



RBC Capital Markets®

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Registration Statement No. 333-227001**

Pricing Supplement

Dated December 24, 2019

To the Product Prospectus Supplement ERN-ETF-1 Dated September 11, 2018, the Prospectus Supplement Dated September 7, 2018, and the Prospectus Dated September 7, 2018

\$6,331,000

Auto-Callable Barrier Notes
Linked to the Lesser Performing of One Exchange
Traded Fund and One Equity Index, Due December
30, 2024
Royal Bank of Canada

Royal Bank of Canada is offering Auto-Callable Barrier 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 are our senior unsecured obligations, and will have the terms described in the documents described above, as supplemented or modified by this pricing supplement. We will not make any payments on the Notes until the maturity date or a prior automatic call. The Notes do not guarantee any return of principal at maturity. Any payments on the Notes are subject to our credit risk.

The Notes will be automatically called at the applicable Call Amount if the closing level of each Reference Asset is greater than or equal to the applicable Call Level on any quarterly Observation Date beginning in June 2020. The Call Amounts are based on a rate of return of 10.00% per annum (2.50% per quarter), and will increase on each quarterly Observation Date to reflect that rate of return. If the Notes are not called, you may lose all or a substantial portion of your principal amount.

Reference Assets	Initial Levels	Barrier Levels*
iShares® MSCI Emerging Markets ETF ("EEM")	\$44.57	\$31.20, which is 70.00% of its Initial Level
FTSE® 100 Index ("UKX")	7,632.24	5,342.57, which is 70.00% of its Initial Level

* Rounded to two decimal places.

Investing in the Notes involves a number of risks. See "Selected Risk Considerations" beginning on page P-8 of this pricing supplement, "Additional Risk Factors Specific to the Notes" beginning on page PS-6 of the product prospectus supplement dated September 11, 2018, and "Risk Factors" beginning on page S-1 of the prospectus supplement dated September 7, 2018.

The Notes will not constitute deposits insured by the Canada Deposit Insurance Corporation, the U.S. Federal Deposit Insurance Corporation or any other Canadian or U.S. government agency or instrumentality. The Notes are not subject to conversion into our common shares under subsection 39.2(2.3) of the Canada Deposit Insurance Corporation Act. Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of the Notes or determined that this pricing supplement is truthful or complete. Any representation to the contrary is a criminal offense.

Issuer:	Royal Bank of Canada	Stock Exchange Listing:	None
Trade Date:	December 24, 2019	Principal Amount:	\$1,000 per Note
Issue Date:	December 30, 2019	Maturity Date:	December 30, 2024
Valuation Date:	December 24, 2024		

Final Level: For each Reference Asset, its closing price or closing level, as applicable, on the Valuation Date.

Call Feature: If the closing price or the closing level, as applicable, of each Reference Asset is greater than or equal to its Call Level starting in June 2020 or on any Observation Date thereafter, the Notes will be called and we will pay the applicable Call Amount on the corresponding Call Settlement Date.

Call Level: 100% of the applicable Initial Level for each Observation Date until March 2021, and thereafter, 95% of the applicable Initial Level.

Observation Dates and Call Settlement Dates: Quarterly, beginning in June 2020, as set forth below.

Payment at Maturity (if held to maturity): If the Notes are not called on any Observation Date (including the Valuation Date), we will pay you at maturity an amount based on the Final Level of the Lesser Performing Reference Asset:

For each \$1,000 in principal amount, \$1,000, unless the Final Level of the Lesser Performing Reference Asset is less than its Barrier Level.

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

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

Investors could lose some or all of the principal amount if there is a decline in the value of Lesser Performing Reference Asset below its Barrier Level.

Lesser Performing Reference Asset: The Reference Asset which has the lowest Percentage Change.

CUSIP: 78015KJS4

	Per Note	Total
Price to public ⁽¹⁾	100.00%	\$6,331,000.00
Underwriting discounts and commissions ⁽¹⁾	2.75%	\$174,102.50

(1) 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 was between \$972.50 and \$1,000 per \$1,000 in principal amount. The initial estimated value of the Notes as of the Trade Date is \$976.05 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 our agent, will receive a commission of \$27.50 per \$1,000 in principal amount of the Notes and will use a portion of that commission to allow selling concessions to other dealers of up to \$27.50 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

Auto-Callable Barrier Notes Royal Bank of Canada

SUMMARY

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

General:	This pricing supplement relates to an offering of Auto-Callable Barrier 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")
Trade Date (Pricing Date):	December 24, 2019
Issue Date:	December 30, 2019
Denominations:	Minimum denomination of \$1,000, and integral multiples of \$1,000 thereafter.
Designated Currency:	U.S. Dollars
Call Feature:	If, on any Observation Date, the closing level or closing price, as applicable, of each Reference Asset is greater than or equal to its Call Level, then the Notes will be automatically called and the applicable Call Amount will be paid on the corresponding Call Settlement Date.
Call Level:	100% of the applicable Initial Level until the Observation Date occurring in March 2021, and 95% of the applicable Initial Level thereafter.
Call Return Rate:	10% per annum

Observation
Dates/Call Settlement
Dates/Call Amounts:

Observation Date	Call Settlement Date	Call Amounts
June 24, 2020	June 29, 2020	105.00%
September 24, 2020	September 29, 2020	107.50%
December 24, 2020	December 30, 2020	110.00%
March 24, 2021	March 29, 2021	112.50%
June 24, 2021	June 29, 2021	115.00%
September 24, 2021	September 29, 2021	117.50%
December 29, 2021	January 3, 2022	120.00%
March 24, 2022	March 29, 2022	122.50%
June 24, 2022	June 29, 2022	125.00%
September 26, 2022	September 29, 2022	127.50%
December 28, 2022	January 3, 2023	130.00%
March 24, 2023	March 29, 2023	132.50%
June 26, 2023	June 29, 2023	135.00%
September 25, 2023	September 28, 2023	137.50%
December 27, 2023	January 2, 2024	140.00%
March 25, 2024	March 28, 2024	142.50%
June 24, 2024	June 27, 2024	145.00%
September 24, 2024	September 27, 2024	147.50%
December 24, 2024 (the "Valuation Date")	December 30, 2024 (the "Maturity Date")	150.00%

The Call Amounts correspond to a return of 10.00% per annum (2.50% per quarter) on the Notes, if they are called. Accordingly, you will not receive any return on the Notes that exceeds the applicable amount set forth above, even if the value of one or more of the Reference Assets increases substantially.

