

ROYAL BANK OF CANADA  
Form 424B2  
March 21, 2017

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

Pricing Supplement

Dated March 17, 2017

To the Product

Prospectus Supplement \$7,698,000

No. TP-1, Auto-Callable Contingent Coupon Barrier Notes

the Prospectus Linked to the Lesser Performing of Two Exchange

Supplement and the Traded Funds and One Equity Index, Due March 21,

Prospectus, 2019

Each Dated January 8, Royal Bank of Canada

2016

Royal Bank of Canada is offering Auto-Callable Contingent Coupon Barrier Notes (the “Notes”) linked to the lesser performing of two exchange traded funds and one equity index (each, a “Reference Asset” and collectively, the “Reference Assets”). The Notes offered are senior unsecured obligations of Royal Bank of Canada, will pay a quarterly Contingent Coupon at the rate 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. The Notes will not be listed on any securities exchange.

| Reference Assets                           | Initial Levels <sup>(1)</sup> | Coupon Barriers and Trigger Levels <sup>(2)</sup> |
|--|-------------------------------|---|
| iShares® MSCI Emerging Markets ETF (“EEM”) | \$39.49                       | \$29.62, which is 75.00% of its Initial Level     |
| SPDR® S&P Midcap 400® ETF (“MDY”)          | \$314.22                      | \$235.67, which is 75.00% of its Initial Level    |
| NASDAQ-100® Index (“NDX”)                  | 5,408.76                      | 4,056.57, which is 75.00% of its Initial Level    |

<sup>(1)</sup>For the EEM and MDY each Initial Level was its respective closing price, and for the NDX, its closing level, on the Trade Date.

<sup>(2)</sup> 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 January 8, 2016, on page S-1 of the prospectus supplement dated January 8, 2016, and “Selected Risk Considerations” beginning on page P-7 of this pricing supplement.

The Notes will not constitute deposits insured by the Canada Deposit Insurance Corporation, the U.S. Federal Deposit Insurance Corporation or any other Canadian or U.S. government agency or instrumentality.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of the Notes or determined that this pricing supplement is truthful or complete. Any representation to the contrary is a criminal offense.

|                    |   |                         |                               |
|--------------------|---|-------------------------|-------------------------------|
| Issuer:            | Royal Bank of Canada  | Listing:                | None                          |
| Trade Date:        | March 17, 2017  | Principal Amount:       | \$1,000 per Note              |
| Issue Date:        | March 22, 2017  | Maturity Date:          | March 21, 2019                |
| Observation Dates: | Quarterly, as set forth below.  | Coupon Payment Dates:   | Quarterly, as set forth below |
| Valuation Date:    | March 18, 2019  | Contingent Coupon Rate: | 9.15% per annum               |
| Contingent Coupon: | If the Observation Level of each Reference Asset is greater than or equal to its Coupon Barrier on the applicable Observation Date, we will pay the Contingent Coupon applicable to the corresponding Observation Date. You may not receive any |                         |                               |

Contingent Coupons during the term of the Notes.

If the Notes are not previously called, we will pay you at maturity an amount based on the Final Level of the Lesser Performing Reference Asset:

For each \$1,000 in principal amount, \$1,000 plus the Contingent Coupon at maturity, unless the Final Level of the Lesser Performing Reference Asset is less than its Trigger Level.

Payment at Maturity (if held to maturity):

If the Final Level of the Lesser Performing Reference Asset is less than its Trigger Level, then the investor will receive at maturity, for each \$1,000 in principal amount, a cash payment equal to:

$\$1,000 + (\$1,000 \times \text{Reference Asset Return of the Lesser Performing Reference Asset})$

Investors could lose some or all of the value of their initial investment if there has been a decline in the trading price, or the trading level, as applicable, of the Lesser Performing Reference Asset.

Lesser Performing Reference Asset:

The Reference Asset with the largest percentage decrease between its Initial Level and its Final Level.

Call Feature:

If the Observation Level of each Reference Asset is greater than or equal to its Initial Level starting on June 19, 2017 and on any Observation Date thereafter, the Notes will be automatically called for 100% of their principal amount, plus the Contingent Coupon applicable to the corresponding Observation Date.

Call Settlement Dates:

The Coupon Payment Date corresponding to that Observation Date.

Observation Level:

For the EEM and MDY, their respective closing prices, and for the NDX, its closing level, on any Observation Date.

Final Level:

For the EEM and MDY, their respective closing price on the Valuation Date, and for the NDX, its closing level on the Valuation Date.

CUSIP:

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Dividend Equivalent Payments:

Non-U.S. holders will not be subject to withholding on dividend equivalent payments under Section 871(m) of the U.S. Internal Revenue Code. Please see the section below, "Supplemental Discussion of U.S. Federal Income Tax Consequences," which applies to the Notes.

|  | Per Note | Total          |
|--|----------|----------------|
| Price to public                        | 100.00%  | \$7,698,000.00 |
| Underwriting discounts and commissions | 1.75%    | \$134,715.00   |
| Proceeds to Royal Bank of Canada       | 98.25%   | 7,563,285.00   |

The initial estimated value of the Notes as of the date of this pricing supplement is \$971.61 per \$1,000 in principal amount, which is less than the price to public. The actual value of the Notes at any time will reflect many factors, cannot be predicted with accuracy, and may be less than this amount. We describe our determination of the initial estimated value in more detail below.

RBC Capital Markets, LLC, which we refer to as RBCCM, acting as agent for Royal Bank of Canada, received a commission of \$17.50 per \$1,000 in principal amount of the Notes and used a portion of that commission to allow selling concessions to other dealers of up to \$17.50 per \$1,000 in principal amount of the Notes. The other dealers may forgo, in their sole discretion, some or all of their selling concessions. See "Supplemental Plan of Distribution (Conflicts of Interest)" on page P-29 below.

RBC Capital Markets, LLC

Auto-Callable Contingent Coupon Barrier Notes  
 Linked to the Lesser Performing of Two  
 Exchange Traded Funds, and One Equity  
 Index, Due March 21, 2019  
 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.

This pricing supplement relates to an offering of Auto-Callable Contingent Coupon Barrier Notes (the “Notes”) linked to the lesser performing of the following (each, a “Reference Asset”, and collectively, the “Reference Assets”):

- General: (i) the shares of iShares<sup>®</sup> MSCI Emerging Markets ETF (the “EEM”);  
 (ii) the shares of SPDR<sup>®</sup> S&P Midcap 400<sup>®</sup> ETF (the “MDY”, and together with the EEM, the “Exchange Traded Funds”); and  
 (iii) the NASDAQ-100<sup>®</sup> Index (the “NDX”).

See “Additional Terms of your Notes Related to Indices” below, which relates to the NDX.

Issuer: Royal Bank of Canada (“Royal Bank”)  
 Issue: Senior Global Medium-Term Notes, Series G  
 Trade Date: March 17, 2017  
 Issue Date: March 22, 2017  
 Term: Approximately two (2) years  
 Denominations: Minimum denomination of \$1,000, 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:

- Contingent Coupon: · If the Observation Level of each Reference Asset is greater than or equal to its Coupon Barrier on the applicable Observation Date, we will pay the Contingent Coupon applicable to that Observation Date.  
 · If the Observation Level of any of the Reference Assets is less than its Coupon Barrier on the applicable Observation Date, we will not pay you the Contingent Coupon applicable to that Observation Date.  
 You may not receive a Contingent Coupon for one or more quarterly periods during the term of the Notes.

Contingent Coupon Rate: 9.15% per annum (2.2875% per quarter)  
 Observation Dates: Quarterly on June 19, 2017, September 18, 2017, December 18, 2017, March 19, 2018, June 18, 2018, September 17, 2018, December 17, 2018 and the Valuation Date.  
 Coupon Payment Dates: The Contingent Coupon, if applicable, will be paid quarterly on June 22, 2017, September 21, 2017, December 21, 2017, March 22, 2018, June 21, 2018, September 20, 2018, December 20, 2018 and the Maturity Date.

