

ROYAL BANK OF CANADA  
Form 424B2  
September 26, 2018

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

Pricing Supplement  
Dated September 25,  
2018 \$254,000  
To the Product Barrier Return Notes  
Prospectus Supplement Linked to a Basket of Equity Indices,  
ERN-EI-1, Prospectus Due March 28, 2024  
Supplement, and Royal Bank of Canada  
Prospectus, each Dated  
September 7, 2018

Royal Bank of Canada is offering the Barrier Return Notes (the “Notes”) linked to the performance of an equally weighted basket of equity indices (the “Basket”) comprised of the S&P 500 Index (50%) and the Dow Jones Industrial Average® (50%).

The CUSIP number for the Notes is 78013XF94. The Notes do not pay interest. The Notes provide a one-for-one positive return if the value of the Basket increases from the Initial Level to the Final Level. If the Percentage Change of the Basket is less than 0% but greater than -50%, the Notes will pay the principal amount. However, investors are subject to one-for-one loss of the principal amount of the Notes in percentage terms if the closing value of the Basket on the Valuation Date is less than 50% of the Initial Level. Any payments on the Notes are subject to our credit risk. The Notes will not be listed on any securities exchange.

Issue Date: September 28, 2018

Maturity Date: March 28, 2024

Investing in the Notes involves a number of risks. See “Selected Risk Considerations” beginning on page P-6 of this pricing supplement, “Additional Risk Factors Specific to the Notes” beginning on page PS-4 of the product prospectus supplement dated September 7, 2018 and “Risk Factors” beginning on page S-1 of the prospectus supplement dated September 7, 2018.

The Notes will not constitute deposits insured by the Canada Deposit Insurance Corporation, the U.S. Federal Deposit Insurance Corporation or any other Canadian or U.S. government agency or instrumentality. The Notes are not subject to conversion into our common shares under subsection 39.2(2.3) of the Canada Deposit Insurance Corporation Act. Neither the Securities and Exchange Commission 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.

	<u>Per Note</u>	<u>Total</u>
Price to public <sup>(1)</sup>	100.00%	\$254,000.00
Underwriting discounts and commissions <sup>(1)</sup>	3.25%	\$8,255.00
Proceeds to Royal Bank of Canada	96.75%	\$245,745.00

<sup>(1)</sup> Certain dealers who purchased the Notes for sale to certain fee-based advisory accounts may have foregone some or all of their underwriting discount or selling concessions. The public offering price for investors purchasing the Notes in these accounts may be between \$967.50 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 \$932.58 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, which we refer to as RBCCM, acting as agent for Royal Bank of Canada, received a commission of \$32.50 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 \$32.50 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.

RBC Capital Markets, LLC

---

Barrier Return Notes  
Royal Bank of Canada

SUMMARY

The information in this “Summary” section is qualified by the more detailed information set forth in this pricing supplement, the product prospectus supplement, the prospectus supplement, and the prospectus.

Issuer:	Royal Bank of Canada (“Royal Bank”)
Issue:	Senior Global Medium-Term Notes, Series H
Underwriter:	RBC Capital Markets, LLC (“RBCCM”)
Reference Assets:	The Notes are linked to the value of an equally weighted basket (the “Basket”) of two equity indices (each, a “Basket Component,” collectively, the “Basket Components”). The Basket Components and their respective Component Weights are indicated in the table below.
Currency:	U.S. Dollars
Minimum Investment:	\$1,000 and minimum denominations of \$1,000 in excess thereof
Pricing Date:	September 25, 2018
Issue Date:	September 28, 2018
CUSIP:	78013XF94
Valuation Date:	March 25, 2024
Term of the Notes:	5 years and 6 months
Payment at Maturity (if held to maturity):	<p>If, on the Valuation Date, the Percentage Change is positive, then the investor will receive an amount per \$1,000 principal amount per Note equal to: Principal Amount + (Principal Amount x Percentage Change)</p> <p>If, on the Valuation Date, the Percentage Change is less than or equal to 0%, but not by more than 50% (that is, the Percentage Change is between zero and -50%), then the investor will receive a cash payment equal to the principal amount.</p> <p>If, on the Valuation Date, the Final Level is less than the Barrier Level (that is, the Percentage Change is between -50.01% and -100%), then the investor will receive a cash payment equal to: Principal Amount + (Principal Amount x Percentage Change)</p> <p>In this case, the payment on the Notes will be less than the principal amount, and you will lose all or a substantial portion of the principal amount.</p>
Percentage Change:	The Percentage Change, expressed as a percentage, is calculated using the following formula:

P-2 RBC Capital Markets, LLC

---

Barrier Return Notes  
Royal Bank of Canada

Initial Level: With respect to each Basket Component, its closing level on the Pricing Date, as provided in the table below.

