

ROYAL BANK OF CANADA  
Form 424B2  
September 27, 2018

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

Pricing Supplement  
Dated September 25,  
2018

To the Product  
Prospectus Supplement \$1,108,000  
ERN-ETF-1, Dated Barrier Absolute Return Notes Linked to the Lesser  
September 11, 2018, the Performing of One Exchange Traded Fund and One  
Prospectus Supplement Equity Index, Due September 28, 2023  
Dated September 7, 2018, Royal Bank of Canada  
and the Prospectus Dated  
September 7, 2018

Royal Bank of Canada is offering Barrier Absolute Return Notes (the “Notes”) linked to the lesser performing of one exchange traded fund 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 and will have the terms described in the documents described above, as supplemented or modified by this pricing supplement.

| Reference Assets                           | Initial Levels | Barrier Levels*                                |
|--------------------------------------------|----------------|------------------------------------------------|
| iShares® MSCI Emerging Markets ETF (“EEM”) | \$42.91        | 23.60, which is 55.00% of its Initial Level    |
| EURO STOXX 50® Index (“SX5E”)              | 3,419.78       | 1,880.88, which is 55.00% of its Initial Level |

\* 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 “Additional Risk Factors Specific to the Notes” beginning on page PS-5 of the product prospectus supplement dated September 11, 2018, “Risk Factors” beginning on page S-1 of the prospectus supplement dated September 7, 2018, 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. The Notes are not subject to conversion into our common shares under subsection 39.2(2.3) of the Canada Deposit Insurance Corporation Act. Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of the Notes or determined that this pricing supplement is truthful or complete. Any representation to the contrary is a criminal offense.

|                 |                      |                         |                    |
|-----------------|----------------------|-------------------------|--------------------|
| Issuer:         | Royal Bank of Canada | Stock Exchange Listing: | None               |
| Pricing Date:   | September 25, 2018   | Principal Amount:       | \$1,000 per Note   |
| Issue Date:     | September 28, 2018   | Maturity Date:          | September 28, 2023 |
| Valuation Date: | September 25, 2023   | Leverage Factor:        | 166%               |
| Initial Level:  |                      |                         |                    |

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|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                    | For each Reference Asset, its closing price or closing level, as applicable, on the Pricing Date, as set forth above.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Final Level:                       | For each Reference Asset, its closing price or closing level, as applicable, on the Valuation Date.<br>If, on the Valuation Date, the Final Level of the Lesser Performing Reference Asset is greater than its Initial Level, then the investor will receive a return equal to the principal amount multiplied by the product of the Percentage Change (as defined below) of the Lesser Performing Reference Asset and the Leverage Factor.<br>If the Final Level of the Lesser Performing Reference Asset is less than or equal to its Initial Level, but greater than or equal to its Barrier Level (55.00% of its Initial Level), the investor will receive a one-for-one positive return equal to the absolute value of the Percentage Change of the Lesser Performing Reference Asset.<br>If the Final Level of the Lesser Performing Reference Asset is less than the Barrier Level, the Notes will provide a negative return that is equal to the percentage decrease of the Lesser Performing Reference Asset. An investor could lose some or all of its investment in the Notes. |
| Payment at Maturity:               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Lesser Performing Reference Asset: | The Reference Asset which has the lowest Percentage Change.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Interest Payments:                 | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| CUSIP:                             | 78013XF60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

|                                                       | Per Note | Total       |
|-------------------------------------------------------|----------|-------------|
| Price to public <sup>(1)</sup>                        | 100.00%  | \$1,108,000 |
| Underwriting discounts and commissions <sup>(1)</sup> | 3.25%    | \$36,010    |
| Proceeds to Royal Bank of Canada                      | 96.75%   | \$1,071,990 |

<sup>(1)</sup>Certain dealers who purchased the Notes for sale to certain fee-based advisory accounts may have foregone some or all of their underwriting discount or selling concessions. The public offering price for investors purchasing the Notes in these accounts may be between \$967.50 and \$1,000 per \$1,000 in principal amount.

The initial estimated value of the Notes as of the date of this pricing supplement is \$930.70 per \$1,000 in principal amount, which is less than the price to public. The actual value of the Notes at any time will reflect many factors, cannot be predicted with accuracy, and may be less than this amount. We describe our determination of the initial estimated value in more detail below.

RBC Capital Markets, LLC, which we refer to as RBCCM, acting as agent for Royal Bank of Canada, received a commission of \$32.50 per \$1,000 in principal amount of the Notes and used a portion of that commission to allow selling concessions to other dealers of up to \$32.50 per \$1,000 in principal amount of the Notes. The other dealers may forgo, in their sole discretion, some or all of their selling concessions. See “Supplemental Plan of Distribution (Conflicts of Interest)” below.

RBC Capital Markets, LLC

Barrier Absolute Return Notes Linked to the  
Lesser Performing of One Exchange Traded  
Fund and One Equity Index