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

Call Feature: If, starting on June 19, 2017 and on any Observation Date thereafter, the Observation Level of each Reference Asset is greater than or equal to its Initial Level, then the Notes will be automatically

called.

If the Notes are automatically called, then, on the applicable Call Settlement Date, for each \$1,000 Payment if Called:principal amount, you will receive \$1,000 plus the Contingent Coupon otherwise due on that Call Settlement Date.

P-2 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes

Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

Call Settlement Dates: If the Notes are called on any Observation Date, the Call Settlement Date will be the Coupon Payment Date corresponding to that Observation Date.

Valuation Date: March 18, 2019

Maturity Date: March 21, 2019

Initial Level: For the EEM and the MDY, their respective closing prices, and for the NDX, its closing level, as specified on the cover page of this pricing supplement.

Final Level: For the EEM and the MDY, their respective closing prices, and for the NDX, its closing level, on the Valuation Date.

Observation Level: For the EEM and the MDY, their respective closing prices, and for the NDX, its closing level, on any Observation Date.

Trigger Level and Coupon Barrier: For each Reference Asset, 75.00% of its Initial Level.

If the Notes are not previously called, we will pay you at maturity an amount based on the Final Level of the Lesser Performing Reference Asset:

· If the Final Level of the Lesser Performing Reference Asset is greater than or equal to its Trigger Level, we will pay you a cash payment equal to the principal amount plus the Contingent Coupon otherwise due on the Maturity Date.

· If the Final Level of the Lesser Performing Reference Asset is below its Trigger Level, you will receive at maturity, for each \$1,000 in principal amount, a cash payment equal to:  
\$1,000 + (\$1,000 x Reference Asset Return of the Lesser Performing Reference Asset)

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 Asset from the Trade Date to the Valuation Date. Investors in the Notes could lose some or all of their investment if there has been a decline in the value of the Lesser Performing Reference Asset below its Trigger Level.

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

With respect to each Reference Asset:

Reference Asset Return:  $\frac{\text{Final Level} - \text{Initial Level}}{\text{Initial Level}}$

Lesser

Performing Reference Asset: The Reference Asset with the largest percentage decrease between its Initial Level and its Final Level.

Market Disruption Events: The occurrence of a market disruption event (or a non-trading day) as to any of the Reference Assets will result in the postponement of an Observation Date or the Valuation Date as to that Reference Asset, as described in the product prospectus supplement, but not to any non-affected Reference Asset.

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

U.S. Tax Treatment: By purchasing a Note, each holder agrees (in the absence of a change in law, an administrative determination or a judicial ruling to the contrary) to treat the Note as a callable pre-paid cash-settled contingent income-bearing derivative contract linked to the Reference Assets for U.S. federal income tax purposes. However, the U.S. federal income tax consequences of your investment in the Notes are uncertain and the Internal Revenue Service could assert that the Notes should be taxed in a manner that is different from that described in the preceding sentence. Please see the section below, "Supplemental Discussion of U.S. Federal Income Tax Consequences," and the discussion (including the opinion of our counsel Morrison & Foerster LLP) in the product prospectus supplement dated January 8, 2016 under "Supplemental Discussion of U.S. Federal Income Tax Consequences," which apply to the Notes.

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

P-3 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

**Listing:** The Notes will not be listed on any securities exchange.  
**Settlement:** DTC global (including through its indirect participants Euroclear and Clearstream, Luxembourg as described under “Description of Debt Securities—Ownership and Book-Entry Issuance” in the prospectus dated January 8, 2016).  
**Terms Incorporated in the Master Note:** All of the terms appearing above the item captioned “Secondary Market” on the cover page and pages P-2 and P-3 of this pricing supplement and the terms appearing under the caption “General Terms of the Notes” in the product prospectus supplement dated January 8, 2016, as modified by this pricing supplement.

P-4 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

#### ADDITIONAL TERMS OF YOUR NOTES

You should read this pricing supplement together with the prospectus dated January 8, 2016, as supplemented by the prospectus supplement dated January 8, 2016 and the product prospectus supplement dated January 8, 2016, relating to our Senior Global Medium-Term Notes, Series G, of which these Notes are a part. Capitalized terms used but not defined in this pricing supplement will have the meanings given to them in the product prospectus supplement. In the event of any conflict, this pricing supplement will control. The Notes vary from the terms described in the product prospectus supplement in several important ways. You should read this pricing supplement carefully, including “- Additional Terms Relating to Indices” below, which relate to the NDX.

This pricing supplement, together with the documents listed below, contains the terms of the Notes and supersedes all prior or contemporaneous oral statements as well as any other written materials including preliminary or indicative pricing terms, correspondence, trade ideas, structures for implementation, sample structures, brochures or other educational materials of ours. You should carefully consider, among other things, the matters set forth in “Risk Factors” in the prospectus supplement dated January 8, 2016 and in the product prospectus supplement dated January 8, 2016, as the Notes involve risks not associated with conventional debt securities. We urge you to consult your investment, legal, tax, accounting and other advisors before you invest in the Notes. You may access these documents on the Securities and Exchange Commission (the “SEC”) website at [www.sec.gov](http://www.sec.gov) as follows (or if that address has changed, by reviewing our filings for the relevant date on the SEC website):

Prospectus dated January 8, 2016:

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

Prospectus Supplement dated January 8, 2016:

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

Product Prospectus Supplement dated January 8, 2016:

<https://www.sec.gov/Archives/edgar/data/1000275/000114036116047446/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

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Auto-Callable Contingent Coupon Barrier Notes  
 Linked to the Lesser Performing of Two  
 Exchange Traded Funds, and One Equity  
 Index, Due March 21, 2019  
 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 (including the final Contingent Coupon, if payable) for a hypothetical range of performance for the Lesser Performing Reference Asset, assuming the following terms and that the Notes are not automatically called prior to maturity:

|  |  |
|--|--|
| Hypothetical Trigger Level and Coupon Barrier: | 75.00% of the hypothetical Initial Level |
| Contingent Coupon Rate:                        | 9.15% per annum (or 2.2875% per quarter) |
| Contingent Coupon Amount:                      | \$22.875 per quarter                     |
| Observation Dates:                             | Quarterly                                |
| Principal Amount:                              | \$1,000 per Note                         |

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

Hypothetical Final Levels of the Lesser Performing Reference Asset, expressed as a percentage of its Initial Level, are shown in the first column on the left. The second column shows the Payment at Maturity for a range of Reference Asset Returns on the Valuation Date. The third column shows the amount of cash to be paid on the Notes per \$1,000 in principal amount. If the Notes are called prior to maturity, the hypothetical examples below will not be relevant, and you will receive on the applicable interest payment date, for each \$1,000 principal amount, \$1,000 plus the Contingent Coupon otherwise due on the Notes.

| Final Level of the Lesser Performing Reference Asset (%) | Payment at Maturity as Percentage of Principal Amount | Cash Payment Amount per \$1,000 in Principal Amount |
|--|---|---|
| 130.00%  | 100.00%   | \$1,022.875*  |
| 120.00%  | 100.00%   | \$1,022.875*  |
| 110.00%  | 100.00%   | \$1,022.875*  |
| 100.00%  | 100.00%   | \$1,022.875*  |
| 90.00%   | 100.00%   | \$1,022.875*  |
| 85.00%   | 100.00%   | \$1,022.875*  |
| 75.00%   | 100.00%   | \$1,022.875*  |
| 74.99%   | 74.99%  | \$749.90  |
| 70.00%   | 70.00%  | \$700.00  |
| 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

\*Including the final Contingent Coupon, if payable.

P-6 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
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, assuming the Notes have not been called.

