

ROYAL BANK OF CANADA  
 Form 424B2  
 December 26, 2018

Pricing Supplement (To the Prospectus, the Prospectus Supplement and the Product Prospectus Supplement, each dated September 7, 2018)	Filed Pursuant to Rule 424(b)(2) Registration No. 333-227001 December 21, 2018
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\$2,210,000  
 Capped Levered Buffered Market Plus Notes  
 Royal Bank of Canada Due June 24, 2020  
 Linked to the S&P 500® Index  
 Senior Global Medium Term Notes, Series H

**General**

The Notes are designed for investors who seek a return linked to the appreciation of the S&P 500® Index (the “Index”), subject to the Maximum Return set forth below. Investors should be willing to forgo interest and dividend payments and, if the Index declines by more than 20.00%, be willing to lose some or all of their principal.

- Senior unsecured obligations of Royal Bank of Canada maturing June 24, 2020.<sup>(a)</sup>
- Minimum denominations of \$10,000 and integral multiples of \$1,000 in excess thereof.

The Notes priced on December 21, 2018 (the “pricing date”), and are expected to be issued on December 28, 2018 (the “issue date”).

**Key Terms** Terms used in this pricing supplement, but not defined herein, will have the meanings ascribed to them in the product prospectus supplement.

**Issuer:** Royal Bank of Canada

**Reference Asset:** S&P 500® Index (Bloomberg ticker symbol “SPX”)

If the Final Level is greater than the Initial Level, you will receive a cash payment that provides you with a return equal to the Percentage Change. Accordingly, if the Percentage Change is positive, your payment per \$1,000 in principal amount of the Notes will be calculated as follows:

$$\$1,000 + [\$1,000 \times \text{Percentage Change}]$$

However, the payment on the Notes will not exceed \$1,253 for each \$1,000 in principal amount.

If the Final Level is equal to or less than the Initial Level but greater than or equal to the Buffer Level, resulting in a Percentage Change that is equal to or less than 0% but greater than or equal -20.00%, you will receive the principal amount of your Notes at maturity.

**Payment at**

**Maturity:** If the Final Level is less than the Buffer Level, you will lose 1.25% of the principal amount of your Notes for every 1% that the Final Level is less than the Buffer Level. Accordingly, if the Percentage Change is less than -20.00%, your payment per \$1,000 in principal amount of the Notes will be calculated as follows:

$$\$1,000 + [\$1,000 \times ((\text{Percentage Change} + \text{Buffer Percentage}) \times \text{Downside Multiplier})]$$

If the Final Level is less than the Buffer Level, you will lose 1.25% of the principal amount of your Notes for every 1% that the Percentage Change is less than -20%. Any payment on the Notes, including any repayment of principal, is subject to the creditworthiness of the Issuer and is not guaranteed by any third party.

**Percentage Change:** The performance of the Index from the Initial Level to the Final Level, calculated as follows:

$$\frac{\text{Final Level} - \text{Initial Level}}{\text{Initial Level}}$$

Initial Level

\$1,253 per \$1,000 in principal amount of the Notes.

Maximum

Return:

Buffer Level: 1,933.30 (which is 80% of the Initial Level, rounded to two decimal places)

Downside Multiplier: 1 divided by 0.80, which equals 1.25.

Initial Level: 2,416.62, which was the closing level of the Index on the pricing date.

Final Level: The arithmetic average of the closing levels of the Index on each of the valuation dates.

Valuation Dates: June 15, 2020, June 16, 2020, June 17, 2020, June 18, 2020 and June 19, 2020<sup>(a)</sup>

Maturity Date: June 24, 2020 <sup>(a)</sup>

Calculation Agent: RBC Capital Markets, LLC

CUSIP/ISIN: 78013XV70/US78013XV701

Estimated Value: The initial estimated value of the Notes as of the date of this document is \$995.70 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.

<sup>(a)</sup> Subject to postponement if a market disruption event occurs, as described under “General Terms of the Notes—Market Disruption Events” in the product prospectus supplement.

Investing in the Notes involves a number of risks. See “Additional Risk Factors Specific to the Notes” beginning on page PS-4 of the product prospectus supplement, “Risk Factors” beginning on page S-1 of the prospectus supplement and beginning on page 1 of the prospectus and “Selected Risk Considerations” beginning on page PS-5 of this pricing supplement.

