

ROYAL BANK OF CANADA
Form 424B2
March 04, 2019

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

Pricing Supplement

Dated March 1, 2019

To the Product

Prospectus Supplement \$1,695,000

No. CCBN-1, dated Contingent Coupon Barrier Notes with Memory Coupon

September 10, 2018, and Linked to the Lesser Performing of Three Exchange

the Prospectus Traded Funds, Due March 4, 2021

Supplement and the Royal Bank of Canada

Prospectus, Each Dated

September 7, 2018

Royal Bank of Canada is offering Contingent Coupon Barrier Notes (the “Notes”) linked to the lesser performing of three exchange traded funds (each, a “Reference Stock” and collectively, the “Reference Stocks”). The Notes offered are senior unsecured obligations, and will pay a Contingent Coupon in the amounts and under the circumstances specified below, and will have the terms described in the documents described above, as supplemented or modified by this pricing supplement.

Reference Stocks	Initial Stock Prices	Coupon Barriers and Trigger Levels*
iShares® MSCI Emerging Markets ETF (“EEM”)	\$42.49	\$29.74, which is 70.00% of its Initial Stock Price
Health Care Select Sector SPDR® Fund (“XLV”)	\$92.95	\$65.07, which is 70.00% of its Initial Stock Price
SPDR® S&P® Oil & Gas Exploration & Production ETF (“XOP”)	\$30.41	\$21.29, which is 70.00% of its Initial Stock Price

* Rounded to two decimal places.

The Notes do not guarantee any return of principal at maturity. Any payments on the Notes are subject to our credit risk.

Investing in the Notes involves a number of risks. See “Risk Factors” beginning on page PS-5 of the product prospectus supplement dated September 10, 2018, on page S-1 of the prospectus supplement dated September 7, 2018, and “Selected Risk Considerations” beginning on page P-8 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. 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 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
Trade Date:	March 1, 2019		\$1,000 per Note

Edgar Filing: ROYAL BANK OF CANADA - Form 424B2

		Principal Amount:	
Issue Date:	March 6, 2019	Maturity Date:	March 4, 2021
Observation Dates:	Approximately quarterly, as set forth below	Coupon Payment Dates:	Approximately quarterly, as set forth below
Valuation Dates:	Each trading day from February 23, 2021 to March 1, 2021 (both inclusive)	Contingent Coupons:	\$25.50 per \$1,000 in principal amount of the Notes, if payable.
Contingent Coupon and Memory Feature:	<p>If the closing price of each Reference Stock is greater than or equal to its Coupon Barrier on the applicable Observation Date (or the Final Stock Price in the case of the final Coupon Payment Date), we will pay the Contingent Coupon on the applicable Coupon Payment Date. You may not receive any Contingent Coupons during the term of the Notes.</p> <p>If a Contingent Coupon is not payable on any Coupon Payment Date, it will be paid on any later Coupon Payment Date (or at maturity) on which the Contingent Coupon is then payable, together with the payment otherwise due on that later date.</p> <p>We will pay you at maturity an amount based on the Final Stock Price of the Lesser Performing Reference Stock:</p> <p>For each \$1,000 in principal amount, \$1,000 plus the Contingent Coupon at maturity (and any unpaid Contingent Coupons), unless the Final Stock Price of the Lesser Performing Reference Stock is less than its Trigger Price.</p> <p>If the Final Stock Price of the Lesser Performing Reference Stock is less than its Trigger Price, then the investor will receive at maturity, for each \$1,000 in principal amount, a cash payment equal to: \$1,000 + (\$1,000 x Reference Stock Return of the Lesser Performing Reference Stock)</p> <p>Investors could lose some or all of their principal amount if the Final Stock Price of the Lesser Performing Reference Stock is below its Trigger Price.</p>		
Payment at Maturity (if held to maturity):			
Lesser Performing Reference Stock:	The Reference Stock with the lowest Reference Stock Return.		
Final Stock Price:	For each Reference Stock, the arithmetic average of its closing price on the Valuation Dates.		
Call Feature:	The Notes are not callable at our option prior to maturity, and are not subject to automatic call.		
CUSIP:	78013X2P2		

	Per Note	Total
Price to public	100.00%	\$1,695,000
Underwriting discounts and commissions ⁽¹⁾	1.50%	\$25,425
Proceeds to Royal Bank of Canada	98.50%	\$1,669,575

⁽¹⁾ JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC and their affiliates will act as placement agents for the Notes and will receive a fee from the Issuer of \$15 per \$1,000 in principal amount of the Notes.

The initial estimated value of the Notes as of the date of this pricing supplement is \$972.59 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 JPMorgan Chase Bank, N.A. J.P. Morgan Securities LLC
Placement Agents

Contingent Coupon Barrier Notes with Memory Coupon
 Linked to the Lesser Performing of Three Exchange Traded Funds
 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.

General: This pricing supplement relates to an offering of Contingent Coupon Barrier Notes (the “Notes”) linked to the lesser performing of the three Reference Stocks set forth on the cover page.

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

Trade Date: March 1, 2019

Issue Date: March 6, 2019

Valuation Dates: February 23, 2021, February 24, 2021, February 25, 2021, February 26, 2021 and March 1, 2021.

Maturity Date: March 4, 2021

Denominations: Minimum denomination of \$10,000, and integral multiples of \$1,000 thereafter.

Designated Currency: U.S. Dollars

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

- If the closing price of each Reference Stock is greater than or equal to its Coupon Barrier on the applicable Observation Date (or in the case of the final Contingent Coupon, the Final Stock Price), we will pay the Contingent Coupon applicable to that Observation Date, together with any previously unpaid Contingent Coupons.

Contingent Coupon and Memory Feature: · If the closing price of any Reference Stock is less than its Coupon Barrier on the applicable Observation Date, we will not pay you the Contingent Coupon applicable to that Observation Date. You will not receive any Contingent Coupon on the Maturity Date if the Final Stock Price of any Reference Stock is less than its Coupon Barrier.

You may not receive a Contingent Coupon for one or more Coupon Payment Dates during the term of the Notes.

For the avoidance of doubt, once a previously unpaid Contingent Coupon has been paid on a later Coupon Payment Date, it will not be paid again on a subsequent date.

Contingent Coupon: \$25.50 per \$1,000 in principal amount of the Notes, if payable.

Observation Dates: June 3, 2019, August 30, 2019, December 2, 2019, March 2, 2020, June 1, 2020, August 31, 2020, December 1, 2020 and March 1, 2021.

Coupon Payment Dates: The Contingent Coupon, if applicable, will be paid on June 6, 2019, September 5, 2019, December 5, 2019, March 5, 2020, June 4, 2020, September 3, 2020, December 4, 2020 and the Maturity Date.

Record Dates: The record date for each Coupon Payment Date will be one business day prior to that scheduled Coupon Payment Date; provided, however, that any Contingent Coupons payable at maturity will be payable to the person to whom the payment at maturity will be payable.