Example 1: The Final Level of the Lesser Performing Reference Asset is 120%, an increase of 20% from its Initial Level. Because the Final Level of the Lesser Performing Reference Asset is greater than its Trigger Level of 75.00%, the investor receives at maturity, in addition to the final Contingent Coupon of \$22.875 otherwise due on the Notes, a cash payment of \$1,000 per Note, despite the 20% appreciation in the value of the Lesser Performing Reference Asset.

Example 2: The Final Level of the Lesser Performing Reference Asset is 90.00%, a decrease of 10% from its Initial Level. Because the Final Level of the Lesser Performing Reference Asset is greater than its Trigger Level of 75.00%, the investor receives at maturity, in addition to the final Contingent Coupon of \$22.875 otherwise due on the Notes, a cash payment of \$1,000 per Note, despite the 10% decline in the value of the Lesser Performing Reference Asset.

Example 3: The Final Level of the Lesser Performing Reference Asset is 50.00% on the Valuation Date, which is less than its Trigger Level of 75.00%. Because the Final Level of the Lesser Performing Reference Asset is less than its Trigger Level, the final Contingent Coupon will not be payable on the Maturity Date, and we will pay only \$500.00 for each \$1,000 in the principal amount of the Notes, calculated as follows:

Principal Amount + (Principal Amount x Reference Asset Return of the Lesser Performing Reference Asset)  
= \$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 values of the Reference Assets that may not be achieved on the Valuation Date and on assumptions that may prove to be erroneous. The actual market value of your Notes on the Maturity Date or at any other time, including any time you may wish to sell your Notes, may bear little relation to the hypothetical Payments at Maturity shown above, and those amounts should not be viewed as an indication of the financial return on an investment in the Notes or on an investment in any Reference Asset or the securities included in any of the Reference Assets.

P-7 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
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 Assets. 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 value of the Lesser Performing Reference Asset between the Trade Date and the Valuation Date. If the Notes are not automatically called and the Final Level of the Lesser Performing Reference Asset on the Valuation Date is less than its Trigger Level, the amount of cash that you receive at maturity will represent a loss of your principal that is proportionate to the decline in the closing price or closing level, as applicable, of the Lesser Performing Reference Asset from the Trade Date to the Valuation Date. Any Contingent Coupons received on the Notes prior to the Maturity Date may not be sufficient to compensate for any such loss.

**The Notes Are Subject to an Automatic Call** — If on any Observation Date (other than the Valuation Date), the Observation Level of each Reference Asset is greater than or equal to its Initial Level, then the Notes will be automatically called. If the Notes are automatically called, then, on the applicable Call Settlement Date, for each \$1,000 in principal amount, you will receive \$1,000 plus the Contingent Coupon otherwise due on the applicable Call Settlement Date. You will not receive any Contingent Coupons after the Call Settlement Date. You may be unable to reinvest your proceeds from the automatic call in an investment with a return that is as high as the return on the Notes would have been if they had not been called.

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

**The Notes Are Linked to the Lesser Performing Reference Asset, Even if the Other Reference Assets Perform Better** — If any of the Reference Assets has a Final Level that is less than its Trigger Level, your return will be linked to the lesser performing of the three Reference Assets. Even if the Final Levels of the other Reference Assets have increased compared to their respective Initial Levels, or have experienced a decrease that is less than that of the Lesser Performing Reference Asset, your return will only be determined by reference to the performance of the Lesser Performing Reference Asset, regardless of the performance of the other Reference Assets.

**Your Payment on the Notes Will Be Determined by Reference to Each Reference Asset Individually, Not to a Basket, and the Payment at Maturity Will Be Based on the Performance of the Lesser Performing Reference Asset** — The Payment at Maturity will be determined only by reference to the performance of the Lesser Performing Reference Asset, regardless of the performance of the other Reference Assets. 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 Assets would not be combined, and the depreciation of one Reference Asset would not be mitigated by any appreciation of the other Reference Assets.

Instead, your return will depend solely on the Final Level of the Lesser Performing Reference Asset.

**The Call Feature and the Contingent Coupon Feature Limit Your Potential Return** — The return potential of the Notes is limited to the pre-specified Contingent Coupon Rate, regardless of the appreciation of the Reference Assets. 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 or an automatic call. Further, if the Notes are called due to the Call Feature, you will not receive any Contingent Coupons or any other payment in respect of any Observation Dates after the applicable Call Settlement Date. Since the Notes could be called as early as the first Observation Date, the total return on the Notes could be minimal. If the Notes are not called, you may be subject to the full downside performance of the Lesser Performing Reference Asset even though your potential return is limited to the Contingent Coupon Rate. As a result, the return on an investment in the Notes could be less than the return on a direct investment in the Reference Assets.

**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.

P-8 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

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

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

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 or levels of the Reference Assets, 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.

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

Owning the Notes Is Not the Same as Owning the Exchange Traded Funds or the Securities Represented by the NDX — The return on your Notes is unlikely to reflect the return you would realize if you actually owned shares of the Exchange Traded Funds or the securities represented by the NDX. 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 Assets may appreciate substantially during the term of the Notes, while your potential return will be limited to the applicable Contingent Coupon payments.

P-9 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

Prior to Maturity, the Value of the Notes Will Be Influenced by Many Unpredictable Factors — Many economic and market factors will influence the value of the Notes. We expect that, generally, the price or level of each Reference Asset on any day will affect the value of the Notes more than any other single factor. However, you should not expect the value of the Notes in the secondary market to vary in proportion to changes in the value of the Reference Assets. The value of the Notes will be affected by a number of other factors that may either offset or magnify each other, including:

- Ø the market value of the Reference Assets;
- Ø whether the market value of one or more of the Reference Assets is below the Coupon Barrier or the Barrier Level;
- Ø the expected volatility of the Reference Assets;
- Ø the time to maturity of the Notes;
- Ø the dividend rate on the Reference Assets or on the equity securities represented by the Reference Assets;
- Ø interest and yield rates in the market generally, as well as in the markets of the equity securities represented by the Reference Assets;
- Ø the occurrence of certain events relating to a Reference Asset that may or may not require an adjustment to the Initial Level, the Coupon Barrier and the Barrier Level;
- Ø economic, financial, political, regulatory or judicial events that affect the Reference Assets or the equity securities represented by the Reference Assets or stock markets generally, and which may affect the market value of the Reference Assets on any Observation Date;
- Ø the exchange rates and the volatility of the exchange rates between the U.S. dollar and the currencies in which the equity securities represented by the EEM are traded; and
- Ø our creditworthiness, including actual or anticipated downgrades in our credit ratings.

Some or all of these factors will influence the price you will receive if you choose to sell your Notes prior to maturity. The impact of any of the factors set forth above may enhance or offset some or all of any change resulting from another factor or factors. You may have to sell your Notes at a substantial discount from the principal amount if the market value of the Reference Assets is at, below or not sufficiently above their Initial Levels, the Coupon Barrier or the Trigger Level.

**Our Business Activities May Create Conflicts of Interest** — We and our affiliates expect to engage in trading activities related to the securities included in or represented by the Reference Assets 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 or levels of the Reference Assets, 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 included in or represented by the Reference Assets, 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 Assets or securities included in or represented by the Reference Assets. 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 or levels of the Reference Assets and, therefore, the market value of the Notes.

**Market Disruption Events and Adjustments** — The Payment at Maturity, each Observation Date and the Valuation Date are subject to adjustment as to each Reference Asset 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 “Additional Terms of the Notes” below.

**You Must Rely on Your Own Evaluation of the Merits of an Investment Linked to the Reference Assets** — In the ordinary course of their business, our affiliates may have expressed views on expected movement in the Reference Assets or the equity securities that the Reference Assets 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 Asset may at any time have significantly different views from those of

P-10 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

our affiliates. For these reasons, you are encouraged to derive information concerning the Reference Assets from multiple sources, and you should not rely solely on views expressed by our affiliates.

