlying supplement, before you decide that an investment in the notes is suitable for you.***

Risks Relating to the Indices Generally

J.P. Morgan Securities LLC, an affiliate of the Issuer and the Guarantor (if applicable), coordinated with the Index Sponsor in the development of the Indices.

J.P. Morgan Securities LLC, which is referred to in this underlying supplement as JPMS, an affiliate of the Issuer and the Guarantor (if applicable), coordinated with the Index Sponsor in its development of the guidelines and policies governing the composition and calculation of the Indices. Although the Index Sponsor, in developing the Indices, coordinated with JPMS, JPMorgan Chase & Co., as the ultimate parent company of JPMS, ultimately controls JPMS. The policies and judgments for which JPMS was responsible could have an impact, positive or negative, on the levels of the Indices and the value of your notes. JPMS was under no obligation to consider your interests as an investor in the notes in its role in developing the guidelines and policies governing an Index or making judgments that may affect the level of that Index. Furthermore, the inclusion of the equity securities in an Index is not an investment recommendation by the Issuer, the Guarantor (if applicable) or JPMS of those equity securities.

The level of each Index will reflect the deduction of a notional financing cost.

One way in which each Index may differ from a typical index is that it is an excess return index that tracks the return of its Underlying Index, subject to the leverage factor, over and above a short-term money market investment. As such, each Index's level will include the deduction of a notional financing cost from the performance of its Underlying Index. In other words, each Index provides a return based on the performance of a notional investment in its Underlying Index, subject to the leverage factor, where the investment was made using borrowed funds. The notional financing cost accrues based on the daily SOFR rate plus a fixed spread. The notional financing cost will be deducted daily. As a result of the deduction of the notional financing cost, the level of each Index will trail the value of a hypothetical identically constituted notional portfolio from which no such cost is deducted.

SOFR, the Secured Overnight Financing Rate, is intended to be a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities. SOFR 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. SOFR has fluctuated significantly over time. For example, on September 17, 2019, the SOFR rate was 5.25% and, on December 31, 2021, the SOFR rate was 0.05%. The Federal Reserve raised its federal funds target rate over periods in the past and may do so again in the future. Any increase in SOFR 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 each Index. In addition, the fixed spreads added to SOFR in calculating the notional financing cost will increase the notional financing cost, which will negatively affect the performance of each Index.

The notional financing cost will place a significant drag on the performance of each Index, assuming that the rates underlying the notional financing cost remain positive, potentially offsetting positive returns of the relevant Underlying Index, exacerbating negative returns of the relevant Underlying Index and causing the level of each Index to decline steadily if the performance of the relevant Underlying Index is relatively flat. Each Index will not appreciate unless the performance of the relevant Underlying Index is sufficient to offset the negative effects of the notional financing cost, and then only to the extent that the performance of the Underlying Index, subject to the leverage factor, is greater than the deducted amount.

As a result of the notional financing cost, the level of each Index may decline even if the performance of the relevant Underlying Index is positive.

JPMorgan Chase & Co. is currently one of the companies that make up the S&P 500® Index and may be included in the S&P 500® Dividend Aristocrats Risk Control 8% Excess Return Index.

JPMorgan Chase & Co. will not have any obligation to consider your interests in taking any corporate action that might affect the level of any Underlying Index or Index.

Each Index may not be successful or outperform or underperform its Underlying Index.

Each Index provides notional exposure to its Underlying Index, while targeting its target volatility. No assurance can be given that the volatility targeting strategy will be successful or that any Index will outperform or underperform its Underlying Index or any alternative strategy that might be employed to provide volatility-adjusted exposure to its Underlying Index.

Each Index may not approximate its target volatility.

No assurance can be given that an Index will approximate its target volatility. The actual realized volatility of each Index may be greater or less than its target volatility. The exposure of an Index to its Underlying Index is dynamically adjusted on a daily basis, subject to a maximum exposure limit, based on the historical volatility of that Underlying Index. However, there is no guarantee that trends existing in the past will continue in the future. The volatility of an Underlying Index on any day may change quickly and unexpectedly. Accordingly, the actual realized annualized volatility of an Index may be greater than or less than the target volatility, which may affect the level of that Index and may adversely affect the value of the notes.

The daily adjustment of the exposure of an Index to its Underlying Index may cause that Index not to reflect fully any appreciation of its Underlying Index or to magnify any depreciation of its Underlying Index.

In an effort to approximate its target volatility, each Index adjusts its exposure to its Underlying Index daily based on the historical volatility of that Underlying Index, subject to a maximum exposure limit of 150%. When the historical volatility is greater than the target volatility, an Index will reduce its exposure to its Underlying Index. When the historical volatility is less than the target volatility, an Index will increase the exposure to its Underlying Index, up to 150%. Due to the daily exposure adjustments, an Index may fail to realize gains due to appreciation of its Underlying Index at a time when the exposure is less than 100% or may suffer increased losses due to depreciation of its Underlying Index when the exposure is above 100%. As a result, each Index may perform differently from a similar index that does not include a daily exposure adjustment feature.

Each Index may be significantly uninvested, which will result in a portion of that Index reflecting no return.

