

ROYAL BANK OF CANADA  
 Form 424B2  
 October 02, 2018

Pricing Supplement (To the Prospectus dated September 7, 2018, the Prospectus Supplement dated September 7, 2018, and the Product Prospectus Supplement dated September 11, 2018)	Filed Pursuant to Rule 424(b)(2) Registration No. 333-227001 September 28, 2018
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\$2,850,000  
 Buffered Digital Return Notes due January 3, 2020  
 Linked to the iShares® MSCI Emerging Markets ETF  
 Royal Bank of Canada Senior Global Medium-Term Notes, Series H

**General**

The Notes are designed for investors who seek to receive a Contingent Digital Return at maturity based on the performance of the iShares® MSCI Emerging Markets ETF (the “Reference Asset”). Investors should be willing to forgo interest and dividend payments and, if the price of the Reference Asset declines by more than 15.60%, be willing to lose some or all of their principal on a leveraged basis.

- Senior unsecured obligations of Royal Bank of Canada maturing January 3, 2020.<sup>(a)</sup>
- Minimum denominations of \$10,000 and integral multiples of \$1,000 in excess thereof.
- The Notes price on September 28, 2018 (the “pricing date”) and will be issued on October 3, 2018 (the “issue date”).

**Key Terms** Terms used in this pricing supplement, but not defined herein, will have the meanings ascribed to them in the product prospectus supplement.

**Issuer:** Royal Bank of Canada

**Reference Asset:** iShares® MSCI Emerging Markets ETF (Bloomberg symbol “EEM”)

**Contingent Digital Return:** 8.00%

If the Percentage Change is greater than or equal to -15.60%, you will receive a cash payment that provides you with a return equal to the Contingent Digital Return. Accordingly, if the Final Level is greater than or equal to the Buffer Level, your payment per \$1,000 in principal amount of the Notes will be calculated as follows:

$$\$1,000 + (\$1,000 \times \text{Contingent Digital Return})$$

**Payment at Maturity:** If the Percentage Change is less than -15.60%, you will receive at maturity, for each \$1,000 in principal amount, an amount calculated as follows:

$$\$1,000 + [(\$1,000 \times \text{Percentage Change} + \text{Buffer Percentage}) \times \text{Downside Multiplier}]$$

In this case, you will lose approximately 1.1848% of the principal amount for every 1% that the Final Level declines from the Initial Level by more than 15.60%. You may lose a significant portion, or possibly even all, of the principal amount.

Any payment on the Notes, including any repayment of principal, is subject to the creditworthiness of the Issuer.

**Percentage Change:** The performance of the Reference Asset from the Initial Level to the Final Level, calculated as follows:

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

**Buffer Percentage:** 15.60%

**Buffer Level:** \$36.22, which is 84.40% of the Initial Level (rounded to two decimal places).

**Downside Multiplier:** 100/84.40, which equals approximately 1.1848.

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Initial Level: \$42.92, which was the closing share price of the Reference Asset on the pricing date.  
Final Level: The arithmetic average of the closing price of the Reference Asset on each of the valuation dates.  
Valuation Dates: December 23, 2019, December 24, 2019, December 26, 2019, December 27, 2019 and December 30, 2019 (the “final valuation date”<sup>(p)</sup>)  
Maturity Date: January 3, 2020<sup>(a)</sup>

Calculation Agent: RBC Capital Markets, LLC (“RBCCM”)

CUSIP/ISIN: 78013XK49/ US78013XK498

Estimated Value: The estimated initial value of the Notes as of the date of this document is \$982.65 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.

<sup>(a)</sup> Subject to postponement if a market disruption event occurs, as described under “General Terms of the Notes—Market Disruption Events” in the product prospectus supplement.

Investing in the Notes involves a number of risks. See “Additional Risk Factors Specific to the Notes” beginning on page PS-5 of the product prospectus supplement, “Risk Factors” beginning on page S-1 of the prospectus supplement and beginning on page 1 of the prospectus and “Selected Risk Considerations” beginning on page PS-3 of this pricing supplement.

The Notes will not be listed on any U.S. securities exchange or quotation system. Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of these securities or determined that this pricing supplement is truthful or complete. Any representation to the contrary is a criminal offense.

