

ROYAL BANK OF CANADA  
 Form 424B2  
 August 30, 2018

RBC Capital Markets® Filed Pursuant to Rule 424(b)(2)  
 Registration Statement No. 333-208507

Pricing Supplement

Dated August 29, 2018

To the Product

\$815,000

Prospectus Supplement

Auto-Callable Notes

No. ERN-EI-1, Dated

Linked to the S&P 500® Index,

January 12, 2016, the

due Septemeber 2, 2021

Prospectus Supplement

Royal Bank of Canada

Dated January 8, 2016,

and the Prospectus Dated

January 8, 2016

Royal Bank of Canada is offering Auto-Callable Notes (the “Notes”) linked to the S&P 500 Index (the “Reference Asset”). The Notes are senior unsecured obligations of Royal Bank of Canada, and will have the terms described in the documents described above, as supplemented or modified by this pricing supplement. We will not make any payments on the Notes until the maturity date or a prior automatic call.

The Notes will be automatically called at the applicable Call Amount if the closing level of the Reference Asset is greater than or equal to the Initial Level on any annual Observation Date on or after August 29, 2019. The Call Amounts are based on a rate of return of 6.55% per annum, and will increase on each annual Observation Date to reflect that rate of return. However, if the Notes are called on the final Observation Date, you will receive a return that is the greater of the return represented by that rate of return (19.65%) or the Percentage Change. If the Notes are not called, you may lose all or a substantial portion of your principal amount.

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

Investing in the Notes involves a number of risks. See “Additional Risk Factors Specific to the Notes” beginning on page PS-5 of the product prospectus supplement dated January 12, 2016, “Risk Factors” beginning on page S-1 of the prospectus supplement dated January 8, 2016, and “Selected Risk Considerations” beginning on page P-7 of this pricing supplement.

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.

Neither the Securities and Exchange Commission 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.

Issuer:	Royal Bank of Canada Stock Exchange Listing: None		
Pricing Date:	August 29, 2018	Principal Amount:	\$1,000 per Note
Issue Date:	August 31, 2018	Maturity Date:	September 2, 2021
Valuation Date:	August 30, 2021 (which is the final Observation Date)		
Initial Level:	2,914.04, which was the closing level of the Reference Asset on the Pricing Date.		
Final Level:	The closing level of the Reference Asset on the Valuation Date.		
Call Feature:	If the closing level of the Reference Asset is greater than or equal to the Initial Level starting on August 29, 2019 or on any Observation Date thereafter, the Notes will be called and we will pay the applicable Call Amount on the corresponding Call Settlement Date.		

Observation Dates and Call Settlement Dates: Annually, beginning on August 29, 2019, as set forth below.  
 If the Notes are not called on any Observation Date (including the Valuation Date), we will pay you at maturity an amount based on the Final Level:  
 Payment at Maturity (if held to maturity): If the Final Level is less than the Initial Level, then the investor will receive at maturity, for each \$1,000 in principal amount, a cash payment equal to:  
 $\$1,000 + (\$1,000 \times \text{Percentage Change})$   
 Investors could lose some or all of their initial investment if the level of the Reference Asset declines.  
 CUSIP: 78013XB49

	Per Note	Total
Price to public <sup>(1)</sup>	100.00%	\$815,000.00
Underwriting discounts and commissions <sup>(1)</sup>	2.25%	\$18,337.50
Proceeds to Royal Bank of Canada	97.75%	\$796,662.50

<sup>(1)</sup> Certain dealers who purchased the Notes for sale to certain fee-based advisory accounts 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 \$977.50 and \$1,000 per \$1,000 in principal amount.

The initial estimated value of the Notes as of the date of this pricing supplement is \$969.67 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.

RBC Capital Markets, LLC, (“RBCCM”), acting as our agent, received a commission of \$22.50 per \$1,000 in principal amount of the Notes and used a portion of that commission to allow selling concessions to other dealers of up to \$22.50 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.

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**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.

**General:** This pricing supplement relates to an offering of Auto-Callable Notes (the “Notes”) linked to the Reference Asset.