Final Level: With respect to each Basket Component, its closing level on the Valuation Date.

Barrier Level: 50% of the Initial Level

The Basket:	Basket Component	Bloomberg Ticker	Component Weight	Initial Level*
	S&P 500® Index (the “SPX”)	SPX	50%	2,915.56
	Dow Jones Industrial Average® (the “INDU”)	INDU	50%	26,492.21

\* The Initial Level for each Basket Component was its closing level on the Pricing Date.

Maturity Date: March 28, 2024

Principal at Risk: The Notes are NOT principal protected. You will lose all or a substantial portion of your principal amount at maturity if the Final Level is less than the Barrier Level.

Calculation Agent: RBCCM

U.S. Tax Treatment: By purchasing a Note, each holder agrees (in the absence of a change in law, an administrative determination or a judicial ruling to the contrary) to treat the Note as a pre-paid cash-settled derivative contract in respect of the Basket 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, under “Supplemental Discussion of U.S. Federal Income Tax Consequences” below and the discussion (including the opinion of our counsel Morrison & Foerster LLP) in the product prospectus supplement dated September 7, 2018 under “Supplemental Discussion of U.S. Federal Income Tax Consequences,” which applies 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 substantially less than the principal amount of your Notes.

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

Clearance and 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 September 7, 2018).

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 September 7, 2018, as modified by this pricing supplement.

P-3 RBC Capital Markets, LLC

Barrier Return Notes  
Royal Bank of Canada

#### ADDITIONAL TERMS OF YOUR NOTES

You should read this pricing supplement together with the prospectus dated September 7, 2018, as supplemented by the prospectus supplement dated September 7, 2018 and the product prospectus supplement dated September 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. 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 September 7, 2018 and “Additional Risk Factors Specific to the Notes” in the product prospectus supplement dated September 7, 2018, as the Notes involve risks not associated with conventional debt securities. We urge you to consult your investment, legal, tax, accounting and other advisors before you invest in the Notes. You may access these documents on the Securities and Exchange Commission (the “SEC”) website at [www.sec.gov](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, “we,” “us,” or “our” refers to Royal Bank of Canada.

P-4 RBC Capital Markets, LLC

---

Barrier Return Notes  
Royal Bank of Canada

HYPOTHETICAL RETURNS

The examples set out below are included for illustration purposes only. The hypothetical Percentage Changes of the Basket used to illustrate the calculation of the Payment at Maturity are not estimates or forecasts of the level of any Basket Component on any trading day prior to the Maturity Date. All examples assume that a holder purchased Notes with an aggregate principal amount of \$1,000, and the Barrier Level of 50% of the Initial Level, and that no market disruption event occurs on the Valuation Date.

Example 1          Calculation of the Payment at Maturity where the Percentage Change is positive.  
Percentage Change: 5%  
Payment at Maturity:  $\$1,000 + (\$1,000 \times 5\%) = \$1,000 + \$50.00 = \$1,050.00$   
On a \$1,000 investment, a 5% Percentage Change results in a Payment at Maturity of \$1,050.00, a 5% return on the Notes.

Example 2          Calculation of the Payment at Maturity where the Percentage Change is negative, but the Final Level is greater than the Barrier Level.  
Percentage Change: -10%  
In this case, even though the Percentage Change is negative, you will receive the principal amount of your Notes at maturity.

Example 3          Calculation of the Payment at Maturity where the Percentage Change is negative and the Final Level is less than the Barrier Level.  
Percentage Change: -60%  
Payment at Maturity:  $\$1,000 + (\$1,000 \times -60\%) = \$1,000 - \$600 = \$400$   
In this case, on a \$1,000 investment, a -60% Percentage Change results in a Payment at Maturity of \$400, a -60% return on the Notes.

P-5 RBC Capital Markets, LLC

---

Barrier Return Notes  
Royal Bank of Canada

**SELECTED RISK CONSIDERATIONS**

An investment in the Notes involves significant risks. Investing in the Notes is not equivalent to investing directly in any of the securities included in any Basket Component. 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 the Final Level is less than the Barrier Level. In such a case, you will lose 1% of the principal amount of your Notes for each 1% that the Final Level is less than the Initial 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 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 the amount due on the Maturity Date is dependent upon Royal Bank’s ability to repay its obligations at that time. This will be the case even if the value of the Basket 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 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.

