



Pricing Supplement

Dated July 15, 2021

to the Product Prospectus Supplement No. CCBN-1 Dated September 10, 2018, the Prospectus Supplement Dated September 7, 2018 and the Prospectus Dated September 7, 2018

\$1,804,000

Auto-Callable Contingent Coupon Barrier Notes
Linked to the Common Stock of Twitter, Inc., Due
July 18, 2024

Royal Bank of Canada

Royal Bank of Canada is offering Auto-Callable Contingent Coupon Barrier Notes (the "Notes") linked to the common stock (the "Reference Stock") of Twitter, Inc. (the "Reference Stock Issuer"). The Notes are our senior unsecured obligations, will pay a quarterly Contingent Coupon at the rate and under the circumstances specified below, and will have the terms described in the documents described above, as supplemented or modified by this pricing supplement.

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

Investing in the Notes involves a number of risks. See "Selected Risk Considerations" beginning on page P-8 of this pricing supplement, and "Risk Factors" beginning on page PS-5 of the product prospectus supplement dated September 10, 2018 and 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:	July 15, 2021	Principal Amount:	\$1,000 per Note
Issue Date:	July 20, 2021	Maturity Date:	July 18, 2024
Observation Dates:	Quarterly, as set forth below.	Coupon Payment Dates:	Quarterly, as set forth below.
Valuation Date:	July 15, 2024	Contingent Coupon Rate:	10.00% per annum

Initial Stock Price: \$68.07, which was the closing price of the Reference Stock on the Trade Date.

Final Stock Price: The closing price of the Reference Stock on the Valuation Date.

Call Stock Price: 100% of the Initial Stock Price.

Trigger Price and Coupon Barrier: \$44.25, which is 65% of the Initial Stock Price (rounded to two decimal places).

Contingent Coupon: If the closing price of the Reference Stock is greater than or equal to the Coupon Barrier on the applicable Observation Date, we will pay the Contingent Coupon applicable to that Observation Date. You may not receive any Contingent Coupons during the term of the Notes.

Payment at Maturity (if held to maturity): If the Notes are not previously called, we will pay you at maturity an amount based on the Final Stock Price: For each \$1,000 in principal amount, \$1,000 plus the Contingent Coupon at maturity, unless the Final Stock Price is less than the Trigger Price.

If the Final Stock Price is less than the Trigger Price, then the investor will receive at maturity, for each \$1,000 in principal amount, a cash payment equal to: \$1,000 + (\$1,000 x Reference Stock Return)

Investors in the Notes will lose some or all of their principal amount if the Final Stock Price of the Reference Stock is less than the Trigger Price.

Call Feature: If the closing price of the Reference Stock is greater than or equal to the Call Stock Price starting on January 18, 2022 and on any Observation Date thereafter, the Notes will be automatically called for 100% of their principal amount, plus the Contingent Coupon applicable to the corresponding Observation Date.

Call Settlement Dates: The Coupon Payment Date corresponding to that Observation Date.

CUSIP: 78016EKZ9

	Per Note	Total
Price to public ⁽¹⁾	100.00%	\$1,804,000
Underwriting discounts and commissions ⁽¹⁾	2.25%	\$40,590
Proceeds to Royal Bank of Canada	97.75%	\$1,763,410

⁽¹⁾ Certain dealers who purchase the Notes for sale to certain fee-based advisory accounts may forego some or all of their underwriting discount or selling concessions. The public offering price for investors purchasing the Notes in these accounts may be between \$977.50 and \$1,000 per \$1,000 in principal amount.

RBC Capital Markets, LLC ("RBCCM"), acting as our agent, will receive a commission of \$22.50 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 \$22.50 per \$1,000 in principal amount of the Notes. The other dealers may forego, in their sole discretion, some or all of their selling concessions. See "Supplemental Plan of Distribution (Conflicts of Interest)" below.

The initial estimated value of the Notes as of the Trade Date is \$960.62 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.