SUMMARY

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

|                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General:                                 | This pricing supplement relates to an offering of Barrier Absolute Return Notes (the “Notes”) linked to the lesser performing of one exchange traded fund and one equity index (the “Reference Assets”).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Issuer:                                  | Royal Bank of Canada (“Royal Bank”)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Issue:                                   | Senior Global Medium-Term Notes, Series H                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Pricing Date:                            | September 25, 2018                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Issue Date:                              | September 28, 2018                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Denominations:                           | Minimum denomination of \$1,000, and integral multiples of \$1,000 thereafter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Designated<br>Currency:                  | U.S. Dollars                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Valuation Date:                          | September 25, 2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Maturity Date:                           | September 28, 2023                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Initial Level:                           | For each Reference Asset, its closing price or closing level, as applicable, on the Pricing Date, as set forth on the cover page.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Final Level:                             | For each Reference Asset, its closing price or closing level, as applicable, on the Valuation Date.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Barrier Level:                           | For each Reference Asset, 55.00% of its Initial Level, as set forth on the cover page.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Leverage Factor:                         | 166%<br>On the Valuation Date, we will pay you at maturity an amount based on the Final Level of the Lesser Performing Reference Asset:<br><ul style="list-style-type: none"> <li>• If the Final Level of the Lesser Performing Reference Asset is greater than its Initial Level, then the investor will receive an amount equal to:<br/> <math>\\$1,000 + (\\$1,000 \times \text{Percentage Change of the Lesser Performing Reference Asset} \times \text{Leverage Factor})</math></li> <li>• If the Final Level of the Lesser Performing Reference Asset is less than or equal to its Initial Level, but greater than or equal to its Barrier Level, the investor will receive a one-for-one positive return equal to the absolute value of the Percentage Change of the Lesser Performing Reference Asset, calculated as follows:<br/> <math>\\$1,000 + [-1 \times (\\$1,000 \times \text{Percentage Change of the Lesser Performing Reference Asset})]</math></li> <li>• If the Final Level of the Lesser Performing Reference Asset is less than its Barrier Level, then the investor will receive an amount equal to:<br/> <math>\\$1,000 + [\\$1,000 \times (\text{Percentage Change of the Lesser Performing Reference Asset})]</math><br/>                     In this case, you will lose all or a substantial portion of the principal amount.</li> </ul> With respect to each Reference Asset:<br>$\frac{\text{Final Level} - \text{Initial Level}}{\text{Initial Level}}$ |
| Payment at<br>Maturity:                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Percentage<br>Change:                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Lesser<br>Performing<br>Reference Asset: | The Reference Asset which has the lowest Percentage Change.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Market<br>Disruption                     | If a market disruption event occurs on the Valuation Date as to a Reference Asset, the determination of the Final Level of that Reference Asset will be postponed. However, the determination of the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

Events: Final Level of any Reference Asset that is not affected by that market disruption event will not be postponed.

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

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Barrier Absolute Return Notes Linked to the  
Lesser Performing of One Exchange Traded  
Fund and One Equity Index

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|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| U.S. Tax Treatment:                    | By purchasing a Note, each holder agrees (in the absence of a change in law, an administrative determination or a judicial ruling to the contrary) to treat the Note as a pre-paid cash settled derivative contract in respect of the 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 September 11, 2018 under “Supplemental Discussion of U.S. Federal Income Tax Consequences,” which apply to the Notes. |
| Secondary Market:                      | RBCCM (or one of its affiliates), though not obligated to do so, may maintain a secondary market in the Notes after the Issue Date. The amount that you may receive upon sale of your Notes prior to maturity may be less than the principal amount.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Listing:                               | The Notes will not be listed on any securities exchange.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Settlement:                            | DTC global (including through its indirect participants Euroclear and Clearstream, Luxembourg as described under “Description of Debt Securities—Ownership and Book-Entry Issuance” in the prospectus dated September 7, 2018).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Terms Incorporated in the Master Note: | All of the terms appearing above the item captioned “Secondary Market” on the cover page and pages P-2 and P-3 of this pricing supplement and the terms appearing under the caption “General Terms of the Notes” in the product prospectus supplement dated September 11, 2018, as modified by this pricing supplement.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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Barrier Absolute Return Notes Linked to the  
Lesser Performing of One Exchange Traded  
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ADDITIONAL TERMS OF YOUR NOTES

You should read this pricing supplement together with the prospectus dated September 7, 2018, as supplemented by the prospectus supplement dated September 7, 2018 and the product prospectus supplement dated September 11, 2018, relating to our Senior Global Medium-Term Notes, Series H, of which these Notes are a part. Capitalized terms used but not defined in this pricing supplement will have the meanings given to them in the product prospectus supplement. In the event of any conflict, this pricing supplement will control. The Notes vary from the terms described in the product prospectus supplement in several important ways. You should read this pricing supplement carefully, including “—Additional Terms Related to the SX5E” below.

This pricing supplement, together with the documents listed below, contains the terms of the Notes and supersedes all prior or contemporaneous oral statements as well as any other written materials including preliminary or indicative pricing terms, correspondence, trade ideas, structures for implementation, sample structures, brochures or other educational materials of ours. You should carefully consider, among other things, the matters set forth in “Risk Factors” in the prospectus supplement dated September 7, 2018 and “Additional Risk Factors Specific to the Notes” in the product prospectus supplement dated September 11, 2018, as the Notes involve risks not associated with conventional debt securities. We urge you to consult your investment, legal, tax, accounting and other advisors before you invest in the Notes. You may access these documents on the Securities and Exchange Commission (the “SEC”) website at [www.sec.gov](http://www.sec.gov) as follows (or if that address has changed, by reviewing our filings for the relevant date on the SEC website):

Prospectus dated September 7, 2018:

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

Prospectus Supplement dated September 7, 2018:

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

Product Prospectus Supplement ERN-ETF-1 dated September 11, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000114036118038211/form424b5.htm>

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

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Barrier Absolute Return Notes Linked to the  
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### HYPOTHETICAL EXAMPLES

The table set out below is included for illustration purposes only. The table illustrates the Redemption Amount of the Notes for a hypothetical range of performance for the Lesser Performing Reference Asset, assuming the following terms:

|                                                        |                                                           |
|--------------------------------------------------------|-----------------------------------------------------------|
| Hypothetical Initial Level (for each Reference Asset): | 1,000.00*                                                 |
| Hypothetical Barrier Level (for each Reference Asset): | 550.00, which is 55.00% of the hypothetical Initial Level |
| Barrier Amount:                                        | 55.00%                                                    |
| Leverage Factor:                                       | 166%                                                      |
| Principal Amount:                                      | \$1,000 per Note                                          |