**Issuer:** Royal Bank of Canada (“Royal Bank”)

**Issue:** Senior Global Medium-Term Notes, Series G

**Pricing Date:** August 29, 2018

**Issue Date:** August 31, 2018

**Denominations:** Minimum denomination of \$1,000, and integral multiples of \$1,000 thereafter.

**Designated Currency:** U.S. Dollars

**Call Feature:** If, starting on August 29, 2019 or any Observation Date thereafter, the closing level of the Reference Asset is greater than or equal to the Initial Level, then the Notes will be automatically called and the applicable Call Amount will be paid on the corresponding Call Settlement Date.

Observation Dates/Call Settlement Dates/Call Amounts:	Observation Date	Call Settlement Date	Call Amounts
	August 29, 2019	September 4, 2019	\$1,065.50
	August 31, 2020	September 3, 2020	\$1,131.00
	August 30, 2021 (the “Valuation Date”)	September 2, 2021 (the “Maturity Date”)	The greater of (a) \$1,196.50 or (b) \$1,000 + (\$1,000 x Percentage Change)

The Call Amounts correspond to a return of (a) 6.55% per annum (the “Annual Call Return Rate”) on the Notes, if they are called on one of the first two Observation Dates, and (b) the greater of the Annual Call Return Rate or the Percentage Change if called on the final Observation Date. Accordingly, you will not receive any return on the Notes that exceeds the amount represented by the Annual Call Return Rate if the Notes are called on the first or second Observation Date, even if the level of the Reference Asset increases substantially.

**Valuation Date:** August 30, 2021

**Maturity Date:** September 2, 2021

**Initial Level:** 2,914.04, which was the closing level of the Reference Asset on the Pricing Date.

**Final Level:** The closing level of the Reference Asset on the Valuation Date.

**Payment at Maturity (if not previously called)** If the Notes are not called on any Observation Date (including the Valuation Date), we will pay you at maturity an amount based on the Final Level:

- If the Final Level is below the Initial Level, you will receive at maturity, for each \$1,000 in principal amount, a cash payment equal to: \$1,000 + (\$1,000 x Percentage Change)

and held to maturity): The amount of cash that you receive will be less than your principal amount, if anything, resulting in a loss that is proportionate to the decline from the Pricing Date to the Valuation Date. Investors in the Notes could lose some or all of their investment if the level of the Reference Asset declines.

Percentage Change:  $\frac{\text{Final Level} - \text{Initial Level}}{\text{Initial Level}}$

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Market Disruption Events:	The occurrence of a market disruption event (or a non-trading day) as to the Reference Asset will result in the postponement of an Observation Date or the Valuation Date, as described in the product prospectus supplement.
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 callable pre-paid cash-settled derivative contract linked to the Reference Asset 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 dated January 12, 2016 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.
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 dated January 8, 2016).
Terms Incorporated in the Master Note:	All of the terms appearing above the item captioned “Secondary Market” on the cover page and 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 dated January 12, 2016, as modified by this pricing supplement. In addition to those terms, the following two sentences are also incorporated into the master note: RBC confirms that it fully understands and is able to calculate the effective annual rate of interest applicable to the Notes based on the methodology for calculating per annum rates provided for in the Notes. RBC irrevocably agrees not to plead or assert Section 4 of the Interest Act (Canada), whether by way of defense or otherwise, in any proceeding relating to the Notes.