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.

	Price to Public <sup>1</sup>	Underwriting Commission <sup>2</sup>	Proceeds to Royal Bank of Canada
Per Note	\$1,000.00	\$11.20	\$988.80
Total	\$2,850,000.00	\$31,920.00	\$2,818,080.00

Certain fiduciary accounts purchasing the Notes will pay a purchase price of \$988.80 per Note, and the placement agents will forgo any fees with respect to sales made to those accounts. The price to the public for all other purchases of the Notes is 100%.

JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC and their affiliates will act as placement agents for the Notes and will receive a fee from the Issuer of \$11.20 per \$1,000 in principal amount of the Notes, but will forgo any fees for sales to certain fiduciary accounts.

RBC Capital Markets, LLC JPMorgan Chase Bank, N.A. J.P. Morgan Securities LLC  
Placement Agents

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

Prospectus dated September 7, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000121465918005973/l96181424b3.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, “Royal Bank”, “we,” “us,” or “our” refers to Royal Bank of Canada.

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What Is the Total Return on the Notes at Maturity Assuming a Range of Performance for the Reference Asset?

The following table illustrates the hypothetical total return at maturity on the Notes. The “total return,” as used in this pricing supplement, is the number, expressed as a percentage, that results from comparing the payment at maturity per \$1,000 in principal amount of the Notes to \$1,000. The hypothetical total returns and examples set forth below are based on a hypothetical Initial Level of \$100.00, a hypothetical Buffer Level of \$84.40, the Contingent Digital Return of 8.00%, the Downside Multiplier of 100/84.40 (approximately 1.1848), and hypothetical Final Levels as set forth below. The actual Initial Level is set forth on the cover page, and the actual Final Level will be determined based on the arithmetic average of the closing price of the Reference Asset on each of the valuation dates.

The hypothetical total returns and examples set forth below are for illustrative purposes only and may not be the actual total returns applicable to a purchaser of the Notes. The numbers appearing in the following table and examples have been rounded for ease of analysis. The examples below do not take into account any tax consequences from investing in the Notes.

Final Level	Percentage Change	Payment at Maturity	Total Return on the Notes
\$170.00	70.00%	\$1,080.00	8.000%
\$150.00	60.00%	\$1,080.00	8.000%
\$140.00	40.00%	\$1,080.00	8.000%
\$130.00	30.00%	\$1,080.00	8.000%
\$120.00	20.00%	\$1,080.00	8.000%
\$110.00	10.00%	\$1,080.00	8.000%
\$105.00	5.00%	\$1,080.00	8.000%
\$100.00	0.00%	\$1,080.00	8.000%
\$95.00	-5.00%	\$1,080.00	8.000%
\$90.00	-10.00%	\$1,080.00	8.000%
\$84.40	-15.60%	\$1,080.00	8.000%
\$80.00	-20.00%	\$947.87	-5.213%
\$70.00	-30.00%	\$829.38	-17.062%
\$60.00	-40.00%	\$710.90	-28.910%
\$50.00	-50.00%	\$592.42	-40.758%
\$40.00	-60.00%	\$473.93	-52.607%
\$30.00	-70.00%	\$355.45	-64.455%
\$20.00	-80.00%	\$236.97	-76.303%
\$10.00	-90.00%	\$118.48	-88.152%
\$0.00	-100.00%	\$0.00	-100.000%

Hypothetical Examples of Amounts Payable at Maturity

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

Example 1: The price of the Reference Asset increases from an Initial Level of \$100 to a Final Level of \$120, resulting in a Percentage Change of 20.00%.

Because the Percentage Change is positive and greater than -15.60%, the investor receives a payment at maturity of \$1,080 per \$1,000 in principal amount of the Notes.

$$\$1,000 + (\$1,000 \times 8.00\%) = 1,000 + \$80 = 1,080$$

In this case, the return on the Notes is less than the Percentage Change.

Example 2: The price of the Reference Asset decreases from an Initial Level of \$100 to a Final Level of \$95, resulting in a Percentage Change of -5.00%.