**You Will Not Have Any Rights to the Securities Included in the Basket Components** – 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 a Basket Component would have. The Final Levels of the Basket Components will not reflect any dividends paid on the securities included in the Basket Components, and accordingly, any positive return on the Notes may be less than the potential positive return on those securities.

**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 value of the Basket, the borrowing rate we pay to issue securities of this kind, and the inclusion in the price to the public of the underwriting discount and the estimated costs relating to our hedging of the Notes. These factors, together with various credit, market and economic factors over the term of the Notes, are expected to reduce the price at which you may be able to sell the Notes in any secondary market and will affect the value of the Notes in complex and unpredictable ways. Assuming no change in market conditions or any other relevant factors, the price, if any, at which you may be able to sell your Notes prior to maturity may be less than your original purchase price, as any such sale price would not be expected to include the underwriting discount and the hedging costs relating to the Notes. In addition to bid-ask spreads, the value of the Notes determined for any secondary market price is expected to be based on the secondary rate rather than the internal funding rate used to price the Notes and

P-6 RBC Capital Markets, LLC

---



Barrier Return Notes  
Royal Bank of Canada

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 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 Basket. We may also publish research from time to time on financial markets and other matters that may influence the value of the Basket or the value of the Notes, or express opinions or provide recommendations that may be inconsistent with purchasing or holding the Notes or with the investment view implicit in the Notes or the Basket. You should make your own independent investigation of the merits of investing in the Notes and the Basket.

**Changes in the Level of One Basket Component May Be Offset by Changes in the Level of the Other Basket Component**—A change in the level of one Basket Component may not correlate with changes in the levels of the other Basket Component. The level of one Basket Component may increase, while the level of the other Basket Component may not increase as much, or may even decrease. Therefore, in determining the value of the Basket as of any time, increases in the level of one Basket Component may be moderated, or wholly offset, by lesser increases or decreases in the level of the other Basket Component.

**Market Disruption Events and Adjustments**—The Payment at Maturity 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.

P-7 RBC Capital Markets, LLC

---

Barrier Return Notes  
Royal Bank of Canada

INFORMATION REGARDING THE REFERENCE INDICES

All disclosures contained in this pricing supplement regarding the Basket Components, including, without limitation, their make-up, method of calculation, and changes in their components, have been derived from publicly available sources prepared by the sponsors of the Basket Components. Such information reflects the policies of, and is subject to change by the sponsors. The sponsors have no obligation to continue to publish, and may discontinue publication of, the Basket Components. The consequences of the index sponsors discontinuing publication of the Basket Components 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 any Basket Component or any successor index.

S&P 500<sup>®</sup> Index (“SPX”)

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

S&P 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.

P-8 RBC Capital Markets, LLC

---

Barrier Return Notes  
Royal Bank of Canada

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.

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.

Barrier Return Notes  
Royal Bank of Canada

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&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 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.**

Barrier Return Notes  
Royal Bank of Canada

Historical Information

The graph below sets forth the information relating to the historical performance of the SPX. In addition, below the graph is a table setting forth the intra-day high, intra-day low and period-end closing levels of the SPX. The information provided in this table is for the four calendar quarters of 2013 through 2017, and for the period from January 1, 2018 through September 25, 2018.

We obtained the information regarding the historical performance of the SPX 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 SPX should not be taken as an indication of its future performance, and no assurance can be given as to the Final Level of the SPX. We cannot give you assurance that the performance of the SPX will result in any positive return on your initial investment.

Barrier Return Notes  
Royal Bank of Canada

Period- Start Date	Period- End Date	High Intra-Day Level of the Reference Asset	Low Intra-Day Level of the Reference Asset	Period-End Closing Level of the Reference Asset
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
7/1/2008	9/30/2008	1,313.15	1,106.39	1,166.36
10/1/2008	12/30/2008	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	12/30/2009	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	12/30/2010	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
1/01/2012	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	3/28/2013	1,570.28	1,426.19	1,569.19
4/1/2013	6/28/2013	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
3/1/2016	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

Edgar Filing: ROYAL BANK OF CANADA - Form 424B2

1/1/2017	3/31/2017	2,400.98	2,245.13	2,362.72
3/1/2017	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	3/31/2018	2,872.87	2,532.69	2,640.87
3/1/2018	6/30/2018	2,791.47	2,553.80	2,718.37
7/1/2018	9/25/2018	2,940.91	2,698.95	2,915.56

PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

P-12 RBC Capital Markets, LLC

---



Barrier Return Notes  
Royal Bank of Canada

The Dow Jones Industrial Average® (“INDU”)

The INDU is a price-weighted index, which means an underlying stock’s weight in the INDU is based on its price per share rather than the total market capitalization of the issuer. The INDU is designed to provide an indication of the composite performance of 30 common stocks of corporations representing a broad cross-section of U.S. industry. The corporations represented in the INDU tend to be market leaders in their respective industries and their stocks are typically widely held by individuals and institutional investors.

