

## Pricing Supplement

(To the Product Supplement dated May 12, 2022,  
the Prospectus Supplement dated May 12, 2022,  
and the Base Prospectus dated May 28, 2021)

**SUBJECT TO COMPLETION, DATED APRIL [28], 2023**

## CONTINGENT INCOME NOTES LINKED TO THE PERFORMANCE OF THE S&P 500 FUTURES 35% DEFINED VOLATILITY INDEX



**BNP PARIBAS**

Terms used in this "Pricing Supplement" are described or defined in the Product Supplement. The Notes will have terms described in the Product Supplement, Prospectus Supplement and Base Prospectus, as supplemented by this Pricing Supplement. If the terms described in this Pricing Supplement are different from or inconsistent with those described in the Product Supplement, Prospectus Supplement or Base Prospectus, the terms described in this Pricing Supplement will supersede. Before you decide to invest in the Notes, we urge you to read this Pricing Supplement together with the Product Supplement, Prospectus Supplement and Base Prospectus, each of which can be accessed via the hyperlink below:

<http://eqdpo.bnpparibas.com/USMTNPD>

**THE UNDERLYING ASSET IS SUBJECT TO RISKS ASSOCIATED WITH THE USE OF SIGNIFICANT LEVERAGE. IN ADDITION, THE UNDERLYING ASSET MAY BE SIGNIFICANTLY UNINVESTED ON ANY GIVEN DAY, AND, IN THAT CASE, WILL REALIZE ONLY A PORTION OF ANY GAINS DUE TO APPRECIATION OF ITS UNDERLYING INDEX (WHICH IS BASED ON THE SPX E-MINI FUTURES CONTRACTS) ON THAT DAY. NO ASSURANCE CAN BE GIVEN THAT THE INVESTMENT STRATEGY USED TO CONSTRUCT THE UNDERLYING ASSET WILL ACHIEVE ITS INTENDED RESULTS OR THAT THE UNDERLYING ASSET WILL BE SUCCESSFUL OR WILL OUTPERFORM ANY ALTERNATIVE INDEX OR STRATEGY. SEE "SELECTED RISK CONSIDERATIONS" BEGINNING IN THIS PRICING SUPPLEMENT.**

**Issuer:** BNP Paribas.

**Guarantor:** BNP Paribas acting through its NY Branch.

**Calculation Agent:** BNP Paribas Securities Corp. ("BNPP Securities").

**Principal Amount:** \$[●] <sup>≠</sup>.

**Status of the Notes:** Senior Preferred Notes.

**Final Level:** The Closing Level of the Underlying Asset on the Final Valuation Date.

**Underlying Asset Performance:** (Final Level - Initial Level) / Initial Level, expressed as a percentage.

**Pricing Date:** May [31], 2023 <sup>≠</sup>.

**Initial Valuation Date:** May [31], 2023 <sup>≠</sup>.

**Issue Date:** June [5], 2023 <sup>≠</sup>.

**Final Valuation Date:** June [2], 2026 <sup>≠</sup>.

**Maturity Date:** June [5], 2026 <sup>≠</sup>.

**Business Days for Payment:** New York - Modified Following Business Day.

**Initial Offering Price:** 100.00%.

**Conditional Coupon:** If on any Coupon Valuation Date the Closing Level of the Underlying Asset is greater than or equal to [70]% of the Initial Level, the Conditional Coupon will equal the Conditional Coupon applicable on such Coupon Valuation Date, paid on the relevant Coupon Payment Date, subject to the Modified Following Business Day Convention. Conditional Coupons should not be viewed as periodic interest payments.

**Early Redemption:** If on any Early Redemption Valuation Date the Closing Level of the Underlying Asset is greater than or equal to the Initial Level, the Issuer will redeem the Notes on the relevant Early Redemption Date for the relevant Early Redemption Amount. If the Notes are Early Redeemed, on the relevant Early Redemption Date, you will receive the Conditional Coupon, if any, in addition to the Early Redemption Amount. No further payments will be made on the Notes.

| Coupon Valuation Date | Coupon Payment Date | Conditional Coupon (per \$1,000 Note) |
|-----------------------|---------------------|---------------------------------------|
| August [30], 2023     | September [5], 2023 | \$[32.50]                             |
| November [30], 2023   | December [5], 2023  | \$[32.50]                             |
| February [29], 2024   | March [5], 2024     | \$[32.50]                             |
| May [31], 2024        | June [5], 2024      | \$[32.50]                             |
| August [30], 2024     | September [5], 2024 | \$[32.50]                             |
| December [2], 2024    | December [5], 2024  | \$[32.50]                             |
| February [28], 2025   | March [5], 2025     | \$[32.50]                             |
| June [2], 2025        | June [5], 2025      | \$[32.50]                             |
| September [2], 2025   | September [5], 2025 | \$[32.50]                             |
| December [2], 2025    | December [5], 2025  | \$[32.50]                             |
| March [2], 2026       | March [5], 2026     | \$[32.50]                             |
| June [2], 2026        | June [5], 2026      | \$[32.50]                             |

**Underlying Asset:** The S&P 500 Futures 35% Defined Volatility Index (Bloomberg symbol "SPX FV35E <Index>").

**Initial Level:** The Closing Level of the Underlying Asset on the Initial Valuation Date, which is equal to [●].

| Early Redemption Valuation Date <sup>‡</sup> | Early Redemption Date <sup>‡</sup> | Early Redemption Amount <sup>‡</sup>                 |
|--|------------------------------------|--|
| November [30], 2023                          | December [5], 2023                 | \$[1,000] for each \$1,000 principal amount of Notes |
| February [29], 2024                          | March [5], 2024                    | \$[1,000] for each \$1,000 principal amount of Notes |
| May [31], 2024                               | June [5], 2024                     | \$[1,000] for each \$1,000 principal amount of Notes |
| August [30], 2024                            | September [5], 2024                | \$[1,000] for each \$1,000 principal amount of Notes |
| December [2], 2024                           | December [5], 2024                 | \$[1,000] for each \$1,000 principal amount of Notes |
| February [28], 2025                          | March [5], 2025                    | \$[1,000] for each \$1,000 principal amount of Notes |
| June [2], 2025                               | June [5], 2025                     | \$[1,000] for each \$1,000 principal amount of Notes |
| September [2], 2025                          | September [5], 2025                | \$[1,000] for each \$1,000 principal amount of Notes |
| December [2], 2025                           | December [5], 2025                 | \$[1,000] for each \$1,000 principal amount of Notes |
| March [2], 2026                              | March [5], 2026                    | \$[1,000] for each \$1,000 principal amount of Notes |

**Redemption Amount at Maturity:** Unless early redeemed, you will receive the following amount at maturity:

- If the Final Level is greater than or equal to the Barrier Level, you will receive, for each \$1,000 principal amount of Notes, \$1,000.
- If the Final Level is less than the Barrier Level, you will receive, for each \$1,000 principal amount of Notes:  $\$1,000 \times (100\% + \text{Underlying Asset Performance})$ .

**In this case, you will receive less than the principal amount of your Notes, and you could receive zero.**

**All payments on the Notes are subject to the creditworthiness of the Issuer and Guarantor.**

**Barrier Level:** [●], which is equal to [70]% of the Initial Level.

**Denominations:** The Notes will be issued in denominations of \$1,000. Minimum trading size is \$1,000. The Notes may only be transferred in amounts of \$1,000 and increments of \$1,000 thereafter.

**CUSIP:** 05602YUP9.

**ISIN:** US05602YUP95.

**Series:** 9929.

\* Subject to postponement in the event of a Market Disruption Event as described under "Additional Terms — Market Disruption Events" herein.

<sup>‡</sup> To be determined on the Pricing Date.

|          | Price to Public <sup>1</sup> | Agent's Commission <sup>2</sup> | Proceeds to BNP Paribas |
|----------|------------------------------|---------------------------------|-------------------------|
| Per Note | [100]%                       | [0]%                            | [100]%                  |
| Total    | \$[●]                        | \$[●]                           | \$[●]                   |

<sup>1</sup> The price to the public for any single purchase by an investor in certain trust accounts, who is not being charged the full selling concession or fee by other dealers of approximately [0.00]%, is [100]%. The price to the public for all other purchases of Notes is [100]%.

<sup>2</sup> BNP Paribas or one of our affiliates may pay varying underwriting discounts of up to [0.00]%. In addition, BNPP Securities may pay selected broker-dealers additional marketing, referral or other fees of up to 1% in consideration for providing education, structuring or other services with respect to the distribution of the Notes. In no case will the sum of the commissions and fees exceed [1]%.

The estimated value of the Notes at the time the terms of the Notes are set on the Pricing Date (as determined by reference to pricing models used by BNPP Securities and taking into account the Issuer's credit spreads) is expected to be between \$963.07 and \$972.75 per \$1,000 principal amount, which is less than the Initial Offering Price. The value of the Notes at any time will reflect many factors and cannot be predicted; however, the price (not including BNPP Securities' customary bid and ask spreads) at which BNPP Securities would initially buy or sell Notes (if it makes a market, which it is not obligated to do) will exceed the estimated value of the Notes as determined by reference to these models. The amount of the excess will decline on a straight line basis over the period from the trade date through [ ], 2023.

BNPP Securities, the Lead Dealer for the Notes, is an affiliate of BNP Paribas. As such, BNPP Securities has a "conflict of interest" in this offering within the meaning of FINRA Rule 5121. Consequently, the offering is being conducted in compliance with the provisions of Rule 5121. BNPP Securities is not permitted to make sales in this offering to an account over which it exercises discretionary authority without the prior specific written approval of the account holder.

The Issuer has not been registered under the Investment Company Act of 1940, as amended (the "Investment Company Act"), and the Notes and the Guarantee have not been, and will not be, registered under the Securities Act of 1933, as amended (the "Securities Act"), or the state securities laws of any state of the United States or the securities laws of any other jurisdiction and are being offered pursuant to the registration exemption contained in Section 3(a)(2) of the Securities Act.

Neither the Securities and Exchange Commission (the "SEC") nor any state securities commission has approved or disapproved of the Notes or determined that this Pricing Supplement is truthful or complete. Any representation to the contrary is a criminal offense. Under no circumstances shall this Pricing Supplement constitute an offer to sell or a solicitation of an offer to buy, nor shall there be any sale of these Notes, in any jurisdiction in which such offer, solicitation or sale would be unlawful prior to qualification under the securities laws of any such jurisdiction.

The Notes constitute unconditional liabilities of the Issuer and the Guarantee constitutes an unconditional obligation of the Guarantor. The Notes and the Guarantee are not bank deposits and are not insured or guaranteed by the Federal Deposit Insurance Corporation or any other federal agency.

BNP PARIBAS SECURITIES CORP.