Because the Percentage Change is negative but greater than -15.60%, the investor will receive a payment at maturity of \$1,080 per \$1,000 in principal amount of the Notes.

In this case, the return on the Notes is positive, even though the Percentage Change is negative.

Example 3: The price of the Reference Asset decreases from an Initial Level of \$100 to a Final Level of \$50, resulting in a Percentage Change of -50.00%.

Because the Percentage Change is less than -15.60%, the investor will receive a payment at maturity of \$592.43 per \$1,000 in principal amount of the Notes, calculated as follows:

$$\$1,000 + [\$1,000 \times (-50.00\% + 15.60\%) \times (100/84.40)] = \$592.42$$

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### Selected Purchase Considerations

**Appreciation Potential**— The Notes provide the opportunity to receive the Contingent Digital Return if the Final Level is greater than or equal to the Buffer Level.

**Limited Protection Against Loss**— Payment at maturity of the principal amount of the Notes is protected against a decline in the Final Level, as compared to the Initial Level, of up to 15.60%. If the Final Level is less than the Initial Level by more than 15.60%, you will lose an amount equal to approximately 1.1848% of the principal amount of your Notes for every 1% that the Percentage Change is less than 15.60%. Because the Notes are our senior unsecured obligations, payment of any amount at maturity is subject to our ability to pay our obligations as they become due and is not guaranteed by any third party. For a description of the risks with respect to our credit, see “Selected Risk Considerations—Credit of Issuer” in this pricing supplement.

### Selected Risk Considerations

An investment in the Notes involves significant risks. Investing in the Notes is not equivalent to investing directly in the Reference Asset. These risks are explained in more detail in the section “Additional Risk Factors Specific to the Notes,” beginning on page PS-6 of the product prospectus supplement. In addition to the risks described in the prospectus supplement and the product prospectus supplement, you should consider the following:

**Principal at Risk** — Investors in the Notes could lose all or a substantial portion of their principal amount if there is a decline in the price of the Reference Asset. You will lose approximately 1.1848% of the principal amount of your Notes for each 1% that the Final Level is less than the Initial Level by more than 15.60%.

**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. As a result, your return may be less than the return you would earn if you purchased one of our conventional senior interest bearing debt securities.

**Your Potential Payment at Maturity Is Limited** — The Notes will provide less opportunity to participate in the appreciation of the Reference Asset than an investment in a security linked to the Reference Asset providing full participation in the appreciation, because your return at maturity will not exceed the Contingent Digital Return. Accordingly, your return on the Notes may be less than your return would be if you made an investment in a security directly linked to the positive performance of the 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 the amount due on the maturity date is dependent upon our ability to repay our obligations at that time. This will be the case even if the price of the Reference Asset increases after the pricing date. No assurance can be given as to what our financial condition will be at the maturity of the Notes.

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

**You Will Not Have Any Rights to the Securities Included in the Reference Asset** — As a holder of the Notes, you will not have voting rights, rights to receive cash dividends or other distributions or any other rights that holders of the Reference Asset or the securities included in the Reference Asset would have. The Final Level will not reflect any dividends paid on the securities included in the Reference Asset.

**Many Economic and Market Factors Will Impact the Value of the Notes** — In addition to the share price of the Reference Asset on any day, the value of the Notes will be affected by a number of economic and market factors that may either offset or magnify each other, including:

- the expected volatility of the Reference Asset;
- the time to maturity of the Notes;
- the dividend rate on the securities included in the Reference Asset;
- interest and yield rates in the market generally;
- the exchange rate between the U.S. dollar and the currencies in which the securities held by the Reference Asset are principally traded;
- a variety of economic, financial, political, regulatory or judicial events; and
- our creditworthiness, including actual or anticipated downgrades in our credit ratings.

**The Estimated Initial Value of the Notes Is Less than the Price to the Public** — The estimated initial 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 estimated initial value. This is due to, among other things, changes in the share price of the Reference Asset, 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 costs relating to our hedging of the Notes. These factors, together with various credit, market and economic factors over the term of the Notes, are expected to reduce the price at which you may be able to sell the Notes in any secondary market and will affect the value of the Notes in complex and unpredictable ways. Assuming no change in market conditions or any other relevant factors, the price, if any, at which you may be able to sell your Notes prior to maturity may be less than your original purchase price. The Notes are not designed to be short-term trading instruments. Accordingly, you should be able and willing to hold your Notes to maturity.