\* The hypothetical Initial Level of 1,000.00 used in the examples below has been chosen for illustrative purposes only and does not represent the actual Initial Level of either Reference Asset. The actual Initial Levels for each Reference Asset is set forth on the cover page of this pricing supplement. 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 are shown in the first column on the left. The second column shows the Redemption Amount for a range of Final Levels of the Lesser Performing Reference Asset on the Valuation Date. The third column shows the Redemption Amount to be paid on the Notes per \$1,000 in principal amount.

| Hypothetical Final Level of the Lesser Performing Reference Asset | Redemption Amount as Percentage of Principal Amount | Redemption Amount per \$1,000 in Principal Amount |
|-------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------|
| 1,300.00                                                          | 149.80%                                             | \$1,498.00                                        |
| 1,200.00                                                          | 133.20%                                             | \$1,332.00                                        |
| 1,100.00                                                          | 116.60%                                             | \$1,166.00                                        |
| 1,000.00                                                          | 100.00%                                             | \$1,000.00                                        |
| 900.00                                                            | 110.00%                                             | \$1,100.00                                        |
| 850.00                                                            | 115.00%                                             | \$1,150.00                                        |
| 800.00                                                            | 120.00%                                             | \$1,200.00                                        |
| 750.00                                                            | 125.00%                                             | \$1,250.00                                        |
| 700.00                                                            | 130.00%                                             | \$1,300.00                                        |
| 600.00                                                            | 140.00%                                             | \$1,400.00                                        |
| 550.00                                                            | 145.00%                                             | \$1,450.00                                        |
| 500.00                                                            | 50.00%                                              | \$500.00                                          |
| 400.00                                                            | 40.00%                                              | \$400.00                                          |
| 250.00                                                            | 25.00%                                              | \$250.00                                          |
| 0.00                                                              | 0.00%                                               | \$0.00                                            |

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Barrier Absolute Return Notes Linked to the  
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Hypothetical Examples of Amounts Payable at Maturity

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

Example 1: The value of the Lesser Performing Reference Asset increases by 10% from the Initial Level of 1,000.00 to its Final Level of 1,100.00. Because the Final Level of the Lesser Performing Reference Asset is greater than the Initial Level, the investor receives at maturity, a cash payment of \$1,166.00 per Note, calculated as follows:

$$\begin{aligned} & \$1,000 + (\$1,000 \times \text{Percentage Change of the Lesser Performing Reference Asset} \times \text{Leverage Factor}) \\ & = \$1,000 + (\$1,000 \times 10\% \times 166\%) = \$1,166.00 \end{aligned}$$

Example 2: The value of the Lesser Performing Reference Asset decreases by 15% from the Initial Level of 1,000.00 to its Final Level of 850.00. Because the Final Level of the Lesser Performing Reference Asset is less than the Initial Level but greater than its Barrier Level, the investor receives at maturity, a positive return equal to the absolute value of the Percentage Change, despite the 15% decline in the value of the Lesser Performing Reference Asset, calculated as follows:

$$\begin{aligned} & \$1,000 + [-1 \times (\$1,000 \times \text{Percentage Change of the Lesser Performing Reference Asset})] \\ & = \$1,000 + [-1 \times (\$1,000 \times -15\%)] = \$1,000 + \$150 = \$1,150.00. \end{aligned}$$

Example 3: The value of the Lesser Performing Reference Asset is 400.00 on the Valuation Date, which is less than its Barrier Level. Because the Final Level of the Lesser Performing Reference Asset is less than its Barrier Level, we will pay only \$400.00 for each \$1,000 in the principal amount of the Notes, calculated as follows:

$$\begin{aligned} & \text{Principal Amount} + [\text{Principal Amount} \times (\text{Reference Asset Return of the Lesser Performing Reference Asset})] \\ & = \$1,000 + [\$1,000 \times -60.00\%] = \$1,000 - \$600.00 = \$400.00 \end{aligned}$$

\* \* \*

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 Redemption Amounts 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 the EEM or the securities held by or included in either Reference Asset.

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Barrier Absolute Return Notes Linked to the  
Lesser Performing of One Exchange Traded  
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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 “Additional Risk Factors Specific to the Notes” in the product prospectus supplement. In addition to the risks described in the prospectus supplement and the product prospectus supplement, you should consider the following:

**Principal at Risk** – Investors in the Notes could lose all or a substantial portion of their principal amount if there is a decline in the value of the Lesser Performing Reference Asset between the Pricing Date and the Valuation Date of more than 45%. If the Percentage Change is less than -45%, you will lose 1% of the principal amount of your Notes for each 1% that the Final Level of the Lesser Performing Reference Asset is less than its Initial Level.

**Your Redemption Amount Will Be Determined Solely by Reference to the Lesser Performing Reference Asset Even if the Other Reference Asset Performs Better** – Your Redemption Amount will be determined solely by reference to the performance of the Lesser Performing Reference Asset. Even if the Final Level of the other Reference Asset has increased compared to its Initial Level, or has 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 Asset. 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 Asset. Instead your return will depend solely on the Final Level of the Lesser Performing Reference Asset.

**The Notes Do Not Pay Interest and Your Return May Be Lower than the Return on a Conventional Debt Security of Comparable Maturity** – You will not receive any interest payments on the Notes as there would be on a conventional fixed-rate or floating-rate debt security having the same maturity. The return that you will receive on the Notes, which could be negative, may be less than the return you could earn on other investments. Even if your return is positive, your return may be less than the return you would earn if you bought a conventional senior interest bearing debt security of Royal Bank.