Initial Stock Price: For each Reference Stock, its closing price on the Trade Date.

Final Stock Price: For each Reference Stock, the arithmetic average of its closing prices on each Valuation Date.

Trigger Price and Coupon Barrier: For each Reference Stock, 70.00% of its Initial Stock Price.

Contingent Coupon Barrier Notes with Memory Coupon
 Linked to the Lesser Performing of Three Exchange Traded Funds
 Royal Bank of Canada

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

· If the Final Stock Price of the Lesser Performing Reference Stock is greater than or equal to its Trigger Price, we will pay you a cash payment equal to the principal amount plus the Contingent Coupon otherwise due on the Maturity Date, together with any previously unpaid Contingent Coupons.
 Payment at Maturity (if held to maturity):
 · If the Final Stock Price of the Lesser Performing Reference Stock is less than its Trigger Price, you will receive at maturity, for each \$1,000 in principal amount, a cash payment equal to:
 $\$1,000 + (\$1,000 \times \text{Reference Stock Return of the Lesser Performing Reference Stock})$

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 of the Lesser Performing Reference Stock from the Trade Date to each Valuation Date. Investors in the Notes will lose some or all of their principal amount if the Final Stock Price of the Lesser Performing Reference Stock is less than its Trigger Price.

Stock Settlement: Not applicable. Payments on the Notes will be made solely in cash.

Reference Stock Return: With respect to each Reference Stock:
 $\frac{\text{Final Stock Price} - \text{Initial Stock Price}}{\text{Initial Stock Price}}$

Lesser Performing Reference Stock: The Reference Stock with the lowest Reference Stock Return.

Call Feature: None. The Notes are not callable at our option prior to maturity, and are not subject to an automatic call. The occurrence of a market disruption event (or a non-trading day) as to any of the Reference Stocks will result in the postponement of an Observation Date or any Valuation Date as to that Reference Stock, as described in the product prospectus supplement, but not to any non-affected Reference Stock.

Market Disruption Events: If a market disruption event occurs or is continuing on any scheduled Valuation Date other than the final Valuation Date, the closing price of the applicable Reference Stock for that Valuation Date will equal its closing price on the next scheduled Valuation Date. For example, if a market disruption event occurs or is continuing on the first and second scheduled Valuation Dates, but not on the third scheduled Valuation Date, then the closing price of the applicable Reference Stock will also be deemed to be the closing price of such Reference Stock on the first and second scheduled Valuation Dates. If no further scheduled Valuation Dates occur after a Valuation Date on which a market disruption event occurs or is continuing or if a market disruption event occurs or is continuing on the final Valuation Date, then the applicable closing price for that Valuation Date will be determined (or, if not determinable, estimated by the calculation agent in a manner which is considered to be commercially reasonable under the circumstances) by the calculation agent on that final Valuation Date, regardless of the occurrence or continuation of a market disruption event on that day. In such an event, the calculation agent will make a good faith estimate in its sole discretion of the closing price of the applicable Reference Stock that would have prevailed in the absence of the market disruption event.

Calculation Agent: RBC Capital Markets, LLC ("RBCCM")

U.S. Tax Treatment: By purchasing a Note, each holder agrees (in the absence of a change in law, an administrative determination or a judicial ruling to the contrary) to treat the Note as a pre-paid cash-settled contingent income-bearing derivative contract in respect of the Reference Stocks 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 September 10, 2018 under “Supplemental Discussion of U.S. Federal Income Tax Consequences,” which apply to the Notes.

P-3 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

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 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 10, 2018, as modified by this pricing supplement.

P-4 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
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 10, 2018, relating to our Senior Global Medium-Term Notes, Series H, of which these Notes are a part. Capitalized terms used but not defined in this pricing supplement will have the meanings given to them in the product prospectus supplement. In the event of any conflict, this pricing supplement will control. The Notes vary from the terms described in the product prospectus supplement in several important ways. You should read this pricing supplement carefully. In addition, the Notes are not callable at our option prior to maturity, and are not subject to an automatic call.

This pricing supplement, together with the documents listed below, contains the terms of the Notes and supersedes all prior or contemporaneous oral statements as well as any other written materials including preliminary or indicative pricing terms, correspondence, trade ideas, structures for implementation, sample structures, brochures or other educational materials of ours. You should carefully consider, among other things, the matters set forth in “Risk Factors” in the prospectus supplement dated September 7, 2018 and in the product prospectus supplement dated September 10, 2018, as the Notes involve risks not associated with conventional debt securities. We urge you to consult your investment, legal, tax, accounting and other advisors before you invest in the Notes. You may access these documents on the Securities and Exchange Commission (the “SEC”) website at www.sec.gov as follows (or if that address has changed, by reviewing our filings for the relevant date on the SEC website):

Prospectus dated September 7, 2018:

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

Prospectus Supplement dated September 7, 2018:

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

Product Prospectus Supplement dated September 10, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000114036118038091/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-5 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
 Linked to the Lesser Performing of Three Exchange Traded Funds
 Royal Bank of Canada

HYPOTHETICAL EXAMPLES

The table set out below is included for illustration purposes only. The table illustrates the Payment at Maturity of the Notes (excluding the final Contingent Coupon, if payable) for a hypothetical range of performance for the Lesser Performing Reference Stock, assuming the following terms:

Hypothetical Trigger Price and Coupon Barrier:	70.00% of the hypothetical Initial Stock Price of the Lesser Performing Reference Stock
Contingent Coupon:	\$25.50 per \$1,000 in principal amount of the Notes
Observation Dates:	Approximately quarterly
Principal Amount:	\$1,000 per Note

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

Hypothetical Final Stock Prices of the Lesser Performing Reference Stock, expressed as a percentage of its Initial Stock Price, are shown in the first column on the left. The second column shows the Payment at Maturity for a range of Final Stock Prices. The third column shows the amount of cash to be paid on the Notes per \$1,000 in principal amount.

Final Stock Price of the Lesser Performing Reference Stock	Payment at Maturity as Percentage of Principal Amount	Cash Payment Amount per \$1,000 in Principal Amount
130.00%	100.00%	\$1,000.00*
120.00%	100.00%	\$1,000.00*
110.00%	100.00%	\$1,000.00*
100.00%	100.00%	\$1,000.00*
90.00%	100.00%	\$1,000.00*
85.00%	100.00%	\$1,000.00*
80.00%	100.00%	\$1,000.00*
70.00%	100.00%	\$1,000.00*
69.99%	69.99%	\$699.90
60.00%	60.00%	\$600.00
50.00%	50.00%	\$500.00
40.00%	40.00%	\$400.00
25.00%	25.00%	\$250.00
0.00%	0.00%	\$0.00

*Excluding the final Contingent Coupon (and any previously unpaid Contingent Coupons), if payable.

