

ROYAL BANK OF CANADA
Form 424B2
October 31, 2018

RBC Capital Markets® Filed Pursuant to Rule 424(b)(2)
Registration Statement No. 333-227001

Pricing Supplement

Dated October 29, 2018
To the Product
Prospectus Supplement \$150,000
No. CCBN-2, Dated Contingent Coupon Barrier Notes, due
September 10, 2018, the November 2, 2023
Prospectus Supplement Royal Bank of Canada
Dated September 7, 2018,
and the Prospectus Dated
September 7, 2018

Royal Bank of Canada is offering Contingent Coupon Barrier Notes (the “Notes”). The Notes offered are senior unsecured obligations of Royal Bank of Canada, and will pay a semi-annual Contingent Coupon at the annual rate of 6.30% if the level of each of the Reference Indices is equal to or greater than its applicable Coupon Barrier. The CUSIP number for the Notes is 78013XP85.

Reference Indices	Initial Levels	Trigger Levels and Coupon Barriers*
S&P 500® Index (“SPX”)	2,641.25	1,848.88, which is 70% of the Initial Level
Russell 2000® Index (“RTY”)	1,477.306	1,034.114, which is 70% of the Initial Level

*Rounded to two decimal places in the case of the SPX and three decimal places in the case of the RTY.

At maturity, we will pay the principal amount of the Notes, unless the Final Level of any of the Reference Indices is less than its respective Trigger Level. If the Final Level of any Reference Index is less than its Trigger Level, instead of the principal amount, you will receive an amount of cash which will be less than the principal amount, based upon the percentage decrease of the Lesser Performing Reference Index. Investors could lose some or all of their investment at maturity if there has been a decline in the level of any Reference Index.

Any payments on the Notes are subject to our credit risk.

Issue Date: October 31, 2018

Maturity Date: November 2, 2023

The Notes will not be listed on any securities exchange.

Investing in the Notes involves a number of risks. See “Selected Risk Factors” beginning on page 7 of this pricing supplement, “Risk Factors” beginning on page S-1 of the prospectus supplement dated September 7, 2018, and “Risk Factors” beginning on page PS-4 of the product prospectus supplement dated September 10, 2018.

The Notes will not constitute deposits insured by the Canada Deposit Insurance Corporation, the U.S. Federal Deposit Insurance Corporation or any other Canadian or U.S. government agency or instrumentality. The Notes are not subject to conversion into our common shares under subsection 39.2(2.3) of the Canada Deposit Insurance Corporation 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.

	<u>Per Note</u>	<u>Total</u>
Price to public ⁽¹⁾	100.00%	\$150,000
Underwriting discounts and commissions ⁽¹⁾	2.75%	\$4,125

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Proceeds to Royal Bank of Canada 97.25% \$145,875

⁽¹⁾ Certain dealers who purchased the Notes for sale to certain fee-based advisory accounts may have foregone some or all of their underwriting discount or selling concessions. The public offering price for investors purchasing the Notes in these accounts was between \$972.50 and \$1,000 per \$1,000 in principal amount.

RBC Capital Markets, LLC, which we refer to as RBCCM, acting as agent for Royal Bank of Canada, received a commission of \$27.50 per \$1,000 in principal amount of the Notes and used all or a portion of that commission to allow selling concessions to other dealers of up to \$27.50 per \$1,000 in principal amount of the Notes. The other dealers may forgo, in their sole discretion, some or all of their selling concessions. See “Supplemental Plan of Distribution (Conflicts of Interest)” below.

The initial estimated value of the Notes as of the date of this pricing supplement is \$940.60 per \$1,000 in principal amount, which is less than the price to public. The actual value of the Notes at any time will reflect many factors, cannot be predicted with accuracy, and may be less than this amount. We describe our determination of the initial estimated value in more detail below.