Each Index utilizes its existing Underlying Index methodology, plus an overlying mathematical algorithm designed to control the level of risk of its Underlying Index by establishing a specific volatility target and dynamically adjusting the exposure to that Underlying Index based on its observed historical volatility. If an Index's Underlying Index experiences volatility in excess of the applicable volatility target over the relevant period, the exposure to its Underlying Index is decreased, meaning that that Index will be partially uninvested, and, accordingly, that Index will reflect no return with respect to the uninvested portion. Accordingly, when the exposure of an Index to its Underlying Index is less than 100% on any day, that Index will be partially uninvested. For example, if the exposure is set at 20%, the relevant Index will be 80% uninvested. Under normal market conditions, each Index is expected to be significantly uninvested. Increased volatility in an Index's Underlying Index may affect the performance of that Index and may adversely affect the value of the notes.

Each Index's methodology for calculating its notional financing cost was recently changed.

Effective December 20, 2021, the notional financing cost on each day was set equal to the daily SOFR rate on that day plus a fixed spread. Prior to December 20, 2021, the notional financing cost for the S&P 500® Daily Risk Control 5% Index and the S&P 500® Daily Risk Control 10% Excess Return Index was calculated based on overnight USD LIBOR rates. Prior to December 20, 2021, the notional financing cost for the S&P 500® Dividend Aristocrats Risk Control 8% Excess Return was calculated as a composite rate of interest intended to track the overnight rate of return of a notional position in a 3-month time deposit in U.S. dollars, calculated by reference to 2-month and 3-month USD LIBOR rates.

In June 2017, the Federal Reserve Bank of New York's Alternative Reference Rates Committee (the "ARRC") announced SOFR as its recommended alternative to U.S. dollar LIBOR. However, the composition and characteristics of SOFR are not the same as those of U.S. dollar LIBOR. SOFR is a broad Treasury repo financing rate that represents overnight secured funding transactions and is not the economic equivalent of U.S. dollar LIBOR. While SOFR is a secured rate, U.S. dollar LIBOR is an unsecured rate. In addition, while SOFR currently is an overnight rate only, U.S. dollar LIBOR is a forward-looking rate that represents interbank funding for a specified term. As a result, there can be no assurance that SOFR will perform in the same way as U.S. dollar LIBOR would have at any time, including, without limitation, as a result of changes in interest and yield rates in the market, bank credit risk, market volatility or global or regional economic, financial, political, regulatory, judicial or other events. For the same reasons, SOFR is not expected to be a comparable substitute, successor or replacement for U.S. dollar LIBOR.

The fixed spread added to SOFR in calculating the notional financing cost of each Index is arbitrary and will negatively affect the performance of that Index.

The change to the notional financing cost may adversely affect the performance of each Index and the value of the notes, as the notional financing cost derived from daily SOFR rates plus a spread may be different, perhaps significantly, than the notional financing cost that would have been derived from the relevant LIBOR rates. In addition, this change may affect the composition of an Index after the effective date of the change, which may affect the performance of each Index and adversely affect the value of the notes. Moreover, the performance of each Index prior to December 20, 2021 does not reflect this change. Each Index lacked any operating history with the new notional financing cost methodology prior to December 20, 2021 and may perform in unanticipated ways.

Risks Relating to the Notional Financing Cost

SOFR has a limited history and its future performance cannot be predicted based on historical performance.

The publication of SOFR began in April 2018, and, therefore, it has a limited history. In addition, the future performance of SOFR cannot be predicted based on the limited historical performance. The level of SOFR during the term of the notes may bear little or no relation to historical actual or historical indicative SOFR data. Prior observed patterns, if any, in the behavior of market variables and their relation to SOFR, such as correlations, may change in the future. While some pre-publication historical data has been released by the Federal Reserve Bank of New York ("FRBNY"), production of such historical indicative SOFR data inherently involves assumptions, estimates and approximations. No future performance of SOFR may be inferred from any of historical actual or historical indicative SOFR data. Hypothetical or historical performance data are not indicative of, and have no bearing on, the potential performance of SOFR. Changes in the levels of SOFR will affect the notional financing cost and, therefore, the performance of each Index and the return on the notes and the trading price of the notes, but it is impossible to predict whether such levels will rise or fall.

SOFR will be affected by a number of factors and may be volatile.

The notional financing cost will depend on SOFR. SOFR will depend on a number of factors, including, but not limited to:

- supply and demand for overnight U.S. Treasury repurchase agreements;
- general U.S. and global economic conditions;
- sentiment regarding underlying strength in the U.S. and global economies;
- inflation and expectations concerning inflation;
- sentiment regarding credit quality in the U.S. and global credit markets;
- central bank policy regarding interest rates;
- performance of capital markets; and
- any statements from public government officials regarding the cessation of SOFR.

These and other factors may have a material effect on the performance of SOFR, on the notional financing cost, on the performance of each Index and on the value of the notes in the secondary market. Additionally, these factors may result in volatility in SOFR, and volatility in SOFR may affect the notional financing cost, which may adversely affect your return on the notes.

The composition and characteristics of SOFR are not the same as those of LIBOR, and there is no guarantee that SOFR is a comparable substitute for LIBOR.

In June 2017, the FRBNY's Alternative Reference Rates Committee (the "**ARRC**") announced SOFR as its recommended alternative to U.S. dollar LIBOR. However, the composition and characteristics of SOFR are not the same as those of U.S. dollar LIBOR. SOFR is a broad Treasury repo financing rate that represents overnight secured funding transactions and is not the economic equivalent of U.S. dollar LIBOR. While SOFR is a secured rate, U.S. dollar LIBOR is an unsecured rate. In addition, while SOFR currently is an overnight rate only, U.S. dollar LIBOR is a forward-looking rate that represents interbank funding for a specified term. As a result, there can be no assurance that SOFR will perform in the same way as U.S. dollar LIBOR would have at any time, including, without limitation, as a result of changes in interest and yield rates in the market, bank credit risk, market volatility or global or regional economic, financial, political, regulatory, judicial or other events. For the same reasons, SOFR is not expected to be a comparable substitute, successor or replacement for U.S. dollar LIBOR.