P-6 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

Hypothetical Examples of Amounts Payable at Maturity

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

Example 1: The Final Stock Price of the Lesser Performing Reference Stock is 120%, an increase of 20% from its Initial Stock Price. Because the Final Stock Price of the Lesser Performing Reference Stock is greater than its Trigger Price and Coupon Barrier, the investor receives at maturity, in addition to the final Contingent Coupon (and any previously unpaid Contingent Coupons) otherwise due on the Notes, a cash payment of \$1,000 per Note, despite the 20% appreciation in the price of the Lesser Performing Reference Stock.

Example 2: The Final Stock Price of the Lesser Performing Reference Stock is 90.00%, a decrease of 10% from its Initial Stock Price. Because the Final Stock Price of the Lesser Performing Reference Stock is greater than its Trigger Price and Coupon Barrier, the investor receives at maturity, in addition to the final Contingent Coupon (and any previously unpaid Contingent Coupons) otherwise due on the Notes, a cash payment of \$1,000 per Note, despite the 10% decline in the price of the Lesser Performing Reference Stock.

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

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

* * *

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

P-7 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
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 the Reference Stocks. These risks are explained in more detail in the section “Risk Factors” in the product prospectus supplement. In addition to the risks described in the prospectus supplement and the product prospectus supplement, you should consider the following:

Principal at Risk — Investors in the Notes could lose all or a substantial portion of their principal amount if there is a decline in the price of the Lesser Performing Reference Stock between the Trade Date and the Valuation Dates. If the Final Stock Price of the Lesser Performing Reference Stock is less than its Trigger Price, the amount of cash that you receive at maturity will represent a loss of your principal that is proportionate to the decline in the price of the Lesser Performing Reference Stock from the Trade Date to its Final Stock Price. Any Contingent Coupons received on the Notes prior to the Maturity Date may not be sufficient to compensate for any such loss.

You May Not Receive Any Contingent Coupons — We will not necessarily make any coupon payments on the Notes. If the closing price of one or more Reference Stocks on an Observation Date (or in the case of the final Contingent Coupon, the Final Stock Price) is less than the Coupon Barrier, we will not pay you the applicable Contingent Coupon. It is possible that you will not receive any Contingent Coupons during the term of the Notes.

Notwithstanding the memory feature described above, there can be no assurance that any unpaid Contingent Coupon will become payable during the term of the Notes.

The Contingent Coupon Feature Limits Your Potential Return — The return potential of the Notes is limited to the pre-specified Contingent Coupons, regardless of the appreciation of any Reference Stock. In addition, the total return on the Notes will vary based on the number of Observation Dates on which the Contingent Coupon becomes payable prior to maturity. You may be subject to the full downside performance of the Lesser Performing Reference Stock, even though your potential return is limited to the Contingent Coupons. As a result, the return on an investment in the Notes could be less than the return on a direct investment in securities included in one or more of the Reference Stocks.

Your Redemption Amount Will Be Determined Solely by Reference to the Lesser Performing Reference Stock, Even if the Other Reference Stocks Perform Better — If any of the Reference Stocks has a Final Stock Price that is less than its Trigger Price, your return will be linked to the lesser performing of the three Reference Stocks. Even if the Final Stock Prices of the other Reference Stocks have increased compared to their respective Initial Stock Prices, or have experienced a decrease that is less than that of the Lesser Performing Reference Stock, your return will only be determined by reference to the performance of the Lesser Performing Reference Stock, regardless of the performance of the other Reference Stocks.

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

Your Return May Be Lower than the Return on a Conventional Debt Security of Comparable Maturity — The return that you will receive on the Notes, which could be negative, may be less than the return you could earn on other investments. Even if your return is positive, your return may be less than the return you would earn if you bought 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 our senior unsecured debt securities. As a result, your receipt of any Contingent Coupons, if payable, and the amount due on any relevant payment date is dependent upon our ability to repay its obligations on the applicable payment dates. This will be the case even if the prices of the Reference Stocks increase after the Trade Date. No assurance can be given as to what our financial condition will be at any time during the term of the Notes.

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

P-8 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

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 prices of the Reference Stocks, 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 Trade Date will vary based on many factors, including changes in market conditions, and cannot be predicted with accuracy. As a result, the actual value you would receive if you sold the Notes in any secondary market, if any, should be expected to differ materially from the initial estimated value of your Notes.

Owning the Notes Is Not the Same as Owning the Reference Stocks or the Securities Represented by the Reference Stocks — The return on your Notes is unlikely to reflect the return you would realize if you actually owned shares of the Reference Stocks. For instance, you will not receive or be entitled to receive any dividend payments or other distributions on these 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 these securities may have. Furthermore, the Reference Stocks may appreciate substantially during the term of the Notes, while your potential return will be limited to the applicable Contingent Coupon payments.

Our Business Activities May Create Conflicts of Interest — We and our affiliates expect to engage in trading activities related to the securities represented by the Reference Stocks that are not for the account of holders of the Notes or on their behalf. These trading activities may present a conflict between the holders’ interests in the Notes and the interests we and our affiliates will have in their proprietary accounts, in facilitating transactions, including options and other derivatives transactions, for their customers and in accounts under their management. These trading activities, if they influence the prices of the Reference Stocks, could be adverse to the interests of the holders of the Notes. We and one or more of our affiliates may, at present or in the future, engage in business with the securities represented by the Reference Stocks, including making loans to or providing advisory services. These services could include investment banking and merger and acquisition advisory services. These activities may present a conflict between our or one or more of our affiliates’ obligations and your interests as a holder of the Notes. Moreover, we, and our affiliates may

have published, and in the future expect to publish, research reports with respect to the Reference Stocks or securities represented by the Reference Stocks. This research is modified from time to time without notice and may express opinions or provide recommendations that are inconsistent with purchasing or holding the Notes. Any of these activities by us or one or more of our affiliates may affect the prices of the Reference Stocks and, therefore, the market value of the Notes.

Market Disruption Events and Adjustments — The Payment at Maturity, each Observation Date and the Valuation Dates are subject to adjustment as to each Reference Stock 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 and the section “Summary-Market Disruption Events” above.

You Must Rely on Your Own Evaluation of the Merits of an Investment Linked to the Reference Stocks — In the ordinary course of their business, our affiliates may have expressed views on expected movements in the Reference Stocks or the equity securities that they represent, and may do so in the future. These views or reports may be communicated to our clients and clients of our affiliates. However, these views are subject to change from time to time. Moreover, other professionals who transact business in markets relating to any Reference Stock may at any time have significantly different views from those of our affiliates. For these reasons, you are encouraged to derive information concerning the Reference Stocks from multiple sources, and you should not rely solely on views expressed by our affiliates.