Valuation Date: December 24, 2024
Maturity Date: December 30, 2024
Initial Level: For each Reference Asset, its closing price or closing level, as applicable, as set forth on the cover page of this pricing supplement.

P-2

RBC Capital Markets, LLC

Auto-Callable Barrier Notes Royal Bank of Canada

Final Level: For each Reference Asset, its closing price or closing level, as applicable, on the Valuation Date.

Barrier Level: For each Reference Asset, 70.00% of its Initial Level, as set forth on the cover page of this pricing supplement.

Payment at Maturity (if not previously called and held to maturity): If the Notes are not called on any Observation Date (including the Valuation Date), we will pay you at maturity an amount based on the Final Level of the Lesser Performing Reference Asset:

- If the Final Level of the Lesser Performing Reference Asset is greater than or equal to its Barrier Level, we will pay you a cash payment equal to the principal amount.
- If the Final Level of the Lesser Performing Reference Asset is less than its Barrier Level, you will receive at maturity, for each \$1,000 in principal amount, a cash payment equal to:

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

In this case, the amount of cash that you receive will be less than your principal amount, if anything, resulting in a loss that is proportionate to the decline of the Lesser Performing Reference Asset from the Trade Date to the Valuation Date. *Investors in the Notes could lose some or all of their investment if the Final Level of the Lesser Performing Reference Asset is less than its Barrier Level.*

Percentage Change: With respect to each Reference Asset:

$$\frac{\text{Final Level} - \text{Initial Level}}{\text{Initial Level}}$$

Lesser Performing Reference Asset: The Reference Asset which has the lowest Percentage Change.

Market Disruption Events: If a market disruption event (or a non-trading day) occurs on an Observation Date as to a Reference Asset, the determination of its closing level or closing price will be postponed, as described in the product prospectus supplement. However, the determination of the closing price or closing level of any Reference Asset that is not affected by that market disruption event will not be postponed. If an Observation Date is so postponed, any payment on the Notes may be postponed by the same number of business days.

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

U.S. Tax Treatment: By purchasing a Note, each holder agrees (in the absence of a change in law, an administrative determination or a judicial ruling to the contrary) to treat the Note as a callable pre-paid cash-settled derivative contract 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).

P-3

RBC Capital Markets, LLC

Auto-Callable Barrier Notes
Royal Bank of Canada

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.

P-4

RBC Capital Markets, LLC

Auto-Callable Barrier Notes
Royal Bank of Canada

ADDITIONAL TERMS OF YOUR NOTES

You should read this pricing supplement together with the prospectus dated September 7, 2018, as supplemented by the prospectus supplement dated September 7, 2018 and the product prospectus supplement dated September 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 UKX” 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 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.

Auto-Callable Barrier Notes
Royal Bank of Canada

HYPOTHETICAL EXAMPLES

The table set out below is included for illustration purposes only. The table illustrates the payment upon an automatic call and the Payment at Maturity 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*
Hypothetical Barrier Level (for each Reference Asset):	700, which is 70% of the hypothetical Initial Level
Principal Amount:	\$1,000 per Note
Call Return Rate:	10.00% per annum (2.50% per quarter)
Hypothetical Call Amounts:	\$1,050.00 if called on the first Observation Date (occurring in June 2020), increasing by \$25.00 on each subsequent Observation Date, as set forth in the table above.

* The hypothetical Initial Level of 1,000 used in the examples below has been chosen for illustrative purposes only and is not the actual Initial Level of any Reference Asset. The actual Initial Levels for each Reference Asset are 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.**

Summary of the Hypothetical Examples

	Notes Are Called on an Observation Date						Notes Are Not Called on Any Observation Date			
	Example 1		Example 2		Example 3		Example 4		Example 5	
	EEM	UKX	EEM	UKX	EEM	UKX	EEM	UKX	EEM	UKX
Initial Level	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Closing Value on the First Observation Date (June 2020)	1,200	1,250	1,100	900	900	1,050	880	805	980	805
Closing Value on the Second Observation Date	N/A	N/A	1,020	1,025	850	1,200	780	900	780	1,100
Closing Value on the 3rd to 18th Observation Dates (the next to last Observation Date)	N/A	N/A	N/A	N/A	*	*	*	*	*	*
Closing Value on the Final Observation Date	N/A	N/A	N/A	N/A	970	1,105	850	1,200	600	1,120
Percentage Change of the Reference Assets	N/A	N/A	N/A	N/A	N/A	N/A	-15%	20%	-40%	12%
Percentage Change of the Lesser Performing Reference Asset	N/A		N/A		N/A		-15%		-40%	
Call Amount	\$1,050.00		\$1,075.00		\$1,500.00 (paid on the maturity date)		N/A		N/A	N/A
Payment at Maturity (if not previously called)	N/A		N/A		N/A		\$1,000		\$600	

* Various Closing Values, each below the applicable Call Level. The Call Level decreases to 95% of the applicable Initial Level beginning with the 5th Observation Date on June 24, 2021.

Auto-Callable Barrier Notes
Royal Bank of Canada

Hypothetical Examples of Amounts Payable Upon an Automatic Call

The following hypothetical examples illustrate payments of the Call Amounts set forth in the table on page P-2.