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#### ADDITIONAL TERMS OF YOUR NOTES

You should read this pricing supplement together with the prospectus dated January 8, 2016, as supplemented by the prospectus supplement dated January 8, 2016 and the product prospectus supplement dated January 12, 2016, relating to our Senior Global Medium-Term Notes, Series G, 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. 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 January 8, 2016 and “Additional Risk Factors Specific to the Notes” in the product prospectus supplement dated January 12, 2016, 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 January 8, 2016:

<http://www.sec.gov/Archives/edgar/data/1000275/000121465916008810/j18160424b3.htm>

Prospectus Supplement dated January 8, 2016:

<http://www.sec.gov/Archives/edgar/data/1000275/000121465916008811/p14150424b3.htm>

Product Prospectus Supplement dated January 12, 2016:

<https://www.sec.gov/Archives/edgar/data/1000275/000114036116047560/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 payments upon an automatic call and the Payment at Maturity of the Notes for a hypothetical range of performance for the Reference Asset, assuming the following terms:

Hypothetical Initial Level (for each Reference Asset):	1,000.00*
Principal Amount:	\$1,000 per Note
Annual Call Return Rate:	6.55%
Call Amounts:	\$1,065.50 if called on the first Observation Date \$1,131.00 if called on the second Observation Date \$1,196.50 (or the return represented by the Percentage Change, if higher) if called on the third Observation Date

\* The hypothetical Initial Level of 1,000.00 used in the examples below has been chosen for illustrative purposes only, and does not represent the actual Initial Level.

In this case, if the Percentage Change on the Valuation Date is between 0% and 19.65%, the Call Amount payable on the maturity date will be \$1,196.50. However, if the Percentage Change on the Valuation Date is greater than 19.65% (the Annual Call Return Rate multiplied by 3), you will receive a return based on the Percentage Change, and that payment will exceed \$1,196.50.

#### Summary of Hypothetical Examples

	Notes Are Called on an Observation Date				Notes Are Not Called on Any Observation Date
	Example 1	Example 2	Example 3	Example 4	
Initial Level	1,000	1,000	1,000	1,000	1,000
Closing Level on the First Observation Date	1,250	900	900	900	980
Closing Level on the Second Observation Date	N/A	1,100	850	850	780
Closing Level on the Final Observation Date	N/A	N/A	1,100	1,250	600
Percentage Change of the Reference Asset	N/A	N/A	10%	25%	-40%
Call Amount	\$1,065.50	\$1,131.00	\$1,196.50 (paid on the maturity date)	\$1,250 (paid on the maturity date)	N/A
	N/A	N/A	N/A	N/A	\$600

Payment Maturity  
(if  
not previously  
called)

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**Hypothetical Examples of Amounts Payable Upon an Automatic Call**

The following hypothetical examples illustrate payments of the Call Amounts set forth in the table in the “Summary” section above.

Example 1: The level of the Reference Asset increases by 25% from the Initial Level to a closing level of 1,250 on the first Observation Date. Because the closing level of the Reference Asset on the first Observation Date is greater than its Initial Level, the investor receives on the applicable Call Settlement Date a cash payment of \$1,065.50, representing the corresponding hypothetical Call Amount. After the Notes are called, they will no longer remain outstanding and there will be no further payments on the Notes.

Example 2: The level of the Reference Asset decreases by 10% from the Initial Level to its closing level on the first Observation Date of 900, but the level of the Reference Asset increases by 10% from the Initial Level to a closing level of 1,100 on the second Observation Date. Because the Notes are not called on the first Observation Date and the closing level of the Reference Asset on the second Observation Date is greater than its Initial Level, the investor receives on the applicable Call Settlement Date a cash payment of \$1,131, representing the corresponding hypothetical Call Amount. After the Notes are called, they will no longer remain outstanding and there will be no further payments on the Notes.

Example 3: The Notes are not called on the first two Observation Dates and the Final Level is 1,100 on the Valuation Date, which is greater than its Initial Level; however the Percentage Change does not exceed 19.65% (the hypothetical Annual Call Return Rate multiplied by 3). Because the Notes are not called on the first two Observation Dates and the closing level of the Reference Asset on the Valuation Date is greater than its Initial Level, the investor receives on the Maturity Date a cash payment of \$1,196.50, representing the corresponding hypothetical Call Amount.