P-9 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

Each Reference Stock and Its Underlying Index Are Different — The performance of each Reference Stock may not exactly replicate the performance of its Underlying Index, because the Reference Stock will reflect transaction costs and fees that are not included in the calculation of that index. It is also possible that the performance of a Reference Stock may not fully replicate or may in certain circumstances diverge significantly from the performance of its Underlying Index due to the temporary unavailability of certain securities in the secondary market, the performance of any derivative instruments owned by the Reference Stock or due to other circumstances. The Reference Stock may use futures contracts, options, swap agreements, currency forwards and repurchase agreements in seeking performance that corresponds to its Underlying Index and in managing cash flows.

During periods of market volatility, securities underlying the applicable Reference Stock may be unavailable in the secondary market, market participants may be unable to calculate accurately the net asset value per share of the Reference Stock and its liquidity may be adversely affected. This kind of market volatility may also disrupt the ability of market participants to create and redeem shares of the Reference Stock. Further, market volatility may adversely affect, sometimes materially, the prices at which market participants are willing to buy and sell shares of the Reference Stock. As a result, under these circumstances, the market value of shares of the Reference Stock may vary substantially from its net asset value per share. For all of the foregoing reasons, the performance of the Reference Stock may not correlate with the performance of its Underlying Index as well as its net asset value, which could materially and adversely affect the value of the Notes in the secondary market and/or reduce your payments on the Notes.

Management Risk — The Reference Stocks are not managed according to traditional methods of “active” investment management, which involve the buying and selling of securities based on economic, financial and market analysis and investment judgment. Instead, each Reference Stock, utilizing a “passive” or indexing investment approach, attempts to approximate the investment performance of its Underlying Index by investing in a portfolio of securities that generally replicate its Underlying Index. Therefore, unless a specific security is removed from its Underlying Index, the Reference Stock generally would not sell a security because the security’s issuer was in financial trouble. In addition, each Reference Stock subject to the risk that the investment strategy of its investment advisor may not produce the intended results.

We and Our Affiliates Do Not Have Any Affiliation with the Advisors or the Sponsors of the Reference Stocks or the Underlying Indices and Are Not Responsible for Their Public Disclosure of Information — We and our affiliates are not affiliated with the investment advisors or the sponsors of any Reference Stock or their Underlying Indices in any way and have no ability to control or predict their actions, including any errors in or discontinuance of disclosure regarding their methods or policies relating to the Reference Stocks or the Underlying Indices. The investment advisors or the sponsors of the Reference Stocks and the Underlying Indices are not involved in the offering of the Notes in any way and have no obligation to consider your interests as an owner of the Notes in taking any actions relating to the Reference Stocks that might affect the value of the Notes. Neither we nor any of our affiliates has independently verified the adequacy or accuracy of the information about the investment advisors, the sponsors, or the Reference Stocks contained in any public disclosure of information. You, as an investor in the Notes, should make your own investigation into the Reference Stocks.

The Policies of the Reference Stocks’ Investment Advisers or Underlying Indices Could Affect the Amount Payable on the Notes and Their Market Value — The policies of the Reference Stocks’ investment advisers concerning the management of the Reference Stocks, or the index sponsor for each Underlying Index, concerning the calculation of each Underlying Index, additions, deletions or substitutions of the securities held by the Reference Stocks could affect the market price of shares of the Reference Stocks and, therefore, the amount payable on the Notes on the maturity date and the market value of the Notes before that date. The amount payable on the Notes and their market value could also be affected if the Reference Stocks’ investment advisers or relevant sponsors change these policies,

for example, by changing the manner in which an investment adviser manages the Reference Stocks, or if the sponsor changes the manner in which it calculates the applicable index, or if a Reference Stock's investment adviser discontinues or suspends maintenance of a Reference Stock, in which case it may become difficult to determine the market value of the Notes. The Reference Stocks' investment advisers have no connection to the offering of the Notes and have no obligations to you as an investor in the Notes in making its decisions regarding the Reference Stocks. An Investment in Notes Linked to the EEM Is Subject to Risks Associated with Foreign Securities Markets — The EEM tracks the value of certain foreign equity securities. You should be aware that investments in securities linked to the value of foreign equity securities involve particular risks. The foreign securities markets represented by the EEM may have less liquidity and may be more volatile than U.S. or other securities markets and market developments may affect foreign markets differently from U.S. or other securities markets. Direct or indirect government intervention to stabilize these foreign securities markets, as well as cross-shareholdings in foreign companies, may affect trading prices and volumes in these markets. Also, there is generally less publicly available information about foreign companies than about those U.S. companies that are subject to the reporting requirements of the U.S. Securities and Exchange Commission, and foreign companies are subject to accounting, auditing and financial reporting standards and requirements that differ from those applicable to U.S. reporting companies.

P-10 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

Prices of securities in foreign countries are subject to political, economic, financial and social factors that apply in those geographical regions. These factors, which could negatively affect those securities markets, include the possibility of recent or future changes in a foreign government's economic and fiscal policies, the possible imposition of, or changes in, currency exchange laws or other laws or restrictions applicable to foreign companies or investments in foreign equity securities and the possibility of fluctuations in the rate of exchange between currencies, the possibility of outbreaks of hostility and political instability and the possibility of natural disaster or adverse public health developments in the region. Moreover, foreign economies may differ favorably or unfavorably from the U.S. economy in important respects such as growth of gross national product, rate of inflation, capital reinvestment, resources and self-sufficiency.

An Investment in the Notes is Subject to Emerging Markets Risk — Investments in securities linked directly or indirectly to emerging market equity securities, such as the EEM, involve many risks, including, but not limited to: economic, social, political, financial and military conditions in the emerging market; regulation by national, provincial, and local governments; less liquidity and smaller market capitalizations than exist in the case of many large U.S. companies; different accounting and disclosure standards; and political uncertainties. Stock prices of emerging market companies may be more volatile and may be affected by market developments differently than U.S. companies. Government intervention to stabilize securities markets and cross-shareholdings may affect prices and volume of trading of the securities of emerging market companies. Economic, social, political, financial and military factors could, in turn, negatively affect such companies' value. These factors could include changes in the emerging market government's economic and fiscal policies, possible imposition of, or changes in, currency exchange laws or other laws or restrictions applicable to the emerging market companies or investments in their securities, and the possibility of fluctuations in the rate of exchange between currencies. Moreover, emerging market economies may differ favorably or unfavorably from the U.S. economy in a variety of ways, including growth of gross national product, rate of inflation, capital reinvestment, resources and self-sufficiency. You should carefully consider the risks related to emerging markets, to which the Notes are highly susceptible, before making a decision to invest in the Notes.

The Securities Composing the Underlying Index of the XLV and XOP Are Each Concentrated in One Sector — All of the securities included in the XLV and XOP are issued by companies in a single sector, namely, the health care sector and the energy sector, respectively. As a result, the securities that will determine the performance of the XLV and XOP and the levels of each Underlying Index, are concentrated in one sector. Although an investment in the Notes will not give holders any ownership or other direct interests in the securities composing an Underlying Index, the return on an investment in the Notes will be subject to certain risks associated with a direct equity investment in companies in these market sectors. Accordingly, by investing in the Notes, you may not benefit from the diversification which could result from an investment linked to companies that operate in multiple sectors.