The Notes will not be listed on any U.S. securities exchange or quotation system. Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined that this pricing supplement is truthful or complete. Any representation to the contrary is a criminal offense.

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.

	Price to Public	Underwriting Commission <sup>1</sup>	Proceeds to Royal Bank of Canada
Per Note	\$1,000	\$0	\$1,000
Total	\$2,210,000	\$0	\$2,210,000

<sup>1</sup> JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC and their affiliates will act as placement agents for the Notes and will not receive an underwriting discount in connection with this offering.

RBC Capital Markets, LLC JPMorgan Chase Bank, N.A. J.P. Morgan Securities LLC  
Placement Agents

ADDITIONAL TERMS OF THE 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 7, 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. 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 and “Additional Risk Factors Specific to the Notes” in the product prospectus 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. You may access these documents on the Securities and Exchange Commission (the “SEC”) website at [www.sec.gov](http://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 ERN-EI-1 dated September 7, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000114036118038044/form424b5.htm>

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

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## What Is the Total Return on the Notes at Maturity Assuming a Range of Performance for the Index?

The following table illustrates the hypothetical total return at maturity on the Notes. The “total return,” as used in this pricing supplement, is the number, expressed as a percentage, that results from comparing the payment at maturity per \$1,000 in principal amount of the Notes to \$1,000. The hypothetical total returns and examples set forth below assume a hypothetical Initial Level of 1,000.00, a hypothetical Buffer Level of 800.00, the Maximum Return of \$1,253.00 per \$1,000 in principal amount of the Notes, a Downside Multiplier of 1.25, and hypothetical Final Levels, as set forth below. The actual Initial Level and Buffer Level are set forth on the cover page, and the actual Final Level will be determined based on the arithmetic average of the closing levels of the Index on each of the valuation dates. The hypothetical total returns and examples set forth below are for illustrative purposes only and may not be the actual total returns applicable to a purchaser of the Notes. The numbers appearing in the following table and examples have been rounded for ease of analysis. The examples below do not take into account any tax consequences from investing in the Notes.

Final Level	Percentage Change	Payment at Maturity	Total Return on the Notes
1,400.00	40.00%	\$1,253.00	25.30%
1,300.00	30.00%	\$1,253.00	25.30%
1,253.00	25.30%	\$1,253.00	25.30%
1,250.00	25.00%	\$1,250.00	25.00%
1,200.00	20.00%	\$1,200.00	20.00%
1,150.00	15.00%	\$1,150.00	15.00%
1,100.00	10.00%	\$1,100.00	10.00%
1,080.00	8.00%	\$1,080.00	8.00%
1,050.00	5.00%	\$1,050.00	5.00%
1,025.00	2.50%	\$1,025.00	2.50%
1,000.00	0.00%	\$1,000.00	0.00%
900.00	-10.00%	\$1,000.00	0.00%
800.00	-20.00%	\$1,000.00	0.00%
750.00	-25.00%	\$937.50	-6.25%
700.00	-30.00%	\$875.00	-12.50%
600.00	-40.00%	\$750.00	-25.00%
500.00	-50.00%	\$625.00	-37.50%
400.00	-60.00%	\$500.00	-50.00%
300.00	-70.00%	\$375.00	-62.50%
200.00	-80.00%	\$250.00	-75.00%
100.00	-90.00%	\$125.00	-87.50%
0.00	-100.00%	\$0.00	-100.00%

Hypothetical Examples of Amounts Payable at Maturity

The following examples illustrate how the payments set forth in the table above are calculated.

Example 1: The level of the Index increases from an Initial Level to a Final Level of 1,100.00, resulting in a Percentage Change of 10.00%.

Because the Percentage Change is positive, the investor receives a payment at maturity of \$1,100 per \$1,000 in principal amount of the Notes, calculated as follows:

$$\$1,000 + [\$1,000 \times 10.00\%] = \$1,100$$

Example 2: The level of the Index increases from an Initial Level to a Final Level of 1,300.00, resulting in a Percentage Change of 30.00%.

In this example, the Percentage Change would result in a payment that is greater than the Maximum Return. Accordingly, the payment on the notes would be \$1,253.00 per \$1,000 in principal amount, representing the Maximum Return.