Example 1: The level of the Lesser Performing Reference Asset increases by 25% from the Initial Level of 1,000 to a closing level of 1,250 on the first Observation Date. Because the closing level of the Lesser Performing Reference Asset on the first Observation Date is greater than its Initial Level of 1,000, the investor receives on the applicable Call Settlement Date a cash payment of \$1,050.00, representing the corresponding hypothetical Call Amount. After the Notes are called, they will no longer remain outstanding and there will be no further payments on the Notes.

Example 2: The level of the Lesser Performing Reference Asset decreases by 10% from the Initial Level of 1,000 to a closing level on the first Observation Date of 900 but the level of the Lesser Performing Reference Asset increases by 10% from the Initial Level of 1,000 to a closing level of 1,100 on the second Observation Date. Because the Notes are not called on the first Observation Date and the closing level of the Lesser Performing Reference Asset on the second Observation Date is greater than its Initial Level of 1,000, the investor receives on the applicable Call Settlement Date a cash payment of \$1,075.00, representing the corresponding hypothetical Call Amount. After the Notes are called, they will no longer remain outstanding and there will be no further payments on the Notes.

Example 3: The Notes are not called on any of the Observation Dates and the Final Level of the Lesser Performing Reference Asset is 1,200 on the Valuation Date, which is greater than its Initial Level of 1,000. Because the Notes are not called on any of the Observation Dates and the closing level of the Lesser Performing Reference Asset on the Valuation Date is greater than its Initial Level of 1,000, the investor receives on the Maturity Date a cash payment of \$1,500.00, representing the corresponding hypothetical Call Amount.

Hypothetical Examples of Amounts Payable at Maturity

The following hypothetical examples illustrate how the payments at maturity set forth in the table above are calculated, **assuming the Notes have not been called.**

Example 4: The level of the Lesser Performing Reference Asset decreases by 10% from the Initial Level of 1,000 to its Final Level of 900. The Notes are not called on any Observation Date because the closing level of at least one Reference Asset is below its Initial Level on each Observation Date (including the Valuation Date). Because the Final Level of the Lesser Performing Reference Asset is less than its Initial Level of 1,000 but greater than its Barrier Level, the investor receives at maturity, a cash payment of \$1,000 per Note, despite the 10% decline in the level of the Lesser Performing Reference Asset.

Example 5: The level of the Lesser Performing Reference Asset is 600 on the Valuation Date, which is less than its Barrier Level of 700. The Notes are not called on any Observation Date because the closing level of at least one Reference Asset is below its Initial Level on each Observation Date (including the Valuation Date). Because the Final Level of the Lesser Performing Reference Asset is less than its Barrier Level, we will pay only \$600 for each \$1,000 in the principal amount of the Notes, calculated as follows:

$$\begin{aligned} & \text{Principal Amount} + (\text{Principal Amount} \times \text{Reference Asset Return of the Lesser Performing Reference Asset}) \\ &= \$1,000 + (\$1,000 \times -40\%) = \$1,000 - \$400 = \$600 \end{aligned}$$

* * *

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

SELECTED RISK CONSIDERATIONS

An investment in the Notes involves significant risks. Investing in the Notes is not equivalent to investing directly in the Reference 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 Trade Date and the Valuation Date. If the Notes are not automatically called and the Final Level of the Lesser Performing Reference Asset on the Valuation Date is less than its Barrier Level, the amount of cash that you receive at maturity will represent a loss of your principal that is proportionate to the decline in the value of the Lesser Performing Reference Asset from the Trade Date to the Valuation Date.
- **The Notes Are Subject to an Automatic Call** — If, starting in June 2020 and on any Observation Date, the closing price or closing level of each Reference Asset is greater than or equal to the applicable Call Level, then the Notes will be automatically called. If the Notes are automatically called, then, on the applicable Call Settlement Date, for each \$1,000 in principal amount, you will receive the applicable Call Amount on the corresponding Call Settlement Date. You will not receive any payments after the Call Settlement Date and you will not receive any return on the Notes that exceeds the applicable Call Amount provided above, even if the value of one or both of the Reference Assets increases substantially. You may be unable to reinvest your proceeds from the automatic call in an investment with a return that is as high as the return on the Notes.

Because the Call Level will decrease after March 2021, it may be more likely for the Notes to be automatically called on an Observation Date occurring after that date.

- **The Notes Do Not Pay Interest and Your Return May Be Lower than the Return on a Conventional Debt Security of Comparable Maturity** — There will be no periodic interest payments on the Notes as there would be on a conventional fixed-rate or floating-rate debt security having the same maturity. The return that you will receive on the Notes, which could be negative, may be less than the return you could earn on other investments. Your return may be less than the return you would earn if you purchased one of our conventional senior interest bearing debt securities.
- **Your Redemption Amount Will Be Determined Solely by Reference to the Lesser Performing Reference Asset, Even if the Other Reference Asset Performs Better** — If either of the Reference Assets has a Final Level that is less than its Initial Level or its Barrier Level, your return will be linked to the Lesser Performing Reference Asset. Even if the Final Level of one or both of the other Reference Assets 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.
- **Your Payment on the Notes Will Be Determined by Reference to Each Reference Asset Individually, Not to a Basket, and the Payment at Maturity Will Be Based on the Performance of the Lesser Performing Reference Asset** — The Payment at Maturity will be determined only by reference to the performance of the Lesser Performing Reference Asset, regardless of the performance of the other Reference 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 component, as scaled by the weighting of those basket components. 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.
- **Payments on the Notes Are Subject to Our Credit Risk, and Changes in Our Credit Ratings Are Expected to Affect the Market Value of the Notes** — The Notes are our senior unsecured debt securities. As a result, your receipt of any Call Amounts, if payable, or the amount due on the maturity date, is dependent upon our ability to repay our obligations on the applicable payment date. This will be the case even if the values of the Reference Assets increase after the Trade Date. No assurance can be given as to what our financial condition will be at any time during the term of the Notes.
- **There May Not Be an Active Trading Market for the Notes – Sales in the Secondary Market May Result in Significant Losses** — There may be little or no secondary market for the Notes. The Notes will not be listed on any securities exchange. RBCCM and our other affiliates may make a market for the Notes; however, they are not required to do so. RBCCM or our other affiliates 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 the Notes in any secondary market could be substantial.