Risks Associated with the Healthcare Sector - The equity securities held by the XLV are issued by companies that are in the following industries: pharmaceuticals, health care equipment and supplies, health care providers and services, biotechnology, life sciences tools and services, and health care technology. As a result, the value of the Notes may be subject to greater volatility and be more adversely affected by a single economic, environmental, political or regulatory occurrence affecting such industries than an investment linked to a more broadly diversified group of issuers. Stock prices for these types of companies are affected by supply and demand both for their specific product or service and for health care products and services in general.

The Stocks of Companies in the Energy Sector Are Subject to Swift Price Fluctuations -The issuers of the stocks held by the XOP develop and produce, among other things, crude oil and natural gas, and provide, among other things, drilling services and other services related to energy resources production and distribution. Stock prices for these types of companies are affected by supply and demand both for their specific product or service and for energy

products in general. The price of oil and gas, exploration and production spending, government regulation, world events and economic conditions will likewise affect the performance of these companies. The stock prices of oil service companies could be subject to wide fluctuations in response to a variety of factors, including the ability of the OPEC to set and maintain production levels and pricing, the level of production in non-OPEC countries, the demand for oil and gas, which is negatively impacted by economic downturns, the policies of various governments regarding exploration and development of oil and gas reserves, advances in exploration and development technology and the political environment of oil-producing regions. Correspondingly, securities of companies in the energy field are subject to swift price and supply fluctuations caused by events relating to international politics, energy conservation, the success of exploration projects and tax and other governmental regulatory policies.

P-11 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

INFORMATION REGARDING THE REFERENCE STOCKS

We have derived the following information regarding each of the Reference Stocks from publicly available documents. We have not independently verified the accuracy or completeness of the following information. Information provided to or filed with the SEC as to each Reference Stock can be obtained through the SEC's website, www.sec.gov. We have not independently verified the accuracy or completeness of the applicable information or reports, and the information in those reports shall not be deemed to be included or incorporated into this document. The selection of the Reference Stocks is not a recommendation to buy or sell those shares. Neither we nor any of our affiliates make any representation to you as to the performance of the Reference Stocks.

iShares® MSCI Emerging Markets ETF (“EEM”)

The shares of the EEM are issued by iShares, Inc. (“iShare®”), a registered investment company, which consists of numerous separate investment portfolios, including the iShares® MSCI Emerging Markets ETF. The EEM seeks investment results that correspond generally to the price and yield performance, before fees and expenses, of the MSCI Emerging Markets Index (the “Underlying Index”). BlackRock Fund Advisors (the “Advisor”) serves as the investment advisor to the EEM. The EEM typically earns income from dividends from securities included in the Underlying Index. These amounts, net of expenses and taxes (if applicable), are passed along to the EEM's shareholders as “ordinary income.” In addition, the EEM realizes capital gains or losses whenever it sells securities. Net long-term capital gains are distributed to shareholders as “capital gain distributions.” However, because the Notes are linked only to the share price of the EEM, you will not be entitled to receive income, dividend, or capital gain distributions from the EEM or any equivalent payments.

“iShare®” and BlackRock® are registered trademarks of BlackRock, Inc. (“BlackRock®”). BlackRock® has licensed certain trademarks and trade names of BlackRock® for our use. The Notes are not sponsored, endorsed, sold, or promoted by BlackRock®, or by iShares®. Neither BlackRock® nor iShares® make any representations or warranties to the owners of the Notes or any member of the public regarding the advisability of investing in the Notes. Neither BlackRock® nor iShares® shall have any obligation or liability in connection with the registration, operation, marketing, trading, or sale of the Notes or in connection with our use of information about the iShares® funds.

The EEM

The EEM trades on the NYSE Arca under the ticker symbol “EEM.” BlackRock employs a technique known as representative sampling to track the Underlying Index. The EEM generally invests at least 90% of its assets in the securities of the Underlying Index and in American Depositary Receipts or Global Depositary Receipts based on the securities of the Underlying Index. The EEM may invest the remainder of its assets in securities not included in the Underlying Index, but which Blackrock believes will help the EEM track the Underlying Index, or in futures contracts, options on futures contracts, other types of options and swaps related to the Underlying Index, as well as cash and cash equivalents, including shares of money market funds affiliated with BlackRock or its affiliates. BlackRock will waive portfolio management fees in an amount equal to the portfolio management fees of such other iShares funds for any portion of the EEM's assets invested in shares of such other funds.

Investment Objective and Strategy

The EEM seeks to provide investment results that correspond generally to the price and yield performance, before fees and expenses, of publicly traded securities in emerging markets, as represented by the Underlying Index. The EEM's investment objective and the Underlying Index may be changed at any time without shareholder approval.

The return on the Notes is linked to the performance of the EEM, and not to the performance of the Underlying Index on which the EEM is based. Although the EEM seeks results that correspond generally to the performance of the Underlying Index, the EEM follows a strategy of “representative sampling,” which means the EEM's holdings do not identically correspond to the holdings and weightings of the Underlying Index, and may significantly diverge from the Underlying Index. Although the EEM generally invests at least 90% of its assets in some of the same securities as

those contained in the Underlying Index and in depositary receipts representing the same securities as those contained in the Underlying Index, it does not hold all of the securities underlying the Underlying Index and may invest the remainder in securities that are not contained in the Underlying Index, or in other types of investments. Currently, the EEM holds substantially fewer securities than the Underlying Index. Additionally, when the EEM purchases securities not held by the Underlying Index, the EEM may be exposed to additional risks, such as counterparty credit risk or liquidity risk, to which the Underlying Index components are not exposed. Therefore, the EEM will not directly track the performance of the Underlying Index and there may be significant variation between the performance of the EEM and the Underlying Index on which it is based.

P-12 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

Representative Sampling

BlackRock uses a representative sampling strategy to track the Underlying Index. Representative sampling is an indexing strategy that involves investing in a representative sample of securities that collectively has an investment profile similar to the Underlying Index. The securities selected are expected to have, in the aggregate, investment characteristics (based on factors such as market capitalization and industry weightings), fundamental characteristics (such as return variability and yield) and liquidity measures similar to those of the Underlying Index. Funds may or may not hold all of the securities that are included in the Underlying Index.

Correlation

The Underlying Index is a theoretical financial calculation, while the EEM is an actual investment portfolio. The performance of the EEM and the index will vary somewhat due to transaction costs, foreign currency valuations, asset valuations, corporate actions (such as mergers and spin-offs), timing variances and differences between the EEM's portfolio and the index resulting from legal restrictions (such as diversification requirements that apply to the EEM but not to the index) or representative sampling. A figure of 100% would indicate perfect correlation. Any correlation of less than 100% is called "tracking error." The EEM, using representative sampling, can be expected to have a greater tracking error than if it used a replication indexing strategy. "Replication" is a strategy in which a fund invests in substantially all of the securities in its Underlying Index in approximately the same proportions as in the Underlying Index.