**Payments on the Notes Are Subject to Our Credit Risk, and Changes in Our Credit Ratings Are Expected to Affect the Market Value of the Notes** – The Notes are Royal Bank’s senior unsecured debt securities. As a result, your receipt of the Redemption Amount is dependent upon Royal Bank’s ability to repay its obligations at that time. This will be the case even if the prices or levels of the Reference Assets increase after the Pricing Date. No assurance can be given as to what our financial condition will be at the maturity of the Notes.

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

**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

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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 Is an Estimate Only, Calculated as of the Time the Terms of the Notes Were Set** — The initial estimated value of the Notes is based on the value of our obligation to make the payments on the Notes, together with the mid-market value of the derivative embedded in the terms of the Notes. See “Structuring the Notes” below. Our estimate is based on a variety of assumptions, including our credit spreads, expectations as to dividends, interest rates and volatility, and the expected term of the Notes. These assumptions are based on certain forecasts about future events, which may prove to be incorrect. Other entities may value the Notes or similar securities at a price that is significantly different than we do.

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

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

**Market Disruption Events and Adjustments** – The Redemption Amount 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 “—Additional Terms of Your Notes Related to the SX5E—Market Disruption Events” below.

**Our Business Activities May Create Conflicts of Interest** — We and our affiliates expect to engage in trading activities related to the Reference Assets or the securities held by or included in 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 issuers of the securities held by or included in 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 held by or included in 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.

You Will Not Have Any Shareholder Rights and Will Have No Right to Receive Any Shares of the EEM or the Securities Held by or Included in the Reference Assets at Maturity — The return on your Notes is unlikely to reflect the return you would realize if you actually owned shares of the EEM or the securities held by or included in a Reference Asset. For instance, you will not receive or be entitled to receive any dividend payments or other distributions on those securities during the term of your Notes. As an owner of the Notes, you will not have voting rights or any other rights that holders of those securities may have. The Final Level of either Reference Asset will not reflect any dividends paid on the EEM or the securities held by or included in the Reference Asset, and accordingly, any positive return on the Notes may be less than the potential positive return on the EEM or the securities held by or included in a Reference Asset.

The EEM and its Underlying Index Are Different — The performance of the EEM may not exactly replicate the performance of its Underlying Index (as defined below), because the EEM 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 EEM may not fully replicate or may in certain circumstances diverge significantly from the performance of its Underlying Index due to the

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temporary unavailability of certain securities in the secondary market, the performance of any derivative instruments contained in the EEM or due to other circumstances. The EEM 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 held by the EEM may be unavailable in the secondary market, market participants may be unable to calculate accurately the net asset value per share of the EEM and the liquidity of the EEM may be adversely affected. This kind of market volatility may also disrupt the ability of market participants to create and redeem shares of the EEM. Further, market volatility may adversely affect, sometimes materially, the prices at which market participants are willing to buy and sell shares of the EEM. As a result, under these circumstances, the market value of shares of the EEM may vary substantially from the net asset value per share of the EEM. For all of the foregoing reasons, the performance of the EEM may not correlate with the performance of its Underlying Index as well as the net asset value per share of the EEM, which could materially and adversely affect the value of the Notes in the secondary market and/or reduce your payment at maturity

**The EEM Is Subject to Management Risks** — The EEM is subject to management risk, which is the risk that the investment advisor's investment strategy, the implementation of which is subject to a number of constraints, may not produce the intended results. For example, the investment advisor may invest a portion of the EEM's assets in securities not included in the relevant industry or sector but which the investment advisor believes will help the EEM track the relevant industry or sector.

**Adjustments to the Reference Assets or the Underlying Index Could Adversely Affect the Notes** — The investment advisor or the sponsor of the relevant Reference Asset or the Underlying Index is responsible for calculating and maintaining the relevant Reference Asset or the Underlying Index. The investment advisor or the sponsor can add, delete or substitute the stocks comprising the relevant Reference Asset or the Underlying Index. The investment advisor or the sponsor may make other methodological changes that could change the value of the relevant Reference Asset or the Underlying Index at any time. If one or more of these events occurs, the calculation of the amount payable at maturity may be adjusted to reflect such event or events. Consequently, any of these actions could adversely affect the amount payable at maturity and/or the market value of the Notes.

**We and Our Affiliates Do Not Have Any Affiliation with the Advisor or the Sponsor of the Reference Assets or the Underlying Index and Are Not Responsible for its Public Disclosure of Information** — We and our affiliates are not affiliated with the investment advisor or the sponsor of either Reference Asset or the Underlying Index of the EEM in any way and have no ability to control or predict its actions, including any errors in or discontinuance of disclosure regarding its methods or policies relating to the Reference Assets or the Underlying Index. The investment advisor or the sponsor of either Reference Asset or the Underlying Index is not involved in the offering of the Notes in any way and has no obligation to consider your interests as an owner of the Notes in taking any actions relating to the Reference Assets that might affect the value of the Notes. Neither we nor any of our affiliates has independently verified the adequacy or accuracy of the information about the investment advisor, the sponsor, or the Reference Assets contained in any public disclosure of information. You, as an investor in the Notes, should make your own investigation into the Reference Assets.

**An Investment in Notes Linked to the Reference Assets Is Subject to Risks Associated with Foreign Securities Markets** — The Reference Assets track 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 relevant foreign securities markets 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.

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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.

As a Holder of the Notes, You Will Not Have Direct Exposure to Fluctuations in the U.S. Dollar/Euro Exchange Rate Related to the SX5E — The value of the Notes will not be adjusted for exchange rate fluctuations between the U.S. dollar and the euro, even though any currency fluctuations could affect the performance of the SX5E. Therefore, if the euro appreciates or depreciates relative to the U.S. dollar over the term of the Notes, you will not receive any additional payment or incur any reduction in any payment on the Notes.