- **Owning the Notes Is Not the Same as Owning the Securities Represented by the Reference Assets** — The return on your Notes is unlikely to reflect the return you would realize if you actually owned the securities represented by the Reference Assets. 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 these securities may have. Furthermore, the Reference Assets may appreciate substantially during the term of the Notes, while your potential return will be limited to the applicable Call Amounts.
- **The Initial Estimated Value of the Notes Is Less than the Price to the Public** — The initial estimated value that is 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 values 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 the Notes prior to maturity may be less than your original purchase price, as any such sale price would not be expected to include the underwriting discount and the hedging costs relating to the Notes. In addition to bid-ask spreads, the value of the Notes determined by RBCCM for any secondary market price is expected to be based on the secondary rate rather than the internal funding rate used to price the Notes and determine the initial estimated value. As a result, the secondary price will be less than if the internal funding rate was used. The Notes are not designed to be short-term trading instruments. Accordingly, you should be able and willing to hold the Notes to maturity.
- **The Initial Estimated Value of the Notes on the Cover Page of this Pricing Supplement Is an Estimate Only, Calculated as of the Time the Terms of the Notes Were Set** — The initial estimated value of the Notes is based on the value of our obligation to make the payments on the Notes, together with the mid-market value of the derivative embedded in the terms of the Notes. See “Structuring the Notes” below. Our estimate is based on a variety of assumptions, including our credit spreads, expectations as to dividends, interest rates and volatility, and the expected term of the Notes. These assumptions are based on certain forecasts about future events, which may prove to be incorrect. Other entities may value the Notes or similar securities at a price that is significantly different than we do.

The value of the Notes at any time after the Trade Date will vary based on many factors, including changes in market conditions, and cannot be predicted with accuracy. As a result, the actual value you would receive if you sold the Notes in any secondary market, if any, should be expected to differ materially from the initial estimated value of the Notes.
- **An Investment in the Notes Is Subject to Risks Relating to Non-U.S. Securities Markets** — Because foreign companies or foreign equity securities included in the Reference Assets are publicly traded in the applicable foreign countries and are denominated in currencies other than U.S. dollars, an investment in the securities involves particular risks. For example, the non-U.S. securities markets may be more volatile than the U.S. securities markets, and market developments may affect these markets differently from the U.S. or other securities markets. Direct or indirect government intervention to stabilize the securities markets outside the U.S., as well as cross-shareholdings in certain companies, may affect trading prices and trading volumes in those markets. Also, the public availability of information concerning the foreign issuers may vary depending on their home jurisdiction and the reporting requirements imposed by their respective regulators. In addition, the foreign issuers may be subject to accounting, auditing and financial reporting standards and requirements that differ from those applicable to U.S. reporting companies.
- **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.

- **Market Disruption Events and Adjustments** — The payment at maturity, each Observation Date, and the Valuation Date are subject to adjustment as to each Reference Asset as described above and 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 UKX—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.
- **The EEM and its Underlying Index is Different** — The performance of the EEM may not exactly replicate the performance of its underlying index, because this Reference Asset 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 this Reference Asset may not fully replicate or may in certain circumstances diverge significantly from the performance of their underlying indices due to the temporary unavailability of certain securities in the secondary market, the performance of any derivative instruments contained in the Reference Asset, or due to other circumstances. This Reference Asset may use futures contracts, options, swap agreements, currency forwards and repurchase agreements in seeking performance that corresponds to their underlying indices and in managing cash flows.

During periods of market volatility, securities held by this Reference Asset may be unavailable in the secondary market, market participants may be unable to calculate accurately their net asset value per share and their liquidity may be adversely affected. This kind of market volatility may also disrupt the ability of market participants to create and redeem shares of the Reference Asset. Further, market volatility may adversely affect, sometimes materially, the prices at which market participants are willing to buy and sell shares of the applicable Reference Asset. As a result, under these circumstances, the market value of shares of this Reference Asset may vary substantially from the applicable net asset value per share. For all of the foregoing reasons, the performance of this Reference Asset may not correlate with the performance of its underlying index as well as their net asset value per share, which could materially and adversely affect the value of the Notes in the secondary market and/or reduce the payments on the Notes.
- **Adjustments to the Reference Assets or the Underlying Index of the EEM Could Adversely Affect the Notes** — The investment advisor or the sponsor of the relevant Reference Asset or the underlying index of EEM is responsible for calculating and maintaining the relevant Reference Asset or 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. Consequently, any of these actions could adversely affect the amounts payable on the Notes or their market value.
- **We and Our Affiliates Do Not Have Any Affiliation with the Advisor or the Sponsors of the Reference Assets or the Underlying Indices and Are Not Responsible for Their Public Disclosure of Information** — We and our affiliates are not affiliated with the investment advisor or the sponsors of any Reference Asset or the underlying index of the EEM in any way and have no ability to control or predict their actions, including any errors in or discontinuance of disclosure regarding its methods or policies relating to the Reference Assets or the underlying indices. The investment advisor or the sponsors of the Reference Assets and the underlying indices are not involved in the offering of the Notes in any way and have no obligation to consider your interests as an owner of the Notes in taking any actions relating to the Reference 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 sponsors, 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.