The fixed spread added to SOFR in calculating the notional financing cost will negatively affect the performance of each Index.

The notional financing cost is intended to approximate the cost of maintaining a position in an Underlying Index using borrowed funds at a rate of interest equal to the daily SOFR rate plus a fixed spread. The fixed spread is arbitrary and will increase the notional financing cost, which will negatively affect the performance of each Index.

The notional financing cost is calculated by reference to daily SOFR rates, not compounded SOFR rates.

The notional financing cost is calculated by reference to daily SOFR rates, plus a fixed spread, not to SOFR compounded over any period. Accordingly, the notional financing cost is expected to be more representative of current overnight rates than of the overnight rate of return of a notional position in a time deposit in U.S. dollars. The notional financing cost may in some circumstances be higher than if compounded SOFR were used to calculate the notional financing cost.

The administrator of SOFR may make changes that could adversely affect the level of SOFR or discontinue SOFR and has no obligation to consider your interest in doing so.

SOFR is a relatively new rate, and FRBNY (or a successor), as administrator of SOFR, may make methodological or other changes that could change the value of SOFR, including changes related to the method by which SOFR is calculated, eligibility criteria applicable to the transactions used to calculate SOFR, or timing related to the publication of SOFR. If the manner in which SOFR is calculated is changed, that change may result in an increase to the notional financing cost, which would adversely affect the performance of each Index and the value of the notes. The administrator of SOFR may

withdraw, modify, amend, suspend or discontinue the calculation or dissemination of SOFR in its sole discretion and without notice and has no obligation to consider the interests of holders of the notes in calculating, withdrawing, modifying, amending, suspending or discontinuing SOFR.

THE S&P RISK CONTROL INDEX SERIES

All information contained in this underlying supplement regarding each of the indices in the S&P Risk Control Index Series set forth in the table below (each, an “**Index**” and collectively the “**Indices**”), including, without limitation, their make-up, method of calculation and changes in their components, has been derived from publicly available information and other information provided by S&P Dow Jones Indices LLC (the “**Index Sponsor**” and “**Index Calculation Agent**”), without independent verification. This information reflects the policies of, and is subject to change by, the Index Sponsor. Each Index was developed by the Index Sponsor, in coordination with J.P. Morgan Securities LLC. Each Index is maintained by the Index Sponsor and is calculated and published by the Index Calculation Agent. The Index Sponsor has no obligation to continue to publish, and may discontinue the publication of, any Index.

Index	Bloomberg Ticker	Underlying Index	Target Volatility
The S&P 500® Daily Risk Control 5% Excess Return Index	SPXT5UE	S&P 500® Total Return Index	5%
The S&P 500® Daily Risk Control 10% Excess Return Index	SPXT10UE	S&P 500® Total Return Index	10%
The S&P 500® Dividend Aristocrats Risk Control 8% Excess Return Index	SPXD8UE	S&P 500® Dividend Aristocrats Total Return Index	8%

Each Index is reported by the Bloomberg Professional® service (“**Bloomberg**”) under the applicable ticker symbol set forth in the table above.

Each Index attempts to provide variable notional exposure to its underlying index set forth in the table above (each, an “**Underlying Index**” and collectively the “**Underlying Indices**”), while targeting an annualized volatility equal to the target volatility set forth in the table above, subject to the deduction on a daily basis of the notional financing cost described below:

- The S&P 500® Total Return Index consists of stocks of 500 companies selected to provide a performance benchmark for the U.S. equity markets and is calculated on a total-return basis (*i.e.*, dividends and other distributions are notionally reinvested). For additional information about the S&P 500® Total Return Index, see “Background on the S&P 500® Total Return Index” below.
- The S&P 500® Dividend Aristocrats Total Return Index measures the performance of companies within the S&P 500® Index that have followed a policy of consistently increasing dividends every year for at least 25 years and is calculated on a total-return basis (*i.e.*, dividends and other distributions are notionally reinvested). For additional information about the S&P 500® Dividend Aristocrats Total Return Index, see “S&P 500® Dividend Aristocrats Total Return Index” below.

Volatility Control

Each Index will adjust its notional exposure to its Underlying Index daily in an attempt to maintain an annualized volatility for that Index approximately equal to its target volatility, subject to a maximum exposure of 150% and a minimum exposure of 0%. We refer to the notional exposure that an Index has to the performance of its Underlying Index on any day as the “leverage factor” of that Index on that day. The leverage factor of an Index on any day is equal to its target volatility divided by the annualized volatility of its Underlying Index as of the second immediately preceding Index trading day, subject to the maximum and minimum exposures. Accordingly, as the volatility of an Underlying Index increases, the exposure provided by the relevant Index to that Underlying Index decreases, and, as the volatility of that Underlying Index decreases, the exposure provided by that Index to that Underlying Index increases. If the leverage factor of an Index is greater than 100% on any day, that Index will provide leveraged exposure to its Underlying Index. If the leverage factor of an Index is less than 100% on any day, the difference will be notionally uninvested and will earn no return. Under normal market conditions, each Index is expected to be significantly uninvested.