The Notes Are Subject to Foreign Currency Exchange Rate Risk Related to the EEM — The 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 the EEM are traded. Accordingly, investors in the notes 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 in part 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 its price may decrease.

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.

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ADDITIONAL TERMS OF YOUR NOTES RELATED TO THE SX5E

Closing Level

The closing level of the SX5E 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 SX5E means a day on which the principal trading market for the SX5E is open for trading.

Unavailability of the Level of the SX5E

If the sponsor of the SX5E discontinues publication of the SX5E 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 SX5E (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 the SX5E for all purposes, including for purposes of determining whether a market disruption event exists with respect to the SX5E.

If the sponsor of the SX5E discontinues publication of the SX5E prior to, and that discontinuance is continuing on, any trading day on which the level of the SX5E 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 the SX5E for the relevant date in accordance with the formula for and method of calculating the SX5E 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 the SX5E 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 the SX5E. Notwithstanding these alternative arrangements, discontinuance of the publication of the SX5E may adversely affect the value of your Notes.

If at any time the method of calculating a closing level for the SX5E or a successor index is changed in a material respect, or if such index is in any other way modified so that it does not, in the opinion of the calculation agent, fairly represent its level 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 such index as if those changes or modifications had not been made. Accordingly, if the method of calculating an index is modified so that the level of that index is a fraction of what it would have been if it had not been modified (e.g., due to a split in that index), then the calculation agent will adjust the level of that index in order to arrive at a level of that index as if it had not been modified (e.g., as if such split had not occurred).

Market Disruption Events

A “market disruption event” with respect to the SX5E or a successor index 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 that index:

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

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 such index, or (ii) effect transactions in, or obtain market values for, futures or options contracts relating to such index on their respective markets;

the closure on any day of the primary market for futures or options contracts relating to such index or index components constituting 20% or more, by weight, of such index 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

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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 such index or (ii) the exchanges or quotation systems, if any, on which futures or options contracts on such index 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.

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INFORMATION REGARDING THE REFERENCE ASSETS

We have derived the following information regarding each of the applicable Reference Assets from publicly available documents. We have not independently verified the accuracy or completeness of the following information.

iShares® MSCI Emerging Markets ETF (“EEM”)

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

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.

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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.

Correlation

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

Share Prices

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

The Underlying Index

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

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

General – MSCI Indices

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

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

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

- defining the equity universe;

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

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

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

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

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

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

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

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

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

DM and EM Minimum Liquidity Requirement: This investability screen is applied at the individual security level. To be eligible for inclusion in a market investable equity universe, a security must have adequate liquidity. The twelve-month and three-month Annual Traded Value Ratio (“ATVR”), a measure that screens out extreme daily trading volumes and takes into account the free float–adjusted market capitalization size of securities, together with the three-month frequency of trading are used to measure liquidity. A minimum liquidity level of 20% of three- and twelve-month ATVR and 90% of three-month frequency of trading over the last four consecutive quarters are required for inclusion of a security in a market investable equity universe of a DM, and a minimum liquidity level of 15% of three- and twelve-month ATVR and 80% of three-month frequency of trading over the last four consecutive

quarters are required for inclusion of a security in a market investable equity universe of an EM.

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

**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.

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

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

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

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

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

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

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

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

Index Maintenance

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

- (i) Semi-Annual Index Reviews (“SAIRs”) in May and November of the Size Segment and Global Value and Growth Indices which include:
  - updating the indices on the basis of a fully refreshed equity universe;
  - taking buffer rules into consideration for migration of securities across size and style segments; and
  - updating FIFs and Number of Shares (“NOS”).
- (ii) Quarterly Index Reviews in February and August of the Size Segment Indices aimed at:
  - including significant new eligible securities (such as IPOs that were not eligible for earlier inclusion) in the index;
  - allowing for significant moves of companies within the Size Segment Indices, using wider buffers than in the SAIR;
  - and
  - reflecting the impact of significant market events on FIFs and updating NOS.

(iii) Ongoing Event–Related Changes: changes of this type are generally implemented in the indices as they occur. Significantly large IPOs are included in the indices after the close of the company’s tenth day of trading. None of us, RBCCM or any of our other affiliates accepts any responsibility for the calculation, maintenance, or publication of, or for any error, omission, or disruption in, the index or any successor to the index.

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Barrier Absolute Return Notes Linked to the  
Lesser Performing of One Exchange Traded  
Fund and One Equity Index

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

The graph below sets forth the information relating to the historical performance of the EEM. In addition, below the graph is a table setting forth the intra-day high, intra-day low and period-end closing prices of the EEM. The information provided in this table is for the period from January 1, 2008 through September 25, 2018.

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

We have not independently verified the accuracy or completeness of the information obtained from Bloomberg Financial Markets. The historical performance of the EEM should not be taken as an indication of its future performance, and no assurance can be given as to the Final Level of the EEM. We cannot give you assurance that the performance of the EEM will result in any positive return on your initial investment.