Share Prices

The approximate value of one share of the EEM is disseminated every fifteen seconds throughout the trading day by the national securities exchange on which the EEM is listed or by other information providers or market data vendors. This approximate value should not be viewed as a "real-time" update of the net asset value, because the approximate value may not be calculated in the same manner as the net asset value, which is computed once a day. The approximate value generally is determined by using current market quotations and/or price quotations obtained from broker-dealers that may trade in the portfolio securities held by the EEM. The EEM is not involved in, or responsible for, the calculation or dissemination of the approximate value and makes no warranty as to its accuracy.

The Underlying Index

The information below is included only to give insight to the Underlying Index, the performance of which the EEM attempts to reflect. The Notes are linked to the performance of the EEM and not to the Underlying Index. We have derived all information contained in this document regarding the Underlying Index, including, without limitation, its make-up, method of calculation and changes in its components, from publicly available information. The Underlying Index is a stock index calculated, published and disseminated daily by MSCI, Inc. ("MSCI"), a majority-owned subsidiary of Morgan Stanley, through numerous data vendors, on the MSCI website and in real time on Bloomberg Financial Markets and Reuters Limited. Neither MSCI nor Morgan Stanley has any obligation to continue to calculate and publish, and may discontinue calculation and publication of the Underlying Index

The Underlying Index is intended to measure equity market performance in the global emerging markets. The Underlying Index is a free float-adjusted market capitalization index with a base date of December 31, 1987 and an initial value of 100. The Underlying Index is calculated daily in U.S. dollars and published in real time every 60 seconds during market trading hours. The Underlying Index currently consists of the following 24 emerging market country indices: Brazil, Chile, China, Colombia, Czech Republic, Greece, Egypt, Hungary, India, Indonesia, South Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Russia, South Africa, Taiwan, Thailand, Turkey and United Arab Emirates. According to MSCI, beginning in June 2018, MSCI began to include Chinese A Shares in the Underlying Index. The Underlying Index is part of the MSCI Regional Equity Indices series and is an MSCI Global Investable Market Index, which is a family within the MSCI International Equity Indices.

General – MSCI Indices

MSCI provides global equity indices intended to measure equity performance in international markets and the MSCI International Equity Indices are designed to serve as global equity performance benchmarks. In constructing these indices, MSCI applies its index construction and maintenance methodology across developed, emerging, and frontier markets.

MSCI enhanced the methodology used in its MSCI International Equity Indices. The MSCI Standard and MSCI Small Cap Indices, along with the other MSCI equity indices based on them, transitioned to the global investable market indices methodology described below. The transition was completed at the end of May 2008. The Enhanced MSCI Standard Indices are composed of the MSCI Large Cap and Mid Cap Indices. The MSCI Global Small Cap Index transitioned to the MSCI Small Cap Index resulting from the Global Investable Market Indices methodology and contains no overlap with constituents of the transitioned MSCI Standard Indices. Together, the relevant MSCI Large Cap, Mid Cap, and Small Cap Indices will make up the MSCI investable market index for each country, composite, sector, and style index that MSCI offers.

P-13 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

Constructing the MSCI Global Investable Market Indices. MSCI undertakes an index construction process, which involves:

- defining the equity universe;
- determining the market investable equity universe for each market;
- determining market capitalization size segments for each market;
- applying index continuity rules for the MSCI Standard Index;
 - creating style segments within each size segment within each market; and
- classifying securities under the Global Industry Classification Standard (the “GICS”).

Defining the Equity Universe. The equity universe is defined by:

Identifying Eligible Equity Securities: the equity universe initially looks at securities listed in any of the countries in the MSCI Global Index Series, which will be classified as either Developed Markets (“DM”) or Emerging Markets (“EM”). All listed equity securities, including Real Estate Investment Trusts, are eligible for inclusion in the equity universe. Conversely, mutual funds, ETFs, equity derivatives and most investment trusts are not eligible for inclusion in the equity universe.

Classifying Eligible Securities into the Appropriate Country: each company and its securities (i.e., share classes) are classified in only one country.

Effective with the November 2015 semi-annual index review, companies traded outside of their country of classification (i.e., “foreign listed companies”) became eligible for inclusion in the MSCI Country Investable Market Indexes along with the applicable MSCI Global Index. In order for a MSCI Country Investable Market Index to be eligible to include foreign listed companies, it must meet the Foreign Listing Materiality Requirement. To meet the Foreign Listing Materiality Requirement, the aggregate market capitalization of all securities represented by foreign listings should represent at least (i) 5% of the free float-adjusted market capitalization of the relevant MSCI Country Investable Market Index and (ii) 0.05% of the free-float adjusted market capitalization of the MSCI ACWI Investable Market Index.

Determining the Market Investable Equity Universes. A market investable equity universe for a market is derived by applying investability screens to individual companies and securities in the equity universe that are classified in that market. A market is equivalent to a single country, except in DM Europe, where all DM countries in Europe are aggregated into a single market for index construction purposes. Subsequently, individual DM Europe country indices within the MSCI Europe Index are derived from the constituents of the MSCI Europe Index under the global investable market indices methodology.

The investability screens used to determine the investable equity universe in each market are as follows:

Equity Universe Minimum Size Requirement: this investability screen is applied at the company level. In order to be included in a market investable equity universe, a company must have the required minimum full market capitalization.

Equity Universe Minimum Free Float-Adjusted Market Capitalization Requirement: this investability screen is applied at the individual security level. To be eligible for inclusion in a market investable equity universe, a security must have a free float-adjusted market capitalization equal to or higher than 50% of the equity universe minimum size requirement.

DM and EM Minimum Liquidity Requirement: this investability screen is applied at the individual security level. To be eligible for inclusion in a market investable equity universe, a security must have adequate liquidity. The twelve-month and three-month Annual Traded Value Ratio (“ATVR”), a measure that screens out extreme daily trading volumes and takes into account the free float-adjusted market capitalization size of securities, together with the three-month frequency of trading are used to measure liquidity. A minimum liquidity level of 20% of three- and

twelve-month ATVR and 90% of three-month frequency of trading over the last four consecutive quarters are required for inclusion of a security in a market investable equity universe of a DM, and a minimum liquidity level of 15% of three- and twelve-month ATVR and 80% of three-month frequency of trading over the last four consecutive quarters are required for inclusion of a security in a market investable equity universe of an EM.