The INDU is maintained by an Averages Committee comprised of the Managing Editor of The Wall Street Journal (“WSJ”), the head of Dow Jones Indexes research and the head of CME Group Inc. research. The Averages Committee was created in March 2010, when Dow Jones Indexes became part of CME Group Index Services, LLC, a joint venture company owned 90% by CME Group Inc. and 10% by Dow Jones & Company. Generally, composition changes occur only after mergers, corporate acquisitions or other dramatic shifts in a component's core business. When such an event necessitates that one component be replaced, the entire INDU is reviewed. As a result, when changes are made they typically involve more than one component. While there are no rules for component selection, a stock typically is added only if it has an excellent reputation, demonstrates sustained growth, is of interest to a large number of investors and accurately represents the sector(s) covered by the average.

Changes in the composition of the INDU are made entirely by the Averages Committee without consultation with the corporations represented in the INDU, any stock exchange, any official agency or us. Unlike most other indices, which are reconstituted according to a fixed review schedule, constituents of the INDU are reviewed on an as-needed basis. Changes to the common stocks included in the INDU tend to be made infrequently, and the underlying stocks of the INDU may be changed at any time for any reason. The companies currently represented in the INDU are incorporated in the United States and its territories and their stocks are listed on the New York Stock Exchange and NASDAQ.

The INDU initially consisted of 12 common stocks and was first published in the WSJ in 1896. The INDU was increased to include 20 common stocks in 1916 and to 30 common stocks in 1928. The number of common stocks in the INDU has remained at 30 since 1928, and, in an effort to maintain continuity, the constituent corporations represented in the INDU have been changed on a relatively infrequent basis.

Computation of the INDU

The level of the INDU is the sum of the primary exchange prices of each of the 30 component stocks included in the INDU, divided by a divisor that is designed to provide a meaningful continuity in the level of the INDU. Because the INDU is price-weighted, stock splits or changes in the component stocks could result in distortions in the index level. In order to prevent these distortions related to extrinsic factors, the divisor is periodically changed in accordance with a mathematical formula that reflects adjusted proportions within the INDU. The current divisor of the INDU is published daily in the WSJ and other publications. In addition, other statistics based on the INDU may be found in a variety of publicly available sources.

Barrier Return Notes  
Royal Bank of Canada

License Agreement

S&P® is a registered trademark of Standard & Poor's Financial Services LLC ("S&P") 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 Dow Jones Indices LLC. "DJIA®" is a trademark of Dow Jones. The trademark has been sublicensed for certain purposes by us. The INDU is a product of S&P Dow Jones Indices LLC 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, Dow Jones, S&P 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 INDU to track general market performance. S&P Dow Jones Indices' only relationship to us with respect to the INDU is the licensing of the INDU and certain trademarks, service marks and/or trade names of S&P Dow Jones Indices and/or its third party licensors. The INDU 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 us or holders of the Notes into consideration in determining, composing or calculating the INDU. 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 INDU 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 INDU. 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 INDU 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 INDU 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.

P-14 RBC Capital Markets, LLC

---

Barrier Return Notes  
Royal Bank of Canada

Historical Information

The graph below sets forth the information relating to the historical performance of the INDU. In addition, below the graph is a table setting forth the intra-day high, intra-day low and period-end closing levels of the INDU. The information provided in this table is for the four calendar quarters of 2013 through 2017, and for the period from January 1, 2018 through September 25, 2018.

We obtained the information regarding the historical performance of the INDU 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 INDU should not be taken as an indication of its future performance, and no assurance can be given as to the Final Level of the INDU. We cannot give you assurance that the performance of the INDU will result in any positive return on your initial investment.