**The Estimated Initial Value of the Notes Is an Estimate Only, Calculated as of the Pricing Date** — The value of the Notes at any time after the pricing date will vary based on many factors, including changes in market conditions, and cannot be predicted with accuracy. As a result, the actual value you would receive if you sold the Notes in any secondary market, if any, should be expected to differ materially from the estimated initial value of your Notes.

**Market Disruption Events or Unavailability of the Share Price of the Reference Asset and Adjustments** — The payment at maturity, the valuation dates and the Reference Asset are subject to adjustment as described in the product prospectus supplement. For a description of what constitutes a market disruption event as well as the consequences of that market disruption event and the unavailability of the share price of the Reference Asset on a valuation date, see “General Terms of the Notes— Unavailability of the Level of the Reference Asset on a Valuation Date” and “—Market Disruption Events” in the product prospectus supplement.

**Changes that Affect the Underlying Index Will Affect the Market Value of the Notes and the Amount You Will Receive at Maturity** — The policies of the sponsor of the of the Underlying Index (the “Index Sponsor”), concerning the calculation of the Underlying Index, additions, deletions or substitutions of the components of the Underlying Index and the manner in which changes affecting those components, such as stock dividends, reorganizations or mergers, may be reflected in the Underlying Index and, therefore, could affect the share price of the Reference Asset, the amount payable on the Notes at maturity, and the market value of the Notes prior to maturity. The amount payable on the Notes and their market value could also be affected if the Index Sponsor changes these policies, for example, by changing the manner in which it calculates the Underlying Index, or if the sponsor discontinues or suspends the calculation or publication of the Underlying Index.

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An Investment in Notes Linked to the Reference Asset Is Subject to Risks Associated with Foreign Securities Markets — The Underlying Index tracks the value of certain foreign equity securities. You should be aware that investments in securities linked to the value of foreign equity securities involve particular risks. The foreign securities markets comprising the Underlying Index may have less liquidity and may be more volatile than U.S. or other securities markets and market developments may affect foreign markets differently from U.S. or other securities markets. Direct or indirect government intervention to stabilize these foreign securities markets, as well as cross-shareholdings in foreign companies, may affect trading prices and volumes in these markets. Also, there is generally less publicly available information about foreign companies than about those U.S. companies that are subject to the reporting requirements of the U.S. Securities and Exchange Commission, and foreign companies are subject to accounting, auditing and financial reporting standards and requirements that differ from those applicable to U.S. reporting companies.

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

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

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

Adjustments to the Reference Asset Could Adversely Affect the Notes — BlackRock Investments, LLC ("BlackRock," or the "Advisor"), as the investment adviser of the Reference Asset, is responsible for calculating and maintaining the Reference Asset. BlackRock can add, delete or substitute the stocks comprising the Reference Asset. BlackRock may make other methodological changes that could change the share price of the Reference Asset at any time. If one or

more of these events occurs, the calculation of the

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amount payable at maturity may be adjusted to reflect such event or events. Consequently, any of these actions could adversely affect the amount payable at maturity and/or the market value of the Notes.

**We Have No Affiliation with the Index Sponsor and Will Not Be Responsible for Any Actions Taken by the Index Sponsor** — The Index Sponsor is not an affiliate of ours and will not be involved in the offering of the Notes in any way. Consequently, we have no control over the actions of the Index Sponsor, including any actions of the type that would require the calculation agent to adjust the payment to you at maturity. The Index Sponsor has no obligation of any sort with respect to the Notes. Thus, the Index Sponsor has no obligation to take your interests into consideration for any reason, including in taking any actions that might affect the value of the Notes. None of our proceeds from the issuance of the Notes will be delivered to the Index Sponsor.