Global Minimum Foreign Inclusion Factor Requirement: this investability screen is applied at the individual security level. To be eligible for inclusion in a market investable equity universe, a security's Foreign Inclusion Factor ("FIF") must reach a certain threshold. The FIF of a security is defined as the proportion of shares outstanding that is available for purchase in the public equity markets by international investors. This proportion accounts for the available free float of and/or the foreign ownership limits applicable to a specific security (or company). In general, a security must have an FIF equal to or larger than 0.15 to be eligible for inclusion in a market investable equity universe.

P-14 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

Minimum Length of Trading Requirement: this investability screen is applied at the individual security level. For an initial public offering (“IPO”) to be eligible for inclusion in a market investable equity universe, the new issue must have started trading at least three months before the implementation of a semi-annual index review (as described below). This requirement is applicable to small new issues in all markets. Large IPOs are not subject to the minimum length of trading requirement and may be included in a market investable equity universe and the Standard Index outside of a Quarterly or Semi-Annual Index Review.

Minimum Foreign Room Requirement: this investability screen is applied at the individual security level. For a security that is subject to a foreign ownership limit to be eligible for inclusion in a market investable equity universe, the proportion of shares still available to foreign investors relative to the maximum allowed (referred to as “foreign room”) must be at least 15%.

Defining Market Capitalization Size Segments for Each Market. Once a market investable equity universe is defined, it is segmented into the following size-based indices:

- Investable Market Index (Large + Mid + Small);
- Standard Index (Large + Mid);
- Large Cap Index;
- Mid Cap Index; or
- Small Cap Index.

Creating the size segment indices in each market involves the following steps:

- defining the market coverage target range for each size segment;
- determining the global minimum size range for each size segment;
- determining the market size segment cutoffs and associated segment number of companies;
- assigning companies to the size segments; and
- applying final size-segment investability requirements.

Index Continuity Rules for the Standard Indices. In order to achieve index continuity, as well as to provide some basic level of diversification within a market index, and notwithstanding the effect of other index construction rules described in this section, a minimum number of five constituents will be maintained for a DM Standard Index and a minimum number of three constituents will be maintained for an EM Standard Index.

Creating Style Indices within Each Size Segment. All securities in the investable equity universe are classified into value or growth segments using the MSCI Global Value and Growth methodology.

Classifying Securities under the Global Industry Classification Standard. All securities in the global investable equity universe are assigned to the industry that best describes their business activities. To this end, MSCI has designed, in conjunction with S&P Dow Jones Indexes, the GICS. Under the GICS, each company is assigned to one sub-industry according to its principal business activity. Therefore, a company can belong to only one industry grouping at each of the four levels of the GICS.

Calculation Methodology for the Underlying Index

The performance of the Underlying Index is a free float weighted average of the U.S. dollar values of its component securities.

Prices used to calculate the component securities are the official exchange closing prices or prices accepted as such in the relevant market. In case of market closure, or if a security does not trade on a specific day or during a specific period, MSCI carries forward the previous day’s price (or latest available closing price). In the event of a market outage resulting in any component security price to be unavailable, MSCI will generally use the last reported price for such component security for the purpose of performance calculation unless MSCI determines that another price is more appropriate based on the circumstances. Closing prices are converted into U.S. dollars, as applicable, using the closing exchange rates calculated by WM/Reuters at 4:00 P.M. London time.

P-15 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

Index Maintenance

The MSCI Global Investable Market Indices are maintained with the objective of reflecting the evolution of the underlying equity markets and segments on a timely basis, while seeking to achieve index continuity, continuous investability of constituents and replicability of the indices, index stability and low index turnover. In particular, index maintenance involves:

(i) Semi-Annual Index Reviews (“SAIRs”) in May and November of the Size Segment and Global Value and Growth

Indices which include:

- updating the indices on the basis of a fully refreshed equity universe;
- taking buffer rules into consideration for migration of securities across size and style segments; and
- updating FIFs and Number of Shares (“NOS”).

(ii) Quarterly Index Reviews in February and August of the Size Segment Indices aimed at:

- including significant new eligible securities (such as IPOs that were not eligible for earlier inclusion) in the index;
- allowing for significant moves of companies within the Size Segment Indices, using wider buffers than in the SAIR;
- and
- reflecting the impact of significant market events on FIFs and updating NOS.

(iii) Ongoing Event-Related Changes: changes of this type are generally implemented in the indices as they occur.

Significantly large IPOs are included in the indices after the close of the company’s tenth day of trading.

None of us, RBCCM or any of our other affiliates accepts any responsibility for the calculation, maintenance, or publication of, or for any error, omission, or disruption in, the index or any successor to the index.

P-16 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

Historical Information for the iShares® MSCI Emerging Markets ETF (“EEM”)

The graph below sets forth the information relating to the historical performance of the EEM. The information provided in this graph is for the period from January 1, 2009 through March 1, 2019. On March 1, 2019, the closing price of this Reference Stock was \$42.49.

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

P-17 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

The Health Care Select Sector SPDR® Fund (“XLV”)

The XLV seeks to provide investment results that correspond generally to the price and yield performance, before fees and expenses, of the S&P® Health Care Select Sector Index (the “Underlying Index”). The Underlying Index measures the performance of the health care sector of the U.S. equity market. The XLV is composed of companies whose primary line of business is directly associated with the health care sector. The XLV trades on the NYSE Arca under the ticker symbol “XLV.”

The XLV utilizes a “replication” investment approach in attempting to track the performance of the Underlying Index. The XLV typically invests in substantially all of the securities which comprise the Underlying Index in approximately the same proportions as Underlying Index. The XLV will normally invest at least 95% of its total assets in the common stocks that comprise the Underlying Index.

Eligibility Criteria for Index Components

The stocks included in each Select Sector Index are selected from the universe of companies represented by the S&P 500® Index. Standard & Poor’s Financial Services LLC (“S&P”) acts as index calculation agent in connection with the calculation and dissemination of each Select Sector Index. Each stock in the S&P 500® Index is allocated to only one Select Sector Index, and the nine Select Sector Indices together comprise all of the companies in the S&P 500® Index.

Index Maintenance

Each Select Sector Index was developed and is maintained in accordance with the following criteria:

Each of the component stocks in a Select Sector Index (the “SPDR Component Stocks”) is a constituent company of the S&P 500® Index.

The nine Select Sector Indices together will include all of the companies represented in the S&P 500® Index and each of the stocks in the S&P 500® Index will be allocated to one and only one of the Select Sector Indices.

Each constituent stock of the S&P 500® Index is assigned to a Select Sector Index on the basis of that company’s sales and earnings composition and the sensitivity of the company’s stock price and business results to the common factors that affect other companies in each Select Sector Index.

S&P has sole control over the removal of stocks from the S&P 500® Index and the selection of replacement stocks to be added to the S&P 500® Index. However, S&P plays only a consulting role in the Select Sector Indices.