Auto-Callable Barrier Notes
Royal Bank of Canada

ADDITIONAL TERMS OF YOUR NOTES RELATED TO THE UKX

Closing Level

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

Unavailability of the Level of the UKX

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

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

If at any time the method of calculating a closing level for the UKX or a successor index is changed in a material respect, or if the UKX 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 UKX 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:

- 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 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;

P-11

RBC Capital Markets, LLC

Auto-Callable Barrier Notes Royal Bank of Canada

- 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.

P-12

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

iShares® MSCI Emerging Markets ETF (“EEM”)

iShares consists of numerous separate investment portfolios (the “iShares Funds”), including the applicable Reference Asset. Each of these Reference Assets seeks investment results that correspond generally to the price and yield performance, before fees and expenses, of their respective underlying indices. These Reference Assets typically earn income from dividends from securities held by the Reference Assets. These amounts, net of expenses and taxes (if applicable), are passed along to these Reference Assets’ shareholders as “ordinary income.” In addition, the Reference Assets realizes capital gains or losses whenever they sell securities. Net long-term capital gains are distributed to their respective shareholders as “capital gain distributions.” However, because the Notes are linked only to the share price of the applicable Reference Asset, you will not be entitled to receive income, dividend, or capital gain distributions from the applicable Reference Asset or any equivalent payments.

“iShares®” and “BlackRock®” are registered trademarks of BlackRock®. The Notes are not sponsored, endorsed, sold, or promoted by BlackRock®, or by any of the iShares® Funds. Neither BlackRock® nor the iShares® Funds 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 the iShares® Funds shall have any obligation or liability in connection with the registration, operation, marketing, trading, or sale of any of the Notes or in connection with our use of information about any of the Reference Assets or any of the iShares® Funds.

Information provided to or filed with the SEC under the Securities Exchange Act of 1934 and the Investment Company Act of 1940 relating to the EEM may be obtained through the SEC’s website at <http://www.sec.gov>. Information on that website is not included or incorporated by reference into this document.

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 MSCI Emerging Markets Index. The EEM generally invests at least 90% of its assets in the securities of the MSCI Emerging Markets Index and in American Depositary Receipts or Global Depositary Receipts based on the securities of the MSCI Emerging Markets Index. The EEM may

invest the remainder of its assets in securities not included in the MSCI Emerging Markets Index, but which the Advisor believes will help the EEM track the MSCI Emerging Markets Index, or in futures contracts, options on futures contracts, other types of options and swaps related to the MSCI Emerging Markets 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.

The MSCI Emerging Markets Index

The information below is included only to give insight to the MSCI Emerging Markets Index, the performance of which the EEM attempts to reflect. The Notes are linked to the performance of the EEM and not to the MSCI Emerging Markets Index. We have derived all information contained in this document regarding the MSCI Emerging Markets Index, including, without limitation, its make-up, method of calculation and changes in its components, from publicly available information. The MSCI Emerging Markets Index is a stock index calculated, published and disseminated daily by MSCI, Inc. ("MSCI"), through numerous data vendors, on the MSCI website and in real time on Bloomberg Financial Markets and Reuters Limited. MSCI has no obligation to continue to calculate and publish, and may discontinue calculation and publication of the MSCI Emerging Markets Index

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

General – MSCI Indices

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

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

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

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

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

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

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

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

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

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

- **Equity Universe Minimum Size Requirement:** this investability screen is applied at the company level. In order to be included in a market investable equity universe, a company must have the required minimum full market capitalization.
- **Equity Universe Minimum Free Float-Adjusted Market Capitalization Requirement:** this investability screen is applied at the individual security level. To be eligible for inclusion in a market investable equity universe, a security must have a free float-adjusted market capitalization equal to or higher than 50% of the equity universe minimum size requirement.
- **DM and EM Minimum Liquidity Requirement:** this investability screen is applied at the individual security level. To be eligible for inclusion in a market investable equity universe, a security must have adequate liquidity. The twelve-month and three-month Annual Traded Value Ratio (“ATVR”), a measure that screens out extreme daily trading volumes and takes into account the free float-adjusted market capitalization size of securities, together with the three-month frequency of trading are used to measure liquidity. A minimum liquidity level of 20% of three- and twelve-month ATVR and 90% of three-month frequency of

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

- **Global Minimum Foreign Inclusion Factor Requirement:** this investability screen is applied at the individual security level. To be eligible for inclusion in a market investable equity universe, a security’s Foreign Inclusion Factor (“FIF”) must reach a certain threshold. The FIF of a security is defined as the proportion of shares outstanding that is available for purchase in the public equity markets by international investors. This proportion accounts for the available free float of and/or the foreign ownership limits applicable to a specific security (or company). In general, a security must have an FIF equal to or larger than 0.15 to be eligible for inclusion in a market investable equity universe.
- **Minimum Length of Trading Requirement:** this investability screen is applied at the individual security level. For an initial public offering (“IPO”) to be eligible for inclusion in a market investable equity universe, the new issue must have started trading at least three months before the implementation of a semi-annual index review (as described below). This requirement is applicable to small new issues in all markets. Large IPOs are not subject to the minimum length of trading requirement and may be included in a market investable equity universe and the Standard Index outside of a Quarterly or Semi-Annual Index Review.
- **Minimum Foreign Room Requirement:** this investability screen is applied at the individual security level. For a security that is subject to a foreign ownership limit to be eligible for inclusion in a market investable equity universe, the proportion of shares still available to foreign investors relative to the maximum allowed (referred to as “foreign room”) must be at least 15%.

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, these indices or any successor to these indices.