**Each Exchange Traded Fund and its Underlying Index Are Different** — The performance of each Exchange Traded Fund may not exactly replicate the performance of its underlying index, because each Exchange Traded Fund will reflect transaction costs and fees that are not included in the calculation of its underlying index. It is also possible that the performance of the each Exchange Traded Fund 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 contained in such Exchange Traded Fund or due to other circumstances. Each Exchange Traded Fund 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 each Exchange Traded Fund may be unavailable in the secondary market, market participants may be unable to calculate accurately the net asset value per share of an Exchange Traded Fund and the liquidity of an Exchange Traded Fund may be adversely affected. This kind of market volatility may also disrupt the ability of market participants to create and redeem shares of an Exchange Traded Fund. Further, market volatility may adversely affect, sometimes materially, the prices at which market participants are willing to buy and sell shares of an Exchange Traded Fund. As a result, under these circumstances, the market value of shares of such Exchange Traded Fund may vary substantially from the net asset value per share of such Exchange Traded Fund. For all of the foregoing reasons, the performance of each Exchange Traded Fund may not correlate with the performance of its underlying index as well as the net asset value per share of such Exchange Traded Fund, which could materially and adversely affect the value of the Notes in the secondary market and/or reduce your payment at maturity

**Management Risk** — The Exchange Traded Funds 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 Exchange Traded Fund, 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 Exchange Traded Fund generally would not sell a security because the security’s issuer was in financial trouble. In addition, each Exchange Traded Fund is subject to the risk that the investment strategy of its investment advisor may not produce the intended results.

**The Policies of the Exchange Traded Funds’ Investment Adviser Could Affect the Amount Payable on the Notes and Their Market Value** — The policies of the Exchange Traded Funds’ investment adviser concerning the management of the Exchange Traded Funds, additions, deletions or substitutions of the securities held by the Exchange Traded Funds could affect the market price of shares of the Exchange Traded Funds 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 Exchange Traded Funds’ investment adviser changes these policies, for example, by changing the manner in which it manages the Exchange Traded Funds, or if the Exchange Traded Funds’ investment adviser discontinues or suspends maintenance of the Exchange Traded Funds, in which case it may become difficult to determine the market value of the Notes. The Exchange Traded Funds’ 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 Exchange Traded Funds.

**An Investment in Notes Linked to the EEM Is Subject to Risks Associated with Foreign Securities Markets** — The Underlying Index 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 comprising the Underlying Index 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.

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.

P-11 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

**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.

**Notes Linked to the EEM Are Subject to Foreign Currency Exchange Rate Risk** — The share price of the EEM will fluctuate based upon its net asset value, which will in turn depend in part upon changes in the value of the currencies in which the stocks held by this Reference Asset are traded. Accordingly, investors in notes linked to the EEM will be exposed to currency exchange rate risk with respect to each of the currencies in which the stocks held by the EEM are traded. An investor's net exposure will depend on the extent to which these currencies strengthen or weaken against the U.S. dollar. If, the dollar strengthens against these currencies, the net asset value of the EEM will be adversely affected and the price of the EEM may decrease.

**Changes that Affect an Index Will Affect the Market Value of the Notes and the Payments on the Notes** - The policies of the sponsor of each of the MSCI Emerging Markets Index (which underlies the EEM), the S&P MidCap Index (which underlies the MDY) or the NDX concerning the calculation of the applicable index, additions, deletions or substitutions of the components of that index and the manner in which changes affecting those components, such as stock dividends, reorganizations or mergers, may be reflected in the index and, therefore, could affect the amounts payable on the Notes at maturity, and the market value of the Notes prior to maturity. The amounts payable on the Notes and their market value could also be affected if the index sponsor changes these policies, for example, by changing the manner in which it calculates the index, or if the index sponsor discontinues or suspends calculation or publication of the index, in which case it may become difficult to determine the market value of the Notes.

**We Have No Affiliation with any Index Sponsor and Will Not Be Responsible for any Actions Taken by an Index Sponsor** - No index sponsor is an affiliate of ours or will be involved in the offering of the Notes in any way. Consequently, we have no control of the actions of any index sponsor, including any actions of the type that might impact the value of the Notes. No index sponsor has any obligation of any sort with respect to the Notes. Thus, no index sponsor has any obligation to take your interests into consideration for any reason, including in taking any actions that might affect the value of the Notes. None of our proceeds from the issuance of the Notes will be delivered to any index sponsor.

P-12 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

#### ADDITIONAL TERMS OF YOUR NOTES RELATED TO INDICES

##### Closing Level

The closing level of the NDX on any trading day will equal its closing level published following the regular official weekday close of trading on that trading day.

A “trading day” as to the NDX means a day on which the principal trading market for that index is open for trading.

##### Unavailability of the Level of an Index

If the sponsor of the NDX discontinues publication of that index and its sponsor or another entity publishes a successor or substitute index that the calculation agent determines, in its sole discretion, to be comparable to the discontinued index (such successor or substitute index being referred to in this section as a “successor index”), then any subsequent index closing level will be determined by reference to the published level of that successor index at the regular weekday close of trading on the applicable trading day.

Upon any selection by the calculation agent of a successor index, the calculation agent will provide written notice to the trustee of the selection, and the trustee will furnish written notice thereof, to the extent the trustee is required to under the senior debt indenture, to each noteholder, or in the case of global notes, the depositary, as holder of the global notes.

If a successor index is selected by the calculation agent, that successor index will be used as a substitute for that index for all purposes, including for purposes of determining whether a market disruption event exists with respect to that index.

If the sponsor of the NDX discontinues publication of that index prior to, and that discontinuance is continuing on, any trading day on which the level of that index must be determined, and the calculation agent determines, in its sole discretion, that no successor index is available at that time, then the calculation agent will determine the level of that index for the relevant date in accordance with the formula for and method of calculating that index last in effect prior to the discontinuance, without rebalancing or substitution, using the closing level (or, if trading in the relevant underlying securities or components of that index have been materially suspended or materially limited, its good faith estimate of the closing level that would have prevailed but for that suspension or limitation) at the close of the principal trading session of the relevant exchange on that date of each security or component most recently comprising that index. Notwithstanding these alternative arrangements, discontinuance of the publication of the NDX may adversely affect the value of your Notes.

If at any time the method of calculating a closing level for the NDX or a successor index is changed in a material respect, or if the NDX is in any other way modified so that it does not, in the opinion of the calculation agent, fairly represent the level of the NDX had those changes or modifications not been made, then, from and after that time, the calculation agent will, at the close of business in New York City on the applicable trading day, make such calculations and adjustments as, in the good faith judgment of the calculation agent, may be necessary in order to arrive at a level of an index comparable to the NDX as if those changes or modifications had not been made. Accordingly, if the method of calculating the NDX is modified so that the value of the NDX is a fraction of what it would have been if it had not been modified (e.g., due to a split in the NDX), then the calculation agent will adjust the NDX in order to arrive at a value of the NDX as if it had not been modified (e.g., as if such split had not occurred).

##### Index Market Disruption Events

A “market disruption event” with respect to the NDX means any event, circumstance or cause which we determine, and the calculation agent confirms, has or will have a material adverse effect on our ability to perform our obligations under the Notes or to hedge our position in respect of our obligations to make payment of amounts owing thereunder and more specifically includes the following events to the extent that they have such effect with respect to the NDX:

• a suspension, absence or limitation of trading in index components constituting 20% or more, by weight, of the NDX;

a suspension, absence or limitation of trading in futures or options contracts relating to an index on their respective markets;

any event that disrupts or impairs, as determined by the calculation agent, the ability of market participants to (i) effect transactions in, or obtain market values for, index components constituting 20% or more, by weight, of the NDX, or (ii) effect transactions in, or obtain market values for, futures or options contracts relating to the NDX on their respective markets;

P-13 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

the closure on any day of the primary market for futures or options contracts relating to the NDX or index components constituting 20% or more, by weight, of the NDX on a scheduled trading day prior to the scheduled weekday closing time of that market (without regard to after hours or any other trading outside of the regular trading session hours) unless such earlier closing time is announced by the primary market at least one hour prior to the earlier of (i) the actual closing time for the regular trading session on such primary market on such scheduled trading day for such primary market and (ii) the submission deadline for orders to be entered into the relevant exchange system for execution at the close of trading on such scheduled trading day for such primary market; any scheduled trading day on which (i) the primary markets for index components constituting 20% or more, by weight, of the NDX or (ii) the exchanges or quotation systems, if any, on which futures or options contracts on the NDX are traded, fails to open for trading during its regular trading session; or any other event, if the calculation agent determines in its sole discretion that the event interferes with our ability or the ability of any of our affiliates to unwind all or a portion of a hedge with respect to the Notes that we or our affiliates have effected or may effect.