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 Contingent Coupon Barrier Notes (the “Notes”) linked to the common stock of Twitter, Inc.
Issuer:	Royal Bank of Canada (“Royal Bank”)
Trade Date:	July 15, 2021
Issue Date:	July 20, 2021
Valuation Date:	July 15, 2024
Maturity Date:	July 18, 2024
Denominations:	Minimum denomination of \$1,000, and integral multiples of \$1,000 thereafter.
Designated Currency:	U.S. Dollars
Contingent Coupon:	<p>We will pay you a Contingent Coupon during the term of the Notes, periodically in arrears on each Coupon Payment Date, under the conditions described below:</p> <ul style="list-style-type: none"> • If the closing price of the Reference Stock is greater than or equal to the Coupon Barrier on the applicable Observation Date, we will pay the Contingent Coupon applicable to that Observation Date. • If the closing price of the Reference Stock is less than the Coupon Barrier on the applicable Observation Date, we will not pay you the Contingent Coupon applicable to that Observation Date. <p><i>You may not receive a Contingent Coupon for one or more quarterly periods during the term of the Notes.</i></p>
Contingent Coupon Rate:	10.00% per annum (2.50% per quarter)
Observation Dates:	Quarterly on October 15, 2021, January 18, 2022, April 18, 2022, July 15, 2022, October 17, 2022, January 17, 2023, April 17, 2023, July 17, 2023, October 16, 2023, January 16, 2024, April 15, 2024 and the Valuation Date.
Coupon Payment Dates:	The Contingent Coupon, if payable, will be paid quarterly on October 20, 2021, January 21, 2022, April 21, 2022, July 20, 2022, October 20, 2022, January 20, 2023, April 20, 2023, July 20, 2023, October 19, 2023, January 19, 2024, April 18, 2024 and the Maturity Date.
Record Dates:	The record date for each Coupon Payment Date will be one business day prior to that scheduled Coupon Payment Date; provided, however, that any Contingent Coupon payable at maturity or upon a call will be payable to the person to whom the payment at maturity or upon the call, as the case may be, will be payable.
Call Feature:	If, starting on January 18, 2022 and on any Observation Date thereafter, the closing price of the Reference Stock is greater than or equal to the Call Stock Price, then the Notes will be automatically called.
Call Settlement Dates:	If the Notes are called on any Observation Date starting on January 18, 2022 and thereafter, the Call Settlement Date will be the Coupon Payment Date corresponding to that Observation Date.

Payment if Called:	If the Notes are automatically called, then, on the applicable Call Settlement Date, for each \$1,000 principal amount, you will receive \$1,000 plus the Contingent Coupon otherwise due on that Call Settlement Date.
Initial Stock Price:	The closing price of the Reference Stock on the Trade Date, as set forth on the cover page of this pricing supplement.
Final Stock Price:	The closing price of the Reference Stock on the Valuation Date.
Call Stock Price:	100% of the Initial Stock Price.
Trigger Price and Coupon Barrier:	65% of the Initial Stock Price, as set forth on the cover page of this pricing supplement.
Payment at Maturity (if not previously called and held to maturity):	<p>If the Notes are not previously called, we will pay you at maturity an amount based on the Final Stock Price of the Reference Stock:</p> <ul style="list-style-type: none"> • If the Final Stock Price is greater than or equal to the Trigger Price, we will pay you a cash payment equal to the principal amount plus the Contingent Coupon otherwise due on the Maturity Date. • If the Final Stock Price is below the Trigger Price, you will receive at maturity, for each \$1,000 in principal amount, a cash payment equal to: \$1,000 + (\$1,000 x Reference Stock Return) <p>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 Reference Stock from the Trade Date to the Valuation Date. <i>Investors in the Notes will lose some or all of their principal amount if the Final Stock Price of the Reference Stock is less than the Trigger Price.</i></p>
Reference Stock Return:	$\frac{\text{Final Stock Price} - \text{Initial Stock Price}}{\text{Initial Stock Price}}$
Stock Settlement:	Not applicable. Payments on the Notes will be made solely in cash.
Market Disruption Events:	The occurrence of a market disruption event (or a non-trading day) as to the Reference Stock will result in the postponement of an Observation Date or the Valuation Date, as described in the product prospectus supplement.
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 Notes as a callable pre-paid cash-settled contingent income-bearing derivative contract linked to the Reference Stock 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 special tax counsel) in the product prospectus supplement dated September 10, 2018 under "Supplemental Discussion of U.S. Federal Income Tax Consequences," which apply to the Notes. References in that section of the product prospectus supplement to Morrison & Foerster LLP shall be deemed to refer to Ashurst LLP.
Secondary Market:	RBCCM (or one of its affiliates), though not obligated to do so, may maintain a secondary market in the Notes after the issue date. The amount that you may receive upon sale of your Notes prior to maturity may be less than the principal amount.
Listing:	The Notes will not be listed on any securities exchange.