**We and Our Affiliates Do Not Have Any Affiliation with BlackRock and Are Not Responsible for its Public Disclosure of Information** — We and our affiliates are not affiliated with the investment adviser in any way and have no ability to control or predict its actions, including any errors in or discontinuance of disclosure regarding its methods or policies relating to the Reference Asset. BlackRock is not involved in the offering of the Notes in any way and has no obligation to consider your interests as an owner of the Notes in taking any actions relating to the Reference Asset 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 BlackRock or the Reference Asset contained in any public disclosure of information. You, as an investor in the Notes, should make your own investigation into the Reference Asset.

**The Correlation Between the Performance of the Reference Asset and the Performance of the Underlying Index May Be Imperfect** — The performance of the Reference Asset is linked principally to the performance of the Underlying Index. However, because of the potential discrepancies identified in more detail in the product prospectus supplement, the return on the Reference Asset may correlate imperfectly with the return on the Underlying Index. Additionally, the performance of the Reference Asset may reflect transaction costs and fees that are not included in the calculation of the Underlying Index.

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

**The Reference Asset Is Subject to Management Risks** — The Reference Asset is subject to management risk, which is the risk that BlackRock's investment strategy, the implementation of which is subject to a number of constraints, may not produce the intended results.

**Our Business Activities May Create Conflicts of Interest** — We and our affiliates expect to engage in trading activities related to the Reference Asset or securities held by the Reference Asset that are not for the account of holders of the Notes or on their behalf. These trading activities may present a conflict between the holders' interests in the Notes and the interests we and our affiliates will have in their proprietary accounts, in facilitating transactions, including options and other derivatives transactions, for their customers and in accounts under their management. These trading activities, if they influence the prices of the Reference Asset, 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 securities held by the Reference Asset, 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

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with respect to the Reference Asset. 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 may affect the price of the Reference Asset, and, therefore, the market value of the Notes.

Additionally, we or our affiliates may serve as issuer, agent or underwriter for additional issuances of securities with returns linked or related to changes in the price of the Reference Asset or level of the Underlying Index.

By introducing competing products into the marketplace in this manner, we could adversely affect the value of the Notes.

We may hedge our obligations under the Notes through certain affiliates, who would expect to make a profit on such hedge. We or our affiliates may adjust these hedges by, among other things, purchasing or selling those assets at any time, including around the time of the valuation dates, which could have an impact on the return of the Notes. Because hedging our obligations entails risk and may be influenced by market forces beyond our or our affiliates' control, such hedging may result in a profit that is more or less than expected, or it may result in a loss.

The Anti-dilution Adjustments That the Calculation Agent Is Required to Make Do Not Cover Every Event That Could Affect the Reference Asset — RBCCM, as calculation agent, will adjust the amount payable at maturity for certain events affecting the Reference Asset. However, the calculation agent will not make an adjustment for every event that could affect the Reference Asset. If an event occurs that does not require the calculation agent to adjust the amount payable at maturity, the market price of the Notes may be materially and adversely affected.

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iShares® MSCI Emerging Markets ETF (“EEM”)

Information provided to or filed with the SEC by the Reference Asset under the Securities Act of 1934, as amended, and the Investment Company Act of 1940, as amended, can be located through the SEC’s website at <http://www.sec.gov>. In addition, information may be obtained from other sources including, but not limited to, press releases, newspaper articles and other publicly disseminated documents. We have not participated in the preparation of, or verified, such publicly available information. None of the forgoing documents or filings are incorporated by reference in, and should not be considered part of, this document.

The following information regarding the Reference Asset is derived from publicly available information.

We have not independently verified the accuracy or completeness of reports filed by the Reference Asset with the SEC, information published relating to it on its website or in any other format, information about them obtained from any other source or the information provided below.

The Reference Asset is an investment portfolio maintained and managed by BlackRock Investments, LLC (“BlackRock”). BlackRock is the investment advisor to separate investment portfolios, including the Reference Asset.

The Notes are not sponsored, endorsed, sold or promoted by the investment adviser. The investment adviser makes no representations or warranties to the owners of the Notes or any member of the public regarding the advisability of investing in the Notes. The investment adviser has no obligation or liability in connection with the operation, marketing, trading or sale of the Notes.