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| Period-Start Date | Period-End Date | High Intra-Day Share Price<br>of the EEM<br>(in \$) | Low Intra-Day Share Price<br>of the EEM<br>(in \$) | Period-End Closing Share<br>Price of the EEM<br>(in \$) |
|-------------------|-----------------|-----------------------------------------------------|----------------------------------------------------|---------------------------------------------------------|
| 1/1/2008          | 3/31/2008       | 50.75                                               | 40.68                                              | 44.79                                                   |
| 4/1/2008          | 6/30/2008       | 52.48                                               | 44.43                                              | 45.19                                                   |
| 7/1/2008          | 9/30/2008       | 44.76                                               | 30.88                                              | 34.53                                                   |
| 10/1/2008         | 12/31/2008      | 34.29                                               | 18.22                                              | 24.69                                                   |
| 1/1/2009          | 3/31/2009       | 27.28                                               | 19.87                                              | 24.81                                                   |
| 4/1/2009          | 6/30/2009       | 34.88                                               | 24.72                                              | 32.23                                                   |
| 7/1/2009          | 9/30/2009       | 39.51                                               | 30.25                                              | 38.91                                                   |
| 10/1/2009         | 12/31/2009      | 42.52                                               | 37.30                                              | 41.16                                                   |
| 1/1/2010          | 3/31/2010       | 43.47                                               | 35.01                                              | 42.12                                                   |
| 4/1/2010          | 6/30/2010       | 44.02                                               | 35.21                                              | 37.32                                                   |
| 7/1/2010          | 9/30/2010       | 44.99                                               | 36.76                                              | 44.77                                                   |
| 10/1/2010         | 12/31/2010      | 48.62                                               | 44.51                                              | 47.31                                                   |
| 1/1/2011          | 3/31/2011       | 48.75                                               | 44.25                                              | 48.69                                                   |
| 4/1/2011          | 6/30/2011       | 50.43                                               | 44.77                                              | 47.60                                                   |
| 7/1/2011          | 9/30/2011       | 48.63                                               | 34.71                                              | 35.07                                                   |
| 10/1/2011         | 12/31/2011      | 43.21                                               | 33.43                                              | 37.94                                                   |
| 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          | 3/31/2017       | 40.23                                               | 35.30                                              | 39.39                                                   |
| 4/1/2017          | 6/30/2017       | 42.04                                               | 38.72                                              | 41.39                                                   |
| 7/1/2017          | 9/30/2017       | 45.96                                               | 40.96                                              | 44.81                                                   |
| 10/1/2017         | 12/30/2017      | 47.93                                               | 44.80                                              | 47.12                                                   |
| 1/1/2018          | 3/31/2018       | 52.08                                               | 45.04                                              | 48.28                                                   |

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|          |           |       |       |       |
|----------|-----------|-------|-------|-------|
| 4/1/2018 | 6/30/2018 | 48.31 | 42.16 | 43.33 |
| 7/1/2018 | 9/25/2018 | 45.06 | 40.63 | 42.91 |

PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

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Barrier Absolute Return Notes Linked to the  
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EURO STOXX 50<sup>®</sup> Index (“SX5E”)

The SX5E was created by STOXX Limited (“STOXX”), a subsidiary of Deutsche Börse AG. Publication of the SX5E began in February 1998, based on an initial index level of 1,000 at December 31, 1991.

Composition and Maintenance

The SX5E is composed of 50 component stocks of market sector leaders from within the 19 EURO STOXX<sup>®</sup> Supersector indices, which represent the Eurozone portion of the STOXX Europe 600<sup>®</sup> Supersector indices.

The composition of the SX5E is reviewed annually, based on the closing stock data on the last trading day in August. The component stocks are announced on the first trading day in September. Changes to the component stocks are implemented on the third Friday in September and are effective the following trading day. Changes in the composition of the SX5E are made to ensure that the SX5E includes the 50 market sector leaders from within the SX5E.

The free float factors for each component stock used to calculate the SX5E, as described below, are reviewed, calculated, and implemented on a quarterly basis and are fixed until the next quarterly review.

The SX5E is also reviewed on an ongoing basis. Corporate actions (including initial public offerings, mergers and takeovers, spin-offs, delistings, and bankruptcy) that affect the SX5E composition are announced immediately, implemented two trading days later, and become effective on the next trading day after implementation.

Calculation of the SX5E

The SX5E is calculated with the “Laspeyres formula,” which measures the aggregate price changes in the component stocks against a fixed base quantity weight. The formula for calculating the SX5E value can be expressed as follows:

$$\text{SX5E} = \frac{\text{Free float market capitalization of the SX5E}}{\text{Divisor}} \times 1,000$$

The “free float market capitalization of the SX5E” is equal to the sum of the products of the closing price, market capitalization, the number of shares, the free float factor and weighing cap factor for each component stock as of the time the SX5E is being calculated.

The SX5E is also subject to a divisor, which is adjusted to maintain the continuity of the SX5E values across changes due to corporate actions, such as the deletion and addition of stocks, the substitution of stocks, stock dividends, and stock splits.

License Agreement

We have entered into a non-exclusive license agreement with STOXX providing for the license to us and certain of our affiliated or subsidiary companies, in exchange for a fee, of the right to use indices owned and published by STOXX (including the SX5E) in connection with certain securities, including the Notes offered hereby.

The license agreement between us and STOXX requires that the following language be stated in this document:

STOXX has no relationship to us, other than the licensing of the SX5E and the related trademarks for use in connection with the Notes. STOXX does not:

- sponsor, endorse, sell, or promote the Notes;
- recommend that any person invest in the Notes offered hereby or any other securities;
- have any responsibility or liability for or make any decisions about the timing, amount, or pricing of the Notes;
- have any responsibility or liability for the administration, management, or marketing of the Notes; or
- consider the needs of the Notes or the holders of the Notes in determining, composing, or calculating the SX5E, or have any obligation to do so.

STOXX will not have any liability in connection with the Notes. Specifically:

- STOXX does not make any warranty, express or implied, and disclaims any and all warranty concerning:
  - the results to be obtained by the Notes, the holders of the Notes or any other person in connection with the use of the SX5E and the data included in the SX5E;
  - the accuracy or completeness of the SX5E and its data;

- the merchantability and the fitness for a particular purpose or use of the SX5E and its data;
- STOXX will have no liability for any errors, omissions, or interruptions in the SX5E or its data; and

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Under no circumstances will STOXX be liable for any lost profits or indirect, punitive, special, or consequential damages or losses, even if STOXX knows that they might occur.