For example, assuming a volatility target of 5%, if the annualized volatility of the relevant Underlying Index used to calculate the leverage factor on a given day is equal to 20%, the leverage factor will equal 25% (5% divided by 20%). This means that, subject to the notional financing cost described below, the relevant Index would appreciate only 1% in response to an appreciation of 4% in its Underlying Index, and that Index would depreciate only by 1% in response to a depreciation of 4% in its Underlying Index.

Each Index is an excess return index that tracks the return of its Underlying Index, subject to its leverage factor, over and above a short-term money market investment. In other words, each Index provides a return based on the performance of a notional investment in its Underlying Index, subject to its leverage factor, where the investment was made using borrowed funds. The notional financing cost for each Index is calculated as a daily SOFR rate plus a fixed spread. The S&P 500® Daily Risk Control 5% Index and the S&P 500® Daily Risk Control 10% Excess Return Index have a fixed spread of 0.02963%, and the S&P 500® Dividend Aristocrats Risk Control 8% Excess Return has a fixed spread of 0.13088%. S&P Dow Jones may use other successor interest rates if the daily SOFR rate cannot be obtained. SOFR, the Secured Overnight Financing Rate, is intended to be a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities. See “Background on the Secured Overnight Financing Rate” below for additional information about SOFR.

Prior to December 20, 2021, the notional financing cost for the S&P 500® Daily Risk Control 5% Index and the S&P 500® Daily Risk Control 10% Excess Return Index was calculated based on overnight USD LIBOR rates. Prior to December 20, 2021, the notional financing cost for the S&P 500® Dividend Aristocrats Risk Control 8% Excess Return was calculated as a composite rate of interest intended to track the overnight rate of return of a notional position in a 3-month time deposit in U.S. dollars, calculated by reference to 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 notional financing cost is applied to each Index’s notional exposure to its Underlying Index, so it increases as the leverage factor increases and decreases as the leverage factor decreases. For example, if leverage factor of an Index is 80%, no notional financing costs will be deducted from the remaining 20%. If the leverage factor of an Index is 150%, notional financing costs will be deducted from the entire 150% exposure to its Underlying Index.

No assurance can be given that an Index will approximate its target volatility. The actual realized volatility of an Index may be greater or less than its target volatility.

Calculation of the Value of the Indices

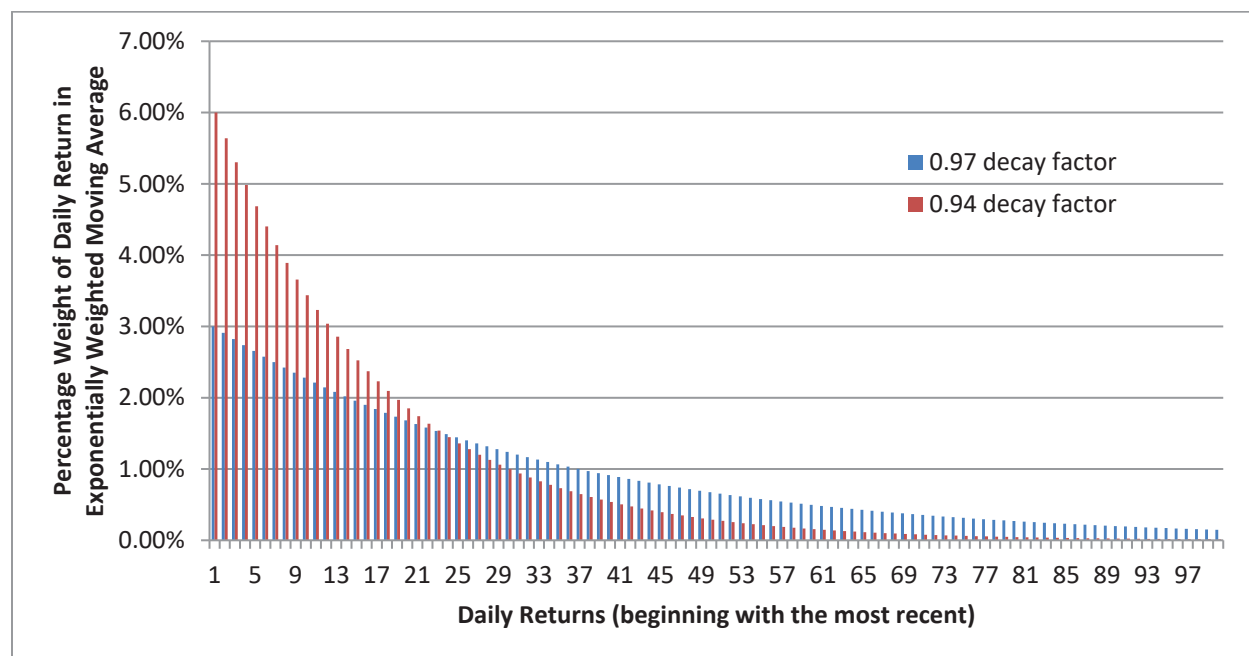
The closing level of each Index on any day reflects (a) the performance of its Underlying Index since the immediately preceding index rebalancing date, *multiplied by* its leverage factor, *less* (b) the notional financing cost that has accrued since the immediately preceding index rebalancing date, calculated using a 360-day year, *multiplied by* the leverage factor. Each day on which 15% or more of the total weight of the Underlying Index of an Index is traded is an index rebalancing date for that Index.