Settlement:	DTC global (including through its indirect participants Euroclear and Clearstream, Luxembourg as described under “Description of Debt Securities — Ownership and Book-Entry Issuance” in the prospectus dated September 7, 2018).
Terms Incorporated in the Master Note:	All of the terms appearing on the cover page and above the item captioned “Secondary Market” on pages P-2 and P-3 of this pricing supplement and the terms appearing under the caption “General Terms of the Notes” in the product prospectus supplement dated September 10, 2018, as modified by this pricing supplement.

ADDITIONAL TERMS OF YOUR NOTES

You should read this pricing supplement together with the prospectus dated September 7, 2018, as supplemented by the prospectus supplement dated September 7, 2018 and the product prospectus supplement dated September 10, 2018, relating to our Senior Global Medium Term Notes, Series H, of which these Notes are a part. Capitalized terms used but not defined in this pricing supplement will have the meanings given to them in the product prospectus supplement. In the event of any conflict, this pricing supplement will control. ***The Notes vary from the terms described in the product prospectus supplement in several important ways. You should read this pricing supplement carefully.***

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

Prospectus dated September 7, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000121465918005973/l96181424b3.htm>

Prospectus Supplement dated September 7, 2018:

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

Product Prospectus Supplement dated September 10, 2018:

<https://www.sec.gov/Archives/edgar/data/1000275/000114036118038091/form424b5.htm>

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

HYPOTHETICAL EXAMPLES

The table set out below is included for illustration purposes only. The table illustrates the Payment at Maturity of the Notes (including the final Contingent Coupon, if payable) for a hypothetical range of performance for the Reference Stock, assuming the following terms and that the Notes are not automatically called prior to maturity:

Hypothetical Initial Stock Price:	\$100.00*
Hypothetical Trigger Price and Coupon Barrier:	\$65.00, which is 65% of the hypothetical Initial Stock Price
Contingent Coupon Rate:	10.00% per annum (or 2.50% per quarter)
Contingent Coupon Amount:	\$25.00 per quarter
Observation Dates:	Quarterly
Principal Amount:	\$1,000 per Note

* The hypothetical Initial Stock Price of \$100 used in the examples below has been chosen for illustrative purposes only and is not the actual Initial Stock Price. The actual Initial Stock Price is set forth on the cover page of this pricing supplement.

Hypothetical Final Stock Prices are shown in the first column on the left. The second column shows the Payment at Maturity for a range of Final Stock Prices on the Valuation Date. The third column shows the amount of cash to be paid on the Notes per \$1,000 in principal amount. If the Notes are called prior to maturity, the hypothetical examples below will not be relevant, and you will receive on the applicable Coupon Payment Date, for each \$1,000 principal amount, \$1,000 plus the Contingent Coupon otherwise due on the Notes.

Hypothetical Final Stock Price of the Reference Stock	Payment at Maturity as Percentage of Principal Amount	Payment at Maturity (assuming that the Notes were not previously called)
\$150.00	102.50%*	\$1,025.00*
\$140.00	102.50%*	\$1,025.00*
\$130.00	102.50%*	\$1,025.00*
\$120.00	102.50%*	\$1,025.00*
\$110.00	102.50%*	\$1,025.00*
\$100.00	102.50%*	\$1,025.00*
\$90.00	102.50%*	\$1,025.00*
\$80.00	102.50%*	\$1,025.00*
\$70.00	102.50%*	\$1,025.00*
\$65.00	102.50%*	\$1,025.00*
\$64.99	64.99%	\$649.90
\$60.00	60.00%	\$600.00
\$50.00	50.00%	\$500.00
\$40.00	40.00%	\$400.00
\$30.00	30.00%	\$300.00
\$20.00	20.00%	\$200.00
\$10.00	10.00%	\$100.00
\$0.00	0%	\$0.00

*Including the final Contingent Coupon, if payable.