## ADDITIONAL TERMS

### General

You should read this Pricing Supplement together with the Product Supplement, Prospectus Supplement and Base Prospectus. This Pricing Supplement, together with the documents listed above, contains the terms of the Notes and supersedes all 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, brochures or other educational materials of ours. You should carefully consider, among other things, the matters set forth in "Selected Risk Considerations" herein and "Risk Factors" in the Base Prospectus, Prospectus Supplement and Product Supplement, as the Notes involve risks not associated with conventional debt securities. We urge you to consult your investment, legal, tax, accounting and other advisors before you invest in the Notes.

An investment in the Notes entails significant risks relating to the Notes not associated with similar investments in a conventional debt security, including those described below. You should read the following information about these risks, together with the other information in this Pricing Supplement, the Product Supplement, the Prospectus Supplement and the Base Prospectus before investing in the Notes.

**THE UNDERLYING ASSET IS SUBJECT TO RISKS ASSOCIATED WITH THE USE OF SIGNIFICANT LEVERAGE. IN ADDITION, THE UNDERLYING ASSET MAY BE SIGNIFICANTLY UNINVESTED ON ANY GIVEN DAY, AND, IN THAT CASE, WILL REALIZE ONLY A PORTION OF ANY GAINS DUE TO APPRECIATION OF ITS UNDERLYING INDEX (WHICH IS BASED ON THE SPX E-MINI FUTURES CONTRACTS) ON THAT DAY. NO ASSURANCE CAN BE GIVEN THAT THE INVESTMENT STRATEGY USED TO CONSTRUCT THE UNDERLYING ASSET WILL ACHIEVE ITS INTENDED RESULTS OR THAT THE UNDERLYING ASSET WILL BE SUCCESSFUL OR WILL OUTPERFORM ANY ALTERNATIVE INDEX OR STRATEGY.**

### *Market Disruption Events*

***For purposes of the Notes, any of the following will be considered a "Market Disruption Event" with respect to the Underlying Asset:***

- a suspension, absence or limitation of trading in any Index Component (as defined below) or unavailability of the level of the Underlying Index;
- a suspension, absence (if such contracts were previously available) or limitation of trading in futures or options contracts relating to an Index Component, the Underlying Asset or the Underlying Index on their respective markets;
- any event that disrupts or impairs, as determined by the Calculation Agent, the ability of market participants to (i) effect transactions in, or obtain market values for, an Index Component, or (ii) effect transactions in, or obtain market values for, futures or options contracts relating to an Index Component, the Underlying Asset or the Underlying Index on their respective markets;
- the closure on any day of the primary market for futures or options contracts relating to the Underlying Asset, the Underlying Index or an Index Component on a scheduled trading day prior to the scheduled weekday closing time of that market (without regard to after hours or any other trading outside of the regular trading session hours) unless such earlier closing time is announced by the primary market at least one hour prior to the earlier of (i) the actual closing time for the regular trading session on such primary market on such scheduled trading day for such primary market and (ii) the submission deadline for orders to be entered into the relevant exchange system for execution at the close of trading on such scheduled trading day for such primary market;
- any scheduled trading day on which (i) the primary markets for an Index Component or (ii) the exchanges or quotation systems, if any, on which futures or options contracts on the Underlying Asset, the Underlying Index or an Index Component are traded, fails to open for trading during its regular trading session; or
- any other event, if the Calculation Agent determines that the event interferes with our ability or the ability of any of our affiliates to unwind all or a portion of a hedge with respect to the Notes that we or our affiliates have effected or may effect as described under "Use of Proceeds and Hedging" in the Base Prospectus.

and, in any of these events, the Calculation Agent determines that the event was material.

The following events will not be a Market Disruption Event:

- a limitation on the hours or number of days of trading on which an Index Component is traded, but only if the limitation results from an announced change in the regular business hours of the relevant market; or
- a decision to permanently discontinue trading in futures or options contracts relating to the Underlying Asset or Underlying Index.

For this purpose, an "absence of trading" on an exchange or market will not include any time when the relevant exchange or market is itself closed for trading under ordinary circumstances.

In contrast, a suspension or limitation of trading in futures or options contracts related to the Underlying Asset or Underlying Index, if available, in the primary market for those contracts, by reason of any of:

- a price change exceeding limits set by that market,
- an imbalance of orders relating to those contracts, or
- a disparity in bid and ask quotes relating to those contracts,

will constitute a suspension or material limitation of trading in futures or options contracts in the primary market for those contracts.

Any equity security, interest rate, currency exchange rate, futures contract, currency, commodity or other asset or variable that is referenced in the calculation of the Underlying Asset or the Underlying Index is herein referred to as an "**Index Component**".

## Events of Default

Events of Default, as defined in Condition 8(a) in the Base Prospectus, shall apply to the Notes and the amount payable to a holder of the Notes upon any acceleration will be equal to the Redemption Amount at Maturity, determined as if the Notes matured on the date of acceleration. Condition 5(g)(i) in the Base Prospectus shall apply to the Notes and, for the purposes of such Condition 5(g)(i), the Final Redemption Amount shall mean the Redemption Amount at Maturity.

## Early Redemption

If on any Early Redemption Valuation Date the Closing Level of the Underlying Asset is greater than or equal to the Initial Level, the Issuer will pay, for each \$1,000 principal amount of Notes, \$[1,000] on the relevant Early Redemption Date. If the Notes are Early Redeemed, on the relevant Early Redemption Date, you will receive the Conditional Coupon Payment, if applicable, for the relevant Coupon Payment Date in addition to the Early Redemption Amount. However, you will not receive any further payments on the Notes. All payments on the Notes are subject to the creditworthiness of the Issuer and Guarantor.

See Example 5 below for further detail.

## Hypothetical Examples

Assuming the Notes are not Early Redeemed, the following examples illustrate hypothetical payments on a \$1,000 investment in the Notes. The numbers appearing in the examples have been rounded for ease of analysis. These examples are provided for purposes of illustration only. The actual payment amounts received by investors and the total return on the Notes resulting from this payment will depend on several variables, including (i) the Initial Level of the Underlying Asset, (ii) the Closing Level of the Underlying Asset on each Coupon Valuation Date and (iii) the Final Level of the Underlying Asset, all determined by the Calculation Agent. All payments on the Notes are subject to the creditworthiness of the Issuer and Guarantor.

For these examples of hypothetical payments at maturity, we have assumed the following:

- No Market Disruption Events, adjustments, or Events of Default occur during the term of the Notes
- Initial Level: [3,072.089]
- Barrier Level: [2,150.4623] ([70]% x Initial Level)
- Conditional Coupon: \$[32.50](per \$1,000 principal amount of Notes)
- The Notes are not Early Redeemed

### Example 1:

The Final Level equals 5,529.7602, and the Conditional Coupon payment is met with respect to some, but not all, of the Coupon Valuation Dates.

|                                  | <b>Was Closing Level of the Underlying Asset greater than or equal to 70% of the Initial Level?</b> | <b>Conditional Coupon Payment (Payable on the Immediately Following Coupon Payment Date)</b> |
|----------------------------------|---|--|
| Coupon Valuation Date 1          | No  | NA   |
| Coupon Valuation Date 2          | No  | NA   |
| Coupon Valuation Date 3          | Yes   | \$32.50  |
| Coupon Valuation Date 4          | No  | NA   |
| Coupon Valuation Date 5          | No  | NA   |
| Coupon Valuation Date 6          | No  | NA   |
| Coupon Valuation Date 7          | No  | NA   |
| Coupon Valuation Date 8          | No  | NA   |
| Coupon Valuation Date 9          | No  | NA   |
| Coupon Valuation Date 10         | No  | NA   |
| Coupon Valuation Date 11         | No  | NA   |
| Coupon Valuation Date 12         | Yes   | \$32.50  |
| <b>Total Conditional Coupons</b> |   | <b>\$65.00</b>   |

Since the Underlying Asset Performance equals 80%, the redemption amount at maturity equals \$1,000.00. Because the total Conditional Coupons paid equals \$65.00, the total amount paid on the Notes equals \$1,065.00. Thus, the total return on the Notes equals 6.50%.

**Example 2:**

The Final Level equals 3,072.0890, and the Conditional Coupon payment is met with respect to all of the Coupon Valuation Dates.

|                                  | <b>Was Closing Level of the Underlying Asset greater than or equal to 70% of the Initial Level?</b> | <b>Conditional Coupon Payment (Payable on the Immediately Following Coupon Payment Date)</b> |
|----------------------------------|---|--|
| Coupon Valuation Date 1          | Yes   | \$32.50  |
| Coupon Valuation Date 2          | Yes   | \$32.50  |
| Coupon Valuation Date 3          | Yes   | \$32.50  |
| Coupon Valuation Date 4          | Yes   | \$32.50  |
| Coupon Valuation Date 5          | Yes   | \$32.50  |
| Coupon Valuation Date 6          | Yes   | \$32.50  |
| Coupon Valuation Date 7          | Yes   | \$32.50  |
| Coupon Valuation Date 8          | Yes   | \$32.50  |
| Coupon Valuation Date 9          | Yes   | \$32.50  |
| Coupon Valuation Date 10         | Yes   | \$32.50  |
| Coupon Valuation Date 11         | Yes   | \$32.50  |
| Coupon Valuation Date 12         | Yes   | \$32.50  |
| <b>Total Conditional Coupons</b> |   | <b>\$390.00</b>  |

Since the Underlying Asset Performance equals 0%, the redemption amount at maturity equals \$1,000.00. Because the total Conditional Coupons paid equals \$390.00, the total amount paid on the Notes equals \$1,390.00. Thus, the total return on the Notes equals 39%.

**Example 3:**

The Final Level equals 1,536.0445, and the Conditional Coupon payment is met with respect to most, but not all, of the Coupon Valuation Dates.

|                                  | <b>Was Closing Level of the Underlying Asset greater than or equal to 70% of the Initial Level?</b> | <b>Conditional Coupon Payment (Payable on the Immediately Following Coupon Payment Date)</b> |
|----------------------------------|---|--|
| Coupon Valuation Date 1          | Yes   | \$32.50  |
| Coupon Valuation Date 2          | Yes   | \$32.50  |
| Coupon Valuation Date 3          | Yes   | \$32.50  |
| Coupon Valuation Date 4          | Yes   | \$32.50  |
| Coupon Valuation Date 5          | Yes   | \$32.50  |
| Coupon Valuation Date 6          | Yes   | \$32.50  |
| Coupon Valuation Date 7          | Yes   | \$32.50  |
| Coupon Valuation Date 8          | Yes   | \$32.50  |
| Coupon Valuation Date 9          | Yes   | \$32.50  |
| Coupon Valuation Date 10         | Yes   | \$32.50  |
| Coupon Valuation Date 11         | Yes   | \$32.50  |
| Coupon Valuation Date 12         | No  | NA   |
| <b>Total Conditional Coupons</b> |   | <b>\$357.50</b>  |

Since the Underlying Asset Performance equals -50%, the redemption amount at maturity equals \$500.00. Because the total Conditional Coupons paid equals \$357.50, the total amount paid on the Notes equals \$857.50. Thus, the total return on the Notes equals -14.25%.