Example 3: The level of the Index decreases from an Initial Level to a Final Level of 900.00, resulting in a Percentage Change of -10.00%.

Because the Percentage Change is negative, but is greater than or equal to -20.00%, the investor will receive a payment at maturity of \$1,000 per \$1,000 in principal amount of the Notes.

Example 4: The level of the Index decreases from an Initial Level to a Final Level of 500.00, resulting in a Percentage Change of -50.00%.

Because the Percentage Change is less than -20.00%, the investor will receive a payment at maturity of \$625.00 per \$1,000 in principal amount of the Notes, calculated as follows:

$$\$1,000 + [(\$1,000 \times (-50.00\% + 20.00\%) \times 1.25)] = \$625.00$$

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### Selected Purchase Considerations

**Appreciation Potential** — The Notes provide the opportunity to receive a positive return if the Reference Asset increases, up to the Maximum Return.

**Limited Protection Against Loss** — Payment at maturity of the principal amount of the Notes is protected against a decline in the Final Level, as compared to the Initial Level, of up to 20.00%. If the Final Level is less than the Initial Level by more than 20.00%, you will lose an amount equal to 1.25% of the principal amount of your Notes for every 1% that the Percentage Change is less than -20%. Because the Notes are our senior unsecured obligations, payment of any amount at maturity is subject to our ability to pay our obligations as they become due and is not guaranteed by any third party. For a description of the risks with respect to our credit, see “Selected Risk Considerations—Credit of Issuer” in this pricing supplement.

### Selected Risk Considerations

An investment in the Notes involves significant risks. Investing in the Notes is not equivalent to investing directly in the Index. These risks are explained in more detail in the section “Additional Risk Factors Specific to the Notes,” beginning on page PS-4 of 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 all or a substantial portion of their principal amount if the level of the Index decreases by more than 20%. If the Percentage Change is less than -20%, the payment that you will receive at maturity will represent a loss of 1.25% of your principal for each 1% that the Final Level is less than the Buffer Level.

**The Notes Do Not Pay Interest and Your Return May Be Lower than the Return on a Conventional Debt Security of Comparable Maturity** — There will be no periodic interest payments on the Notes as there would be on a conventional fixed-rate or floating-rate debt security having the same 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.

**Your Potential Payment at Maturity Is Limited** - The Notes will provide less opportunity to participate in the appreciation of the Index than an investment in a security linked to the Index providing full participation in the appreciation, because the return on the Notes will not exceed the Maximum Return. Accordingly, your return on the Notes may be less than your return would be if you made an investment in a security directly linked to the positive performance of the Index.

**Credit of Issuer** — The Notes are our senior unsecured debt securities. As a result, your receipt of the amount due on the maturity date is dependent upon our ability to repay our obligations at that time. This will be the case even if the level of the Index increases after the pricing date. No assurance can be given as to what our financial condition will be at the maturity 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 our other affiliates may make a market for the Notes; however, they are not required to do so. RBCCM or any other affiliate of ours 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 Securities Included in the Index** — 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 securities included in the Index would have.

**Many Economic and Market Factors Will Impact the Value of the Notes** — In addition to the level of the Index 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:

- the expected volatility of the Index;
- the time to maturity of the Notes;
- the dividend rate on the securities included in the Index;

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- interest and yield rates in the market generally;
- a variety of economic, financial, political, regulatory or judicial events; and
- our creditworthiness, including actual or anticipated downgrades in our credit ratings.

**The Estimated Initial Value of the Notes Is Less than the Price to the Public** — The estimated initial value that is set forth in 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 estimated initial value. This is due to, among other things, changes in the level of the Index, the borrowing rate we pay to issue securities of this kind, and the inclusion in the price to the public of the 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. 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 Estimated Initial Value of the Notes Is an Estimate Only, Calculated as of the Pricing Date** — The value of the Notes at any time after the pricing 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 estimated initial value of your Notes.

**We and Our Affiliates May Have Adverse Economic Interests to the Holders of the Notes** — We, RBCCM and our other respective affiliates trade the securities represented by the Index, and other financial instruments related to the Index, on a regular basis, for their accounts and for other accounts under our or their management. We, RBCCM and our other affiliates may also issue or underwrite or assist unaffiliated entities in the issuance or underwriting of other securities or financial instruments that relate to the Index. To the extent that we or any of our affiliates serves as issuer, agent or underwriter for such securities or financial instruments, our or their interests with respect to such products may be adverse to those of the holders of the Notes. Any of these trading activities could potentially affect the performance of the Index and, accordingly, could affect the value of the Notes, and the amounts, if any, payable on the Notes.