P-14 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

#### INFORMATION REGARDING THE REFERENCE ASSETS

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 EEM. 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 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.

Information provided to or filed with the SEC by iShares® under the Securities Exchange Act of 1934 and the Investment Company Act of 1940 can be located at the SEC’s facilities or through the SEC’s website by reference to SEC file numbers 033-97598 and 811-09102, respectively. We have not independently verified the accuracy or completeness of the information or reports prepared by iShares®.

The selection of the EEM is not a recommendation to buy or sell the shares of the EEM. Neither we nor any of our affiliates make any representation to you as to the performance of the shares of the EEM.

“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.” The Advisor 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 the Advisor 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 the Advisor or its affiliates. The Advisor 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.

#### Representative Sampling

The Advisor 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.

P-15 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

#### Correlation

The Underlying Index is a theoretical financial calculation, while the Reference Asset 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 an EEM using 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 23 emerging market country indices: Brazil, Chile, China, Colombia, Czech Republic, Greece, Egypt, Hungary, India, Indonesia, South Korea, Malaysia, Mexico, Peru, Philippines, Poland, Qatar, Russia, South Africa, Taiwan, Thailand, Turkey and United Arab Emirates. 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.

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”).

P-16 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

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.

**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%.

P-17 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes

Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

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.

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, the dealer 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-18 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

SPDR® S&P Midcap 400® ETF (“MDY”)

Information provided to or filed with the SEC by the MDY under the Securities Exchange Act of 1934 can be located by reference to its Central Index Key, or CIK, 884394, through the SEC’s website at <http://www.sec.gov>. Additional information about the MDY may be obtained from other sources including, but not limited to, press releases, newspaper articles and other publicly disseminated documents and the SPDR website at <http://www.spdrs.com>. We have not independently verified the accuracy or completeness of such information. Information contained in the SPDR’s website is not incorporated by reference in, and should not be considered a part of, this pricing supplement. The MDY seeks to provide investment results that correspond generally to the price and yield performance, before fees and expenses, of the S&P MidCap 400® Index (the “Underlying Index”). To maintain the correspondence between the composition and weightings of stocks held by the MDY and component stocks of the Underlying Index, the MDY adjusts its holdings from time to time to conform to periodic changes in the identity and/or relative weightings of the index securities. The MDY utilizes a “passive” or “indexing” investment approach in attempting to track the performance of the underlying index, and will invest in all of the securities which comprise the underlying index.

All disclosures contained in this pricing supplement regarding the Underlying Index, including, without limitation, its make up, method of calculation, and changes in its components, have been derived from publicly available sources.

The information reflects the policies of, and is subject to change by, S&P Dow Jones Indices, LLC. S&P Dow Jones Indices, LLC, which owns the copyright and all other rights to the Underlying Index, has no obligation to continue to publish, and may discontinue publication of, the Underlying Index.

The Underlying Index

The Underlying Index is intended to provide a benchmark for the performance of publicly traded mid-sized U.S. companies. The Underlying Index tracks the stock price movement of 400 companies with mid-sized market capitalizations, ranging from US\$1.4 billion to US\$5.9 billion. The calculation of the level of the Underlying Index is based on the relative value of the aggregate market value of the common stocks of 400 companies as of a particular time compared to the aggregate average market value of the common stocks of 400 similar companies on the base date of June 28, 1991.

S&P Dow Jones Indices, LLC chooses companies for inclusion in the Underlying Index with the aim of achieving a distribution by broad industry groupings that approximates the distribution of these groupings in the common stock population of the medium capitalization segment of the U.S. equity market. Relevant criteria employed by S&P Dow Jones Indices, LLC include U.S. company status, market capitalization, financial viability, adequate liquidity, and a public float of at least 50%, sector representation, and status as an operating company. S&P from time to time, in its sole discretion, may add companies to, or delete companies from, the Underlying Index to achieve the objectives stated above.

The Underlying Index is calculated using a base-weighted aggregate methodology. The level of the Underlying Index reflects the total market value of all 400 component stocks relative to the base date of June 28, 1991. An indexed number is used to represent the results of this calculation in order to make the level easier to work with and track over time.

The actual total market value of the component stocks on the base date of June 28, 1991 has been set to an indexed level of 100. This is often indicated by the notation June 28, 1991=100. In practice, the daily calculation of the Underlying Index is computed by dividing the total market value of the component stocks by the “index divisor.” By itself, the index divisor is an arbitrary number. However, in the context of the calculation of the Underlying Index, it serves as a link to the original base period level of the Underlying Index. The index divisor keeps the Underlying Index comparable over time and is the manipulation point for all adjustments to the Underlying Index, which is index maintenance.



#### Computation of the Underlying Index

While S&P Dow Jones Indices LLC currently employs the following methodology to calculate the Underlying Index, no assurance can be given that S&P Dow Jones Indices LLC will not modify or change this methodology in a manner that may affect the payments on the Notes.

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

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

In September 2012, all shareholdings representing more than 5% of a stock's outstanding shares, other than holdings by "block owners," were removed from the float for purposes of calculating the Underlying Index. Generally, these "control holders" will include

P-19 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

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

Treasury stock, stock options, restricted shares, equity participation units, warrants, preferred stock, convertible stock, and rights are not part of the float. Shares held in a trust to allow investors in countries outside the country of domicile, such as depositary shares and Canadian exchangeable shares are normally part of the float unless those shares form a control block. If a company has multiple classes of stock outstanding, shares in an unlisted or non-traded class are treated as a control block.

For each stock, an investable weight factor (“IWF”) is calculated by dividing the available float shares by the total shares outstanding. As of September 21, 2012, available float shares are defined as the total shares outstanding less shares held by control holders. This calculation is subject to a 5% minimum threshold for control blocks. For example, if a company’s officers and directors hold 3% of the company’s shares, and no other control group holds 5% of the company’s shares, S&P Dow Jones Indices LLC would assign that company an IWF of 1.00, as no control group meets the 5% threshold. However, if a company’s officers and directors hold 3% of the company’s shares and another control group holds 20% of the company’s shares, S&P Dow Jones Indices LLC would assign an IWF of 0.77, reflecting the fact that 23% of the company’s outstanding shares are considered to be held for control. For companies with multiple classes of stock, S&P Dow Jones Indices LLC calculates the weighted average IWF for each stock using the proportion of the total company market capitalization of each share class as weights.

The Underlying Index is calculated using a base-weighted aggregate methodology. The level of the Underlying Index reflects the total market value of all 400 component stocks relative to the base date of June 28, 1991. An indexed number is used to represent the results of this calculation in order to make the level easier to use and track over time. The actual total market value of the component stocks on the base date has been set to an indexed level of 100. This is often indicated by the notation June 28, 1991 = 100. In practice, the daily calculation of the Underlying Index is computed by dividing the total market value of the component stocks by the “index divisor.” By itself, the index divisor is an arbitrary number. However, in the context of the calculation of the Underlying Index, it serves as a link to the original base period level of the Underlying Index. The index divisor keeps the Underlying Index comparable over time and is the manipulation point for all adjustments to the Underlying Index, which is index maintenance.