We may use this pricing supplement in the initial sale of the Notes. In addition, RBCCM or another of our affiliates may use this pricing supplement in a market-making transaction in the Notes after their initial sale. Unless we or our agent informs the purchaser otherwise in the confirmation of sale, this pricing supplement is being used in a market-making transaction.

RBC Capital Markets, LLC

Contingent Coupon Barrier Notes
Royal Bank of Canada

SUMMARY

The information in this “Summary” section is qualified by the more detailed information set forth in this pricing supplement, the product prospectus supplement, the prospectus supplement and the prospectus. As used in this pricing supplement, the “Company,” “we,” “us,” or “our” refers to Royal Bank of Canada.

Issuer: Royal Bank of Canada (“Royal Bank”)
 Currency: U.S. Dollars
 Minimum Investment: \$1,000 and minimum denominations of \$1,000 in excess thereof
 Trade Date: October 29, 2018
 Issue Date: October 31, 2018
 CUSIP: 78013XP85
 Valuation Date: October 30, 2023
 Maturity Date: November 2, 2023

We will pay you a Contingent Coupon during the term of the Notes, periodically in arrears on each Coupon Payment Date, under the conditions described below:

If the closing level of each Reference Index is greater than or equal to its Coupon Barrier on the applicable Observation Date, we will pay the Contingent Coupon applicable to that Observation Date.

Contingent Coupon: However, if the closing level of any of the Reference Indices is less than its Coupon Barrier on the applicable Observation Date, we will not pay you the Contingent Coupon applicable to that Observation Date.

You may not receive a Contingent Coupon for one or more semi-annual periods during the term of the Notes.

Contingent Coupon Rate: 6.30% per annum, and potentially payable semi-annually.

Observation Dates: Semi-annually on April 29, 2019, October 29, 2019, April 29, 2020, October 29, 2020, April 29, 2021, October 29, 2021, April 29, 2022, October 31, 2022, April 28, 2023, and the Valuation Date, subject to postponement as described in the product prospectus supplement.

Coupon Payment Dates: The coupon, if payable, will be paid semi-annually on May 2, 2019, November 1, 2019, May 4, 2020, November 3, 2020, May 4, 2021, November 3, 2021, May 4, 2022, November 3, 2022, May 3, 2023 and November 2, 2023 (the Maturity Date), subject to postponement as described in the product prospectus supplement.

Initial Level: The closing level of the applicable Reference Index on the trade date, as specified on the cover page of this pricing supplement.

Final Level: The closing level of the applicable Reference Index on the Valuation Date.

Trigger Level

and For each Reference Index, 70.00% of its Initial Level, as specified on the cover page of this pricing
Coupon supplement.

Barrier:

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We will pay you at maturity an amount based on the Final Level of the Lesser Performing Reference Index:

- If the Final Level of the Lesser Performing Reference Index is greater than or equal to its Trigger Level, we will pay you a cash payment equal to the principal amount plus the Contingent Coupon otherwise due on the Maturity Date.
- If the Final Level of the Lesser Performing Reference Index is below its Trigger Level, you will receive at maturity, for each \$1,000 in principal amount, a cash payment equal to:
Principal Amount + (Principal Amount x Percentage Change of the Lesser Performing Reference Index)

Payment at Maturity (if held to maturity):

In this case you will lose all or a portion of the principal amount of the Notes.

Lesser Performing Reference Index: The Reference Index with the largest percentage decrease (or the smallest percentage increase, if none decreases) between its Initial Level and its Final Level.

Percentage Change: For each Reference Index, an amount, expressed as a percentage, equal to:

Call Prior to Maturity: We will not have the option to redeem the Notes prior to maturity, and the Notes are not automatically callable prior to maturity.