The Reference Asset

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

Investment Objective and Strategy

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

The return on the Notes is linked to the performance of the Reference Asset, and not to the performance of the Underlying Index on which the Reference Asset is based. Although the Reference Asset seeks results that correspond generally to the performance of the Underlying Index, the Reference Asset follows a strategy of “representative sampling,” which means the Reference Asset’s holdings do not identically correspond to the holdings and weightings of the Underlying Index, and may significantly diverge from the Underlying Index. Although the Reference Asset generally invests at least 90% of its assets in some of the same securities as those contained in the Underlying Index and in depositary receipts representing the same securities as those contained in the Underlying Index, it does not hold all of the securities underlying the Underlying Index and may invest the remainder in securities that are not contained in the Underlying Index, or in other types of investments. Currently, the Reference Asset holds substantially fewer securities than the Underlying Index. Additionally, when the Reference Asset purchases securities not held by the Underlying Index, the Reference Asset may be exposed to additional risks, such as counterparty credit risk or liquidity risk, to which the Underlying Index components are not exposed. Therefore, the Reference Asset will not directly track the performance of the Underlying Index and there may be significant variation between the performance of the Reference Asset and the Underlying Index on which it is based.

Representative Sampling

The Advisor uses a representative sampling strategy to track the Underlying Index. Representative sampling is an indexing strategy that involves investing in a representative sample of securities that collectively has an investment profile similar to the Underlying Index. The securities selected are expected to have, in the aggregate, investment

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characteristics (based on factors such as market capitalization and industry weightings), fundamental characteristics (such as return variability and yield) and liquidity measures similar to those of the Underlying Index. Funds may or may not hold all of the securities that are included in the Underlying Index.

#### Correlation

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

#### Share Prices

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

#### The Underlying Index

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

The 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 24 emerging market country indices: Brazil, Chile, China, Colombia, Czech Republic, Greece, Egypt, Hungary, India, Indonesia, South Korea, Malaysia, Mexico, Pakistan, Peru, Philippines, Poland, Qatar, Russia, South Africa, Taiwan, Thailand, Turkey and United Arab Emirates. According to MSCI, beginning in June 2018, MSCI began to include Chinese A Shares in this index. 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

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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, the index or any successor to the index.

#### Historical Information

The following graph sets forth the historical performance of the Reference Asset based on the daily closing share prices from January 1, 2011 through September 28, 2018. In addition, below the graph is a table setting forth the high, low and period-end closing prices of the Reference Asset for the period from January 1, 2011 to September 28, 2018.

We obtained the Reference Asset closing share prices below from Bloomberg L.P. We have not independently verified the accuracy or completeness of the information obtained from Bloomberg L.P. The historical share prices of the Reference Asset should not be taken as an indication of future performance, and no assurance can be given as to the Final Level. We cannot give you assurance that the performance of the Reference Asset will result in the return of any of your initial investment.

PAST PERFORMANCE IS NOT INDICATIVE OF FUTURE RESULTS.

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Below is a table setting forth the intra-day high, intra-day low and period-end closing prices of the Reference Asset. The information provided in the table is for the period from January 1, 2011 through September 28, 2018.