The licensing agreement between us and STOXX is solely for their benefit and our benefit, and not for the benefit of the holders of the Notes or any other third parties.

Historical Information for the EURO STOXX 50® Index (“SX5E”)

The graph below sets forth the information relating to the historical performance of the SX5E. In addition, below the graph is a table setting forth the intra-day high, intra-day low and period-end closing levels of the SX5E. The information provided in this table is for the period from January 1, 2008 through September 25, 2018.

We obtained the information regarding the historical performance of the SX5E in the chart below from Bloomberg Financial Markets.

We have not independently verified the accuracy or completeness of the information obtained from Bloomberg Financial Markets. The historical performance of the SX5E should not be taken as an indication of its future performance, and no assurance can be given as to the Final Level of the SX5E. We cannot give you assurance that the performance of the SX5E will result in any positive return on your initial investment.

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Barrier Absolute Return Notes Linked to the  
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| Period-Start<br>Date | Period-End<br>Date | High Intra-Day Level of this<br>SX5E | Low Intra-Day Level of this<br>SX5E | Period-End Closing Level of<br>this SX5E |
|----------------------|--------------------|--------------------------------------|-------------------------------------|------------------------------------------|
| 1/1/2008             | 3/31/2008          | 4,411.59                             | 3,417.25                            | 3,628.06                                 |
| 4/1/2008             | 6/30/2008          | 3,900.30                             | 3,298.05                            | 3,352.81                                 |
| 7/1/2008             | 9/30/2008          | 3,456.81                             | 2,924.13                            | 3,038.20                                 |
| 10/1/2008            | 12/31/2008         | 3,130.25                             | 2,128.29                            | 2,451.48                                 |
| 1/1/2009             | 3/31/2009          | 2,608.15                             | 1,765.49                            | 2,071.13                                 |
| 4/1/2009             | 6/30/2009          | 2,549.32                             | 2,021.53                            | 2,401.69                                 |
| 7/1/2009             | 9/30/2009          | 2,915.71                             | 2,258.60                            | 2,872.63                                 |
| 10/1/2009            | 12/31/2009         | 3,001.56                             | 2,693.80                            | 2,992.08                                 |
| 1/1/2010             | 3/31/2010          | 3,044.37                             | 2,617.77                            | 2,931.16                                 |
| 4/1/2010             | 6/30/2010          | 3,027.14                             | 2,448.10                            | 2,573.32                                 |
| 7/1/2010             | 9/30/2010          | 2,849.45                             | 2,502.50                            | 2,747.90                                 |
| 10/1/2010            | 12/31/2010         | 2,902.80                             | 2,635.08                            | 2,807.04                                 |
| 1/1/2011             | 3/31/2011          | 3,077.24                             | 2,717.74                            | 2,910.91                                 |
| 4/1/2011             | 6/30/2011          | 3,029.68                             | 2,692.95                            | 2,848.53                                 |
| 7/1/2011             | 9/30/2011          | 2,887.30                             | 1,935.89                            | 2,179.66                                 |
| 10/1/2011            | 12/31/2011         | 2,506.22                             | 2,054.98                            | 2,316.55                                 |
| 1/1/2012             | 3/31/2012          | 2,611.42                             | 2,279.73                            | 2,477.28                                 |
| 4/1/2012             | 6/30/2012          | 2,509.93                             | 2,050.16                            | 2,264.72                                 |
| 7/1/2012             | 9/30/2012          | 2,604.77                             | 2,142.46                            | 2,454.26                                 |
| 10/1/2012            | 12/31/2012         | 2,668.23                             | 2,427.32                            | 2,635.93                                 |
| 1/1/2013             | 3/31/2013          | 2,754.80                             | 2,563.64                            | 2,624.02                                 |
| 4/1/2013             | 6/30/2013          | 2,851.48                             | 2,494.54                            | 2,602.59                                 |
| 7/1/2013             | 9/30/2013          | 2,955.47                             | 2,539.15                            | 2,893.15                                 |
| 10/1/2013            | 12/31/2013         | 3,116.23                             | 2,891.39                            | 3,109.00                                 |
| 1/1/2014             | 3/31/2014          | 3,185.68                             | 2,944.13                            | 3,161.60                                 |
| 4/1/2014             | 6/30/2014          | 3,325.50                             | 3,083.43                            | 3,228.24                                 |
| 7/1/2014             | 9/30/2014          | 3,301.15                             | 2,977.52                            | 3,225.93                                 |
| 10/1/2014            | 12/31/2014         | 3,278.97                             | 2,789.63                            | 3,146.43                                 |
| 1/1/2015             | 3/31/2015          | 3,742.42                             | 2,998.53                            | 3,697.38                                 |
| 4/1/2015             | 6/30/2015          | 3,836.28                             | 3,374.18                            | 3,424.30                                 |
| 7/1/2015             | 9/30/2015          | 3,714.26                             | 2,973.16                            | 3,100.67                                 |
| 10/1/2015            | 12/31/2015         | 3,524.04                             | 3,036.17                            | 3,267.52                                 |
| 1/1/2016             | 3/31/2016          | 3,266.01                             | 2,672.73                            | 3,004.93                                 |
| 4/1/2016             | 6/30/2016          | 3,156.86                             | 2,678.27                            | 2,864.74                                 |
| 7/1/2016             | 9/30/2016          | 3,101.75                             | 2,742.66                            | 3,002.24                                 |
| 10/1/2016            | 12/31/2016         | 3,290.52                             | 2,937.98                            | 3,290.52                                 |
| 1/1/2017             | 3/31/2017          | 3,500.93                             | 3,214.31                            | 3,500.93                                 |
| 4/1/2017             | 6/30/2017          | 3,666.80                             | 3,407.33                            | 3,441.88                                 |
| 7/1/2017             | 9/30/2017          | 3,594.85                             | 3,363.68                            | 3,594.85                                 |
| 10/1/2017            | 12/31/2017         | 3,708.82                             | 3,503.20                            | 3,503.96                                 |
| 1/1/2018             | 3/31/2018          | 3,687.22                             | 3,261.86                            | 3,361.50                                 |
| 4/1/2018             | 6/30/2018          | 3,596.20                             | 3,300.50                            | 3,395.60                                 |