Hypothetical Examples of Amounts Payable at Maturity

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

Example 1: The price of the Reference Stock increases by 25% from the Initial Stock Price of \$100.00 to the Final Stock Price of \$125.00. Because the Final Stock Price is greater than the Trigger Price and its Coupon Barrier, the investor receives at maturity, in addition to the final Contingent Coupon otherwise due on the Notes, a cash payment of \$1,000 per Note, despite the 25% appreciation in the price of the Reference Stock.

Example 2: The price of the Reference Stock decreases by 10% from the Initial Stock Price of \$100.00 to the Final Stock Price of \$90.00. Because the Final Stock Price is greater than the Trigger Price and its Coupon Barrier, the investor receives at maturity, in addition to the final Contingent Coupon otherwise due on the Notes, a cash payment of \$1,000 per Note, despite the 10% decline in the price of the Reference Stock.

Example 3: The price of the Reference Stock decreases by 60% from the Initial Stock Price of \$100.00 to the Final Stock Price of \$40.00. Because the Final Stock Price is less than the Trigger Price and its Coupon Barrier, the final Contingent Coupon will not be payable on the Maturity Date, and we will pay only \$400.00 for each \$1,000 in the principal amount of the Notes, calculated as follows:

$$\begin{aligned} & \text{Principal Amount} + (\text{Principal Amount} \times \text{Reference Stock Return}) \\ & = \$1,000 + (\$1,000 \times -60.00\%) = \$1,000 - \$600.00 = \$400.00 \end{aligned}$$

* * *

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

SELECTED RISK CONSIDERATIONS

An investment in the Notes involves significant risks. Investing in the Notes is not equivalent to investing directly in the Reference Stock. These risks are explained in more detail in the section “Risk Factors” in the product prospectus supplement. In addition to the risks described in the prospectus supplement and the product prospectus supplement, you should consider the following:

Risks Relating to the Terms of the Notes

- You May Lose All or a Portion of the Principal Amount at Maturity** — Investors in the Notes could lose all or a substantial portion of their principal amount if there is a decline in the trading price of the Reference Stock between the Trade Date and the Valuation Date. If the Notes are not automatically called and the Final Stock Price is less than the Trigger Price, the amount that you receive at maturity will represent a loss of your principal that is proportionate to the decline in the closing price of the Reference Stock from the Trade Date to the Valuation Date. Any Contingent Coupons received on the Notes prior to the Maturity Date may not be sufficient to compensate for any such loss.
- The Notes Are Subject to an Automatic Call** — If on any Observation Date beginning in January 2022, the closing price of the Reference Stock is greater than or equal to the Call Stock Price, then the Notes will be automatically called. If the Notes are automatically called, then, on the applicable Call Settlement Date, for each \$1,000 in principal amount, you will receive \$1,000 plus the Contingent Coupon otherwise due on the applicable Call Settlement Date. You will not receive any Contingent Coupons after the Call Settlement Date. You may be unable to reinvest your proceeds from the automatic call in an investment with a return that is as high as the return on the Notes would have been if they had not been called.
- You May Not Receive Any Contingent Coupons** — We will not necessarily make any coupon payments on the Notes. If the closing price of the Reference Stock on an Observation Date is less than the Coupon Barrier, we will not pay you the Contingent Coupon applicable to that Observation Date. If the closing price of the Reference Stock is less than the Coupon Barrier on each of the Observation Dates and on the Valuation Date, we will not pay you any Contingent Coupons during the term of, and you will not receive a positive return on your Notes. Generally, this non-payment of the Contingent Coupon coincides with a period of greater risk of principal loss on your Notes. Accordingly, if we do not pay the Contingent Coupon on the Maturity Date, you will also incur a loss of principal, because the Final Stock Price will be less than the Trigger Price.
- The Call Feature and the Contingent Coupon Feature Limit Your Potential Return** — The return potential of the Notes is limited to the pre-specified Contingent Coupon Rate, regardless of the appreciation of the Reference Stock. In addition, the total return on the Notes will vary based on the number of Observation Dates on which the Contingent Coupon becomes payable prior to maturity or an automatic call. Further, if the Notes are called due to the Call Feature, you will not receive any Contingent Coupons or any other payment in respect of any Observation Dates after the applicable Call Settlement Date. Since the Notes could be called as early as the second Observation Date, the total return on the Notes could be minimal. If the Notes are not called, you may be subject to the full downside performance of the Reference Stock even though your potential return is limited to the Contingent Coupon Rate. As a result, the return on an investment in the Notes could be less than the return on a direct investment in the Reference Stock.
- Your Return on the Notes May Be Lower than the Return on a Conventional Debt Security of Comparable Maturity** — The return that you will receive on the Notes, which could be negative, may be less than the return you could earn on other investments. Even if your return is positive, your return may be less than the return you would earn if you bought a conventional senior interest bearing debt security of Royal Bank.
- Payments on the Notes Are Subject to Our Credit Risk, and Changes in Our Credit Ratings Are Expected to Affect the Market Value of the Notes** — The Notes are our senior unsecured debt securities. As a result, your receipt of any Contingent Coupons, if payable, and the amount due on any relevant payment date is dependent upon our ability to repay our obligations on the applicable payment dates. This will be the case even if the price of the Reference Stock increases 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.

Risks Relating to the Secondary Market for 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.

Risks Relating to the Initial Estimated Value of the Notes

- **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 price of the Reference Stock, the borrowing rate we pay to issue securities of this kind, and the inclusion in the price to the public of the underwriting discount and the estimated costs relating to our hedging of the Notes. These factors, together with various credit, market and economic factors over the term of the Notes, are expected to reduce the price at which you may be able to sell the Notes in any secondary market and will affect the value of the Notes in complex and unpredictable ways. Assuming no change in market conditions or any other relevant factors, the price, if any, at which you may be able to sell your Notes prior to maturity may be less than your original purchase price, as any such sale price would not be expected to include the underwriting discount and the hedging costs relating to the Notes. In addition to bid-ask spreads, the value of the Notes determined by RBCCM for any secondary market price is expected to be based on the secondary rate rather than the internal funding rate used to price the Notes and determine the initial estimated value. As a result, the secondary price will be less than if the internal funding rate was used. The Notes are not designed to be short-term trading instruments. Accordingly, you should be able and willing to hold your Notes to maturity.
- **The Initial Estimated Value of the Notes on the Cover Page of this Pricing Supplement Is an Estimate Only, Calculated as of the Time the Terms of the Notes Were Set** — The initial estimated value of the Notes is based on the value of our obligation to make the payments on the Notes, together with the mid-market value of the derivative embedded in the terms of the Notes. See “Structuring the Notes” below. Our estimate is based on a variety of assumptions, including our credit spreads, expectations as to dividends, interest rates and volatility, and the expected term of the Notes. These assumptions are based on certain forecasts about future events, which may prove to be incorrect. Other entities may value the Notes or similar securities at a price that is significantly different than we do.

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

Risks Relating to Conflicts of Interest and Our Trading Activities

- **Our Business Activities May Create Conflicts of Interest** — We and our affiliates expect to engage in trading activities related to the Reference Stock 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 share price of the Reference Stock, 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 Reference Stock Issuer, 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 Stock. 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 share price of the Reference Stock, and, therefore, the market value of the Notes.