Example 4: The Notes are not called on the first two Observation Dates and the Final Level is 1,250 on the Valuation Date, which is greater than its Initial Level, and the Percentage Change exceeds 19.65%. Because the Notes are not called on the first two Observation Dates and the closing level of the Reference Asset on the Valuation Date is greater than its Initial Level, and the Percentage Change exceeds 19.65%, the investor receives on the Maturity Date a cash payment of \$1,250, representing the corresponding hypothetical Call Amount. In this case, the return on the Notes is greater than the call return rate set forth on the cover page.

**Hypothetical Example of Amounts Payable at Maturity**

The following hypothetical example illustrates how the payments at maturity set forth in the table above are calculated, assuming the Notes have not been called on any Observation Date.

The level of the Reference Asset is 600 on the Valuation Date, which is less than the Initial Level. The Notes are not called on any Observation Date because its closing level is below its Initial Level on each Observation Date (including the Valuation Date). Because the Final Level is less than its Initial Level, we will pay only \$600 for each \$1,000 in the principal amount of the Notes, calculated as follows:

$$\text{Principal Amount} + (\text{Principal Amount} \times \text{Percentage Change}) \\ = \$1,000 + (\$1,000 \times -40\%) = \$1,000 - \$400 = \$600$$

\* \* \*

The potential payments shown above are entirely hypothetical; they are based on levels of the Reference Asset that may not be achieved 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

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hypothetical payments at maturity shown above, and those amounts should not be viewed as an indication of the return on an investment in the Notes or on an investment in the securities included in the Reference Asset.

#### SELECTED RISK CONSIDERATIONS

An investment in the Notes involves significant risks. Investing in the Notes is not equivalent to investing directly in the Reference Asset. These risks are explained in more detail in the section “Additional Risk Factors Specific to the Notes” 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 all or a substantial portion of their principal amount if there is a decline in the closing level of the Reference Asset between the Pricing Date and the Valuation Date. If the Notes are not automatically called and the Final Level is less than the Initial 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 Reference Asset from the Pricing Date to the Valuation Date. You could lose all or a substantial portion of the principal amount.

**The Notes Are Subject to an Automatic Call** — If, starting on August 29, 2019 and on any Observation Date thereafter, the closing level of the Reference Asset is greater than or equal to its Initial Level, then the Notes will be automatically called. If the Notes are automatically called, then, on the applicable Call Settlement Date, for each \$1,000 in principal amount, you will receive the applicable Call Amount on the corresponding Call Settlement Date. You will not receive any payments after the Call Settlement Date and you will not receive any return on the Notes that exceeds the applicable Call Amount set forth above as to the first or second Observation Date, even if the level of the Reference Asset increases substantially. You may be unable to reinvest your proceeds from the automatic call in an investment with a return that is as high as the return on the Notes.

**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. Your return may be less than the return you would earn if you bought a conventional senior interest bearing debt security of Royal Bank.

**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 Royal Bank’s senior unsecured debt securities. As a result, your receipt of any Call Amounts, if payable, and the amount due on the maturity date is dependent upon Royal Bank’s ability to repay its obligations on the applicable payment date. This will be the case even if the level of the Reference Asset increases after the Pricing 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 Royal Bank may make a market for the Notes; however, they are not required to do so. RBCCM or any other affiliate of Royal Bank 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.

**Owning the Notes Is Not the Same as Owning the Securities Represented by the Reference Asset** — The return on your Notes is unlikely to reflect the return you would realize if you actually owned the securities represented by the Reference Asset. For instance, you will not receive or be entitled to receive any dividend



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payments or other distributions on those securities during the term of your Notes. As an owner of the Notes, you will not have voting rights or any other rights that holders of the Reference Asset may have. Furthermore, the Reference Asset may appreciate substantially during the term of the Notes, while your potential return as to the first or second Observation Date will be limited to the applicable Call Amounts.

Your Notes could be called on the final Observation Date, in which case your return on the Notes could exceed the Annual Call Return Rate. However, you would only receive the benefit on such a higher return if the level of the Reference Asset increases by more than 19.65% (which represents the Annual Call Return Rate multiplied by 3) between the second and third Observation Dates; this is due to the fact that the closing level of the Reference Asset on the second Observation Date will be less than its Initial Level on the second Observation Date if the Notes are not called on that date.