Calculation Agent: RBC Capital Markets, LLC (“RBCCM”)

U.S. Tax Treatment: By purchasing a Note, each holder agrees (in the absence of a change in law, an administrative determination or a judicial ruling to the contrary) to treat the Note as a pre-paid cash settled contingent income-bearing derivative contract linked to the Reference Indices for U.S. federal income tax purposes. However, the U.S. federal income tax consequences of your investment in the Notes are uncertain and the Internal Revenue Service could assert that the Notes should be taxed in a manner that is different from that described in the preceding sentence. Please see the section below, “Supplemental Discussion of U.S. Federal Income Tax Consequences” and the discussion (including the opinion of our counsel Morrison & Foerster LLP) in the product prospectus supplement under “Supplemental Discussion of U.S. Federal Income Tax Consequences,” which apply to the Notes.

Secondary Market: RBCCM (or one of its affiliates), though not obligated to do so, may maintain a secondary market in the Notes after the Issue Date. The amount that you may receive upon sale of your Notes prior to maturity may be less than the principal amount of your Notes.

Listing: The Notes will not be listed on any securities exchange.

Settlement: DTC global (including through its indirect participants Euroclear and Clearstream, Luxembourg as described under “Description of Debt Securities—Ownership and Book-Entry Issuance” in the prospectus).

Terms Incorporated in the Master Note: All of the terms appearing above the item captioned “Secondary Market” on pages P-2 and P-3 of this pricing supplement and the terms appearing under the caption “General Terms of the Notes” in the product prospectus supplement, as modified by this pricing supplement.

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ADDITIONAL TERMS OF YOUR NOTES

You should read this pricing supplement together with the prospectus dated September 7, 2018, as supplemented by the prospectus supplement dated September 7, 2018 and the product prospectus supplement dated September 10, 2018, relating to our Senior Global Medium-Term Notes, Series H, of which these Notes are a part. Capitalized terms used but not defined in this pricing supplement will have the meanings given to them in the product prospectus supplement. In the event of any conflict, this pricing supplement will control. The Notes vary from the terms described in the product prospectus supplement in several important ways. For example, the Notes are not callable prior to maturity. You should read this pricing supplement carefully.

This pricing supplement, together with the documents listed below, 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 “Risk Factors” in the prospectus supplement dated September 7, 2018 and in the product prospectus supplement dated September 10, 2018, 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. You may access these documents on the Securities and Exchange Commission (the “SEC”) website at www.sec.gov as follows (or if that address has changed, by reviewing our filings for the relevant date on the SEC website):

Prospectus dated September 7, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000121465918005973/196181424b3.htm>

Prospectus Supplement dated September 7, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000121465918005975/f97180424b3.htm>

Product Prospectus Supplement dated September 10, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000114036118038089/form424b5.htm>

Our Central Index Key, or CIK, on the SEC website is 1000275. As used in this pricing supplement, “we,” “us,” or “our” refers to Royal Bank of Canada.

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HYPOTHETICAL EXAMPLES

The table set out below is included for illustration purposes only. The table illustrates the Payment at Maturity of the Notes (excluding the final Contingent Coupon, if payable) for a hypothetical range of performance for the Lesser Performing Reference Index, assuming an Initial Level for that Reference Index of 100.00, a Trigger Level of 70.00 and an initial investment of \$1,000. The actual Initial Level and Trigger Level of each Reference Index are set forth on the cover page of this pricing supplement. Hypothetical Final Levels are shown in the first column on the left. The second column shows the Payment at Maturity for a range of Final Levels on the Valuation Date. The third column shows the amount of cash to be paid on the Notes per \$1,000 in principal amount.

We make no representation or warranty as to which of the Reference Indices will be the Lesser Performing Reference Index. It is possible that the Final Level of each Reference Index will be less than its Initial Level.

Hypothetical Final Level	Payment at Maturity as Percentage of Principal Amount	Cash Payment Amount per \$1,000 in Principal Amount
130.00	100.00%	\$1,000.00
120.00	100.00%	\$1,000.00
110.00	100.00%	\$1,000.00
100.00	100.00%	\$1,000.00
85.00	100.00%	\$1,000.00
80.00	100.00%	\$1,000.00
75.00	75.00%	\$1,000.00
70.00	70.00%	\$1,000.00
69.99	69.99%	\$699.90
60.00	60.00%	\$600.00
50.00	50.00%	\$500.00
25.00	25.00%	\$250.00\$25.
0.00	0.00%	\$0.00

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Hypothetical Examples of Amounts Payable at Maturity

The following hypothetical examples illustrate how the total returns set forth in the table above are calculated.