The FTSE® 100 Index (“UKX”)

The FTSE® 100 Index (the “UKX”) is a market capitalization-weighted index of the 100 most highly capitalized U.K.-listed blue chip companies traded on the London Stock Exchange. The UKX was developed with a base level of 1,000 as of December 30, 1983. It is calculated, published and disseminated by FTSE International Limited (“FTSE”), a company owned by the London Stock Exchange Plc (the “Exchange”). Additional information on the UKX is available from the following website: www.ftse.com/uk. We are not incorporating by reference the website or any material it includes in this document. FTSE is under no obligation to continue to publish the UKX and may discontinue publication of the UKX at any time.

Index Composition and Selection Criteria

The UKX consists of the 100 largest U.K.-listed blue chip companies, based on full market capitalization, that pass screening tests for price and liquidity. The UKX is reviewed on a quarterly basis in March, June, September and December based on data from the close of business on the Tuesday before the first Friday of the review month. The FTSE Europe, Middle East & Africa Regional Advisory Committee (the “Committee”), meets quarterly to approve the constituents of the index. These meetings are held on the Wednesday before the first Friday in March, June, September and December. Any constituent changes are implemented after the close of business on the third Friday of the review month (i.e., effective Monday), following the expiration of the London International Financial Futures and Options Exchange futures and options contracts.

Eligibility Standards

Only “premium listed” equity shares, as defined by the Financial Conduct Authority in its Listing Rules Sourcebook, are eligible for inclusion in the UKX. Eligible stocks must pass price and liquidity screens before being included in the index. Additionally, a stock must have a free float (as described below) of greater than 5%.

Price Screen — With regard to the price screen, the Committee must be satisfied that an accurate and reliable price exists for purposes of determining the market value of a company. To be eligible for inclusion in the UKX, a stock must have a full listing on the London Stock Exchange with a Sterling-denominated price on SETS (SETS is the London Stock Exchange’s trading service for UK blue chip securities).

Liquidity Screen — With regard to liquidity, each eligible stock is tested for liquidity annually in June by calculating its median daily trading per month. When calculating the median of daily trades per month of any security, a minimum of five trading days in each month must exist, otherwise the month is excluded from the test. Liquidity is tested from the first business day in May of the previous year to the last business day of April. The median trade is calculated by ranking each daily trade total and selecting the middle-ranking day. Any period of suspension is not included in the test. The liquidity test is applied on a pro-rata basis where the testing period is less than 12 months. A stock not presently included in the UKX that does not turnover at least 0.025% of its shares in issue (after application of any investability weightings) based on its median daily trade per month in at least ten of the 12 months prior to the annual index review in June will not be eligible for inclusion until the next annual review. An existing constituent failing to trade at least 0.015% of its shares in issue (after the application of any investability weightings) based on its median daily trade per month for at least eight of the 12 months prior to the annual index review will be removed from the UKX and will not be eligible for inclusion until the next annual review. New issues will become eligible for inclusion in the index at the quarterly review following their issuance provided that they have a minimum trading record of at least 20 trading days prior to the review date and that they have turned over at least 0.025% of their shares in issue (after the application of any investability weightings) based on their median daily trade per month since listing.

In addition, in order to be included in the UKX, a company is required to have greater than 5% of its voting rights (aggregated across all of its equity securities, including, where identifiable, those that are not listed or trading) in the hands of unrestricted shareholders. Current constituents of this index that who do not meet this requirement will have until the September 2022 review to meet the requirement; otherwise they will be removed from the UKX.

Market Capitalization Ranking — Eligible stocks that pass the price and liquidity screens are ranked by the Committee according to their market capitalization before the application of any adjustments based on the extent to which the shares are publicly traded. Only the quoted equity capital of a constituent company will be included in the calculation of its market capitalization. Where a company has two or more classes of equity, secondary lines will be included in the calculation of the market capitalization of the company only if those lines are significant and liquid. The Committee will add a stock to the UKX at the quarterly review if it has risen to 90th place or above on the full market capitalization rankings and will delete a stock at the quarterly review if it has fallen to 111th place or below on these rankings. Market capitalization rankings are calculated using data as of the close of business on the day before the review.

100 Constituent Limitation — The UKX always contains 100 constituents. If a greater number of companies qualify to be inserted in the index than qualify to be removed, the lowest ranking constituents of the index will be removed so that the total number of stocks remains at 100 following inclusion of those that qualify to be inserted. Likewise, if a greater number of companies qualify to be removed than to be inserted at

the quarterly review, securities of the highest ranking companies that are then not included in the UKX will be inserted to match the number of companies being removed, in order to maintain the total at 100.

Auto-Callable Barrier Notes
Royal Bank of Canada

Index Calculation

The UKX is a market capitalization weighted index. This means that the price movement of a larger company (that is, one representing larger percentage of the index) will have a greater effect on the level of the index than will the price movement of a smaller company (that is, one representing a smaller percentage of the index).

The value of the UKX is represented by a fraction, (a) the numerator of which is the sum of the product of (i) the price of each component stock, (ii) the number of shares issued for each such component and (iii) a free float factor for each such component (described more fully below), and (b) the denominator of which is a divisor. The divisor represents the total issued share capital of the index on the base date; the divisor may be adjusted as necessary to allow for changes in issued share capital of individual securities without distorting the index.