Calculation of Leverage Factor and Volatility of the Indices

The historical realized volatility of an Underlying Index used to calculate the leverage factor of an Index is the greater of the short- and long-term volatility measures, where each volatility measure uses exponential weightings to give more significance to recent observations. The degree to which more recent daily returns have a greater effect than less recent daily returns in calculating the volatility measures is dictated by the “decay factor” used. The short-term and long-term decay factors are 0.94 (94%) and 0.97 (97%), respectively. The greater of the short- and long-term measures of volatility is used to cause an Index to deleverage quickly on a relative basis but increase exposure more gradually on a relative basis, subject to the maximum exposure of 150%.

The chart below illustrates the effect of the exponential weighting described above for the decay factors of 0.97 and 0.94. For each daily return shown, the chart indicates the percentage weight that will

be given to that daily return in calculating the relevant volatility measure. As the chart illustrates, the most recent daily returns have a significantly greater weight than less recent daily returns in determining the short- and long-term volatility measures.



The leverage factor as of each index rebalancing date is calculated as (a) the relevant volatility target *divided by* (b) the greater of the short- and long-term volatility measures determined as of the second immediately preceding index rebalancing date, subject to the maximum leverage factor of 150%.

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BACKGROUND ON THE S&P 500® TOTAL RETURN INDEX

All information contained in this underlying supplement regarding the S&P 500® Total Return Index, including, without limitation, its make-up, method of calculation and changes in its components, has been derived from publicly available information, without independent verification. This information reflects the policies of, and is subject to change by, S&P Dow Jones. The S&P 500® Total Return Index is calculated, maintained and published by S&P Dow Jones. S&P Dow Jones has no obligation to continue to publish, and may discontinue publication of, the S&P 500® Total Return Index.

The S&P 500® Total Return Index is reported by Bloomberg L.P. under the ticker symbol “SPTR.”

The S&P 500® Total Return Index represents the total return earned on a portfolio that tracks the S&P 500® Index and reinvests dividend income in the S&P 500® Index, not in the specific stock paying the dividend. While changes in the level of the S&P 500® Index reflect only changes in stock prices, changes in the level of the S&P 500® Total Return Index reflect both movements in stock prices and the reinvestment of dividend income. For more information about the S&P 500® Index, see “— Background on the S&P 500® Index” in this underlying supplement.

The S&P 500® Total Return Index is calculated from the S&P 500® Index and daily total dividend returns. First, on each trading day, the total dividend paid on that day is measured in dollars and converted into index points of the S&P 500® Index by dividing the total dividend paid by the divisor for the S&P 500® Index. The daily total return for that trading day as (a) the return the S&P 500® Index since the immediately preceding trading day plus (b) the total dividend paid, expressed in index points of the S&P 500® Index, divided by the closing level of the S&P 500® Index on the immediately preceding trading day. The closing level of the S&P 500® Total Return Index on that trading day is then calculated by applying the daily total return for that trading day to the closing level of the S&P 500® Total Return Index on the immediately preceding trading day.

The S&P 500® Total Return Index reflects both ordinary and special dividends. Ordinary cash dividends are applied on the ex-date in calculating the S&P 500® Total Return Index. Special dividends are those dividends that are outside of the normal payment pattern established historically by the issuer of the stocks composing the S&P 500® Index. These may be described by the issuer as “special,” “extra,” “year-end,” or “return of capital.” Whether a dividend is funded from operating earnings or from other sources of cash does not affect the determination of whether it is ordinary or special. Special dividends are treated as corporate actions with offsetting price and divisor adjustments. Dividends used to calculate the S&P 500® Total Return Index can be negative if a dividend correction is applied to a particular stock.

BACKGROUND ON THE S&P 500® DIVIDEND ARISTOCRATS INDEX

All information contained in this underlying supplement regarding the S&P 500® Dividend Aristocrats Index, including, without limitation, its make-up, method of calculation and changes in its components, has been derived from publicly available information, without independent verification. This information reflects the policies of, and is subject to change by, S&P Dow Jones. The S&P 500® Dividend Aristocrats Index is calculated, maintained and published by S&P Dow Jones. S&P Dow Jones has no obligation to continue to calculate and publish, and may discontinue publication of, the S&P 500® Dividend Aristocrats Index.

The S&P 500® Dividend Aristocrats Index is reported by Bloomberg L.P. under the ticker symbol “SPDAUDP.”

The S&P 500® Dividend Aristocrats Index measures the performance of companies within the S&P 500® Index that have followed a policy of consistently increasing dividends every year for at least 25 years. The S&P 500® Index consists of stocks of 500 companies selected to provide a performance benchmark for the U.S. equity markets. For more information about the S&P 500® Index, see “— Background on the S&P 500® Index” in this underlying supplement.

Constituents are equal weighted, with the qualifying universe reviewed once a year in January.

To qualify for membership in the S&P 500® Dividend Aristocrats Index, at each annual reconstitution a stock must satisfy the following criteria:

- (1) Be a member of the S&P 500® Index;
- (2) Have increased total dividend per share amount every year for at least 25 consecutive years;
- (3) Have a minimum float-adjusted market capitalization (“**FM**C”) of at least US\$ 3 billion as of the rebalancing reference date; and
- (4) Have an average daily value traded of at least US\$ 5 million for the three-months prior to the rebalancing reference date.