**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 Asset, 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 by RBCCM for any secondary market price is 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 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 initial estimated value of your Notes.

**Inconsistent Research** — Royal Bank or its affiliates may issue research reports on securities that are, or may become, components of the Reference Asset. We may also publish research from time to time on financial markets and other matters that may influence the levels of the Reference Asset or the value of the Notes, or express opinions or provide recommendations that may be inconsistent with purchasing or holding the Notes or

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with the investment view implicit in the Notes or the Reference Asset. You should make your own independent investigation of the merits of investing in the Notes and the Reference Asset.

Market Disruption Events and Adjustments — The payment at maturity, each Observation Date and the Valuation Date 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 ASSET

All disclosures contained in this pricing supplement regarding the Reference Asset, including, without limitation, its make up, method of calculation, and changes in its components, have been derived from publicly available sources. The information reflects the policies of, and is subject to change by, S&P Dow Jones Indices LLC (“S&P”). S&P, which owns the copyright and all other rights to the Reference Asset, has no obligation to continue to publish, and may discontinue publication of, the Reference Asset. The consequences of S&P discontinuing publication of the Reference Asset are discussed in the section of the product prospectus supplement entitled “General Terms of the Notes—Unavailability of the Level of the Reference Asset.” Neither we nor RBCCM accepts any responsibility for the calculation, maintenance or publication of the Reference Asset or any successor index.

The Reference Asset is intended to provide an indication of the pattern of common stock price movement. The calculation of the level of the Reference Asset 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 Reference Asset by reference to the prices of the constituent stocks of the Reference Asset 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 Reference Asset 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 Reference Asset. 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 Reference Asset while a second listed share class line of the same company is excluded.

#### Computation of the Reference Asset

While S&P currently employs the following methodology to calculate the Reference Asset, 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 Reference Asset 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 Reference Asset halfway from a market capitalization weighted formula to a float-adjusted formula, before moving the Reference Asset to full float adjustment on September 16, 2005. S&P’s criteria for selecting stocks for the Reference Asset did not change with the shift to float adjustment. However, the adjustment affects each company’s weight in the Reference Asset.

Under float adjustment, the share counts used in calculating the Reference Asset 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 Reference Asset. 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 depositary 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

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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 Asset. Constituents of the Reference Asset prior to July 31, 2017 with multiple share class lines will be grandfathered in and continue to be included in the Reference Asset. If a constituent company of the Reference Asset reorganizes into a multiple share class line structure, that company will remain in the Reference Asset at the discretion of the S&P Index Committee in order to minimize turnover.

The Reference Asset is calculated using a base-weighted aggregate methodology. The level of the Reference Asset 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 Reference Asset 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 Reference Asset, it serves as a link to the original base period level of the Reference Asset. The index divisor keeps the Reference Asset comparable over time and is the manipulation point for all adjustments to the Reference Asset, 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 Reference Asset, and do not require index divisor adjustments.

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

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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 Reference Asset to track general market performance. S&P Dow Jones Indices' only relationship to us with respect to the Reference Asset is the licensing of the Reference Asset and certain trademarks, service marks and/or trade names of S&P Dow Jones Indices and/or its third party licensors. The Reference Asset 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 Reference Asset. 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.

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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 Reference Asset 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 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 Reference Asset. 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 REFERENCE ASSET 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 REFERENCE ASSET 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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#### Historical Information

The graph below sets forth the information relating to the historical performance of the Reference Asset. In addition, below the graph is a table setting forth the intra-day high, intra-day low and period-end closing levels of the Reference Asset. The information provided in this table is for the period from January 1, 2008 through August 29, 2018.

We obtained the information regarding the historical performance of the Reference Asset in the chart below from Bloomberg Financial Markets.

We have not independently verified the accuracy or completeness of the information obtained from Bloomberg Financial Markets. The historical performance of the Reference Asset should not be taken as an indication of its future performance, and no assurance can be given as to closing level of the Reference Asset on any Observation Date. We cannot give you assurance that the performance of the Reference Asset will not result in the loss of all or a portion of your initial investment.