Example 1: The level of the Lesser Performing Reference Index increases by 25% from the Initial Level to the Final Level of 125.00. Because the Final Level of the Lesser Performing Reference Index is greater than the Trigger Level and its Coupon Barrier, the investor receives at maturity, in addition to the final Contingent Coupon otherwise due on the Notes, a cash payment of \$1,000 per Note, despite the 25% appreciation in the level of the Lesser Performing Reference Index.

Example 2: The level of the Lesser Performing Reference Index decreases by 15% from the Initial Level of 100.00 to the Final Level of 85.00. Because the Final Level of the Lesser Performing Reference Index is greater than the Trigger Level and its Coupon Barrier, the investor receives at maturity, in addition to any Contingent Coupon otherwise due on the Notes, a cash payment of \$1,000 per Note, despite the 15% decline in the level of the Lesser Performing Reference Index.

Example 3: The level of the Lesser Performing Reference Index is 50.00 on the Valuation Date, which is less than the Trigger Level and Coupon Barrier of 70.00. Because the Final Level of the Lesser Performing Reference Index is less than the Trigger Level, the final Contingent Coupon will not be payable on the Maturity Date, and we will pay only \$500.00 for each \$1,000 in the principal amount of the Notes, calculated as follows:

Principal Amount + (Principal Amount x Percentage Change of the Lesser Performing Reference Index)
= \$1,000 + (\$1,000 x -50.00%) = \$1,000 - \$500.00 = \$500.00

The Payments at Maturity shown above are entirely hypothetical; they are based on levels of the Reference Indices that may not be achieved on the Valuation Date and on assumptions that may prove to be erroneous. The actual market value of your Notes on the Maturity Date or at any other time, including any time you may wish to sell your Notes, may bear little relation to the hypothetical Payments at Maturity shown above, and those amounts should not be viewed as an indication of the financial return on an investment in the Notes or on an investment in the securities included in any Reference Index.

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SELECTED RISK FACTORS

An investment in the Notes involves significant risks. Investing in the Notes is not equivalent to investing directly in the securities included in any Reference Index. These risks are explained in more detail in the section “Risk Factors” in the product prospectus supplement. In addition to the risks described in the prospectus supplement and the product prospectus supplement, you should consider the following:

Principal at Risk — Investors in the Notes could lose some or all of their principal amount if there is a decline in the levels of any of the Reference Indices between the Trade Date and the Valuation Date. If the Final Level of the Lesser Performing Reference Index on the Valuation Date is less than the Trigger Level, the amount of cash that you receive at maturity will represent a loss of your principal that is proportionate to the decline in the closing level of the Lesser Performing Reference Index from the Trade Date to the Valuation Date. Any Contingent Coupons received on the Notes prior to the maturity date may not be sufficient to compensate for any such loss.

You May Not Receive any Contingent Coupons — We will not necessarily make any coupon payments on the Notes. If the closing level of any of the Reference Indices on an Observation Date is less than the Coupon Barrier, we will not pay you the Contingent Coupon applicable to that Observation Date. If the closing level of any of the Reference Indices is less than its Coupon Barrier on each of the Observation Dates and on the Valuation Date, we will not pay you any Contingent Coupons during the term of, and you will not receive a positive return on, your Notes. Generally, this non-payment of the Contingent Coupon coincides with a period of greater risk of principal loss on your Notes. Accordingly, if we do not pay the Contingent Coupon on the Maturity Date, you will also incur a loss of principal, because the Final Level of the Lesser Performing Reference Index will be less than the Trigger Level.