Calendar years and ex-dates are used for the dividend analysis, with the data being reviewed every January. In situations where a dividend payment, or payments, deviates from the company’s standard dividend payment cycle, S&P Dow Jones will, at its discretion, allocate payments to the appropriate year in order to take a full cycle into account.

A dividend initiation or re-initiation does not count as a dividend increase. The initiation calendar year may include payment of all four quarterly dividends, or only one, two or three quarterly payments. Evaluations are made on a best-effort basis.

S&P Dow Jones only considers cash dividend payments declared as regular by the paying company for index eligibility and selection purposes. Cash dividend payments declared as special by the paying company, including recurring special cash dividends, are not considered. Gross cash dividend amounts, before any withholding tax, are used.

For spin-offs occurring after January 1, 2013, the yearly dividend increase history of the parent company is assigned to both the parent and spun-off company on the spin-off effective date. To determine annual dividend payments, the dividends of the parent and spun-off companies are combined until two full calendar year cycles of dividend payments are available for both post-spin-off companies. For evaluation purposes the combined dividend amount is adjusted by the spin-off ratio. Subsequent dividend comparisons are based on the annual dividend amounts of each respective company.

For merger and acquisition events, S&P Dow Jones, at its discretion, may retain dividend history for newly formed entities from their predecessor companies.

Stock Diversification

At each annual reconstitution, the minimum number of constituent stocks is 40. As part of the annual reconstitution, if the number of constituent stocks is fewer than 40, the following steps are taken:

- The S&P 500® Index constituent stocks with history of increased dividends of more than 20 consecutive years, also satisfying the criteria on market capitalization and liquidity above, are added in decreasing order of dividend yield until the stock diversification criteria is satisfied.
- If the stock diversification criteria is still not satisfied, the remaining constituents of the S&P 500® Index satisfying the criteria on market capitalization and liquidity are added in decreasing order of dividend yield until the stock diversification criteria is satisfied. Dividend yield is calculated as the total dividends paid during the 12 months preceding the reference date, divided by the price on the reference date. Members of the S&P 500® Index that have reduced dividends in the 12 months preceding the reference date, as determined by S&P Dow Jones, are not considered for inclusion.

Sector Diversification Criteria

Constituent stocks are classified according to the Global Industry Classification Standard (“GICS”). At each annual reconstitution, this classification should not result in constituent stocks in a particular GICS sector accounting for more than a 30% weight in the S&P 500® Dividend Aristocrats Index.

As part of the annual reconstitution, if the sector diversification criteria is not satisfied following the selection of constituent stocks as detailed above, the following additional steps are taken:

- The S&P 500® Index constituent stocks with history of increased dividends of more than 20 consecutive years, also satisfying the primary criteria on market capitalization and liquidity above, are added in decreasing order of dividend yield until the sector diversification criteria is satisfied.
- If the sector diversification criteria is still not satisfied, the remaining constituents of the S&P 500® Index from alternative sectors satisfying the criteria on market capitalization and liquidity are added in decreasing order of dividend yield until the sector diversification criteria is satisfied. Members of the S&P 500® Index that have reduced dividends in the 12 months preceding the reference date, as determined by S&P Dow Jones, are not considered for inclusion.

At the discretion of the Index Committee (as defined below), stocks added to satisfy the stock or sector diversification requirements at the previous annual reconstitution may be retained in the S&P 500® Dividend Aristocrats Index if it once again increased annual total dividend per share amount and remains in the parent index universe (S&P 500® Index).

Multiple Share Classes

For companies with multiple share classes of common stock, S&P Dow Jones determines the share class with both the highest one-year trading liquidity and largest FMC as the designated listing. When the liquidity and market capitalization indicators are in conflict, S&P Dow Jones analyzes the relative differences between the two values placing a greater importance on liquidity. Each company in the S&P 500® Dividend Aristocrats Index is represented once by the designated listing.

The S&P 500® Dividend Aristocrats Index Constituent Selection

The selection of index constituents is done as follows:

- (1) All constituents of the S&P 500® Index make up the initial selection universe.
- (2) All companies within the selection universe that meet the eligibility criteria for the S&P 500® Dividend Aristocrats Index.

- (3) If the number of constituent companies chosen in Step 2 is fewer than 40, then the remaining S&P 500® Index constituents are classified (1) according to the length of their dividend growth history in years and (2) according to their dividend yield. Stocks with history of increased dividends of more than 20 consecutive years, also satisfying the primary criteria on market capitalization and liquidity above, are added in decreasing order of dividend yield until the index contains 40 constituents.
- (4) If the number of constituent companies chosen after Step 3 is still fewer than 40, the remaining constituents of the S&P 500 satisfying the criteria on market capitalization and liquidity are added in decreasing order of dividend yield until the stock diversification criteria is satisfied.
- (5) If the weight of any single GICS sector after Steps 2-4 exceeds 30%, then the remaining S&P 500® Index constituents are classified (1) according to the length of their dividend growth history in years and (2) according to their dividend yield. Stocks with history of increased dividends of more than 20 consecutive years, also satisfying the primary criteria on market capitalization and liquidity above, are added in decreasing order of dividend yield until no GICS sector accounts for more than a 30% index weight.
- (6) If the weight of any single GICS sector after Step 5 is still exceeds 30%, the remaining constituents of the S&P 500® Index satisfying the criteria on market capitalization and liquidity are added in decreasing order of dividend yield until the sector diversification criteria is satisfied.

At each reconstitution and rebalancing, constituents are equal weighted. In addition, as part of the annual reconstitution, each GICS sector is capped at 30% of the total index weight.