#### Index Maintenance

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

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

Changes in a company's shares outstanding of 5.00% or more due to mergers, acquisitions, public offerings, tender offers, Dutch auctions, or exchange offers are made as soon as reasonably possible. All other changes of 5.00% or more (due to, for example, company stock repurchases, private placements, redemptions, exercise of options, warrants, conversion of preferred stock, notes, debt, equity participation units, at the market offerings, or other recapitalizations) are made weekly and are announced on Wednesdays for implementation after the close of trading on the following Wednesday. Changes of less than 5.00% due to a company's acquisition of another company in the Underlying Index are made as soon as reasonably possible. All other changes of less than 5.00% are accumulated and made quarterly on the third Friday of March, June, September, and December, and are usually announced two to five days prior.

Changes in IWFs of more than five percentage points caused by corporate actions (such as merger and acquisition activity, restructurings, or spinoffs) will be made as soon as reasonably possible. Other changes in IWFs will be made annually when IWFs are reviewed.

P-20 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

#### NASDAQ-100® Index (“NDX”)

The NASDAQ-100® Index (“NDX”) is a modified market capitalization-weighted index of 100 of the largest stocks of both U.S. and non-U.S. non-financial companies listed on The NASDAQ Stock Market based on market capitalization. It does not contain securities of financial companies, including investment companies. The NASDAQ-100® Index, which includes companies across a variety of major industry groups, was launched on January 31, 1985, with a base index value of 250.00. On January 1, 1994, the base index value was reset to 125.00. The NASDAQ OMX Group, Inc. publishes the NDX. Current information regarding the market value of the NDX is available from NASDAQ OMX Group, Inc. (“NASDAQ OMX”) as well as numerous market information services. The share weights of the component securities of the NDX at any time are based upon the total shares outstanding in each of those securities and are additionally subject, in certain cases, to rebalancing. Accordingly, each underlying stock’s influence on the level of the NDX is directly proportional to the value of its share weight.

#### Index Calculation

At any moment in time, the level of the NDX equals the aggregate value of the then-current share weights of each of the component securities, which are based on the total shares outstanding of each such component security, multiplied by each such security’s respective last sale price on The NASDAQ Stock Market (which may be the official closing price published by The NASDAQ Stock Market), and divided by a scaling factor (the “divisor”), which becomes the basis for the reported level of the NDX. The divisor serves the purpose of scaling such aggregate value to a lower order of magnitude, which is more desirable for reporting purposes.

#### Underlying Stock Eligibility Criteria and Annual Ranking Review

##### Initial Eligibility Criteria

To be eligible for initial inclusion in the NDX, a security must be listed on The NASDAQ Stock Market and meet the following criteria:

- the security’s U.S. listing must be exclusively on the NASDAQ Global Select Market or the NASDAQ Global Market;
- the security must be issued by a non-financial company;
- the security may not be issued by an issuer currently in bankruptcy proceedings;
- the security must generally be a common stock, ordinary share, American Depositary Receipt, or tracking stock (closed-end funds, convertible debentures, exchange traded funds, limited liability companies, limited partnership interests, preferred stocks, rights, shares or units of beneficial interests, warrants, units and other derivative securities are not included in the NDX, nor are the securities of investment companies);
- the security must have a three-month average daily trading volume of at least 200,000 shares; if the security is issued by an issuer organized under the laws of a jurisdiction outside the United States, it must have listed options on a recognized market in the United States or be eligible for listed-options trading on a recognized options market in the United States;
- the issuer of the security may not have entered into a definitive agreement or other arrangement which would likely result in the security no longer being eligible;
- the issuer of the security may not have annual financial statements with an audit opinion that is currently withdrawn; and
- the issuer of the security must have “seasoned” on the NASDAQ Stock Market or another recognized market (generally, a company is considered to be seasoned if it has been listed on a market for at least three full months, excluding the first month of initial listing).

##### Continued Eligibility Criteria

In addition, to be eligible for continued inclusion in the NDX the following criteria apply:

- the security's U.S. listing must be exclusively on the NASDAQ Global Select Market or the NASDAQ Global Market;
- the security must be issued by a non-financial company;
- the security may not be issued by an issuer currently in bankruptcy proceedings;
- the security must have an average daily trading volume of at least 200,000 shares in the previous three-month trading period as measured annually during the ranking review process described below;
- if the issuer of the security is organized under the laws of a jurisdiction outside the United States, then such security must have listed options on a recognized market in the United States or be eligible for listed-options trading on a recognized options market in the United States, as measured annually during the ranking review process;

P-21 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

the issuer of the security may not have entered into a definitive agreement or other arrangement that would likely result in the security no longer being eligible;  
the security must have an adjusted market capitalization equal to or exceeding 0.10% of the aggregate adjusted market capitalization of the NDX at each month-end. In the event that a company does not meet this criterion for two consecutive month-ends, it will be removed from the NDX effective after the close of trading on the third Friday of the following month; and  
the issuer of the security may not have annual financial statements with an audit opinion that is currently withdrawn. These eligibility criteria may be revised from time to time by NASDAQ OMX without regard to the Notes.

#### Annual Ranking Review

The component securities are evaluated on an annual basis (the "Ranking Review"), except under extraordinary circumstances, which may result in an interim evaluation, as follows. Securities that meet the applicable eligibility criteria are ranked by market value. eligible securities that are already in the NDX and that are ranked in the top 100 eligible securities (based on market capitalization) are retained in the NDX. A security that is ranked 101 to 125 is also retained, provided that such security was ranked in the top 100 eligible securities as of the previous Ranking Review or was added to the NDX subsequent to the previous Ranking Review. Securities not meeting such criteria are replaced. The replacement securities chosen are those eligible securities not currently in the NDX that have the largest market capitalization. The data used in the ranking includes end of October market data and is updated for total shares outstanding submitted in a publicly filed SEC document via EDGAR through the end of November.

Replacements are made effective after the close of trading on the third Friday in December. Moreover, if at any time during the year other than the Ranking Review, a component security is determined by NASDAQ OMX to become ineligible for continued inclusion in the NDX, the security will be replaced with the largest market capitalization security meeting the eligibility criteria listed above and not currently included in the NDX.

#### Index Maintenance

In addition to the Ranking Review, the securities in the NDX are monitored every day by NASDAQ OMX with respect to changes in total shares outstanding arising from corporate events, such as stock dividends, stock splits and certain spin-offs and rights issuances. NASDAQ OMX has adopted the following quarterly scheduled weight adjustment procedures with respect to those changes. If the change in total shares outstanding arising from a corporate action is greater than or equal to 10%, that change will be made to the NDX as soon as practical, normally within ten days of such corporate action. Otherwise, if the change in total shares outstanding is less than 10%, then all such changes are accumulated and made effective at one time on a quarterly basis after the close of trading on the third Friday in each of March, June, September and December.

In either case, the share weights for those component securities are adjusted by the same percentage amount by which the total shares outstanding have changed in those securities. Ordinarily, whenever there is a change in the share weights, a change in a component security, or a change to the price of a component security due to spin-off, rights issuances or special cash dividends, NASDAQ OMX adjusts the divisor to ensure that there is no discontinuity in the level of the NDX that might otherwise be caused by any of those changes. All changes will be announced in advance.

#### Index Rebalancing

Under the methodology employed, on a quarterly basis coinciding with NASDAQ OMX's quarterly scheduled weight adjustment procedures, the component securities are categorized as either "Large Stocks" or "Small Stocks" depending on whether their current percentage weights (after taking into account scheduled weight adjustments due to stock repurchases, secondary offerings or other corporate actions) are greater than, or less than or equal to, the average percentage weight in the NDX (i.e., as a 100-stock index, the average percentage weight in the NDX is 1%).

This quarterly examination will result in an index rebalancing if it is determined that: (1) the current weight of the single largest market capitalization component security is greater than 24% or (2) the “collective weight” of those component securities, the individual current weights of which are in excess of 4.5%, when added together, exceed 48%. In addition, NASDAQ OMX may conduct a special rebalancing at any time if it is determined to be necessary to maintain the integrity of the NDX.