Your Payments on the Notes May Be Determined Solely by Reference to the Lesser Performing Reference Index Even if the Other Reference Index Performs Better — If the Final Level of one of the Reference Indices is less than its applicable Trigger Level, your return will be determined by reference to the performance of the Lesser Performing Reference Index. Even if the Final Level of the other Reference Index has increased compared to their Initial Levels, or have experienced a decrease that is less than that of the Lesser Performing Reference Index, your return will only be determined by reference to the performance of the Lesser Performing Reference Index, regardless of the performance of the other Reference Index.

Your Payment on the Notes Will Be Determined by Reference to Each Reference Index Individually, Not to a Basket, and the Payment at Maturity Will Be Based on the Performance of the Lesser Performing Reference Index — The Payment at Maturity will be determined only by reference to the performance of the Lesser Performing Reference Index, regardless of the performance of the other Reference Index. The Notes are not linked to a weighted basket, in which the risk may be mitigated and diversified among each of the basket components. For example, in the case of notes linked to a weighted basket, the return would depend on the weighted aggregate performance of the basket components reflected as the basket return. As a result, the depreciation of one basket component could be mitigated by the appreciation of the other basket components, as scaled by the weighting of that basket component. However, in the case of the Notes, the individual performance of each of the Reference Indices would not be combined, and the depreciation of one Reference Index would not be mitigated by any appreciation of the other Reference Index. Instead, your return will depend solely on the Final Level of the Lesser Performing Reference Index.

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The Contingent Coupon Feature Limits Your Potential Return — The return potential of the Notes is limited to the pre-specified Contingent Coupon Rate, regardless of the appreciation of the Reference Indices. The total return on the Notes will vary based on the number of Observation Dates on which the Contingent Coupon becomes payable prior to maturity. You may be subject to the full downside performance of the Reference Index even though your potential return is limited to the Contingent Coupon Rate. As a result, the return on an investment in the Notes could be less than the return on a direct investment in the securities represented by the Reference Indices.

Your Return May Be Lower than the Return on a Conventional Debt Security of Comparable Maturity — The return that you will receive on the Notes, which could be negative, may be less than the return you could earn on other investments. Even if your return is positive, your return may be less than the return you would earn if you bought one of our conventional senior interest bearing debt securities.

Payments on the Notes Are Subject to Our Credit Risk, and Changes in Our Credit Ratings Are Expected to Affect the Market Value of the Notes — The Notes are our senior unsecured debt securities. As a result, your receipt of the Contingent Coupon payments, if payable, and the amount due on the maturity date is dependent upon our ability to repay our obligations on the applicable payment dates. This will be the case even if the levels of the Reference Indices increase after the Trade Date. No assurance can be given as to what our financial condition will be at any time during the term of the Notes.

There May Not Be an Active Trading Market for the Notes—Sales in the Secondary Market May Result in Significant Losses — There may be little or no secondary market for the Notes. The Notes will not be listed on any securities exchange. RBCCM and other affiliates of ours may make a market for the Notes; however, they are not required to do so. RBCCM or any other of our affiliates may stop any market-making activities at any time. Even if a secondary market for the Notes develops, it may not provide significant liquidity or trade at prices advantageous to you. We expect that transaction costs in any secondary market would be high. As a result, the difference between bid and asked prices for your Notes in any secondary market could be substantial.

You Will Not Have Any Rights to the Constituent Stocks Included in any Reference Index — Investing in the Notes will not make you a holder of any of the constituent stocks of any of the Reference Indices. 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 the constituent stocks included in any of the Reference Indices would have. The payments on the Notes will not reflect any dividends paid on the securities included in the Reference Indices.