As noted above, a free float factor is applied to each index component. By employing this approach, FTSE uses the investable market capitalization, not the total market capitalization, of each constituent to determine the value of the UKX. Investable market capitalization depends on free float. The following are excluded from free float: shares directly owned by state, regional, municipal and local governments (excluding shares held by independently managed pension schemes for governments); shares held by sovereign wealth funds where each holding is 10% or greater of the total number of shares in issue (if the holding subsequently decreases below 10%, the shares will be excluded from free float until the holding falls below 7%); shares held by directors, senior executives and managers of the company, and by their family and direct relations, and by companies with which they are affiliated; shares held within employee share plans; shares held by public companies or by non-listed subsidiaries of public companies; shares held by founders, promoters, former directors, founding venture capital and private equity firms, private companies and individuals (including employees) where the holding is 10% or greater of the total number of shares in issue (if the holding subsequently decreases below 10%, the shares will be excluded from free float until the holding falls below 7%); all shares where the holder is subject to a lock-in clause (for the duration of that clause, after which free float changes resulting from the expiration of a lock-in clause will be implemented at the next quarterly review subsequent to there being a minimum of 20 business days between the expiration date of such lock-in clause and the index review date); shares held for publicly announced strategic reasons, including shares held by several holders acting in concert; and shares that are subject to ongoing contractual agreements (such as swaps) where they would ordinarily be treated as restricted.

The UKX is recalculated whenever errors or distortions occur that are deemed to be significant. Users of the UKX are notified through appropriate media.

Index Maintenance

The UKX is reviewed quarterly for changes in free float. A stock's free float is also reviewed and adjusted if necessary following certain corporate events. Following a takeover or merger involving one or more index constituents, the free float restrictions will be based on restricted holdings in the successor company and will be implemented when the offer has completed (or lapsed) unless it directly reflects a corporate action independent of and not conditional on the takeover or merger completing or lapsing. If the corporate event includes another corporate action that affects the index, a change in free float is implemented at the same time as the corporate action. If there is no corporate action, the change in free float will be applied at the next quarterly review. Following the application of an initial free float restriction, a stock's free float will only be changed if its rounded free float moves more than three percentage points above or below the existing rounded free float. Companies with a free float of above 99% and of 15% or below will not be subject to the three percentage points threshold.

At each quarterly review, the Committee publishes a Reserve List containing the six highest ranking non-constituents of the UKX. The Reserve List will be used in the event that one or more constituents are deleted from the index during the period up to the next quarterly review. If a merger or takeover results in one index constituent being absorbed by another constituent, the resulting company will remain a constituent and a vacancy will be created. This vacancy will be filled by selecting the highest ranking security in the Reserve List as at the close of the UKX calculation two days prior to the deletion and related index adjustment. If an index constituent is taken over by a non-constituent company, the original constituent will be removed and replaced by the highest ranking non-constituent on the Reserve List. Any eligible company resulting from the takeover will be eligible to become the replacement company if it is ranked higher than any other company on the Reserve List. If a constituent company is split to form two or more companies, then the resulting companies will be eligible for inclusion as UKX constituents, based on their respective full market capitalizations (before the application of any investability weightings), provided that they qualify in all other respects. Any eligible company resulting from a split that has no available market price after 20 business days will be removed. If a split results in the inclusion of an ineligible non-equity security, such security will remain in the UKX for two trading days and then be removed. If a

constituent is delisted or ceases to have a firm quotation, it will be removed from the list of constituents and be replaced by the highest ranking eligible company from the Reserve List as at the close of the index calculation two days prior to the deletion.

Capitalization Adjustments

A premium listed secondary line of a company will be considered for index inclusion if its total market capitalization before the application of any adjustments based on the extent to which the shares are publicly traded, is greater than 25% of the total market capitalization of the company's principal line and the secondary line is eligible, in its own right. Should the total market capitalization of a

Auto-Callable Barrier Notes
Royal Bank of Canada

secondary line fall below 20% of the total market capitalization of the company's principal line at an annual review, the secondary line will be deleted from the UKX unless its total market capitalization remains above the qualification level for continued inclusion as a constituent of the UKX at that review. Where a company has partly paid shares, these shares, together with the outstanding call(s), are both included in the UKX. Warrants to purchase ordinary shares and convertible securities are not included in the UKX until they are exercised or converted.

Share Weighting Changes — For the purposes of computing the UKX, the number of shares in issue for each constituent security is expressed to the nearest share and, to prevent a large number of insignificant weighting changes, the number of shares in issue for each constituent security is amended only when the total shares in issue held within the index system changes by more than 1% on a cumulative basis. Changes will be made quarterly after the close of business on the third Friday of March, June, September and December. The data for these changes will be taken from the close of business on the third Wednesday of the month prior to the review month.

If a corporate action is applied to a constituent which involves a change in the number of shares in issue, the change in shares will be applied simultaneously with the corporate action. If accumulated changes in the number of shares in issue add up to 10% or more or when an accumulated share change represents \$2 billion of a company's total market capitalization, they are implemented between quarters. If an adjustment is made, it will be applied for the first time at the next review in March of the following year. All adjustments are made before the start of the index calculation on the day concerned, unless market conditions prevent this.

Shares in Issue Increase — When a company increases the number of shares it has in issue, the market capitalization of that company increases and the total market capitalization will rise accordingly. The index divisor is adjusted to maintain a constant index value.

Weighting Amendments — The market capitalization of a company is adjusted to take account of various corporate actions. To prevent the value of the UKX from changing due to such an event, all corporate actions which affect the market capitalization of the UKX require an offsetting divisor adjustment. By adjusting the divisor, the value of the UKX remains constant before and after the event. Below is a summary of the more frequent corporate actions and their resulting adjustment.

Type of Corporate Action	Adjustment	Adjustment to Divisor
Issue of new shares	Share weighting increased	Yes
Share repurchase	Share weighting decreased	Yes
Bonus issued or stock split	Share weighting multiplied by four. Share price divided by four	No

Rights Issues — A rights issue is where a company raises new capital by offering shareholders additional shares at a set ratio with a discount to the market price. The rights become attached to the shares on a set date—the ex-date. On this date, the price of the company's underlying shares will fall by the value of the rights. The effect of the rights issue is to increase the market capitalization of the company by the value of the additional shares created by the rights issue less the value of the fall in the share price. The share weighting of the company and index divisor are also adjusted to prevent the index falling in line with the reduction in the share price on the ex-date.