**Example 4:**

The Final Level equals 614.4178, and the Conditional Coupon payment is met with respect to none of the Coupon Valuation Dates.

|                                  | <b>Was Closing Level of the Underlying Asset greater than or equal to 70% of the Initial Level?</b> | <b>Conditional Coupon Payment (Payable on the Immediately Following Coupon Payment Date)</b> |
|----------------------------------|---|--|
| Coupon Valuation Date 1          | No  | NA   |
| Coupon Valuation Date 2          | No  | NA   |
| Coupon Valuation Date 3          | No  | NA   |
| Coupon Valuation Date 4          | No  | NA   |
| Coupon Valuation Date 5          | No  | NA   |
| Coupon Valuation Date 6          | No  | NA   |
| Coupon Valuation Date 7          | No  | NA   |
| Coupon Valuation Date 8          | No  | NA   |
| Coupon Valuation Date 9          | No  | NA   |
| Coupon Valuation Date 10         | No  | NA   |
| Coupon Valuation Date 11         | No  | NA   |
| Coupon Valuation Date 12         | No  | NA   |
| <b>Total Conditional Coupons</b> |   | <b>\$0</b>   |

Since the Underlying Asset Performance equals -80%, the redemption amount at maturity equals \$200.00. Because the total Conditional Coupons paid equals \$0, the total amount paid on the Notes equals \$200.00. Thus, the total return on the Notes equals -80%.

For the following example, each of the assumptions above applies except the Notes are Early Redeemed.

**Example 5:** On any Early Redemption Valuation Date, the Closing Level of the Underlying Asset is greater than or equal to the Initial Level and thus the Issuer Early Redeems the Notes. Regardless of how much the Underlying Asset appreciated, you will receive a payment on the respective Early Redemption Date of \$1,000 per \$1,000 principal amount of the Notes, in addition to the Conditional Coupon. If the Notes are early redeemed, you will not receive any further payments on the Notes.

## SELECTED RISK CONSIDERATIONS

An investment in the Notes involves significant risks. Investing in the Notes is not equivalent to investing directly in the Underlying Asset or any of the component securities of the Underlying Asset. Some of these risks are explained in more detail in the "Risk Factors" section of the Product Supplement. For the avoidance of doubt, the fees and commissions on the front cover of this Pricing Supplement will not be rebated if there is an Early Redemption of the Notes, including the risk factors discussed under the following headings:

- "Risk Factors – Risks Relating to All Notes";
- "Risk Factors – Additional Risks Relating to Notes With Underlying Assets That Are Commodities, an Index Containing Commodities or Based in Part on Commodities";
- "Risk Factors – Additional Risks Relating to Notes With Underlying Assets That Are Equity Securities or Interests in Exchange-Traded Funds, That Contain Equity Securities or That are Based in Part on Equity Securities or Interests in Exchange-Traded Funds";
- "Risk Factors – Additional Risks Relating to Notes That Are Not Fully Principal Protected or Are Contingently Protected";
- "Risk Factors – Additional Risks Relating to Notes We May Call or Redeem (Automatically Or Otherwise)"; and
- "Risk Factors – Additional Risks Relating to Notes with a Barrier Percentage or a Barrier Level".

Among other things, you should consider the following:

- **Assuming No Changes in Market Conditions, Our Creditworthiness or Any Other Relevant Factors, the Estimated Value of the Notes on the Pricing Date (as Determined by Reference to Pricing Models Used by BNPP Securities) Will Be Significantly Less than the Initial Offering Price** – The Initial Offering Price for the Notes will exceed the estimated value of the Notes as of the time the terms of the Notes are set on the Pricing Date, as determined by reference to BNPP Securities' pricing models and taking into account our credit spreads. Such expected estimated value on the Pricing Date is set forth on the cover of this Pricing Supplement; after the Pricing Date, the estimated value as determined by reference to these models will be affected by changes in market conditions, the issuer's creditworthiness and other relevant factors. The price at which BNPP Securities would initially buy or sell your Notes (if BNPP Securities makes a market, which it is not obligated to do) will also exceed the estimated value of your Notes as determined by reference to these models. As agreed by us and the distribution participants, the amount of the excess will decline on a straight line basis over the period from the date hereof through the applicable date set forth on the cover. Thereafter, if BNPP Securities buys or sells your Notes it will do so at prices that reflect the estimated value determined by reference to such pricing models at that time. The price at which BNPP Securities will buy or sell your Notes at any time also will reflect its then current bid and ask spread for similar sized trades of structured notes.

In estimating the value of the Notes as of the time the terms of the Notes are set on the Pricing Date, as disclosed on the front cover of this Pricing Supplement, BNPP Securities' pricing models consider certain variables, including principally our credit spreads, interest rates (forecasted, current and historical rates), volatility, price sensitivity analysis and the time to maturity of the Notes. These pricing models are proprietary and rely in part on certain assumptions about future events, which may prove to be incorrect. As a result, the actual value you would receive if you sold your Notes in the secondary market, if any, to others may differ, perhaps materially, from the estimated value of your Notes determined by reference to BNPP Securities' models due to, among other things, any differences in pricing models or assumptions used by others. See "Many Economic and Market Factors Will Impact the Market Value of the Notes" in this Pricing Supplement.

The difference between the estimated value of the Notes as of the time the terms of the Notes are set on the Pricing Date and the Initial Offering Price is a result of certain factors, including principally the underwriting discount and commissions, the expenses incurred in creating, documenting and marketing the Notes, and an estimate of the difference between the amounts we pay to BNPP Securities and the amounts BNPP Securities pays to us in connection with the Notes. We pay to BNPP Securities amounts based on what we would pay to holders of a non-structured note with a similar maturity. In return for such payment, BNPP Securities pays to us the amounts we owe under the Notes.

In addition to the factors discussed above, the value and quoted price of the Notes at any time will reflect many factors and cannot be predicted. If BNPP Securities makes a market in the Notes, the price quoted by BNPP Securities would reflect any changes in market conditions and other relevant factors, including any deterioration in our creditworthiness or perceived creditworthiness. These changes may adversely affect the value of your Notes, including the price you may receive for your Notes in any market making transaction. To the extent that BNPP Securities makes a market in the Notes, the quoted price will reflect the estimated value determined by reference to BNPP Securities' pricing models at that time, plus or minus its then current bid and ask spread for similar sized trades of structured notes (and subject to the declining excess amount described above).

If at any time a third party dealer quotes a price to purchase the Notes or otherwise values the Notes, that price may be significantly different (higher or lower) than any price quoted by BNPP Securities. You should read "Many Economic and Market Factors Will Impact the Market Value of the Notes" below.

Furthermore, if you sell any of the Notes, you will likely be charged a commission for secondary market transactions, or the price will likely reflect a dealer discount. This commission or discount will further reduce the proceeds you would receive for your Notes in a secondary market sale.

There is no assurance that BNPP Securities, or any other party, will be willing to purchase the Notes at any price. In this regard, BNPP Securities is not obligated to make a market in the Notes. See "The Notes May Lack Liquidity" below.

- **Suitability of Notes for Investment** – You should reach a decision to invest in the Notes after carefully considering, with your advisors, the suitability of the Notes in light of your investment objectives and the specific information set out in this Pricing Supplement, the Product Supplement, the Prospectus Supplement and the Base Prospectus. Neither the Issuer nor any dealer participating in the offering makes any recommendation as to the suitability of the Notes for investment.
- **Any Amount Payable Under the Notes Is Subject to our Credit Risk, and our Credit Ratings and Credit Spreads May Adversely Affect the Market Value of the Notes** – The Notes are the senior unsecured obligations of the issuer, BNP Paribas. Any payments to

be made on the Notes depend on the ability of the Issuer and Guarantor to satisfy its obligations as they come due. Investors are subject to the credit risk, and to changes in the market's view of the creditworthiness of the Issuer and the Guarantor, and in the event the Issuer or Guarantor were to default on its obligation, you may not receive any amounts owed to you under the terms of the Notes. The credit ratings of the Issuer and the Guarantor are an assessment of their ability to pay their obligations, including those on the Notes. Consequently, any actual or anticipated declines in our credit ratings or increase in the credit spreads charged by the market for taking our credit risk is likely to adversely affect the value of the Notes.