S&P 500<sup>®</sup> Index (“SPX”)

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Period Start Date	Period End Date	High Intra-Day Level	Low Intra-Day Level	Period-End Closing Level
1/1/2008	3/31/2008	1,471.77	1,256.98	1,322.70
4/1/2008	6/30/2008	1,440.24	1,272.00	1,280.00
7/1/2009	9/30/2008	1,313.15	1,106.39	1,166.36
10/1/2008	12/31/2008	1,167.03	741.02	890.64
1/1/2009	3/31/2009	943.85	666.79	797.87
4/1/2009	6/30/2009	956.23	783.32	919.32
7/1/2009	9/30/2009	1,080.15	869.32	1,057.08
10/1/2009	12/31/2009	1,130.38	1,019.95	1,126.20
1/1/2010	3/31/2010	1,180.69	1,044.50	1,169.43
4/1/2010	6/30/2010	1,219.80	1,028.33	1,030.71
7/1/2010	9/30/2010	1,157.16	1,010.91	1,141.20
10/1/2010	12/31/2010	1,262.60	1,131.87	1,257.88
1/1/2011	3/31/2011	1,344.07	1,249.05	1,325.83
4/1/2011	6/30/2011	1,370.58	1,258.07	1,320.64
7/1/2011	9/30/2011	1,356.48	1,101.54	1,131.42
10/1/2011	12/31/2011	1,292.66	1,074.77	1,257.61
1/1/2012	3/31/2012	1,419.15	1,258.86	1,408.47
4/1/2012	6/30/2012	1,422.38	1,266.74	1,362.16
7/1/2012	9/30/2012	1,474.51	1,325.41	1,440.67
10/1/2012	12/31/2012	1,470.96	1,343.35	1,426.19
1/1/2013	3/31/2013	1,570.28	1,426.19	1,569.19
4/1/2013	6/30/2013	1,687.18	1,536.03	1,606.28
7/1/2013	9/30/2013	1,729.86	1,604.57	1,681.55
10/1/2013	12/31/2013	1,849.44	1,646.47	1,848.36
1/1/2014	3/31/2014	1,883.97	1,737.92	1,872.34
4/1/2014	6/30/2014	1,968.17	1,814.36	1,960.23
7/1/2014	9/30/2014	2,019.26	1,904.78	1,972.29
10/1/2014	12/31/2014	2,093.55	1,820.66	2,058.90
1/1/2015	3/31/2015	2,119.59	1,980.90	2,067.89
4/1/2015	6/30/2015	2,134.72	2,048.38	2,063.11
7/1/2015	9/30/2015	2,132.82	1,867.01	1,920.03
10/1/2015	12/31/2015	2,116.48	1,893.70	2,043.94
1/1/2016	3/31/2016	2,072.21	1,810.10	2,059.74
4/1/2016	6/30/2016	2,120.55	1,991.68	2,098.86
7/1/2016	9/30/2016	2,193.81	2,074.02	2,168.27
10/1/2016	12/31/2016	2,277.53	2,083.79	2,238.83

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1/1/2017	3/30/2017	2,400.98	2,245.13	2,362.72
4/1/2017	6/30/2017	2,453.82	2,328.95	2,423.41
7/1/2017	9/30/2017	2,519.44	2,407.70	2,519.36
10/1/2017	12/31/2017	2,694.97	2,520.40	2,673.61
1/1/2018	3/29/2018	2,872.87	2,532.69	2,640.87
4/1/2018	6/29/2018	2,791.47	2,553.80	2,718.37
7/1/2018	8/29/2018	2,916.50	2,698.95	2,914.04

PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

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#### SUPPLEMENTAL DISCUSSION OF U.S. FEDERAL INCOME TAX CONSEQUENCES

The following disclosure supplements, and to the extent inconsistent supersedes, the discussion in the product prospectus supplement dated January 12, 2016 under “Supplemental Discussion of U.S. Federal Income Tax Consequences.” The discussions below and in the accompanying product prospectus supplement do not address the tax consequences applicable to holders subject to Section 451(b) of the Code.