The Initial Estimated Value of the Notes Is Less than the Price to the Public — The initial estimated value set forth on the cover page of this pricing supplement does not represent a minimum price at which we, RBCCM or any of our affiliates would be willing to purchase the Notes in any secondary market (if any exists) at any time. If you attempt to sell the Notes prior to maturity, their market value may be lower than the price you paid for them and the initial estimated value. This is due to, among other things, changes in the levels of the Reference Indices, the borrowing rate we pay to issue securities of this kind, and the inclusion in the price to the public of the underwriting discount and the estimated costs relating to our hedging of the Notes. These factors, together with various credit, market and economic factors over the term of the Notes, are expected to reduce the price at which you may be able to sell the Notes in any secondary market and will affect the value of the Notes in complex and unpredictable ways. Assuming no change in market conditions or any other relevant factors, the price, if any, at which you may be able to sell your Notes prior to maturity may be less than your original purchase price, as any such sale price would not be expected to include the underwriting discount and the hedging costs relating to the Notes. In addition to bid-ask spreads, the value of the Notes determined for any secondary market price is

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expected to be based on the secondary rate rather than the internal funding rate used to price the Notes and determine the initial estimated value. As a result, the secondary price will be less than if the internal funding rate was used. 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 Initial Estimated Value of the Notes on the Cover Page of this Pricing Supplement Is an Estimate Only, Calculated as of the Time the Terms of the Notes Were Set – The initial estimated value of the Notes is based on the value of our obligation to make the payments on the Notes, together with the mid-market value of the derivative embedded in the terms of the Notes. See “Structuring the Notes” below. Our estimate is based on a variety of assumptions, including our credit spreads, expectations as to dividends, interest rates and volatility, and the expected term of the Notes. These assumptions are based on certain forecasts about future events, which may prove to be incorrect. Other entities may value the Notes or similar securities at a price that is significantly different than we do. The value of the Notes at any time after the Trade Date will vary based on many factors, including changes in market conditions, and cannot be predicted with accuracy. As a result, the actual value you would receive if you sold the Notes in any secondary market, if any, should be expected to differ materially from the initial estimated value of your Notes.

Inconsistent Research —We or our affiliates may issue research reports on securities that are, or may become, components of the Reference Indices. We may also publish research from time to time on financial markets and other matters that may influence the levels of the Reference Indices or the value of the Notes, or express opinions or provide recommendations that may be inconsistent with purchasing or holding the Notes or with the investment view implicit in the Notes or the Reference Indices. You should make your own independent investigation of the merits of investing in the Notes and the Reference Indices.

The RTY Consists of Stocks Issued by Companies with Relatively Small Market Capitalizations. These companies often have greater stock price volatility, lower trading volume and less liquidity than large-capitalization companies. As a result, the level of the RTY may be more volatile than that of a market measure that does not track solely small-capitalization stocks. Stock prices of small-capitalization companies are also generally more vulnerable than those of large-capitalization companies to adverse business and economic developments, and the stocks of small-capitalization companies may be thinly traded, and be less attractive to many investors if they do not pay dividends. In addition, small capitalization companies are often less well-established and less stable financially than large-capitalization companies and may depend on a small number of key personnel, making them more vulnerable to loss of those individuals. Small capitalization companies tend to have lower revenues, less diverse product lines, smaller shares of their target markets, fewer financial resources and fewer competitive strengths than large-capitalization companies. These companies may also be more susceptible to adverse developments related to their products or services.

Market Disruption Events and Adjustments – The payment dates are subject to adjustment as described in the product prospectus supplement. For a description of what constitutes a market disruption event as well as the consequences of that market disruption event, see “General Terms of the Notes—Market Disruption Events” in the product prospectus supplement.

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INFORMATION REGARDING THE REFERENCE INDICES

All disclosures contained in this pricing supplement regarding the Reference Indices, including, without limitation, their make-up, method of calculation, and changes in their components, have been derived from publicly available sources. The information reflects the policies of, and is subject to change by, the applicable index sponsor. Each of these sponsors has no obligation to continue to publish, and may discontinue publication of, the applicable Reference Index. The consequences of an index sponsor discontinuing publication of a Reference Index are discussed in the section of the product prospectus supplement entitled “General Terms of the Notes—Unavailability of the Level of a Reference Index.” Neither we nor RBCCM accepts any responsibility for the calculation, maintenance or publication of any Reference Index or any successor index.