- **The Notes and the Guarantee May Be Subject to Write-Down, Variation, Suspension or Conversion to Equity Either in the Context Of, Or Outside Of, a Resolution Procedure Applicable to the Issuer** – Pursuant to the EU Bank Recovery and Resolution Directive (the "BRRD"), as transposed into French law by a decree-law dated August 20, 2015, resolution authorities have the power to place the institution in resolution at the point at which the resolution authority determines that (i) the institution individually, or the group to which it belongs, is failing or likely to fail, (ii) there is no reasonable prospect that private action would prevent the failure and (iii) a resolution action is necessary in the public interest. If the institution is placed in resolution, resolution authorities have the power inter alia to ensure that capital instruments, including senior debt instruments, such as Senior Preferred Notes including these Notes, absorb losses of the issuing institution, through the write-down or conversion to equity of such instruments (the "Bail-In Tool"). The Bail-In Tool might also apply to a guarantee obligation such as the Guarantee. Please see the discussion under the heading "Risks Related to the Notes – General Risk relating to the Notes – The Notes and the Notes Guarantees may be subject to write-down, variation, suspension or conversion to equity either in the context of, or outside of, a resolution procedure applicable to the Issuer" in the Base Prospectus.
- **Your Investment in the Notes May Result in a Loss** – The Notes do not guarantee any return of principal. The return on the Notes at maturity is linked to the performance of the Underlying Asset and will depend on whether, and the extent to which, the Underlying Asset Performance is positive or negative. Other than the initial payment for the principal amount of the Note, in no event will you be required to make any additional payments to the Issuer. If the Final Level is less than the Barrier Level, you will be fully exposed to any depreciation in the Underlying Asset based on a 1% loss for every 1% decline in the Final Level, as compared to the Initial Level. In this case, your Redemption Amount at Maturity will be less, and may be significantly less, than your principal amount of Notes. You could receive zero at maturity.
- **No Principal Protection** – The principal amount of your investment is not protected and you may receive less, and possibly significantly less, than the amount you invest. You may lose up to 100% of your investment in the Notes. All payments on the Notes are subject to the creditworthiness of the Issuer and Guarantor.
- **Early Redemption** – If, on an Early Redemption Valuation Date, the Closing Level of the Underlying Asset is greater than or equal to the Initial Level, the Issuer will redeem the Notes on the Early Redemption Date for the Early Redemption Amount. As a result, you will receive no further payments on the Notes. If the Notes are early redeemed prior to the stated Maturity Date, you may not be able to invest in other securities of comparable maturities with similar levels of risk and yield as the Notes.
- **Any Gain is Limited to the Conditional Coupons** – Your return is limited to the Conditional Coupons, if any, regardless of the appreciation of the Underlying Asset, which may be significant. You will not participate in any appreciation in the values of the Underlying Asset. Conditional Coupons should not be viewed as periodic interest payments. All payments on the Notes are subject to the creditworthiness of the Issuer and Guarantor.
- **Investing in the Notes Is Not the Same as Investing in the Underlying Asset, the Underlying Index, the SPX, the Securities Comprising the SPX or Contracts relating to the Underlying Asset, the Underlying Index, the SPX or Securities Comprising the Underlying Asset** – The return on the Notes may not reflect the return you would realize if you directly invested in the Underlying Asset, the S&P 500 Futures (3-Day Roll) Index (the "Underlying Index"), the S&P 500 Index (the "SPX"), the securities or instruments comprising the Underlying Asset, the Underlying Index, the SPX or any other exchange-traded or over-the-counter instruments based on the Underlying Asset, the Underlying Index, the SPX or the securities or instruments comprising the Underlying Asset, the Underlying Index or the SPX.
- **No Dividend Payments or Voting Rights** – As a holder of the Notes, you will not have voting rights or rights to receive cash dividends or other distributions or other rights that holders of a direct investment in securities comprising the SPX would have.
- **You Will Not Have Any Rights in Any Futures Contracts** – As a holder of the Notes, you will have no right to receive any payment in respect of any futures contracts.
- **Certain Built-In Costs Are Likely to Adversely Affect the Value of the Notes Prior to Maturity** – While the payment at maturity described in this Pricing Supplement is based on the full Principal Amount of your Notes, the Initial Offering Price of the Notes includes the agent's commission and the cost of hedging our obligations under the Notes through one or more of our affiliates. As a result, the price, if any, at which BNPP Securities and other affiliates of BNP Paribas may be willing to purchase Notes from you in secondary market transactions will likely be lower than the Initial Offering Price, and any sale prior to the Maturity Date could result in a substantial loss to you. The Notes are not designed to be short-term trading instruments. Accordingly, you should be able and willing to hold your Notes to maturity.
- **The Notes May Lack Liquidity** – The Notes will not be listed on any securities exchange. BNPP Securities intends to offer to purchase the Notes in the secondary market but is not required to do so. Even if there is a secondary market, it may not provide enough liquidity to allow you to trade or sell the Notes prior to maturity. Because other dealers are not likely to make a secondary market for the Notes, the price at which you may be able to trade your Notes is likely to depend on the price, if any, at which BNPP Securities is willing to buy the Notes. You should, therefore, be willing to hold the Notes to maturity.
- **Potential Conflicts** – We and our affiliates play a variety of roles in connection with the issuance of the Notes, including acting as Calculation Agent and hedging our obligations under the Notes. In performing these duties, the economic interests of the Calculation Agent and other affiliates of ours are potentially adverse to your interests as an investor in the Notes. In addition, we or one or more of our affiliates may publish research reports or otherwise express opinions or recommendations with respect to the Underlying Asset and these reports may or may not recommend that investors buy or hold the Underlying Asset. As a prospective purchaser of the Notes, you should undertake an independent investigation of the Underlying Asset that in your judgment is appropriate to make an informed decision with respect to an investment in the Notes.



In addition, our affiliate, BNPP Securities, worked with the Index Sponsor in developing the guidelines and policies governing the composition and calculation of the Underlying Asset and the Underlying Index. Although judgments, policies and determinations in the development of the Underlying Asset and the Underlying Index were made by BNPP Securities, the Underlying Asset and the Underlying Index are owned and operated by the Index Sponsor. The policies and judgments for which BNPP Securities was responsible could have an impact, positive or negative, on the level of the Underlying Asset, the Underlying Index and the value of your Notes. BNPP Securities and the Index Sponsor are under no obligation to consider your interests as an investor in the Notes in their role in developing the guidelines and policies governing the Underlying Asset and the Underlying Index or making judgments that may affect the level of the Underlying Asset and Underlying Index.

- **Taxes** – We intend to treat (i) each Note as a cash-settled derivative contract with respect to the Underlying Asset with associated contingent coupons and (ii) any Conditional Coupon as ordinary income. Please see the discussion under the heading "Taxation – United States Federal Income Taxation – United States Holders – Consequences of Reverse Convertible Notes and Forward Contract Notes – Consequences of Forward Contract Notes" in the Prospectus Supplement and the Base Prospectus.

Under the above agreed-to characterization, a United States holder's tax basis in a Forward Contract Note generally will equal the holder's cost for that Forward Contract Note. Upon the sale or other taxable disposition (including payment in cash on the Maturity Date) of a Forward Contract Note, a United States holder generally will recognize gain or loss equal to the difference between the amount realized on the sale or other taxable disposition (other than amounts representing any Conditional Coupon) and the United States holder's tax basis in the Forward Contract Note. Such gain or loss generally will be long-term capital gain or loss if the United States holder has held the Forward Contract Note for more than one year at the time of disposition. Pursuant to the terms of the Notes, you agree to treat the Notes in accordance with this characterization for all U.S. federal, state, and local income tax purposes.

However, because there are no regulations, published rulings or judicial decisions addressing the characterization for U.S. federal, state, and local income tax purposes of securities with terms that are substantially the same as those of the Notes, other characterizations and treatments are possible. In particular, it is possible that the Notes will be characterized as "contingent payment debt instruments" in which case the tax consequences to you would be different, and could be less favorable, than if the Notes were characterized as prepaid derivative contracts. For a description of the tax consequences of the ownership of contingent payment debt instruments, please see the discussion under the heading "Taxation – United States Federal Income Taxation – United States Holders – Consequences of Notes Characterized As Debt – Linked Debt Notes and Other Notes Providing for Contingent Payments" in the Prospectus Supplement and the Base Prospectus.

The U.S. federal income tax treatment of the Conditional Coupons is uncertain, and although we believe it is reasonable to conclude that the Conditional Coupons are not subject to U.S. withholding tax (at least if the applicable Form W-8 is provided), a withholding agent may nonetheless withhold on these payments (generally at a rate of 30% subject to the possible reduction or elimination of that rate under an applicable income tax treaty), unless income from the Notes is effectively connected with your conduct of a trade or business in the United States.

Pursuant to regulations released by the U.S. Department of the Treasury, Foreign Account Tax Compliance Act (FATCA) withholding (as described in "Taxation – United States Federal Income Taxation – Foreign Account Tax Compliance Act" in the Prospectus Supplement and the Base Prospectus) will generally apply to obligations that are issued on or after July 1, 2014; therefore, the Notes will generally be subject to these withholding tax rules. Pursuant to proposed regulations, the U.S. Department of Treasury has indicated its intent to eliminate the requirements under FATCA of withholding on gross proceeds from the sale, exchange, redemption, maturity or other disposition of relevant financial instruments. The U.S. Department of Treasury has indicated that taxpayers may rely on these proposed regulations pending their finalization.

Individuals that are either (a) a U.S. citizen, (b) a resident alien for any part of the year, (c) a nonresident alien that has made an election to be treated as a resident alien for purposes of filing a joint U.S. federal income tax return or (d) a nonresident alien who is a *bona fide* resident of American Samoa or Puerto Rico and certain entities that own "specified foreign financial assets" with an aggregate value in excess of \$50,000 on the last day of the taxable year (or with an aggregate value in excess of \$75,000 at any time during the taxable year), will generally be required to file an information report on IRS Form 8938 with respect to such assets with their U.S. federal tax returns. "Specified foreign financial assets" include any financial accounts maintained by foreign financial institutions, as well as any of the following, but only if they are held for investment and not held in accounts maintained by financial institutions: (i) stocks and securities issued by non-United States persons, (ii) financial instruments and contracts that have non-United States issuers or counterparties, and (iii) interests in foreign entities. Prospective purchasers are urged to consult their tax advisors regarding the application of this legislation to their ownership of Notes.

Pursuant to Section 871(m) of the Internal Revenue Code, the Treasury Department has issued regulations which impose a withholding tax at a rate of 30% (subject to reduction under an applicable income tax treaty, provided that the non-United States holder has provided the documentation required to claim benefits under such treaty) on amounts attributable to U.S.-source dividends (including, potentially, adjustments to account for extraordinary dividends) that are paid or "deemed paid" under certain equity-linked instruments ("ELIs"), if certain other conditions are met ("dividend equivalents"). Dividend equivalents include payments made pursuant to certain specified equity-linked instruments ("specified ELIs") that reference one or more U.S. stocks on which a U.S.-source dividend is paid, whether or not any payment on the specified ELI corresponds to the U.S.-source dividend payment. Under these regulations, if the Notes are specified ELIs, then withholding is required when cash payments are made on the Notes or upon the maturity or other disposition of the Notes to non-United States holders. If withholding is required, the non-United States holder will not be entitled to additional amounts with respect to amounts so withheld.

A specified ELI is (i) a "simple" ELI that has a delta of 0.8 or greater with respect to an underlying security or (ii) a "complex" ELI that meets a substantial equivalence test with respect to an underlying security. A "simple" ELI is an ELI for which, with respect to each underlying security, (i) all amounts to be paid or received on maturity, exercise, or any other payment determination date are calculated by reference to a single, fixed number of shares of the underlying security, provided that the number of shares can be ascertained when the contract is issued, and (ii) the contract has a single maturity or exercise date with respect to which all amounts (other than any upfront payment or any periodic payments) are required to be calculated with respect to the underlying security. A "complex" ELI is any ELI that is not a "simple" ELI. Delta is the ratio of the change in the fair market value of the contract to a small change in the fair market value of the number of shares of the underlying security referenced by the ELI. The substantial equivalence test assesses whether a complex contract substantially replicates the economic performance of the underlying security by comparing, at various testing prices

for the underlying security, the differences between the expected changes in value of the complex contract and its initial hedge with the difference between the expected changes in value of a "simple contract benchmark" (as defined in the final regulations) with a delta of 0.8 and its initial hedge. In addition, ELIs that reference a "qualified index" (as defined in the final regulations) will not be specified ELIs.

These regulations generally will apply to any specified ELI that has a delta of one and is issued, or significantly modified and treated as retired and reissued, on or after January 1, 2017. If a specified ELI does not have a delta of one, then these regulations generally will apply if the specified ELI is issued, or significantly modified and treated as retired and reissued, on or after January 1, 2025.

We have determined that, as of the date of this Pricing Supplement, this withholding on dividend equivalents should not apply to the Notes. In certain limited circumstances, however, non-United States holders should be aware that it is possible for non-United States holders to be liable for tax under these rules with respect to a combination of transactions treated as having been entered into in connection with each other even when no withholding is required. Non-United States holders should consult their tax advisors regarding these regulations.