The S&P 500® Dividend Aristocrats Index Calculation

Once the constituent stocks are identified, S&P Dow Jones utilizes an equal weighting procedure to determine the composition of the S&P 500® Dividend Aristocrats Index so that each stock constituent has an equal weight in the index at each rebalancing date. Stock constituents are re-weighted every quarter to re-establish equal weighting using the closing prices as of the second Friday of the rebalancing month as the reference price. Since index shares are assigned based on prices one week prior to the rebalancing, the actual weight of each stock at the rebalancing will differ from the target equal weights due to market movements.

The S&P 500® Dividend Aristocrats Index is calculated by means of the divisor methodology. The initial divisor is set to have a base index value of 100 on December 29, 1989. The Index Level is simply the Index Market Value divided by the Divisor for the S&P 500® Dividend Aristocrats Index:

$$\text{Index Level} = \frac{\text{Index Market Value}}{\text{Divisor}}$$

The Index Market Value is calculated as follows:

$$\text{Index Market Value} = \sum_{i=1}^N (\text{Price})_i \times (\text{Shares})_i \times (\text{IWF})_i \times (\text{AWF})_i$$

where Price is the price of the constituent stock, Shares is the number of shares of the constituent stock outstanding, IWF is the constituent stock's Investable Weight Factor, which is a float adjustment factor designed to exclude shares that are closely held by control groups, other publicly traded companies or government agencies, and AWF is the adjustment factor of each constituent stock assigned at each rebalancing date.

The Adjustment Weight Factor, AWF, is calculated for each constituent stock, i , at each index rebalancing date, t , as follows:

$$AWF_{i,t} = \frac{Z}{N \times \text{FloatAdjustedMarketValue}_{i,t}}$$

where N is the number of stocks in the S&P 500® Dividend Aristocrats Index and Z is an index-specific constant set for the purpose of deriving the AWF.

In order to maintain index continuity, it is necessary to adjust the Divisor at the rebalancing so that the Index Level is not altered by the rebalancing:

Therefore,

$$(\text{Divisor})_{\text{after balancing}} = \frac{(\text{Index Market Value})_{\text{after rebalancing}}}{(\text{Index Value})_{\text{before rebalancing}}}$$

The S&P 500® Dividend Aristocrats Index Maintenance and Adjustments

The S&P 500® Dividend Aristocrats Index's constituent membership is reviewed once a year, with changes effective after the close of the last business day of January. The reference date for such additions and deletions is after the close of the last business day of December. In addition to the annual reconstitution, the S&P 500® Dividend Aristocrats Index re-weights quarterly, after the close of business of the last business day of January, April, July and October. The reference date for such re-weightings is five business days prior to the last business day of the re-weighting month. No additions are made to the S&P 500® Dividend Aristocrats Index between annual reconstitutions. However, constituent stocks may be deleted during the December rebalancing if the company no longer meets the eligibility criteria described above or between rebalancings if the stock is removed from the S&P 500® Index.

Index constituents are reviewed on a monthly basis for ongoing eligibility. At the discretion of S&P Dow Jones, an index constituent may be removed effective prior to the open of the first business day of the following month if:

- A scheduled dividend payment is omitted;
- A company announces that it will cease paying dividends for an undetermined period; or
- A company announces a reduced dividend amount and S&P Dow Jones determine that it will no longer qualify for the S&P 500® Dividend Aristocrats Index at the subsequent reconstitution as a result.

Index Committee

The S&P 500® Dividend Aristocrats Index is maintained by an S&P Dow Jones index committee (the "**Index Committee**"). The Index Committee meets regularly. At each meeting, the Index Committee may review pending corporate actions that may affect the S&P 500® Dividend Aristocrats Index constituents, statistics comparing the composition of the S&P 500® Dividend Aristocrats Index to the market, companies that are being considered as candidates for addition to the S&P 500® Dividend Aristocrats Index and any significant market events. In addition, the Index Committee may revise index policy covering rules for selecting companies, treatment of dividends, share counts or other matters.

S&P Dow Jones considers information about changes to the S&P 500® Dividend Aristocrats Index and related matters to be potentially market moving and material. Therefore, all Index Committee discussions are confidential.

The Index Committee reserves the right to make exceptions when applying the methodology if the need arises. In any scenario where the treatment differs from the general rules S&P Dow Jones will provide sufficient notice, whenever possible.

In addition to the daily governance of the S&P 500® Dividend Aristocrats Index and maintenance of index methodologies, at least once within any 12-month period, the Index Committee reviews the methodology to ensure that the S&P 500® Dividend Aristocrats Index continues to achieve the stated objectives and that the data and methodology remain effective. In certain instances, S&P Dow Jones may publish a consultation inviting comments from external parties.

BACKGROUND ON THE S&P 500® INDEX

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

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

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

Composition of the S&P U.S. Indices

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

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

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

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

stocks, preferred and convertible preferred stock, unit trusts, equity warrants, convertible bonds, investment trusts, rights and American depositary receipts.

As of July 2017, the securities of companies with multiple share class structures (including companies with listed and unlisted share classes) are no longer eligible to be added to the S&P U.S. Indices, but securities already included in an S&P U.S. Index have been grandfathered and are not affected by this change.