Barrier Return Notes  
Royal Bank of Canada

Period- Start Date	Period- End Date	High Intra-Day Level of the Reference Asset	Low Intra-Day Level of the Reference Asset	Period-End Closing Level of the Reference Asset
1/1/2008	3/31/2008	13,279.54	11,634.82	12,262.89
4/1/2008	6/30/2008	13,136.69	11,287.56	11,350.01
7/1/2008	9/30/2008	11,867.11	10,365.45	10,850.66
10/1/2008	12/30/2008	10,882.52	7,449.38	8,668.39
1/1/2009	3/31/2009	9,088.06	6,469.95	7,608.92
4/1/2009	6/30/2009	8,877.93	7,483.87	8,447.00
7/1/2009	9/30/2009	9,917.99	8,087.19	9,712.28
10/1/2009	12/30/2009	10,580.33	9,430.08	10,545.41
1/1/2010	3/31/2010	10,955.48	9,835.09	10,856.63
4/1/2010	6/30/2010	11,258.01	9,753.84	9,774.02
7/1/2010	9/30/2010	10,948.88	9,614.32	10,788.05
10/1/2010	12/30/2010	11,625.00	10,711.12	11,569.71
1/1/2011	3/31/2011	12,391.29	11,555.48	12,319.73
4/1/2011	6/30/2011	12,876.00	11,862.53	12,414.34
7/1/2011	9/30/2011	12,753.89	10,597.14	10,913.38
10/1/2011	12/31/2011	12,328.47	10,404.49	12,217.56
1/01/2012	3/31/2012	13,289.08	12,221.19	13,212.04
4/1/2012	6/30/2012	13,338.66	12,035.09	12,880.09
7/1/2012	9/30/2012	13,653.24	12,492.25	13,437.13
10/1/2012	12/31/2012	13,661.87	12,471.49	13,104.14
1/1/2013	3/28/2013	14,585.10	13,104.30	14,578.54
4/1/2013	6/28/2013	15,542.40	14,434.43	14,909.60
7/1/2013	9/30/2013	15,709.58	14,760.41	15,129.67
10/1/2013	12/31/2013	16,588.25	14,719.43	16,576.66
1/1/2014	3/31/2014	16,573.07	15,340.69	16,457.66
4/1/2014	6/30/2014	16,978.02	16,015.32	16,826.60
7/1/2014	9/30/2014	17,350.64	16,333.78	17,042.90
10/1/2014	12/31/2014	18,103.45	15,855.12	17,823.07
1/1/2015	3/31/2015	18,288.63	17,037.76	17,776.12
4/1/2015	6/30/2015	18,351.36	17,576.50	17,619.51
7/1/2015	9/30/2015	18,137.12	15,370.33	16,284.70
10/1/2015	12/31/2015	17,977.85	16,013.66	17,425.03
1/1/2016	3/31/2016	17,790.11	15,450.56	17,685.09
3/1/2016	6/30/2016	18,167.63	17,063.08	17,929.99
7/1/2016	9/30/2016	18,668.44	17,713.45	18,308.15
10/1/2016	12/31/2016	19,987.63	17,883.56	19,762.60

Edgar Filing: ROYAL BANK OF CANADA - Form 424B2

1/1/2017	3/31/2017	21,169.11	19,677.94	20,663.22
3/1/2017	6/30/2017	21,535.03	20,379.55	21,349.63
7/1/2017	9/30/2017	22,419.51	21,279.30	22,405.09
10/1/2017	12/31/2017	24,876.07	22,416.00	24,719.22

1/1/2018	3/31/2018	26,616.71	23,360.29	24,103.11
3/1/2018	6/30/2018	25,402.83	23,344.52	24,271.41
7/1/2018	9/25/2018	26,769.16	24,077.56	26,492.21

PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

P-16 RBC Capital Markets, LLC

---

Barrier Return Notes  
Royal Bank of Canada

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 September 7, 2018 under “Supplemental Discussion of U.S. Federal Income Tax Consequences.”

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 Internal Revenue Service (the “IRS”) has issued guidance that states that the U.S. Treasury Department and the IRS intended 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 Basket Components or the Notes (for example, upon a Basket Component 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 Basket Components 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.

P-17 RBC Capital Markets, LLC

---

Barrier Return Notes  
Royal Bank of Canada

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

Delivery of the Notes will be made against payment for the Notes on September 28, 2018, which is the third (3<sup>rd</sup>) business day following the Pricing Date (this settlement cycle being referred to as “T+3”). See “Plan of Distribution” in the prospectus dated September 7, 2018. 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 September 7, 2018.

We expect to deliver the Notes on a date that is greater than two business days following the trade date. Under Rule 15c6-1 of the Exchange Act, 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 more than two business days prior to the original Issue Date will be required to specify alternative arrangements to prevent a failed settlement.

In the initial offering of the Notes, they will be 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 12 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 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.

P-18 RBC Capital Markets, LLC

---

Barrier Return Notes  
Royal Bank of Canada

## STRUCTURING THE NOTES

The Notes are our debt securities, the return on which is linked to the performance of the Basket Components. 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 Basket Components, 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 reduces the economic terms of the Notes to you. The initial offering price of the Notes also reflects the underwriting discount 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 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.

P-19 RBC Capital Markets, LLC

---