- **Many Economic and Market Factors Will Impact the Value of the Notes** – In addition to the level of the Underlying Asset on any day, the value of the Notes will be affected by a number of economic and market factors that may either offset or magnify each other, including:
  - supply and demand for the Notes, including inventory positions held by BNP Paribas or any other market makers;
  - the expected volatility of the Underlying Asset, Underlying Index, SPX or any of the futures contracts referenced in the calculation of the Underlying Asset;
  - the time to maturity of the Notes;
  - the dividend rate on the securities underlying the SPX;
  - interest and yield rates in the market generally;
  - a variety of economic, financial, political, regulatory or judicial events;
  - other events (including domestic or global health concerns, including the outbreak of contagious or pandemic diseases, such as the recent coronavirus); and
  - our creditworthiness, including actual or anticipated downgrades in our credit ratings.

These factors interrelate in complex ways, and the effect of one factor on the market value of your Notes may offset or enhance the effect of another factor in an unpredictable manner.

- **Market Disruption Events and Adjustments** – The Final Level, Final Valuation Date, Maturity Date, and the payment at maturity, among others, are subject to adjustment as described in the following sections of the Product Supplement:
  - For a description of Market Disruption Events as well as the consequences of that Market Disruption Event, see "Additional Terms – Market Disruption Events" herein and "Underlying Assets–Indices–Market Disruption Events for Notes with the Underlying Asset Comprised of an Index or Indices" in the Product Supplement (to the extent that the disclosure herein and in the Product Supplement conflict, you should rely on the disclosure set forth herein); and
  - For a description of further adjustments that may affect the Underlying Asset, see "Underlying Assets – Indices–Adjustments Relating to Notes with the Underlying Asset Comprised of an Index".
- **If the Level or Price of the Underlying Asset, Instruments Referenced in the Calculation of the Underlying Asset or the Index Components Changes, the Market Value of the Notes May Not Change in the Same Manner** – The Notes may trade quite differently from the performance of the Underlying Asset, the Index Components, instruments referenced in the calculation of the Underlying Asset or other exchange-traded or over-the-counter instruments based on the level of the Underlying Asset. Changes in the level or price, as applicable, of the Underlying Asset, instruments referenced in the calculation of the Underlying Asset or the Index Components may not result in a comparable change in the market value of the Notes.

#### **Risks Relating to the Underlying Asset**

- **No Assurance Can Be Given that the Strategy Used to Construct the Underlying Asset Will Achieve Its Intended Results or that the Underlying Asset Will Be Successful** – No assurance can be given that the investment strategy on which the Underlying Asset is based will be successful or that the Underlying Asset will outperform any alternative strategy that might be employed with respect to the Index Components. The Underlying Asset has been developed based on predetermined rules that may not prove to be advantageous or successful, and that will not be adjusted for market conditions.
- **The Underlying Asset is Subject to Risks Associated with Significant Leverage** – At times, the Underlying Asset will use significant leverage to achieve its target volatility. When the Underlying Asset employs leverage, any declines in the Underlying Index will be magnified, resulting in accelerated losses.
- **The Underlying Asset May Not Be Fully Invested** – On a weekly rebalancing day, the Underlying Asset's exposure to the Underlying Index will be less than 100% when the implied volatility (calculated based on the relevant futures contracts as described below) is greater than the volatility target. If the Underlying Asset's exposure to the Underlying Index is less than 100%, the Underlying Asset will not be fully invested, and any uninvested portion will earn no return. The Underlying Asset may be significantly uninvested on any given day, and will realize only a portion of any gains due to any increase in the level of the Underlying Index on any such day.
- **The Underlying Asset May Not Approximate Its Target Volatility** – No assurance can be given that the Underlying Asset will maintain a realized volatility that approximates its target volatility. The actual realized volatility may be greater than or less than the target volatility, which may adversely affect the performance of the Underlying Asset. On each weekly rebalancing day, the Underlying Asset uses the implied volatility of the SPX as a proxy for the volatility of the Underlying Index. However, there is no guarantee that the methodology used by the Underlying Asset to determine the implied volatility of the SPX will be representative of the implied or realized volatility of the Underlying Index. The performance of the SPX may not correlate with the performance of the Underlying

Index, particularly during periods of market volatility. In addition, the volatility of the Underlying Index on any day may change quickly and unexpectedly. Accordingly, the actual realized annualized volatility of the Underlying Asset may be greater than or less than the target volatility, which may adversely affect the level of the Underlying Asset and the value of the notes.

- **The Volatility Target Mechanism May Cause the Underlying Asset to Perform Poorly in Adverse Market Conditions and to Underperform in Rising Markets** – Because the amount of leverage to be applied is determined only at the weekly rebalancing, the Underlying Asset may not meaningfully reduce its leverage during adverse market conditions, and, because of the delayed application, by the time reduced exposure takes effect, market conditions may have already recovered. Similarly, when markets rise rapidly, the volatility target mechanism will reduce the Underlying Asset's leverage.
- **The Index Is An Excess Return Index That Does Not Reflect "Total Returns"** – The values tracked by the Underlying Asset and the Underlying Index only reflect changes in the prices or levels of the relevant Index Components. The level of the Underlying Asset, and therefore your return on the Notes, will not benefit from any collateral return on any futures contracts or any dividends or other distributions on any Index Components.
- **The Level of the Underlying Asset Will Be Calculated by Reference to Certain Time-Weighted Average Levels Which Could Adversely Affect the Level of the Underlying Asset** – As described in greater detail below, certain calculations with respect to the Underlying Asset will be based on time-weighted average levels of the Underlying Index during a specified window of time. The level of the Underlying Asset may be more favorable if such calculations were based on a closing level or a time-weighted average price during another specified window of time.
- **The Daily Level of the Underlying Asset Is Calculated Based on Performance Measured From the Preceding Weekly Rebalancing Date, Which Could Adversely Affect the Level of the Underlying Asset** – As described in greater detail below, the level of the Underlying Asset on each day that is not a rebalancing day will be calculated based on the performance of the Underlying Index from the preceding rebalancing day and by reference to the level of the Underlying Asset as of the prior rebalancing day. The level of the Underlying Asset may be more favorable if such calculations were done over a different time-horizon – i.e., if such calculations were made based on the levels on the prior trading day rather than the prior rebalancing day or if such calculations were made based on less frequent rebalancing days.
- **We Cannot Control the Actions of the Issuers of the Common Stocks included in the SPX, Including Actions That Could Adversely Affect the Value of Your Notes** – We will have no ability to control the actions of the companies, including actions that could affect the value of the SPX (and therefore the Underlying Asset), the stocks underlying the SPX, or your Notes. None of the proceeds you pay us will go to any of the companies included in the SPX as issuer of an Index Component, and none of those companies will be involved in the offering of the Notes in any way. Neither those companies nor we will have any obligation to consider your interests as a holder of the Notes in taking any corporate actions that might affect the value of your Notes. You will not have any right against the issuer of any Index Component as a shareholder of such issuer solely because you are a holder of the Notes.
- **Concentration Risks Associated with the Underlying Asset May Adversely Affect the Value of Your Notes** – The Underlying Asset generally provides exposure to a single SPX futures contract. Accordingly, the Notes are less diversified than other funds, investment portfolios or indices investing in or tracking a broader range of products and, therefore, could experience greater volatility. You should be aware that other indices may be more diversified than the Underlying Asset in terms of both the number and variety of futures contracts and/or other instruments. You will not benefit, with respect to the Notes, from any of the advantages of a diversified investment and will bear the risks of a highly concentrated investment.
- **The Underlying Asset is Subject to Significant Risks Associated with Futures Contracts, Including Volatility** – The Underlying Asset is subject to significant risks associated with futures contracts, including volatility. The Underlying Asset is calculated by reference to futures contracts and the Underlying Index tracks the returns of futures contracts. The price of a futures contract depends not only on the price of the underlying asset referenced by the futures contract, but also on a range of other factors, including but not limited to changing supply and demand relationships, interest rates, governmental and regulatory policies and the policies of the exchanges on which the futures contracts trade. In addition, the futures markets are subject to temporary distortions or other disruptions due to various factors, including the lack of liquidity in the markets, the participation of speculators and government regulation and intervention. These factors and others can cause the prices of futures contracts to be volatile.
- **Higher Future Prices of Futures Contracts Relative to Their Current Prices, or "Contango", May Lead to a Decrease in the Level of the Underlying Index and, Therefore, the Level of the Underlying Asset and the Amount Payable On The Notes** – If the market for futures contracts tracked by the Underlying Index is in "contango" (where the prices are higher in the distant delivery months than in the nearer delivery months) or, to the contrary, in "backwardation", this could create a negative or positive "carry" or "roll yield" when such contracts are "rolled" and could adversely affect the levels of the Underlying Index, and, therefore, the level of the Underlying Asset and the amount payable at maturity and/or the market value of the Notes.
- **Suspension or Disruptions of Market Trading in Futures Contracts May Adversely Affect the Value of Your Notes** – Suspension or disruptions of market trading in futures contracts may adversely affect the value of your Notes. Futures markets like the Chicago Mercantile Exchange are subject to temporary distortions or other disruptions due to various factors, including the lack of liquidity in the markets, the participation of speculators, and government regulation and intervention. In addition, futures exchanges have regulations that limit the amount of fluctuation in some futures contract prices that may occur during a single day. These limits are generally referred to as "daily price fluctuation limits" and the maximum or minimum price of a contract on any given day as a result of these limits is referred to as a "limit price." Once the limit price has been reached in a particular contract, no trades may be made at a price beyond the limit, or trading may be limited for a set period of time. Limit prices have the effect of precluding trading in a particular contract or forcing the liquidation of contracts at potentially disadvantageous times or prices. These circumstances could affect the level of the Underlying Index, and, therefore, the Underlying Asset and therefore could affect adversely the value of your notes.