We obtained the information regarding the historical performance of each Reference Index set forth below from Bloomberg Financial Markets.

The SPX

The SPX is intended to provide an indication of the pattern of common stock price movement. The calculation of the level of the SPX is based on the relative value of 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 calculates the SPX by reference to the prices of the constituent stocks of the SPX without taking account of the value of dividends paid on those stocks. As a result, the return on the Notes will not reflect the return you would realize if you actually owned the SPX constituent stocks and received the dividends paid on those stocks.

Effective with the September 2015 rebalance, consolidated share class lines will no longer be included in the SPX. Each share class line will be subject to public float and liquidity criteria individually, but the company’s total market capitalization will be used to evaluate each share class line. This may result in one listed share class line of a company being included in the SPX while a second listed share class line of the same company is excluded.

Computation of the SPX

While S&P currently employs the following methodology to calculate the SPX, no assurance can be given that S&P will not modify or change this methodology in a manner that may affect the Payment at Maturity.

Historically, the market value of any component stock of the SPX was calculated as the product of the market price per share and the number of then outstanding shares of such component stock. In March 2005, S&P began shifting the SPX halfway from a market capitalization weighted formula to a float-adjusted formula, before moving the SPX to full float adjustment on September 16, 2005. S&P’s criteria for selecting stocks for the SPX did not change with the shift to float adjustment. However, the adjustment affects each company’s weight in the SPX.

Under float adjustment, the share counts used in calculating the SPX reflect only those shares that are available to investors, not all of a company’s outstanding shares. Float adjustment excludes shares that are closely held by control groups, other publicly traded companies or government agencies.

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In September 2012, all shareholdings representing more than 5% of a stock's outstanding shares, other than holdings by "block owners," were removed from the float for purposes of calculating the SPX. Generally, these "control holders" will include officers and directors, private equity, venture capital and special equity firms, other publicly traded companies that hold shares for control, strategic partners, holders of restricted shares, ESOPs, employee and family trusts, foundations associated with the company, holders of unlisted share classes of stock, government entities at all levels (other than government retirement/pension funds) and any individual person who controls a 5% or greater stake in a company as reported in regulatory filings. However, holdings by block owners, such as depository banks, pension funds, mutual funds and ETF providers, 401(k) plans of the company, government retirement/pension funds, investment funds of insurance companies, asset managers and investment funds, independent foundations and savings and investment plans, will ordinarily be considered part of the float.

Treasury stock, stock options equity participation units, warrants, preferred stock, convertible stock, and rights are not part of the float. Shares held in a trust to allow investors in countries outside the country of domicile, such as depository shares and Canadian exchangeable shares are normally part of the float unless those shares form a control block.

For each stock, an investable weight factor ("IWF") is calculated by dividing the available float shares by the total shares outstanding. Available float shares are defined as the total shares outstanding less shares held by control holders. This calculation is subject to a 5% minimum threshold for control blocks. For example, if a company's officers and directors hold 3% of the company's shares, and no other control group holds 5% of the company's shares, S&P would assign that company an IWF of 1.00, as no control group meets the 5% threshold. However, if a company's officers and directors hold 3% of the company's shares and another control group holds 20% of the company's shares, S&P would assign an IWF of 0.77, reflecting the fact that 23% of the company's outstanding shares are considered to be held for control. As of July 31, 2017, companies with multiple share class lines are no longer eligible for inclusion in the Reference Index. Constituents of the Reference Index prior to July 31, 2017 with multiple share class lines will be grandfathered in and continue to be included in the Reference Index. If a constituent company of the Reference Index reorganizes into a multiple share class line structure, that company will remain in the Reference Index at the discretion of the S&P Index Committee in order to minimize turnover.