- *Market Capitalization.* The total company market capitalization should be within a specified range for the relevant S&P U.S. Index. These ranges are reviewed quarterly and updated as needed to ensure they reflect current market conditions. A company meeting the total company market capitalization criteria is also required to have a security level float-adjusted market capitalization (“**FMC**”) that is at least 50% of the relevant S&P U.S. Index’s total company level minimum market capitalization threshold. For spin-offs, S&P U.S. Index membership eligibility is determined using when-issued prices, if available.
- *Investable Weight Factor (“**IWF**”).* For each component, S&P Dow Jones calculates an IWF, which represents the portion of the total shares outstanding that are considered part of the public float for purposes of the relevant S&P U.S. Index. An IWF of at least 0.10 is required for S&P U.S. Indices.
- *Liquidity.* A float-adjusted liquidity ratio (“**FALR**”), defined as the annual dollar value traded divided by the FMC, is used to measure liquidity. Using composite pricing and consolidated volume (excluding dark pools) across all venues (including historical values), annual dollar value traded is defined as the average closing price multiplied by the historical volume over the 365 calendar days prior to the evaluation date. This is reduced to the available trading period for initial public offerings (“**IPOs**”) or spin-offs that do not have 365 calendar days of trading history. In these cases, the dollar value traded available as of the evaluation date is annualized. The price, shares outstanding and IWF as of the evaluation date are used to calculate the FMC. The evaluation date is the open of trading on the day prior to the announcement date. The stock should trade a minimum of 250,000 shares in each of the six months leading up to the evaluation date. The FALR must be greater than or equal to 1.0 at the time of addition to an S&P U.S. Index. Current index constituents have no minimum requirement.
- *Financial Viability.* The sum of the most recent four consecutive quarters’ Generally Accepted Accounting Principles (“**GAAP**”) earnings (net income excluding discontinued operations) should be positive as should the most recent quarter. For equity REITs, financial viability is based on GAAP earnings and/or funds from operations, if reported.
- *Treatment of IPOs.* IPOs should be traded on an eligible exchange for at least 12 months before being considered for addition to an S&P U.S. Index. For former special purpose acquisition companies (“**SPACs**”), S&P Dow Jones considers the de-SPAC transaction to be an event equivalent to an IPO, and 12 months of trading post the de-SPAC event are required before a former SPAC can be considered for inclusion in an S&P U.S. Index. Spin-offs or in-specie distributions from existing constituents do not need to be seasoned for 12 months prior to their inclusion in an S&P U.S. Index.
- *Sector Classification.* The company is evaluated for its contribution to sector balance maintenance, as measured by a comparison of each Global Industry Classification Standard sector’s weight in the relevant S&P U.S. Index with its weight in the S&P Total Market Index, in the relevant market capitalization range. The S&P Total Market Index is a float-adjusted market capitalization-weighted index designed to track the broad U.S. equity market, including large-, mid-, small- and micro-cap stocks.

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

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

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

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

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

- *Companies that are involved in mergers, acquisitions or significant restructuring such that they no longer meet the eligibility criteria.* Companies delisted as a result of merger, acquisition or other corporate action are removed at a time announced by S&P Dow Jones, normally at the close of the last day of trading or expiration of a tender offer. Constituents that are halted from trading may be kept in an S&P U.S. Index until trading resumes, at the discretion of S&P Dow Jones's U.S. index committee. If a stock is moved to Pink Sheets or the OTC Bulletin Board, the stock is removed.

Any company that is removed from an S&P U.S. Index (including discretionary and bankruptcy/exchange delistings) must wait a minimum of one year from its index removal date before being screened for the eligibility criteria.

- *Companies that substantially violate one or more of the addition criteria.* S&P Dow Jones believes turnover in index membership should be avoided when possible. At times, a stock may appear to temporarily violate one or more of the addition criteria. However, the addition criteria are for addition to an S&P U.S. Index, not for continued membership. As a result, an S&P U.S. Index constituent that appears to violate criteria for addition to that index is not deleted unless ongoing conditions warrant an index change. When a stock is removed from an S&P U.S. Index, S&P Dow Jones explains the basis for the removal.

Calculation of the S&P U.S. Indices

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

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

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

Maintenance of the S&P U.S. Indices

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

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

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

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

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

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

The table below summarizes the treatment of certain corporate actions.

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

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

Governance of the S&P U.S. Indices

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

BACKGROUND ON THE SECURED OVERNIGHT FINANCING RATE

SOFR, the Secured Overnight Financing Rate, is published by the Federal Reserve Bank of New York (“**FRBNY**”) and is intended to be a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities. FRBNY reports that SOFR includes all trades in the Broad General Collateral Rate, plus bilateral Treasury repurchase agreement (“**repo**”) transactions cleared through the delivery-versus-payment service offered by the Fixed Income Clearing Corporation (the “**FICC**”), a subsidiary of The Depository Trust & Clearing Corporation (“**DTCC**”). SOFR is filtered by FRBNY to remove a portion of the foregoing transactions considered to be “specials.” According to FRBNY, “specials” are repos for specific-issue collateral which take place at cash-lending rates below those for general collateral repos because cash providers are willing to accept a lesser return on their cash in order to obtain a particular security.

FRBNY reports that SOFR is calculated as a volume-weighted median of transaction-level tri-party repo data collected from The Bank of New York Mellon, which currently acts as the clearing bank for the tri-party repo market, as well as General Collateral Finance Repo transaction data and data on bilateral Treasury repo transactions cleared through the FICC’s delivery-versus-payment service. FRBNY notes that it obtains information from DTCC Solutions LLC, an affiliate of DTCC.

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