- **The Official Settlement Price and Intraday Trading Prices of the Relevant Futures Contracts May Not Be Readily Available** – The closing level and TWAP Level of the Underlying Index, referenced in the calculation of the Underlying Asset, are calculated by S&P based on the official settlement price and intraday trading prices of the ES futures contracts which are calculated and published by the Chicago Mercantile Exchange. Any disruption in trading of the relevant futures contracts could delay the release or availability of the official settlement price and intraday trading prices and may delay or prevent the calculation of the Underlying Asset.
- **Changes in the Margin Requirements for the Relevant Futures Contracts May Adversely Affect the Value of the Notes** – Futures exchanges require market participants to post collateral in order to open and to keep open positions in futures contracts. If an exchange changes the amount of collateral required to be posted to hold positions in the relevant futures contracts, market participants may adjust their positions, which may affect the prices of the relevant futures contracts referenced in the calculation of the Underlying Index. As a result, the level of the Underlying Asset may be affected, which may adversely affect the value of the Notes.
- **While the Level of the Underlying Asset and the Underlying Index Will Be Determined in Part By the Value of Certain Futures Contracts, neither the Notes Nor the Underlying Asset and Underlying Index are Regulated by the Commodity Futures Trading Commission ("CFTC")** – An investment in the notes thus does not constitute either an investment in futures contracts or options on futures contracts or an investment in a collective investment vehicle that trades in these futures contracts (i.e., the notes will not constitute a direct or indirect investment by you in the futures contracts), and you will not benefit from the regulatory protections of the CFTC. Among other things, this means that neither the Issuer nor the Guarantor are registered with the CFTC as a futures commission merchant and you will not benefit from the CFTC's or any other non-U.S. regulatory authority's regulatory protections afforded to persons who trade in futures contracts on a regulated futures exchange through a registered futures commission merchant. For example, the price you pay to purchase notes will be used by the Issuer for its own purposes and will not be subject to customer funds segregation requirements provided to customers that trade futures on an exchange regulated by the CFTC. Unlike an investment in the notes, an investment in a collective investment vehicle that invests in futures contracts on behalf of its participants may be subject to regulation as a commodity pool, and its operator may be required to register with and be regulated by the CFTC as a commodity pool operator, or qualify for an exemption from the registration requirement. Because the notes will not be interests in a commodity pool, the notes will not be regulated by the CFTC as a commodity pool, neither the Issuer nor the Guarantor will be registered with the CFTC as a commodity pool operator and you will not benefit from the CFTC's or any non-U.S. regulatory authority's regulatory protections afforded to persons who invest in regulated commodity pools.
- **The Policies of the Index Sponsor and Changes that Affect the Underlying Asset or the Index Components Could Affect the Amount Payable on the Notes, if Any, and Their Market Value** – The policies of the sponsor of the Underlying Asset (the "Index Sponsor") concerning the calculation of the levels of the Underlying Asset or additions, deletions or substitutions of the Index Components and the manner in which changes affecting such Index Components or their issuers, such as stock dividends, reorganizations or mergers, are reflected in the level of the Underlying Asset, could affect the levels of the Underlying Asset and, therefore, the amount payable on the Notes, if any, at maturity and the market value of the Notes prior to maturity. The amount payable on the Notes, if any, and their market value could also be affected if the Index Sponsor changes these policies, for example, by changing the manner in which it calculates the level of the Underlying Asset, or if the Index Sponsor discontinues or suspends calculation or publication of the level of the Underlying Asset, in which case it may become difficult to determine the market value of the Notes. If events such as these occur, the Calculation Agent may determine the amount payable, if any, at maturity.
- **No Rights Against Standard & Poor's** – The return on the Notes is linked to the Underlying Asset. Investors will have no rights against S&P Dow Jones Indices, a division of S&P Global or its affiliates (collectively, "S&P") even if S&P decides to suspend the calculation of the Underlying Asset and this suspension adversely impacts the amount investors receive at maturity. For additional information about the Underlying Asset, see the information set forth under "The Underlying Asset" herein.
- **Limited Performance History is Available; Hypothetical Back-Tested Performance Information Is Subject to Significant Limitations** – The Underlying Asset was launched as of its launch date (specified below under "The Underlying Asset"). Accordingly, the Underlying Asset has a limited performance history, and this limited performance history may not reflect the way in which the Underlying Asset would perform in a variety of market conditions, including market conditions which may arise during the term of your Notes. All information regarding the performance of the Underlying Asset prior to its launch date is hypothetical and back-tested, as the Underlying Asset did not exist prior to that date. It is important to understand that back-tested information is subject to significant limitations, in addition to the fact that past performance is never a guarantee of future performance and should never be considered indicative of future performance. In particular, prospective investors are advised to note the following.
  - The Underlying Asset has been developed with the benefit of hindsight and knowledge of factors that may have positively affected the performance of the Underlying Asset – that is, with the benefit of being able to evaluate how the Underlying Asset methodology would have caused the Underlying Asset to perform had it existed during the hypothetical back-test period. It is impossible to predict whether the Underlying Asset will rise or fall. Accordingly, the actual performance of the Underlying Asset may differ significantly from the back-tested information, and if the Underlying Asset is shown to have generally appreciated over the hypothetical back-test period, that may not therefore be an accurate or reliable indication of any fundamental aspect of the Underlying Asset methodology.
  - The back-tested information might look different if it covered a different historical period. The market conditions which existed during the historical period covered by the back-tested information are not necessarily representative of the market conditions which may exist in the future. In addition, the back-tested information does not reflect the effect on the relevant markets of the launch of the Underlying Asset and of the delivery of exposures to the Underlying Asset through the Notes.
  - The back-tested information was created subject to certain assumptions and modifications that differ from the actual Underlying Asset methodology, and which may be different from the methodology that someone else might use to back-test the Underlying Asset. If the hypothetical historical performance of the Underlying Asset were calculated based on different assumptions or if the modifications to the Underlying Asset methodology were not made, the hypothetical performance data of the Underlying Asset might look materially different.

Any back-tested information is provided for illustrative purposes only and has been prepared on the basis of certain assumptions. Prospective investors are advised to familiarize themselves with and understand the assumptions upon which the back-tested information has been prepared.

**Redemption Amount at Maturity**

Unless Early Redeemed, a \$1,000 investment in the Notes will pay \$1,000 at maturity unless the Final Level of the Underlying Asset is below the Barrier Level. If the above condition is true, at maturity you will receive, instead of the full principal amount of your Notes, a cash amount equal to the principal amount you invested reduced by the percentage decrease in the level of the Underlying Asset. Accordingly, you may lose some or all of your principal if you invest in the Notes. All payments on the Notes are subject to the creditworthiness of the Issuer and Guarantor.

## THE UNDERLYING ASSET

Below is a description of the Underlying Asset. Unless otherwise stated, all information contained herein regarding the Underlying Asset is derived from publicly available sources and is provided for informational purposes only. We have not independently verified, and have not confirmed the accuracy or completeness of, such information. Neither the Issuer, the Guarantor nor any of its affiliates assumes any responsibilities for the adequacy or accuracy of information about the Underlying Asset. You should make your own investigation into the Underlying Asset.

### The S&P 500 Futures 35% Defined Volatility Index

#### General

All information regarding the Underlying Asset set forth in this Pricing Supplement reflects the policies of, and is subject to change by, S&P. The Underlying Asset is calculated, maintained and published by S&P. The Underlying Asset seeks to provide dynamically-adjusted leveraged exposure to the S&P 500 Futures (3-Day Roll) Index (the "**Underlying Index**") based on a volatility target of 35%, subject to a maximum exposure of 500%. In an effort to achieve the volatility target, the Underlying Asset is rebalanced weekly based on a time weighted average between 3:20 and 3:30 p.m. (New York time) (or 12:20 and 12:30 p.m. in the case of a scheduled early market closure). Typically, this rebalancing occurs on each Friday, but it may be accelerated or postponed based on closures in the U.S. equity markets.

The Underlying Index is a rolling futures index that seeks to measure the performance of the nearby quarterly E-mini S&P 500 futures contracts (the "**ES Futures Contracts**") on a rolling basis. The S&P 500 Index (the "**SPX**"), the index underlying these futures contracts, measures the performance of the large-cap segment of the U.S. market and is intended to provide a performance benchmark for the U.S. equity markets.

The Underlying Asset was established on June 24, 2022 with a base date of December 31, 2014. The Underlying Asset is reported by the Bloomberg Professional® service under the ticker symbol "SPXFBV35E Index".

**The Underlying Asset is subject to risks associated with the use of significant leverage. In addition, the Underlying Asset may be significantly uninvested on any given day, and, in that case, will realize only a portion of any gains due to appreciation of the Underlying Index based on the ES Futures Contracts on that day.**

**No assurance can be given that the investment strategy used to construct the Underlying Asset will achieve its intended results or that the Underlying Asset will be successful or will outperform any alternative index or strategy that might reference the ES Futures Contracts or the SPX.**

#### Calculation and Maintenance

The Underlying Asset is calculated daily in U.S. dollars on each day the U.S. equity markets are open for trading (each, a "**Calculation Day**") and is rebalanced weekly on the applicable Rebalancing Day. The "**Rebalancing Day**" is typically each Friday, but if the market is not scheduled to open on a particular Friday, that Rebalancing Day will be the immediately preceding Calculation Day. Similarly, if the originally scheduled Rebalancing Day occurs on a Friday on which the market fails to open as expected, closes prior to the relevant observation period (as described in greater detail below) or certain disruptions occur, the applicable rebalancing will occur on the immediately following Calculation Day.

On each day that is not a Rebalancing Day, the level of the Underlying Asset will equal the greater of two products. The first product is equal to 25% multiplied by the TWAP Level (as defined below) of the Underlying Asset as of the preceding Rebalancing Day. The effect of this calculation is to create a temporary floor or circuit breaker, meaning that the level of the Underlying Asset on any day may not be less than 25% than its TWAP Level on the prior Rebalancing Day. The second product (and the calculation that will determine the level of the Underlying Asset unless the "circuit breaker" applies) is equal to the TWAP Level of the Underlying Asset on the prior Rebalancing Day multiplied by the Performance Factor. The "**Performance Factor**" is a calculation designed to represent the performance of the Underlying Index after adjustments are made to reflect the applicable Leverage Factor (determined as of the preceding Rebalancing Day and as described below) and the index fee of 0%. The performance of the Underlying Index is calculated by first dividing the closing level of the Underlying Index on the applicable Calculation Day by the Underlying Index TWAP Level (as defined below) on the preceding Rebalancing Day and then subtracting one. The performance, as calculated in the preceding sentence, is then multiplied by the applicable Leverage Factor to determine the leveraged performance. The Performance Factor is equal to 1 plus the leveraged performance minus the index fee of 0%.

As described in the preceding paragraph, the level of the Underlying Asset is calculated based on the TWAP Level as of the last Rebalancing Day and not based on the level of the Underlying Asset on the prior Calculation Day.

These calculations, expressed as a formula:

$$Index_t = \max \left\{ 25\% \times Index_{rb-1}^{twap}, Index_{rb-1}^{twap} \times \left( 1 + Leverage_{rb-1} \times \left( \frac{Underlying_t}{Underlying_{rb-1}^{twap}} - 1 \right) - AF \times \frac{Days_{rb-1,t}}{360} \right) \right\}$$

Where:

■ = the closing level of the Underlying Asset on Calculation Day  $t$

■ = the TWAP Level of the Underlying Asset on the preceding Rebalancing Day

■ = the Leverage Factor as of the preceding Rebalancing Day

■ = the level of the Underlying Index on Calculation Day  $t$

■ = the Underlying Index TWAP Level on the preceding Rebalancing Day

■ = the index fee of 0% per annum

■ = the number of calendar days between the preceding Rebalancing Day and Calculation Day  $t$

If the exchange fails to open due to unforeseen circumstances, such as natural disasters, inclement weather, outages, or other events, the index uses the prior day's settlement prices. In situations where an exchange is forced to close early due to unforeseen events, such as computer or electric power failures, weather conditions or other events, S&P calculates the settlement price of the indices based on (1) the settlement prices published by the exchange, or (2) if no settlement price is available, the index committee determines the course of action and notifies clients accordingly. If an exchange is fully or partially closed on one or more days during this rebalancing period (i.e the roll of the future contract) and S&P is unable to obtain official settlement prices, the index committee will review the situation on a case-by-case basis and the appropriate treatment will be announced to clients.