We or our affiliates may currently or from time to time engage in business with the issuers of the securities represented by the Index, including extending loans to, or making equity investments in, or providing advisory services to them, including merger and acquisition advisory services. In the course of this business, we or our affiliates may acquire non-public information about these companies, and we will not disclose any such information to you. None of us or our affiliates makes any representation or warranty to any purchaser of the Notes with respect to any matters whatsoever relating to our business with the issuer of any security included in the Index or future price movements of any such security.

Additionally, we or our affiliates may serve as issuer, agent or underwriter for additional issuances of securities with returns linked or related to changes in the level the Index. By introducing competing products into the marketplace in this manner, we could adversely affect the value of the Notes.

We may hedge our obligations under the Notes through certain affiliates, who would expect to make a profit on such hedge. We or our affiliates may adjust these hedges by, among other things, purchasing or selling those assets at any time, including around the time of the valuation dates, which could have an impact on the return of the Notes. Because hedging our obligations entails risk and may be influenced by market forces beyond our or our affiliates' control, such hedging may result in a profit that is more or less than expected, or it may result in a loss.

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

**Market Disruption Events or Unavailability of the Level of the Index and Adjustments** — The payment at maturity, the valuation dates and the Reference Asset are subject to adjustment as described in the product

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prospectus supplement. For a description of what constitutes a market disruption event as well as the consequences of that market disruption event and the unavailability of the level of the Index on the valuation dates, see “General Terms of the Notes—Unavailability of the Level of the Reference Asset” and “—Market Disruption Events” in the product prospectus supplement.

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Historical Information

The following graph sets forth the historical performance of the Index from January 1, 2012 to December 21, 2018. We obtained the Index closing levels below from Bloomberg L.P. We have not independently verified the accuracy or completeness of the information obtained from Bloomberg L.P. The historical levels of the Index should not be taken as an indication of future performance, and no assurance can be given as to the closing level of the Index on the valuation dates. We cannot give you assurance that the performance of the Index will result in the return of any of your initial investment.

PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

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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 Dow Jones Indices LLC (“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.

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 SPX. Constituents of the SPX prior to July 31, 2017 with multiple share class lines will be

grandfathered in and continue to be included in the SPX. If a constituent company of the SPX reorganizes into a multiple share class line structure, that company will remain in the SPX at the discretion of the S&P Index Committee in order to minimize turnover.

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The SPX is calculated using a base-weighted aggregate methodology. The level of the SPX reflects the total market value of all 500 component stocks relative to the base period of the years 1941 through 1943. An indexed number is used to represent the results of this calculation in order to make the level easier to use and track over time. The actual total market value of the component stocks during the base period of the years 1941 through 1943 has been set to an indexed level of 10. This is often indicated by the notation 1941-43 = 10. In practice, the daily calculation of the SPX is computed by dividing the total market value of the component stocks by the “index divisor.” By itself, the index divisor is an arbitrary number. However, in the context of the calculation of the SPX, it serves as a link to the original base period level of the SPX. The index divisor keeps the SPX comparable over time and is the manipulation point for all adjustments to the SPX, which is index maintenance.

#### Index Maintenance

Index maintenance includes monitoring and completing the adjustments for company additions and deletions, share changes, stock splits, stock dividends, and stock price adjustments due to company restructuring or spinoffs. Some corporate actions, such as stock splits and stock dividends, require changes in the common shares outstanding and the stock prices of the companies in the SPX, and do not require index divisor adjustments.

To prevent the level of the SPX from changing due to corporate actions, corporate actions which affect the total market value of the SPX require an index divisor adjustment. By adjusting the index divisor for the change in market value, the level of the SPX remains constant and does not reflect the corporate actions of individual companies in the SPX. Index divisor adjustments are made after the close of trading and after the calculation of the SPX closing level.