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, 2019. 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 a 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.

#### SUPPLEMENTAL PLAN OF DISTRIBUTION (CONFLICTS OF INTEREST)

Delivery of the Notes will be made against payment for the Notes on August 31, 2018, which is the second (2<sup>nd</sup>) business day following the Pricing Date (this settlement cycle being referred to as “T+2”). See “Plan of Distribution” in the prospectus dated January 8, 2016. For additional information as to the relationship between us and RBCCM, please see the section “Plan of Distribution - Conflicts of Interest” in the prospectus dated January 8, 2016.

In the initial offering of the Notes, they were offered to investors at a purchase price equal to par, except with respect to certain accounts as indicated on the cover page of this document.

The value of the Notes shown on your account statement may 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 3 months after the issue date of the Notes, the value of the Notes that may be shown on your account statement may be higher than RBCCM’s estimated value of the Notes at that time. This is because the estimated value of the Notes will not include the underwriting discount and our hedging costs and profits; however, the value of the Notes shown on your account statement during that period may initially be a higher amount, reflecting the addition of RBCCM’s underwriting discount and our estimated costs and profits from hedging the Notes. This excess is expected to decrease over time until the end of this period. After this period, if RBCCM repurchases your Notes, it expects to do so at prices that reflect their estimated value.

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.

No Prospectus (as defined in Directive 2003/71/EC (as amended, the “Prospectus Directive”)) will be prepared in connection with the Notes. Accordingly, the Notes may not be offered to the public in any member state of the European Economic Area (the “EEA”), and any purchaser of the Notes who subsequently sells any of the Notes in any EEA member state must do so only in accordance with the requirements of the Prospectus Directive, as implemented in that member state.

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The Notes are not intended to be offered, sold or otherwise made available to, and should not be offered, sold or otherwise made available to, any retail investor in the EEA. For these purposes, the expression “offer” includes the communication in any form and by any means of sufficient information on the terms of the offer and the Notes to be offered so as to enable an investor to decide to purchase or subscribe the Notes, and a “retail investor” means a person who is one (or more) of: (a) a retail client, as defined in point (11) of Article 4(1) of Directive 2014/65/EU (as amended, “MiFID II”); or (b) a customer, within the meaning of Insurance Distribution Directive 2016/97/EU, as amended, where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or (c) not a qualified investor as defined in the Prospectus Directive. Consequently, no key information document required by Regulation (EU) No 1286/2014 (as amended, the “PRIIPs Regulation”) for offering or selling the Notes or otherwise making them available to retail investors in the EEA has been prepared, and therefore, offering or selling the Notes or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation.

#### STRUCTURING THE NOTES

The Notes are our debt securities, the return on which is linked to the performance of the Reference Asset. 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. Using this relatively lower implied borrowing rate rather than the secondary market rate, is a factor that reduced the initial estimated value of the Notes at the time their terms were set. Unlike the estimated value included in this pricing supplement, any value of the Notes determined for purposes of a secondary market transaction may be based on a different funding rate, which may result in a lower value for the Notes than if our initial internal funding rate were used.

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 Reference Asset, and the tenor of the Notes. The economic terms of the Notes and their initial estimated value depend in part on the terms of these hedging arrangements.

The lower implied borrowing rate is a factor that reduced the economic terms of the Notes to you. The initial offering price of the Notes also reflects the underwriting commission and our estimated hedging costs. These factors resulted in the initial estimated value for the Notes on the Pricing Date being less than their public offering price. See “Selected Risk Considerations—The Initial Estimated Value of the Notes Is Less than the Price to the Public” above.

#### 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 January 8, 2016, which has been filed as Exhibit 5.1 to Royal Bank's Form 6-K dated January 8, 2016.

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 the 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

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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 January 8, 2016, which has been filed as Exhibit 5.2 to the Bank's Form 6-K dated January 8, 2016.

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