### Weekly Rebalancing

On each Rebalancing Day, the Underlying Asset rebalances and a new Leverage Factor is determined. The first step in this process is determining the time-weighted average level of the Underlying Asset (the "TWAP Level"). The TWAP Level for each Rebalancing Day is calculated based on the change from the prior Rebalancing Day's TWAP Level. The TWAP Level will equal the greater of two products. The first product is equal to 25% multiplied by the TWAP Level on the preceding Rebalancing Day. This calculation, similar to the circuit-breaker or temporary floor for the daily Underlying Asset level, serves to limit the maximum change in the Underlying Asset level as measured from week-to-week. As a result, the TWAP Level with respect to a Rebalancing Day will not be less than 25% of the TWAP Level on the immediately preceding Rebalancing Day. The second product is equal to the TWAP Level on the prior Rebalancing Day multiplied by the TWAP Performance Factor. The "TWAP Performance Factor", like the Performance Factor, is a calculation designed to represent the performance of the Underlying Index after adjustments are made to reflect the applicable Leverage Factor and the index fee. The distinction between the calculation of the Performance Factor and the TWAP Performance Factor is that while the performance of the Underlying Index is calculated based on comparing the closing level of the Underlying Index on the applicable Calculation Day to the Underlying Index TWAP Level on the preceding Rebalancing Day to determine the Performance Factor, the TWAP Performance Factor is determined by comparing the Underlying Index TWAP Level on the applicable Rebalancing Day to the Underlying Index TWAP Level on the preceding Rebalancing Day. The "Underlying Index TWAP Level" is determined based on the observed time weighted average level of the Underlying Index between 3:20 and 3:30 P.M. New York time (the "TWAP Window") on the Rebalancing Day, provided, however, that if the U.S. equity markets are scheduled to close early on any Rebalancing Day, the TWAP Window will be between 12:20 and 12:30 P.M. New York time and any scheduled closure of the U.S. equity markets on a Friday will result in the applicable Rebalancing Day being moved to the immediately preceding Calculation Day. If the U.S. equity markets do not open for any reason other than a scheduled closure on a Rebalancing Day, close prior to the TWAP Window on a Rebalancing Day, or suffer a disruption that affects the calculation of the implied volatility of the SPX, the applicable Rebalancing Day will be postponed until the following Calculation Day. The Underlying Index TWAP Level is reported by the Bloomberg Professional® service under the ticker symbol "SPXF3RWE Index".

These calculations, expressed as a formula:

$$Index_t^{twap} = \max \left\{ 25\% \times Index_{rb-1}^{twap}, Index_{rb-1}^{twap} \times \left( 1 + Leverage_{rb-1} \times \left( \frac{Underlying_t^{twap}}{Underlying_{rb-1}^{twap}} - 1 \right) - AF \times \frac{Days_{rb-1,t}}{360} \right) \right\}$$

Where:

■ = the TWAP Level of the Underlying Asset on Calculation Day  $t$

■ = the TWAP Level of the Underlying Asset on the preceding Rebalancing Day

■ = the Leverage Factor as of the preceding Rebalancing Day

■ = the Underlying Index TWAP Level on Calculation Day  $t$

■ = the Underlying Index TWAP Level on the preceding Rebalancing Day

■ = the index fee of 0% per annum

■ = the number of calendar days between the preceding Rebalancing Day and Calculation Day  $t$

On each Rebalancing Day, S&P will also determine the applicable leverage factor that will apply until the next Rebalancing Day (the "Leverage Factor"). The Leverage Factor adjusts the Underlying Asset's exposure to the Underlying Index based on the Underlying Asset's volatility target 35% compared to the implied volatility of the SPX as of the Rebalancing Day. The Leverage factor is subject to a cap of 500%. Expressed as a formula:

$$Leverage_t = \min \left( \max L, \frac{TV}{IV_t} \right)$$

Where:

■ = the Leverage Factor on Calculation Day  $t$

■ = the leverage cap of 500%

■ = the target volatility

■ = the implied volatility of the SPX as of Calculation Day  $t$

Volatility is a measure of the degree of variation in the value of an asset over a period of time. Implied volatility is an estimate of the market's expectation of an asset's volatility over a future period, and is normally calculated based on the prices of listed option contracts that reference the asset. For purposes of the above calculations, the one-week implied volatility of the SPX is calculated using the Black model (a variant of the Black-Scholes model) based on the prices of CBOE Exchange listed call and put options with listed strikes right below and above the forward price. The current reference contracts are the PM-Settled SPX Weeklys with Friday and PM-settled SPX 3<sup>rd</sup> Friday expirations scheduled to be the immediately following Rebalancing Day. In calculating the implied volatility of the SPX, the contribution of a single option to the implied volatility is proportional to the difference between strikes of the options on either side of that option and to the forward price. The lower the difference, the higher the contribution. The forward price referred to above is derived from "call-put parity" and determined based on the mid-price of call and put options with strike price at which the absolute difference between the call mid-price and the put mid-price is the smallest. The constant maturity treasury rate is used to derive the risk-free rate for these calculations.

On an Rebalancing Day, the implied volatility of SPX used to determine the exposure of the Underlying Asset to the Underlying Index is equal to the arithmetic average of the implied volatility of the SPX, calculated as described above at the end of each minute during the period from and including 2:00 p.m. to but excluding 2:30 p.m. (New York time) on that day provided, however, that if the U.S. equity markets are scheduled to close early on any Rebalancing Day, the relevant window will be between 11:00 and 11:30 a.m. (New York time). S&P has entered into an agreement with CBOE pursuant to which CBOE calculates the implied volatility as described herein and provides the result to S&P for use in connection with the Underlying Asset.

Once the new TWAP Level and Leverage Factor have been determined, the S&P will then determine the closing level of the Underlying Asset. The level will be calculated in the same manner as on other Calculation Days, except that on any Rebalancing Day the closing level will be calculated by reference to the new Leverage Factor and the new TWAP Level determined on such day in place of the Leverage Factor and TWAP Level determined on the immediately preceding Rebalancing Day.

S&P reserves the right to recalculate the Underlying Asset at its discretion in the event of an incorrect or revised closing level of any constituent, an incorrect calculation or data entry error, an incorrect application of the index methodology, or certain other events. Any decision to recalculate the Underlying Asset will be made in the sole discretion of S&P.

### Underlying Index

The Underlying Index measures the performance of the nearby ES Futures Contracts on a rolling basis. The relevant ES Futures contracts are rolled quarterly in March, June, September and December over a three day roll period falling on the sixth, seventh and eighth ES Futures Trading Day preceding the last ES Futures Trading Day of the relevant futures contract. An "**ES Futures Trading Day**" is a day on which the Chicago Mercantile Exchange is open for trading. One-third of the weight will be rolled on each day during the roll period, and such roll will be effective after the close of trading.

The level of the index on each ES Futures Trading Day will equal the product of (i) the level of the index on the preceding ES Futures Trading Day multiplied by (ii) the sum of one plus the daily return of the referenced ES Futures Contracts. The daily return of the referenced ES Futures contracts will be determined by (i) dividing the official closing price of the relevant ES Futures Contract on such ES Futures Trading Day by the official closing price of the relevant ES Futures Contract on the preceding ES Futures Trading Day and (ii) then subtracting one. During the roll period, the closing price of the relevant ES Futures Contract will represent a blended price of the expiring and the replacement ES Futures Contract (with each contracts price weighted according to the applicable day's assigned roll weighting which is based on one-third of the weight being rolled on each day).

The Underlying Index was established on May 23, 2022 with a base date of September 9, 1997. The Underlying Index is reported by the Bloomberg Professional® service under the ticker symbol "SPXF3RE Index".

### ES Futures Contracts

The ES Futures Contracts are U.S. dollar-denominated futures contracts on the SPX traded on the Chicago Mercantile Exchange, where each futures contract references a value of \$50 times the level of the S&P 500 Index (i.e., one-fifth the size of standard S&P futures). The prices of ES Futures Contracts are quoted in cents per index point.

ES Futures Contracts are listed for the nearest nine quarters (March, June, September and December) and three additional Decembers. The daily settlement prices of ES Futures Contracts are based on trading activity in the relevant contracts on the CME during a specified settlement period. The final settlement prices of ES Futures Contracts are based on the opening prices of the component stocks in the S&P 500 Index, determined on the third Friday of the applicable contract month.

### *Futures Contracts Generally*

Generally speaking, a futures contract is an agreement to buy or sell an underlying asset on a future expiration date at a price that is agreed upon today. If the underlying asset is worth more on the expiration date than the price specified in the futures contract, then the purchaser of that contract will achieve a gain on that contract, and if it is worth less, the purchaser will incur a loss.



Futures contracts are traded on regulated futures exchanges, in the over-the-counter market and on various types of electronic trading facilities and markets. A futures contract provides for a specified settlement month in which the cash settlement is made by the seller (whose position is therefore described as "short") and acquired by the purchaser (whose position is therefore described as "long").

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

By depositing margin, which may vary in form depending on the exchange, with the clearing house or broker involved, a market participant may be able to earn interest on its margin funds, thereby increasing the total return that it may realize from an investment in futures contracts. The Indices are not total return indices and do not reflect interest that could be earned on funds notionally committed to the trading of futures contracts.

Futures contracts are traded on organized exchanges, known as "contract markets" in the United States, through the facilities of a centralized clearing house and a brokerage firm which is a member of the clearing house. The clearing house guarantees the performance of each clearing member which is a party to the futures contract by, in effect, taking the opposite side of the transaction. At any time prior to the expiration of a futures contract, a trader may elect to close out its position by taking an opposite position on the exchange on which the trader obtained the position, subject to the availability of a liquid secondary market. This operates to terminate the position and fix the trader's profit or loss.

Futures exchanges may adopt rules and take other actions that affect trading, including imposing speculative position limits, maximum price fluctuations and trading halts and suspensions and requiring liquidation of contracts in certain circumstances.

## SPX

The SPX is intended to provide an indication of the pattern of stock price movement. The daily calculation of the level of the SPX, discussed below in further detail, is based on the aggregate market value of the common stocks of 500 companies as of a particular time compared to the aggregate average market value of the common stocks of 500 similar companies during the base period of the years 1941 through 1943.

S&P chooses companies for inclusion in the SPX with the aim of achieving a distribution by broad industry groupings that approximates the distribution of these groupings in the common stock population of its database, which S&P uses as an assumed model for the composition of the total market. Relevant criteria employed by S&P for new additions include the viability of the particular company, the extent to which that company represents the industry group to which it is assigned, the extent to which the market value of that company's common stock is generally responsive to changes in the affairs of the respective industry and the market price and trading activity of the common stock of that company. The eleven main groups of companies that comprise the SPX include: Communication Services, Consumer Discretionary, Consumer Staples, Energy, Financials, Health Care, Industrials, Information Technology, Materials, Real Estate and Utilities. S&P may from time to time, in its sole discretion, add companies to, or delete companies from, the SPX to achieve the objectives stated above.