Period-Start Date	Period-End Date	High Closing Price of the Reference Asset (\$)	Low Closing Price of the Reference Asset (\$)	Period-End Closing Price of the Reference Asset (\$)
1/1/2011	3/31/2011	48.69	44.63	48.69
4/1/2011	6/30/2011	50.21	45.50	47.60
7/1/2011	9/30/2011	48.46	34.95	35.07
10/1/2011	12/31/2011	42.80	34.36	37.94
1/1/2012	3/31/2012	44.76	38.23	42.94
4/1/2012	6/30/2012	43.54	36.68	39.19
7/1/2012	9/30/2012	42.37	37.42	41.32
10/1/2012	12/31/2012	44.35	40.14	44.35
1/1/2013	3/31/2013	45.20	41.80	42.78
4/1/2013	6/30/2013	44.23	36.63	38.57
7/1/2013	9/30/2013	43.29	37.34	40.77
10/1/2013	12/31/2013	43.66	40.44	41.77
1/1/2014	3/31/2014	40.99	37.09	40.99
4/1/2014	6/30/2014	43.95	40.82	43.23
7/1/2014	9/30/2014	45.85	41.56	41.56
10/1/2014	12/31/2014	42.44	37.73	39.29
1/1/2015	3/31/2015	41.07	37.92	40.13
4/1/2015	6/30/2015	44.09	39.04	39.62
7/1/2015	9/30/2015	39.78	31.32	32.78
10/1/2015	12/31/2015	36.29	31.55	32.19
1/1/2016	3/31/2016	34.28	28.25	34.25
4/1/2016	6/30/2016	35.26	31.87	34.36
7/1/2016	9/30/2016	38.20	33.77	37.45
10/1/2016	12/30/2016	38.10	34.08	35.01
1/1/2017	3/30/2017	39.99	35.43	39.39
4/1/2017	6/30/2017	41.93	38.81	41.39
7/1/2017	9/30/2017	45.85	41.05	44.81
10/1/2017	12/29/2017	47.81	44.82	47.12
1/1/2018	3/30/2018	52.08	45.69	48.28
4/1/2018	6/30/2018	48.14	42.33	43.33
7/1/2018	9/28/2018	45.03	41.14	42.92

### Supplemental Plan of Distribution

JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC and its affiliates will act as placement agents for the Notes and will receive a fee from the Issuer that will be \$11.20 per \$1,000 in principal amount of the Notes, but will forgo any fees for sales to certain fiduciary accounts.

Delivery of the Notes will be made against payment for the Notes on October 3 2018 which is the third business day following the pricing date (this settlement cycle being referred to as “T+3”). Under Rule 15c6-1 of the Securities Exchange Act of 1934, 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 on any date prior to two business days before delivery will be required, by virtue of the fact that the Notes will settle in three business days (T+3), to specify alternative settlement arrangements to prevent a failed settlement.

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

The value of the Notes shown on your account statement will be based on RBCCM’s estimate of the value of the Notes if RBCCM or another of our affiliates were to make a market in the Notes (which it is not obligated to do). That estimate will be based upon the price that RBCCM may pay for the Notes in light of then prevailing market conditions, our creditworthiness and transaction costs. For a period of approximately six months after the issue date of the Notes, the price shown on your account statement may initially be higher than RBCCM’s estimated value of the Notes. This is because the estimated value of the Notes will reflect the reduction of the underwriting discount and our hedging costs and profits; however, the value of the Notes shown on your account statement during that period is expected to be a higher amount, reflecting the amortization of RBCCM’s underwriting discount and our estimated profit from hedging the Notes. After this period, if RBCCM repurchases your Notes, it expects to do so at prices that reflect its estimated value.

The Notes are our debt securities, the return on which is linked to the performance of the Reference Asset. 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. This relatively lower implied borrowing rate, which is reflected in the economic terms of the Notes, along with the fees and expenses associated with structured notes, reduced the estimated initial value of the Notes at the time the terms of the Notes were set.

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 Asset, and the tenor of the Notes. The economic terms of the Notes depend in part on the terms of these hedging arrangements.

The lower implied borrowing rate, the underwriting commission and the hedging-related costs relating to the Notes reduced the economic terms of the Notes to you and resulted in the estimated initial value for the Notes being less than their public offering price. See “Selected Risk Considerations—The Estimated Initial Value of the Notes Is Less than the Price to the Public” above.

#### 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.”

In the opinion of our counsel, Morrison & Foerster LLP, it would generally be reasonable to treat a Note with terms described herein as a pre-paid cash-settled derivative contract in respect of the Reference Asset for U.S. federal income tax purposes, and the terms of the Notes require a holder and us (in the absence of a change in law or an administrative or judicial ruling to the contrary) to treat the Notes for all tax purposes in accordance with such characterization. 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.

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

#### Terms Incorporated in the Master Note

All of the terms appearing in the section “Key Terms” (except the item captioned “Estimated Value”) and “U.S. Federal Tax Consequences” in this pricing supplement, and the applicable terms included in the product prospectus supplement, the Series H MTN prospectus supplement and the prospectus are incorporated into the master global note that represents the Notes and is held by the Depository Trust Company.



#### 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.