|          |           |          |          |          |
|----------|-----------|----------|----------|----------|
| 7/1/2018 | 9/25/2018 | 3,536.87 | 3,274.40 | 3,419.78 |
|----------|-----------|----------|----------|----------|

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SUPPLEMENTAL DISCUSSION OF  
U.S. FEDERAL INCOME TAX CONSEQUENCES

The following disclosure supplements, and to the extent inconsistent supersedes, the discussion in the product prospectus supplement dated September 11, 2018 under “Supplemental Discussion of U.S. Federal Income Tax Consequences.”

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

SUPPLEMENTAL PLAN OF DISTRIBUTION (CONFLICTS OF INTEREST)

Delivery of the Notes will be made against payment for the Notes on September 28, 2018, which is the third (3<sup>rd</sup>) business day following the Pricing Date (this settlement cycle being referred to as “T+3”). Under Rule 15c6-1 of the Exchange Act, trades in the secondary market generally are required to settle in two business days, unless the parties to any such trade expressly agree otherwise. Accordingly, purchasers who wish to trade the Notes more than two business days prior to the original Issue Date will be required to specify alternative arrangements to prevent a failed settlement.

For additional information as to the relationship between us and RBCCM, please see the section “Plan of Distribution—Conflicts of Interest” in the prospectus dated September 7, 2018.

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

The value of the Notes shown on your account statement may be based on RBCCM’s estimate of the value of the Notes if RBCCM or another of our affiliates were to make a market in the Notes (which it is not obligated to do). That estimate will be based upon the price that RBCCM may pay for the Notes in light of then prevailing market conditions, our creditworthiness and transaction costs. For a period of approximately 12 months after the issue date of the Notes, the value of the Notes that may be shown on your account statement may be higher than RBCCM’s estimated value of the Notes at that time. This is because the estimated value of the Notes will not include the underwriting discount and our hedging costs and profits; however, the value of the Notes shown on your account statement during that period may be a higher amount, reflecting the addition of RBCCM’s underwriting discount and our estimated costs and profits from hedging the Notes. This excess is expected to decrease over time until the end of

this period. After this period, if RBCCM repurchases your Notes, it expects to do so at prices that reflect their estimated value.

We may use this pricing supplement in the initial sale of the Notes. In addition, RBCCM or another of our affiliates may use this pricing supplement in a market-making transaction in the Notes after their initial sale. Unless we or our agent informs the purchaser otherwise in the confirmation of sale, this pricing supplement is being used in a market-making transaction.

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Barrier Absolute Return Notes Linked to the  
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## 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 Pricing Date being less than their public offering price. See “Selected Risk Considerations—The Initial Estimated Value of the Notes Is Less than the Price to the Public” above.

## VALIDITY OF THE NOTES

In the opinion of Norton Rose Fulbright Canada LLP, the issue and sale of the Notes has been duly authorized by all necessary corporate action of the Bank in conformity with the Indenture, and when the Notes have been duly executed, authenticated and issued in accordance with the Indenture and delivered against payment therefor, the Notes will be validly issued and, to the extent validity of the Notes is a matter governed by the laws of the Province of Ontario or Québec, or the laws of Canada applicable therein, and will be valid obligations of the Bank, subject to equitable remedies which may only be granted at the discretion of a court of competent authority, subject to applicable bankruptcy, to rights to indemnity and contribution under the Notes or the Indenture which may be limited by applicable law; to insolvency and other laws of general application affecting creditors’ rights, to limitations under applicable limitations statutes, and to limitations as to the currency in which judgments in Canada may be rendered, as prescribed by the Currency Act

(Canada). This opinion is given as of the date hereof and is limited to the laws of the Provinces of Ontario and Québec and the federal laws of Canada applicable thereto. In addition, this opinion is subject to customary assumptions about the Trustee’s authorization, execution and delivery of the Indenture and the genuineness of signatures and certain factual matters, all as stated in the letter of such counsel dated September 7, 2018, which has been filed as Exhibit 5.1 to Royal Bank’s Form 6-K filed with the SEC dated September 7, 2018.

In the opinion of Morrison & Foerster LLP, when the Notes have been duly completed in accordance with the Indenture and issued and sold as contemplated by the prospectus supplement and the prospectus, the Notes will be valid, binding and enforceable obligations of Royal Bank, entitled to the benefits of the Indenture, subject to applicable bankruptcy, insolvency and similar laws affecting creditors’ rights generally, concepts of reasonableness and equitable principles of general applicability (including, without limitation, concepts of good faith, fair dealing and the lack of bad faith). This opinion is given as of the date hereof and is limited to the laws of the State of New York. This opinion is subject to customary assumptions about the Trustee’s authorization, execution and delivery of the

Indenture and the genuineness of signatures and to such counsel's reliance on the Bank and other sources as to certain factual matters, all as stated in the legal opinion dated September 7, 2018, which has been filed as Exhibit 5.2 to the Bank's Form 6-K dated September 7, 2018.

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