Changes in a company’s total shares outstanding of 5% or more due to public offerings are made as soon as reasonably possible. Other changes of 5% or more (for example, due to tender offers, Dutch auctions, voluntary exchange offers, company stock repurchases, private placements, acquisitions of private companies or non-index companies that do not trade on a major exchange, redemptions, exercise of options, warrants, conversion of preferred stock, notes, debt, equity participations, at-the-market stock offerings or other recapitalizations) are made weekly, and are generally announced on Fridays for implementation after the close of trading the following Friday (one week later). If a 5% or more share change causes a company’s IWF to change by five percentage points or more, the IWF is updated at the same time as the share change. IWF changes resulting from partial tender offers are considered on a case-by-case basis.

#### License Agreement

S&P® is a registered trademark of Standard & Poor’s Financial Services LLC and Dow Jones® is a registered trademark of Dow Jones Trademark Holdings LLC (“Dow Jones”). These trademarks have been licensed for use by S&P. “Standard & Poor’s”, “S&P 500” and “S&P” are trademarks of Standard & Poor’s Financial Services LLC. These trademarks have been sublicensed for certain purposes by us. The SPX is a product of S&P and/or its affiliates and has been licensed for use by us.

The Notes are not sponsored, endorsed, sold or promoted by S&P Dow Jones Indices LLC, Standard & Poor’s Financial Services LLC or any of their respective affiliates (collectively, “S&P Dow Jones Indices”). S&P Dow Jones Indices make no representation or warranty, express or implied, to the holders 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 SPX to track general market performance. S&P Dow Jones Indices’ only relationship to us with respect to the SPX is the licensing of the SPX and certain trademarks, service marks and/or trade names of S&P Dow Jones Indices and/or its third party licensors. The SPX is determined, composed and calculated by S&P Dow Jones Indices without regard to us or the Notes. S&P Dow Jones Indices have no obligation to take our needs or the needs of holders of the Notes into consideration in determining, composing or calculating the SPX. S&P Dow Jones Indices are not responsible for and have not participated in the determination of the prices, and amount of the Notes or the timing of the issuance or sale of the Notes or in the determination or calculation of the equation by which the Notes are to be converted into

cash. S&P Dow Jones Indices have no obligation or liability in connection with the administration, marketing or trading of the Notes. There is no assurance that investment products based on the SPX will accurately track index performance or provide positive investment returns. S&P Dow Jones Indices LLC and its subsidiaries are not investment advisors. Inclusion of a security or futures contract within an index is not a recommendation by S&P Dow Jones Indices to buy, sell, or hold such security or futures contract, nor is it considered to be investment advice. Notwithstanding the foregoing, CME Group Inc. and its affiliates may

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independently issue and/or sponsor financial products unrelated to the Notes currently being issued by us, but which may be similar to and competitive with the Notes. In addition, CME Group Inc. and its affiliates may trade financial products which are linked to the performance of the SPX. It is possible that this trading activity will affect the value of the Notes.

S&P DOW JONES INDICES DO NOT GUARANTEE THE ADEQUACY, ACCURACY, TIMELINESS AND/OR THE COMPLETENESS OF THE SPX OR ANY DATA RELATED THERETO OR ANY COMMUNICATION, INCLUDING BUT NOT LIMITED TO, ORAL OR WRITTEN COMMUNICATION (INCLUDING ELECTRONIC COMMUNICATIONS) WITH RESPECT THERETO. S&P DOW JONES INDICES SHALL NOT BE SUBJECT TO ANY DAMAGES OR LIABILITY FOR ANY ERRORS, OMISSIONS, OR DELAYS THEREIN. S&P DOW JONES INDICES MAKE NO EXPRESS OR IMPLIED WARRANTIES, AND EXPRESSLY DISCLAIMS ALL WARRANTIES, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE OR AS TO RESULTS TO BE OBTAINED BY US, HOLDERS OF THE NOTES, OR ANY OTHER PERSON OR ENTITY FROM THE USE OF THE SPX OR WITH RESPECT TO ANY DATA RELATED THERETO. WITHOUT LIMITING ANY OF THE FOREGOING, IN NO EVENT WHATSOEVER SHALL S&P DOW JONES INDICES BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES INCLUDING BUT NOT LIMITED TO, LOSS OF PROFITS, TRADING LOSSES, LOST TIME OR GOODWILL, EVEN IF THEY HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, WHETHER IN CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE. THERE ARE NO THIRD PARTY BENEFICIARIES OF ANY AGREEMENTS OR ARRANGEMENTS BETWEEN S&P DOW JONES INDICES AND US, OTHER THAN THE LICENSORS OF S&P DOW JONES INDICES.