In the event that the market price is equal to or below the rights offer price at the close of business immediately before trading ex-dividend, no adjustments will be made. In this circumstance, any resulting new shares will only be added to the index weighting once the take-up proportion is known and together with any associated change to the company's free float. If the rights issue is highly dilutive and the ratio is greater than ten to one, FTSE will include the new shares on a separate temporary line to reflect the market value of the right (together with a temporary line fixed at the value of the outstanding rights subscription price) until the end of the subscription period, at which point the temporary lines will be deleted and the new shares will be merged into the existing share line. In the event the rights issue involves non-equity and the value of the right cannot be determined, there will be no adjustment to the parent stock on the ex-date. The rights line will be included in the index at a value of zero on the ex-date (with no inclusion of the cash call value). If the rights line trades, it will be deleted at the market price after two days. If it does not trade, it will be deleted at a value of zero.

Market Disruption

If there is a system problem or situation in the market that is judged by FTSE to affect the quality of the constituent prices at any time when the index is being calculated, the index will be declared indicative (e.g. normally where a “fast market” exists in the equity market). The message “IND” will be displayed against the index value calculated by FTSE. The Committee must be satisfied that an accurate and reliable price for the purposes of determining the market value of a company exists. The Committee may exclude a security from the UKX should it consider that an “accurate and reliable” price is not available.

If any event leads to an error in the index value of the UKX that is greater than three basis points at the local country index level, then the UKX will generally be recalculated, subject to discovery, within one month of the event. Where an alternative approach is available, FTSE may, at its sole discretion, choose not to recalculate.

P-19

RBC Capital Markets, LLC

Auto-Callable Barrier Notes
Royal Bank of Canada

License Agreement

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P-20

RBC Capital Markets, LLC

Auto-Callable Barrier Notes
Royal Bank of Canada

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

The graph below illustrates the performance of this Reference Asset from January 1, 2009 to December 24, 2019. The Initial Level is \$44.57. The red line represents its Barrier Level of \$31.20, which is equal to 70% of its Initial Level (rounded to two decimal places).



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Auto-Callable Barrier Notes
Royal Bank of Canada

Historical Information for the FTSE® 100 Index

The graph below illustrates the performance of this Reference Asset from January 1, 2009 to December 24, 2019. The Initial Level is 7,632.24. The red line represents its Barrier Level of 5,342.57, which is equal to 70% of its Initial Level (rounded to two decimal places).



PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

Auto-Callable Barrier Notes
Royal Bank of Canada

SUPPLEMENTAL DISCUSSION OF U.S. FEDERAL INCOME TAX CONSEQUENCES

The following disclosure supplements, and to the extent inconsistent supersedes, the discussion in the product prospectus supplement dated September 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, 2023. 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 a Reference Asset or the Notes (for example, upon a Reference Asset rebalancing), and following such occurrence the Notes could be treated as subject to withholding on dividend equivalent payments. Non-U.S. holders that enter, or have entered, into other transactions in respect of the Reference 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.

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

P-23

RBC Capital Markets, LLC

Auto-Callable Barrier Notes
Royal Bank of Canada

SUPPLEMENTAL PLAN OF DISTRIBUTION (CONFLICTS OF INTEREST)

Delivery of the Notes will be made against payment for the Notes on December 30, 2019, which is the third (3rd) business day following the Trade Date (this settlement cycle being referred to as “T+3”). See “Plan of Distribution” in the prospectus dated September 7, 2018. For additional information as to the relationship between us and RBCCM, please see the section “Plan of Distribution—Conflicts of Interest” in the prospectus dated September 7, 2018.

We will deliver the Notes on a date that is greater than two business days following the Trade Date. Under Rule 15c6-1 of the Exchange Act, trades in the secondary market generally are required to settle in two business days, unless the parties to any such trade expressly agree otherwise. Accordingly, purchasers who wish to trade the Notes more than two business days prior to the original Issue Date will be required to specify alternative settlement arrangements to prevent a failed settlement.

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 6 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.***

Each of RBCCM and any other broker-dealer offering the Notes have not offered, sold or otherwise made available and will not offer, sell or otherwise make available the Notes to, any retail investor in the European Economic Area (“EEA”). For these purposes, the expression “offer” includes the communication in any form and by any means of sufficient information on the terms of the offer and the Notes to be offered so as to enable an investor to decide to purchase or subscribe the Notes, and a “retail investor” means a person who is one (or more) of: (a) a retail client, as defined in point (11) of Article 4(1) of Directive 2014/65/EU (as amended, “MiFID II”); or (b) a customer, within the meaning of Directive 2016/97/EU, as amended, where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or (c) not a qualified investor as defined in Regulation (EU) (2017/1129) (the “Prospectus Regulation”). Consequently, no key information document required by Regulation (EU) No 1286/2014 (as amended, the “PRIIPs Regulation”) for offering or selling the Notes or otherwise making them available to retail investors in the EEA has been prepared, and therefore, offering or selling the Notes or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation.

P-24

RBC Capital Markets, LLC

Auto-Callable Barrier Notes
Royal Bank of Canada

STRUCTURING THE NOTES

The Notes are our debt securities, the return on which is linked to the performance of the 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 that is included in this pricing supplement, any value of the Notes determined for purposes of a secondary market transaction may be based on a different funding rate, which may result in a lower value for the Notes than if our initial internal funding rate were used.

In order to satisfy our payment obligations under the Notes, we may choose to enter into certain hedging arrangements (which may include call options, put options or other derivatives) on the issue date with RBCCM or one of our other subsidiaries. The terms of these hedging arrangements take into account a number of factors, including our creditworthiness, interest rate movements, the volatility of the Reference Assets, and the tenor of the Notes. The economic terms of the Notes and their initial estimated value depend in part on the terms of these hedging arrangements.

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

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.