Each Select Sector Index is calculated by S&P using a modified “market capitalization” methodology. This design ensures that each of the component stocks within a Select Sector Index is represented in a proportion consistent with its percentage with respect to the total market capitalization of that Select Sector Index. However, under certain conditions, the number of shares of a component stock within the Select Sector Index may be adjusted to conform to certain Internal Revenue Code requirements.

Calculation of the Underlying Index

Each Select Sector Index is calculated using the same methodology utilized by S&P in calculating the S&P 500® Index, using a base-weighted aggregate methodology. The daily calculation of each Select Sector Index is computed by dividing the total market value of the companies in the Select Sector Index by a number called the index divisor. A SPDR® Component Stock which has been assigned to one Select Sector Index may be determined to have undergone a transformation in the composition of its business, and that it should be removed from that Select Sector Index and assigned to a different Select Sector Index. In the event that a SPDR® Component Stock’s Select Sector Index assignment should be changed, S&P will disseminate notice of the change following its standard procedure for announcing index changes, and will implement the change in the affected Select Sector Indexes on a date no less than one week after the initial dissemination of information on the sector change to the maximum extent practicable.

SPDR® Component Stocks removed from and added to the S&P 500® Index will be deleted from and added to the appropriate Select Sector Index on the same schedule used by S&P for additions and deletions from the S&P 500® Index insofar as practicable.

P-18 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

Historical Information for the Health Care Select Sector SPDR® Fund (“XLV”)

The graph below sets forth the information relating to the historical performance of the XLV. The information provided in this graph is for the period from January 1, 2009 through March 1, 2019. On March 1, 2019, the closing price of this Reference Stock was \$92.95.

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

P-19 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

SPDR® S&P® Oil & Gas Exploration & Production ETF (“XOP”)

We have derived all information contained in this document regarding the XOP, including, without limitation, its make-up, method of calculation and changes in its components, from publicly available information. Such information reflects the policies of, and is subject to change by, S&P.

The Underlying Index is an equal-weighted index that is designed to measure the performance of the oil and gas exploration and production sub-industry portion of the S&P TMI. The S&P TMI includes all U.S. common equities listed on the NYSE (including NYSE Arca), the NYSE American, the Nasdaq Global Select Market, and the Nasdaq Capital Market. Each of the component stocks in the Underlying Index is a constituent company within the oil and gas exploration and production sub-industry portion of the S&P TMI.

To be eligible for inclusion in the Underlying Index, companies must be in the S&P TMI and must be included in the relevant Global Industry Classification Standard (GICS) sub-industry. The GICS was developed to establish a global standard for categorizing companies into sectors and industries. In addition to the above, companies must satisfy one of the two following combined size and liquidity criteria:

- float-adjusted market capitalization above US\$500 million and float-adjusted liquidity ratio above 90%; or
- float-adjusted market capitalization above US\$400 million and float-adjusted liquidity ratio above 150%.

All U.S. companies satisfying these requirements are included in the Underlying Index. The total number of companies in the Underlying Index should be at least 35. If there are fewer than 35 stocks, stocks from a supplementary list of highly correlated sub-industries that meet the market capitalization and liquidity thresholds above are included in order of their float-adjusted market capitalization to reach 35 constituents. Minimum market capitalization requirements may be relaxed to ensure there are at least 22 companies in the Underlying Index as of each rebalancing effective date.

Eligibility factors include:

Market Capitalization: Float-adjusted market capitalization should be at least US\$400 million for inclusion in the Underlying Index. Existing index components must have a float-adjusted market capitalization of US\$300 million to remain in the Underlying Index at each rebalancing.

Liquidity: The liquidity measurement used is a liquidity ratio, defined as dollar value traded over the previous 12-months divided by the float-adjusted market capitalization as of the Underlying Index rebalancing reference date. Stocks having a float-adjusted market capitalization above US\$500 million must have a liquidity ratio greater than 90% to be eligible for addition to the Underlying Index. Stocks having a float-adjusted market capitalization between US\$400 and US\$500 million must have a liquidity ratio greater than 150% to be eligible for addition to the Underlying Index. Existing index constituents must have a liquidity ratio greater than 50% to remain in the Underlying Index at the quarterly rebalancing. The length of time to evaluate liquidity is reduced to the available trading period for IPOs or spin-offs that do not have 12 months of trading history.

Takeover Restrictions: At the discretion of S&P, constituents with shareholder ownership restrictions defined in company bylaws may be deemed ineligible for inclusion in the Underlying Index. Ownership restrictions preventing entities from replicating the index weight of a company may be excluded from the eligible universe or removed from the Underlying Index.

Turnover: S&P believes turnover in index membership should be avoided when possible. At times, a company may appear to temporarily violate one or more of the addition criteria. However, the addition criteria are for addition to the Underlying Index, not for continued membership. As a result, an index constituent that appears to violate the criteria for addition to the Underlying Index will not be deleted unless ongoing conditions warrant a change in the composition of the Underlying Index.

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

Historical Information for the SPDR® S&P® Oil & Gas Exploration & Production ETF (“XOP”)

The graph below sets forth the information relating to the historical performance of the XOP. The information provided in this graph is for the period from January 1, 2009 through March 1, 2019. On March 1, 2019, the closing price of this Reference Stock was \$30.41.

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

P-21 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
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 10, 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 IRS has issued guidance that states that the U.S. Treasury Department and the IRS intend to amend the effective dates of the U.S. Treasury Department regulations to provide that withholding on dividend equivalent payments will not apply to specified ELIs that are not delta-one instruments and that are issued before January 1, 2021. Based on our determination that the Notes are not delta-one instruments, non-U.S. holders should not be subject to withholding on dividend equivalent payments, if any, under the Notes. However, it is possible that the Notes could be treated as deemed reissued for U.S. federal income tax purposes upon the occurrence of certain events affecting the Reference Stocks or the Notes (for example, upon a Reference Stock 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 Stocks or the Notes should consult their tax advisors as to the application of the dividend equivalent withholding tax in the context of the Notes and their other transactions. If any payments are treated as dividend equivalents subject to withholding, we (or the applicable withholding agent) would be entitled to withhold taxes without being required to pay any additional amounts with respect to amounts so withheld.

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

P-22 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

SUPPLEMENTAL PLAN OF DISTRIBUTION (CONFLICTS OF INTEREST)

JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC and its affiliates will act as placement agents for the Notes and will receive a fee from the Issuer of \$15.00 per \$1,000 in principal amount of the Notes.

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

Delivery of the Notes will be made against payment for the Notes on March 6, 2019, which is the third (3rd) business day following the Trade 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.

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 six 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.

STRUCTURING THE NOTES

The Notes are our debt securities, the return on which is linked to the performance of the Reference Stocks. 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 Stocks, 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 Trade 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.

P-23 RBC Capital Markets, LLC

Contingent Coupon Barrier Notes with Memory Coupon
Linked to the Lesser Performing of Three Exchange Traded Funds
Royal Bank of Canada

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-24 RBC Capital Markets, LLC