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### Supplemental Plan of Distribution

JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC and its affiliates will act as placement agents for the Notes. We expect that delivery of the Notes will be made against payment for the Notes on December 28, 2018, which is more than two business days following the pricing date. Under Rule 15c6-1 of the Securities Exchange Act of 1934, trades in the secondary market generally are required to settle in two business days, unless the parties to any such trade expressly agree otherwise. Accordingly, purchasers who wish to trade the Notes on any date prior to two business days before delivery will be required to specify alternative settlement arrangements to prevent a failed settlement.

In addition, RBCCM or another of its affiliates or agents may use this document in market-making transactions after the initial sale of the Notes, but is under no obligation to do so and may discontinue any market-making activities at any time without notice.

The value of the Notes shown on your account statement will be based on RBCCM's estimate of the value of the Notes if RBCCM or another of our affiliates were to make a market in the Notes (which it is not obligated to do). That estimate will be based upon the price that RBCCM may pay for the Notes in light of then prevailing market conditions, our creditworthiness and transaction costs. For a period of approximately six (6) months after the issue date of the Notes, the price shown on your account statement may initially be higher than RBCCM's estimated value of the Notes. This is because the estimated value of the Notes reflects the reduction of our hedging costs and profits; however, the value of the Notes shown on your account statement during that period is expected to be a higher amount, reflecting the amortization of our estimated profit from hedging the Notes. After this period, if RBCCM repurchases your Notes, it expects to do so at prices that reflect its estimated value.

The Notes are our debt securities, the return on which is linked to the performance of the Index. As is the case for all of our debt securities, including our structured notes, the economic terms of the Notes reflect our actual or perceived creditworthiness at the time of pricing. In addition, because structured notes result in increased operational, funding and liability management costs to us, we typically borrow the funds under these Notes at a rate that is more favorable to us than the rate that we might pay for a conventional fixed or floating rate debt security of comparable maturity. This relatively lower implied borrowing rate, which is reflected in the economic terms of the Notes, along with the fees and expenses associated with structured notes, reduced the estimated initial value of the Notes at the time the terms of the Notes were set.

In order to satisfy our payment obligations under the Notes, we may choose to enter into certain hedging arrangements (which may include call options, put options or other derivatives) on the issue date with RBCCM or one of our other subsidiaries. The terms of these hedging arrangements take into account a number of factors, including our creditworthiness, interest rate movements, the volatility of the Index, and the tenor of the Notes. The economic terms of the Notes depend in part on the terms of these hedging arrangements.

The lower implied borrowing rate and the hedging-related costs relating to the Notes reduced the economic terms of the Notes to you and resulted in the estimated initial value for the Notes being less than their public offering price. See "Selected Risk Considerations—The Estimated Initial Value of the Notes Is Less than the Price to the Public" above.

### U.S. Federal Tax Consequences

The following disclosure supplements, and to the extent inconsistent supersedes, the discussion in the product prospectus supplement under “Supplemental Discussion of U.S. Federal Income Tax Consequences.”

In the opinion of our counsel, Morrison & Foerster LLP, it would generally be reasonable to treat a Note with terms described herein as a pre-paid cash-settled derivative contract in respect of the Reference Asset for U.S. federal income tax purposes, and the terms of the Notes require a holder and us (in the absence of a change in law or an administrative or judicial ruling to the contrary) to treat the Notes for all tax purposes in accordance with such characterization. However, the U.S. federal income tax consequences of your investment in the Notes are uncertain and the IRS could assert that the Notes should be taxed in a manner that is different from that described in the preceding sentence.