Effective February 20, 2019, company additions to the SPX should have an unadjusted company market capitalization of \$8.20 billion or more (an increase from the previous requirement of an unadjusted company market capitalization of \$6.10 billion or more). A company meeting the unadjusted company market capitalization criteria is also required to have a security level float-adjusted market capitalization that is at least \$4.1 billion. S&P may from time to time, in its sole discretion, add companies to, or delete companies from, the SPX to achieve the objectives stated above. In addition, a company must have a primary listing of its common stock on the NYSE, NYSE Arca, NYSE American (formerly NYSE MKT), NASDAQ Global Select Market, NASDAQ Select Market, NASDAQ Capital Market, Cboe BZX (formerly Bats BZX), Cboe BYX (formerly Bats BYX), Cboe EDGA (formerly Bats EDGA), or Cboe EDGX (formerly Bats EDGX).

As of September 16, 2005, S&P has used a full float-adjusted formula to calculate the SPX. With a float-adjusted index, the share counts used in calculating the SPX will reflect only those shares that are available to investors, not all of a company's outstanding shares. The float-adjusted SPX is calculated as the quotient of (1) the sum of the products of (a) the price of each common stock, (b) the total shares outstanding of each common stock and (c) the investable weight factor and (2) the index divisor.

The investable weight factor is calculated by dividing (1) the available float shares by (2) the total shares outstanding. Available float shares reflect float adjustments made to the total shares outstanding. Float adjustments seek to distinguish strategic shareholders (whose holdings depend on concerns such as maintaining control rather than the economic fortunes of the company) from those holders whose investments depend on the stock's price and their evaluation of the company's future prospects. S&P defines three groups of shareholders whose holdings are subject to float adjustment:

- holdings by other publicly traded corporations, venture capital firms, private equity firms, strategic partners, or leveraged buyout groups;
- holdings by government entities, including all levels of government in the United States or foreign countries; and
- holdings by current or former officers and directors of the company, founders of the company, or family trusts of officers, directors, or founders, as well as holdings of trusts, foundations, pension funds, employee stock ownership plans, or other investment vehicles associated with and controlled by the company.

In cases where holdings in a group as described above exceeds 5% of the outstanding shares of a company, the holdings of that group are excluded from the float-adjusted count of shares to be used in the SPX calculation. In addition, treasury stock, stock options, restricted shares, equity participation units, warrants, preferred stock, convertible stock, and rights are not part of the float. Shares held by mutual funds, investment advisory firms, pension funds, or foundations not associated with the company and investment funds in insurance companies, shares of a U.S. company traded in Canada as "exchangeable shares," shares that trust beneficiaries may buy or sell without difficulty or significant additional expense beyond typical brokerage fees, and, if a company has multiple classes of stock outstanding, shares in an unlisted or non-traded class if such shares are convertible by shareholders without undue delay and cost, are, however, considered part of the float.

Changes in a company's shares outstanding of 5.0% or more due to mergers, acquisitions, public offerings, private placements, tender offers, Dutch auctions, or exchange offers are made as soon as reasonably possible. All other changes of 5.0% or more (due to, for example, company stock repurchases, redemptions, exercise of options, warrants, subscription rights, conversion of preferred stock, notes, debt, equity participation

units, or other recapitalizations) are made weekly and are announced on Tuesday for implementation after the close of trading on Wednesday. Changes of less than 5.0% are accumulated and made quarterly on the third Friday of March, June, September, and December, and are usually announced two days prior. Corporate actions such as stock splits, stock dividends, spinoffs and rights offerings are generally applied on the close of trading on the day after the ex-date. Changes in investable weight factors of more than ten percentage points caused by corporate actions (such as merger and acquisition activity, restructurings, or spinoffs) will be made as soon as reasonably possible. Other changes in investable weight factors will be made annually, in September when investable weight factors are reviewed.

As discussed above, the value of the SPX is the quotient of (1) the total float-adjusted market capitalization of the SPX's constituents (i.e., the sum of the products of (a) the price of each common stock, (b) the total shares outstanding of each common stock and (c) the investable weight factor) and (2) the index divisor. Continuity in index values is maintained by adjusting the divisor for all changes in the constituents' share capital after the base date, which is the period from 1941 to 1943. This includes additions and deletions to the index, rights issues, share buybacks and issuances, and spinoffs. The index divisor's time series is, in effect, a chronological summary of all changes affecting the base capital of the SPX since the base date. The index divisor is adjusted such that the index value at an instant just prior to a change in base capital equals the index value at an instant immediately following that change. Some corporate actions, like stock splits and stock dividends, require simple changes in the common shares outstanding and the stock prices of the companies in the SPX and do not require adjustments to the index divisor.

Additional information on the Underlying Asset (including information regarding the Underlying Index and the SPX) is available on the following website: <http://www.spglobal.com>.

### **Index Committee**

The Underlying Asset, the Underlying Index and the SPX are each maintained by an index committee. Questions of interpretation or possible exceptions to rules are considered by the applicable index committee. S&P's index committees reserve the right to make exceptions in the treatment described in the applicable methodology. Any changes to or deviations from the applicable methodology are made in the sole judgment and discretion of S&P.

### **License Agreement**

The Issuer entered into a limited exclusive license agreement with S&P whereby we, in exchange for a fee, are permitted to use the Underlying Asset in connection with the Notes. We are not affiliated with S&P; the only relationship between S&P and us is any licensing of the use of S&P's indices and trademarks relating to them.

"Standard & Poor's®", "S&P®" and "S&P 500®" are trademarks of S&P. The Notes are not sponsored, endorsed, sold or promoted by S&P or any of their affiliates, and S&P makes no representation regarding the advisability of investing in the Notes. S&P makes no representation or warranty, express or implied, to the owners of the Notes or any member of the public regarding the advisability of investing in securities generally or in the Notes particularly, or the ability of the Underlying Asset to track general stock market performance. S&P's only relationship to the Issuer is the licensing of certain trademarks and trade names of S&P and of the Underlying Asset which is determined, composed and calculated by S&P without regard to the Issuer or the Notes. S&P has no obligation to take the needs of the Issuer or the owners of the Notes into consideration in determining, composing or calculating the Underlying Asset. S&P is not responsible for and has not participated in the determination of the timing of, prices at, or quantities of the Notes to be issued or in the determination or calculation of the equation by which the Notes are to be converted into cash. S&P has no obligation or liability in connection with the administration, marketing or trading of the Notes.

S&P DOES NOT GUARANTEE THE ACCURACY AND/OR THE COMPLETENESS OF THE UNDERLYING ASSET OR ANY DATA INCLUDED THEREIN AND S&P SHALL HAVE NO LIABILITY FOR ANY ERRORS, OMISSIONS OR INTERRUPTIONS THEREIN. S&P MAKES NO WARRANTY, EXPRESS OR IMPLIED, AS TO RESULTS TO BE OBTAINED BY THE ISSUER, OWNERS OF THE NOTES, OR ANY OTHER PERSON OR ENTITY FROM THE USE OF THE UNDERLYING ASSET OR ANY DATA INCLUDED THEREIN. S&P MAKES NO EXPRESS OR IMPLIED WARRANTIES, AND EXPRESSLY DISCLAIMS ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE WITH RESPECT TO THE UNDERLYING ASSET OR ANY DATA INCLUDED THEREIN. WITHOUT LIMITING ANY OF THE FOREGOING, IN NO EVENT SHALL S&P HAVE ANY LIABILITY FOR ANY SPECIAL, PUNITIVE, INDIRECT OR CONSEQUENTIAL DAMAGES (INCLUDING LOST PROFITS), EVEN IF NOTIFIED OF THE POSSIBILITY OF SUCH DAMAGES.

### *Historical Performance of the S&P 500 Futures 35% Defined Volatility Index*

The following graph sets forth the hypothetical back-tested performance of the Underlying Asset from October 28, 2005 through June 23, 2022 and the daily closing levels of the Underlying Asset from June 24, 2022. The Underlying Asset has been calculated only since June 24, 2022. The hypothetical back-tested performance of the Underlying Asset set forth in the graph below was calculated using the selection criteria and methodology employed to calculate the Underlying Asset since its inception on June 24, 2022, provided however, that certain adjustments were made to account for measures or indices that were not previously available. Specifically, for all values prior to May 20, 2022, another index (the S&P 500 Future Excess Return Index) was substituted for the Underlying Index. The substituted index differs from the Underlying Index and the performance of the Underlying Asset may have been less favorable if the Underlying Index were reflected in the back-tested data. Additionally, for all values corresponding to the period prior to January 1, 2015 and on September 30, 2016, the Underlying Asset's weekly rebalancing was based on the closing level of the S&P 500 Future Excess Return Index on the relevant rebalancing day (rather than the time-weighted average price during the specified ten-minute window). The performance of the Underlying Asset may have been less favorable if the time-weighted average price were used.

The black vertical line shows the inception on June 24, 2022. The closing level of the SPX on April 27, 2023 was [3,072.089]. The hypothetical back-tested performance and historical levels of the Underlying Asset are provided for informational purposes only. You should not take the hypothetical back-tested levels or the historical levels of the Underlying Asset as an indication of future performance, which may be better or worse than the levels set forth below.

## Daily Closing Level of the S&P 500 Futures 35% Defined Volatility Index



The hypothetical back-tested data only reflects the application of that methodology in hindsight, since the Underlying Asset was not actually calculated and published prior to June 24, 2022. As discussed above, the hypothetical data was created subject to certain assumptions and modifications that differ from the actual Underlying Asset methodology, and which may be different from the methodology that someone else might use to back-test the Underlying Asset. If the hypothetical historical performance of the Underlying Asset were calculated based on different assumptions or if the modifications to the Underlying Asset methodology were not made, or if the historical period covered by the hypothetical historical performance was different or a longer time period, the hypothetical performance data of the Underlying Asset might look materially different. The hypothetical back-tested data cannot completely account for the impact of financial risk in actual trading and simulated data is based on criteria applied retroactively with the benefit of hindsight and knowledge of factors that may have positively affected its performance, and may reflect a bias toward strategies that have well in the past. There are numerous factors related to the equities and futures markets in general that cannot be, and have not been, accounted for in the hypothetical back-tested data, all of which can affect actual performance. Consequently, you should not rely on that data as a reflection of what the actual performance of the Underlying Asset would have been had the Underlying Asset been in existence or in forecasting future performance of the Underlying Asset. The graph above also reflects the actual Underlying Asset performance from June 24, 2022 to April 27, 2023 based on information that we obtained from Bloomberg L.P. We make no representation or warranty as to the accuracy or completeness of the information obtained from Bloomberg, L.P. Any hypothetical or actual historical upward or downward trend in the level of the Underlying Asset during any period shown is not an indication that the level of the Underlying Asset is more or less likely to increase or decrease at any time during the term of the Notes.