If either one or both of these weight distribution requirements are met upon quarterly review, or NASDAQ OMX determines that a special rebalancing is required, a weight rebalancing will be performed. First, relating to weight distribution requirement (1) above, if the current weight of the single largest component security exceeds 24%, then the weights of all Large Stocks will be scaled down proportionately towards 1% by enough of an amount for the adjusted weight of the single largest component security to be set to 20%. Second, relating to weight distribution requirement (2) above, for those component securities whose individual current weights or adjusted weights in accordance with the preceding step are in excess of 4.5%, if their “collective weight” exceeds 48%, then the weights of all Large Stocks will be scaled down proportionately towards 1% by just enough amount for the “collective weight,” so adjusted, to be set to 40%.

P-22 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

The aggregate weight reduction among the Large Stocks resulting from either or both of the above rescalings will then be redistributed to the Small Stocks in the following iterative manner. In the first iteration, the weight of the largest Small Stock will be scaled upwards by a factor which sets it equal to the average Index weight of 1.0%. The weights of each of the smaller remaining Small Stocks will be scaled up by the same factor, reduced in relation to each stock's relative ranking among the Small Stocks, such that the smaller the component security in the ranking, the less the scale-up of its weight. This is intended to reduce the market impact of the weight rebalancing on the smallest component securities in the NDX.

In the second iteration, the weight of the second largest Small Stock, already adjusted in the first iteration, will be scaled upwards by a factor which sets it equal to the average index weight of 1%. The weights of each of the smaller remaining Small Stocks will be scaled up by this same factor, reduced in relation to each stock's relative ranking among the Small Stocks, such that, once again, the smaller the component stock in the ranking, the less the scale-up of its weight.

Additional iterations will be performed until the accumulated increase in weight among the Small Stocks exactly equals the aggregate weight reduction among the Large Stocks from rebalancing in accordance with weight distribution requirement (1) and/or weight distribution requirement (2).

Then, to complete the rebalancing procedure, once the final percent weights of each of the component securities are set, the share weights will be determined anew based upon the last sale prices and aggregate capitalization of the NDX at the close of trading on the last day in February, May, August and November. Changes to the share weights will be made effective after the close of trading on the third Friday in March, June, September and December, and an adjustment to the divisor will be made to ensure continuity of the NDX.

Ordinarily, new rebalanced weights will be determined by applying the above procedures to the current share weights. However, NASDAQ OMX may from time to time determine rebalanced weights, if necessary, by instead applying the above procedure to the actual current market capitalization of the component securities. In those instances, NASDAQ OMX would announce the different basis for rebalancing prior to its implementation.

P-23 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

#### HISTORICAL INFORMATION

The graphs below set forth the information relating to the historical performance of the Reference Assets. In addition, below the graphs are tables setting forth the intra-day high, intra-day low and period-end closing prices or levels of the Reference Assets. The information provided in these tables is for the four calendar quarters of 2012, 2013, 2014, 2015 and 2016, and the period from January 1, 2017 through March 17, 2017.

We obtained the information regarding the historical performance of the Reference Assets in the graphs and tables 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 any Reference Asset should not be taken as an indication of its future performance, and no assurance can be given as to the prices or levels of the Reference Assets at any time. We cannot give you assurance that the performance of the Reference Assets will not result in the loss of all or part of your investment.

P-24 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
 Linked to the Lesser Performing of Two  
 Exchange Traded Funds, and One Equity  
 Index, Due March 21, 2019  
 Royal Bank of Canada

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

Below is a table setting forth the intra-day high, intra-day low and period-end closing prices of this Reference Asset. The information provided in the table is for the period from January 1, 2012 through March 17, 2017.

| Period-Start Date | Period-End Date | High Intra-Day Price of this Reference Asset (\$) | Low Intra-Day Price of this Reference Asset (\$) | Period-End Closing Price of this Reference Asset (\$) |
|-------------------|-----------------|---|--|---|
| 1/1/2012          | 3/31/2012       | 44.91   | 38.21  | 42.94   |
| 4/1/2012          | 6/30/2012       | 43.75   | 36.58  | 39.19   |
| 7/1/2012          | 9/30/2012       | 42.83   | 37.15  | 41.32   |
| 10/1/2012         | 12/31/2012      | 44.42   | 39.93  | 44.35   |
| 1/1/2013          | 3/31/2013       | 45.28   | 41.72  | 42.78   |
| 4/1/2013          | 6/30/2013       | 44.26   | 36.16  | 38.57   |
| 7/1/2013          | 9/30/2013       | 43.32   | 36.98  | 40.77   |
| 10/1/2013         | 12/31/2013      | 43.91   | 40.15  | 41.77   |
| 1/1/2014          | 3/31/2014       | 41.25   | 37.06  | 40.99   |
| 4/1/2014          | 6/30/2014       | 43.98   | 40.55  | 43.23   |
| 7/1/2014          | 9/30/2014       | 45.85   | 41.36  | 41.56   |
| 10/1/2014         | 12/31/2014      | 42.46   | 37.23  | 39.29   |
| 1/1/2015          | 3/31/2015       | 41.11   | 37.72  | 40.13   |
| 4/1/2015          | 6/30/2015       | 44.18   | 39.03  | 39.62   |
| 7/1/2015          | 9/30/2015       | 40.02   | 30.00  | 32.78   |
| 10/1/2015         | 12/31/2015      | 36.42   | 31.51  | 32.19   |
| 1/1/2016          | 3/31/2016       | 34.58   | 27.62  | 34.25   |
| 4/1/2016          | 6/30/2016       | 35.34   | 31.71  | 34.36   |
| 7/1/2016          | 9/30/2016       | 38.31   | 33.33  | 37.45   |
| 10/1/2016         | 12/31/2016      | 38.19   | 33.95  | 35.01   |
| 1/1/2017          | 03/17/2017      | 39.65   | 35.30  | 39.49   |

PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

The graph below illustrates the performance of this Reference Asset from January 1, 2012 to March 17, 2017 reflecting its Initial Level of \$39.49. The red line represents its Coupon Barrier and Trigger Level of \$29.62, which is equal to 75.00% of its Initial Level, rounded to two decimal places.

P-25 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
 Linked to the Lesser Performing of Two  
 Exchange Traded Funds, and One Equity  
 Index, Due March 21, 2019  
 Royal Bank of Canada

#### Historical Information for SPDR® S&P Midcap 400® ETF (“MDY”)

Below is a table setting forth the intra-day high, intra-day low and period-end closing prices of this Reference Asset. The information provided in the table is for the period from January 1, 2012 through March 17, 2017.

| Period-Start Date | Period-End Date | High Intra-Day Price of this Reference Asset (\$) | Low Intra-Day Price of this Reference Asset (\$) | Period-End Closing Price of this Reference Asset (\$) |
|-------------------|-----------------|---|--|---|
| 1/1/2012          | 3/31/2012       | 183.33  | 158.46   | 180.67  |
| 4/1/2012          | 6/30/2012       | 183.16  | 160.75   | 171.30  |
| 7/1/2012          | 9/30/2012       | 187.88  | 165.43   | 179.92  |
| 10/1/2012         | 12/31/2012      | 188.23  | 171.56   | 185.71  |
| 1/1/2013          | 3/31/2013       | 210.08  | 188.62   | 209.72  |
| 4/1/2013          | 6/30/2013       | 222.94  | 200.30   | 210.38  |
| 7/1/2013          | 9/30/2013       | 229.87  | 211.75   | 226.33  |
| 10/1/2013         | 12/31/2013      | 244.46  | 221.28   | 244.20  |
| 1/1/2014          | 3/31/2014       | 254.11  | 229.87   | 250.57  |
| 4/1/2014          | 6/30/2014       | 260.62  | 238.41   | 260.56  |
| 7/1/2014          | 9/30/2014       | 263.99  | 246.60   | 249.32  |
| 10/1/2014         | 12/31/2014      | 268.62  | 230.89   | 263.97  |
| 1/1/2015          | 3/31/2015       | 280.36  | 255.32   | 277.24  |
| 4/1/2015          | 6/30/2015       | 282.39  | 271.48   | 273.20  |
| 7/1/2015          | 9/30/2015       | 277.37  | 216.91   | 248.89  |
| 10/1/2015         | 12/31/2015      | 268.71  | 244.88   | 254.09  |
| 1/1/2016          | 3/31/2016       | 264.35  | 220.88   | 262.72  |
| 4/1/2016          | 6/30/2016       | 278.31  | 256.08   | 272.38  |
| 7/1/2016          | 9/30/2016       | 288.40  | 267.87   | 282.27  |
| 10/1/2016         | 12/31/2016      | 309.57  | 268.29   | 301.73  |
| 1/1/2017          | 03/17/2017      | 320.48  | 301.43   | 320.48  |

PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

The graph below illustrates the performance of this Reference Asset from January 1, 2012 to March 17, 2017, reflecting its Initial Level of \$314.22. The red line represents its Coupon Barrier and Trigger Level of \$235.667, which is equal to 75.00% of its Initial Level, rounded to two decimal places.