Under Section 871(m) of the Code, a “dividend equivalent” payment is treated as a dividend from sources within the United States. Such payments generally would be subject to a 30% U.S. withholding tax if paid to a non-U.S. holder. Under U.S. Treasury Department regulations, payments (including deemed payments) with respect to equity-linked instruments (“ELIs”) that are “specified ELIs” may be treated as dividend equivalents if such specified ELIs reference an interest in an “underlying security,” which is generally any interest in an entity taxable as a corporation for U.S. federal income tax purposes if a payment with respect to such interest could give rise to a U.S. source dividend. However, the IRS has issued guidance that states that the U.S. Treasury Department and the IRS intend to amend the effective dates of the U.S. Treasury Department regulations to provide that withholding on dividend equivalent payments will not apply to specified ELIs that are not delta-one instruments and that are issued before January 1, 2021. Based on our determination that the Notes are not delta-one instruments, non-U.S. holders should not be subject to withholding on dividend equivalent payments, if any, under the Notes. However, it is possible that the Notes could be treated as deemed reissued for U.S. federal income tax purposes upon the occurrence of certain events affecting the Reference Asset or the Notes (for example, upon the Reference Asset rebalancing), and following such occurrence the Notes could be treated as subject to withholding on dividend equivalent payments. Non-U.S. holders that enter, or have entered, into other transactions in respect of the Reference Asset or the Notes should consult their tax advisors as to the application of the dividend equivalent withholding tax in the context of the Notes and their other transactions. If any payments are treated as dividend equivalents subject to withholding, we (or the applicable withholding agent) would be entitled to withhold taxes without being required to pay any additional amounts with respect to amounts so withheld.

The accompanying product prospectus supplement notes that FATCA withholding on payments of gross proceeds from a sale or redemption of Notes will only apply to payments made after December 31, 2018. That discussion is modified to reflect regulations proposed by the U.S. Treasury Department in December 2018 indicating an intent to eliminate the requirement under FATCA of withholding on gross proceeds of the disposition of financial instruments. The U.S. Treasury Department has indicated that taxpayers may rely on these proposed regulations pending their finalization. Prospective investors are urged to consult with their own tax advisors regarding the possible implications of FATCA on their investment in the Notes.

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Terms Incorporated in the Master Note

All of the terms appearing in the section “Key Terms” (except the item captioned “Estimated Value”) and “U.S. Federal Tax Consequences” in this pricing supplement, and the applicable terms included in the product prospectus supplement, the Series H MTN prospectus supplement and the prospectus are incorporated into the master global note that represents the Notes and is held by the Depository Trust Company.

Validity of the Notes

In the opinion of Norton Rose Fulbright Canada LLP, the issue and sale of the Notes has been duly authorized by all necessary corporate action of the Bank in conformity with the Indenture, and when the Notes have been duly executed, authenticated and issued in accordance with the Indenture and delivered against payment therefor, the Notes will be validly issued and, to the extent validity of the Notes is a matter governed by the laws of the Province of Ontario or Québec, or the laws of Canada applicable therein, and will be valid obligations of the Bank, subject to equitable remedies which may only be granted at the discretion of a court of competent authority, subject to applicable bankruptcy, to rights to indemnity and contribution under the Notes or the Indenture which may be limited by applicable law; to insolvency and other laws of general application affecting creditors’ rights, to limitations under applicable limitations statutes, and to limitations as to the currency in which judgments in Canada may be rendered, as prescribed by the Currency Act (Canada). This opinion is given as of the date hereof and is limited to the laws of the Provinces of Ontario and Québec and the federal laws of Canada applicable thereto. In addition, this opinion is subject to customary assumptions about the Trustee’s authorization, execution and delivery of the Indenture and the genuineness of signatures and certain factual matters, all as stated in the letter of such counsel dated September 7, 2018, which has been filed as Exhibit 5.1 to Royal Bank’s Form 6-K filed with the SEC dated September 7, 2018. In the opinion of Morrison & Foerster LLP, when the Notes have been duly completed in accordance with the Indenture and issued and sold as contemplated by the prospectus supplement and the prospectus, the Notes will be valid, binding and enforceable obligations of Royal Bank, entitled to the benefits of the Indenture, subject to applicable bankruptcy, insolvency and similar laws affecting creditors’ rights generally, concepts of reasonableness and equitable principles of general applicability (including, without limitation, concepts of good faith, fair dealing and the lack of bad faith). This opinion is given as of the date hereof and is limited to the laws of the State of New York. This opinion is subject to customary assumptions about the Trustee’s authorization, execution and delivery of the Indenture and the genuineness of signatures and to such counsel’s reliance on the Bank and other sources as to certain factual matters, all as stated in the legal opinion dated September 7, 2018, which has been filed as Exhibit 5.2 to the Bank’s Form 6-K dated September 7, 2018.