P-26 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
 Linked to the Lesser Performing of Two  
 Exchange Traded Funds, and One Equity  
 Index, Due March 21, 2019  
 Royal Bank of Canada

#### Historical Information for NASDAQ-100® Index (“NDX”)

Below is a table setting forth the intra-day high, intra-day low and period-end closing levels of this Reference Asset. The information provided in the table is for the period from January 1, 2012 through March 17, 2017.

| Period-Start Date | Period-End Date | High Intra-Day Level of this Reference Asset | Low Intra-Day Level of this Reference Asset | Period-End Closing Level of this Reference Asset |
|-------------------|-----------------|--|---|--|
| 1/1/2012          | 3/31/2012       | 2,794.00                                     | 2,307.56                                    | 2,755.27   |
| 4/1/2012          | 6/30/2012       | 2,795.35                                     | 2,443.92                                    | 2,615.72   |
| 7/1/2012          | 9/30/2012       | 2,878.38                                     | 2,522.89                                    | 2,799.19   |
| 10/1/2012         | 12/31/2012      | 2,845.97                                     | 2,494.38                                    | 2,660.93   |
| 1/1/2013          | 3/31/2013       | 2,820.67                                     | 2,689.83                                    | 2,818.69   |
| 4/1/2013          | 6/30/2013       | 3,053.51                                     | 2,730.97                                    | 2,909.60   |
| 7/1/2013          | 9/30/2013       | 3,248.52                                     | 2,913.48                                    | 3,218.20   |
| 10/1/2013         | 12/31/2013      | 3,592.00                                     | 3,117.69                                    | 3,592.00   |
| 1/1/2014          | 3/31/2014       | 3,738.32                                     | 3,418.88                                    | 3,595.74   |
| 4/1/2014          | 6/30/2014       | 3,860.65                                     | 3,414.11                                    | 3,849.48   |
| 7/1/2014          | 9/30/2014       | 4,118.91                                     | 3,837.16                                    | 4,049.45   |
| 10/1/2014         | 12/31/2014      | 4,347.09                                     | 3,700.22                                    | 4,236.28   |
| 1/1/2015          | 3/31/2015       | 4,483.97                                     | 4,078.85                                    | 4,333.69   |
| 4/1/2015          | 6/30/2015       | 4,562.33                                     | 4,283.91                                    | 4,396.76   |
| 7/1/2015          | 9/30/2015       | 4,694.13                                     | 3,787.23                                    | 4,181.06   |
| 10/1/2015         | 12/31/2015      | 4,739.75                                     | 4,124.55                                    | 4,593.27   |
| 1/1/2016          | 3/31/2016       | 4,522.12                                     | 3,888.78                                    | 4,483.66   |
| 4/1/2016          | 6/30/2016       | 4,574.38                                     | 4,179.74                                    | 4,417.70   |
| 7/1/2016          | 9/30/2016       | 4,895.50                                     | 4,375.72                                    | 4,875.70   |
| 10/1/2016         | 12/31/2016      | 4,992.08                                     | 4,647.59                                    | 4,863.62   |
| 1/1/2017          | 03/17/2017      | 5,426.84                                     | 4,884.52                                    | 5,408.76   |

PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

The graph below illustrates the performance of this Reference Asset from January 1, 2012 to March 17, 2017 reflecting its Initial Level of 5,408.76. The red line represents its Coupon Barrier and Trigger Level of 4,056.57, which is equal to 75.00% of its Initial Level, rounded to two decimal places.

P-27 RBC Capital Markets, LLC

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Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

#### USE OF PROCEEDS AND HEDGING

In anticipation of the sale of the Notes, we expect to enter into hedging transactions with one or more of our affiliates, involving purchases of the securities represented by the Reference Assets, shares of Exchange Traded Funds and/or listed and/or over-the-counter derivative instruments related to any of those securities or the Reference Assets prior to or on the Trade Date. From time to time, including around the time of each Observation Date and the Maturity Date, we, RBCCM, and our other affiliates may enter into additional hedging transactions or unwind those that we or they have entered into. In this regard, we, RBCCM, and our other affiliates may:

- acquire or dispose of investments relating to the Reference Assets;
- acquire or dispose of long or short positions in listed or over-the-counter derivative instruments based on the Reference Assets; or
- any combination of the above two.

We, RBCCM and our other affiliates may acquire a long or short position in securities similar to the Notes from time to time and may, in our or their sole discretion, hold or resell those similar securities.

We, RBCCM and our other affiliates may close out our or their hedges on or before any Observation Date. That step may involve sales or purchases of the securities represented by the Reference Assets, shares of the Exchange Traded Funds, or over-the-counter derivative instruments linked to the Reference Assets.

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

The following disclosure supplements, and to the extent inconsistent supersedes, the discussion in the product prospectus supplement dated January 8, 2016 under “Supplemental Discussion of U.S. Federal Income Tax Consequences.”

A “dividend equivalent” payment is treated as a dividend from sources within the United States and 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, 2018. Based on our determination that the Notes are not delta-one instruments, non-U.S. holders should not be subject to withholding on dividend equivalent payments, if any, under the Notes. However, it is possible that the Notes could be treated as deemed reissued for U.S. federal income tax purposes upon the occurrence of certain events affecting the Reference Asset or the Notes (for example, upon an index rebalancing), and following such occurrence the Notes could be treated as subject to withholding on dividend equivalent payments. Non-U.S. holders that enter, or have entered, into other transactions in respect of the Reference Asset or the Notes should consult their tax advisors as to the application of the dividend equivalent withholding tax in the context of the Notes and their other transactions. If any payments are treated as dividend equivalents subject to withholding, we (or the applicable paying agent) would be entitled to withhold taxes without being required to pay any additional amounts with respect to amounts so withheld.

Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
Royal Bank of Canada

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

Delivery of the Notes will be made against payment for the Notes on March 22, 2017, 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 January 8, 2016. For additional information as to the relationship between us and RBCCM, please see the section “Plan of Distribution—Conflicts of Interest” in the prospectus dated January 8, 2016.

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 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 Assets. 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 Assets, 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.



Auto-Callable Contingent Coupon Barrier Notes  
Linked to the Lesser Performing of Two  
Exchange Traded Funds, and One Equity  
Index, Due March 21, 2019  
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 January 8, 2016, which has been filed as Exhibit 5.1 to Royal Bank's Form 6-K filed with the SEC dated January 8, 2016.

In the opinion of Morrison & Foerster LLP, when the Notes have been duly completed in accordance with the Indenture and issued and sold as contemplated by the prospectus supplement and the prospectus, the Notes will be valid, binding and enforceable obligations of 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 January 8, 2016, which has been filed as Exhibit 5.2 to the Bank's Form 6-K dated January 8, 2016.

P-30 RBC Capital Markets, LLC

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