Risks Relating to the Reference Stock

- **Owning the Notes Is Not the Same as Owning the Reference Stock** — The return on your Notes is unlikely to reflect the return you would realize if you actually owned shares of the Reference Stock. For instance, you will not receive or be entitled to receive any dividend payments or other distributions on the Reference Stock 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 the Reference Stock may have. Furthermore, the Reference Stock may appreciate substantially during the term of the Notes, while your potential return will be limited to the applicable Contingent Coupon payments.
- **There Is No Affiliation Between the Reference Stock Issuer and RBCCM, and RBCCM Is Not Responsible for any Disclosure by the Reference Stock Issuer** — We are not affiliated with the Reference Stock Issuer. However, we and our affiliates may currently, or from time to time in the future engage, in business with the Reference Stock Issuer. Nevertheless, neither we nor our affiliates assume any responsibilities for the accuracy or the completeness of any information that any other company prepares. You, as an investor in the Notes, should make your own investigation into the Reference Stock. The Reference Stock Issuer is not involved in this offering and has no obligation of any sort with respect to your Notes. The Reference Stock Issuer has no obligation to take your interests into consideration for any reason, including when taking any corporate actions that might affect the value of your Notes.
- **The Payments on the Notes Are Subject to Market Disruption Events and Adjustments** — The payment at maturity, each Observation Date and the Valuation Date are subject to adjustment as described in the product prospectus supplement. For a description of what constitutes a market disruption event as well as the consequences of that market disruption event, see “General Terms of the Notes—Market Disruption Events” in the product prospectus supplement.

INFORMATION REGARDING THE REFERENCE STOCK ISSUER

The Reference Stock is registered under the Securities Exchange Act of 1934 (the “Exchange Act”). Companies with securities registered under that Act are required to file periodically certain financial and other information specified by the SEC. Information filed with the SEC can be obtained through the SEC’s website at www.sec.gov. In addition, information regarding the Reference Stock may be obtained from other sources including, but not limited to, press releases, newspaper articles and other publicly disseminated documents.

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

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

We obtained the information regarding the historical performance of the Reference Stock set forth below from Bloomberg Financial Markets.

Twitter, Inc. (“TWTR”)

Twitter, Inc. provides online social networking and microblogging service. The company offers users the ability to follow other users’ activity, read, and post tweets.

The company’s common stock is listed on the New York Stock Exchange under the ticker symbol “TWTR.”

Historical Information

The graph below illustrates the performance of the Reference Stock from November 7, 2013 (the date that the Reference Stock commenced trading) to July 15, 2021, reflecting its Initial Stock Price of \$68.07. The red line represents the Coupon Barrier and Trigger Price of \$44.25, which is equal to 65% of its Initial Stock Price (rounded to two decimal places).



SUPPLEMENTAL DISCUSSION OF U.S. FEDERAL INCOME TAX CONSEQUENCES

The following disclosure supplements, and to the extent inconsistent supersedes, the discussion in the product prospectus supplement dated September 10, 2018 under “Supplemental Discussion of U.S. Federal Income Tax Consequences.” References in that section of the product prospectus supplement to Morrison & Foerster LLP shall be deemed to refer to Ashurst LLP.

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 the Reference Stock 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 Stock 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 that eliminate the requirement of FATCA withholding on payments of gross proceeds upon 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.

SUPPLEMENTAL PLAN OF DISTRIBUTION (CONFLICTS OF INTEREST)

Delivery of the Notes will be made against payment for the Notes on July 20, 2021, 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 will be 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 initially be a higher amount, reflecting the addition of RBCCM's underwriting discount and our estimated costs and profits from hedging the Notes. This excess is expected to decrease over time until the end of this period. After this period, if RBCCM repurchases your Notes, it expects to do so at prices that reflect their estimated value.

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

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 any of the Notes to, any retail investor in the European Economic Area (“EEA”) or in the United Kingdom. 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 (EU) 2016/97, 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 or in the United Kingdom has been prepared, and therefore, offering or selling the Notes or otherwise making them available to any retail investor in the EEA or in the United Kingdom may be unlawful under the PRIIPs Regulation.

STRUCTURING THE NOTES

The Notes are our debt securities, the return on which is linked to the performance of the Reference Stock. 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 set forth on the cover page of 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 Stock, 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 the Bank's Form 6-K dated September 7, 2018.

In the opinion of Ashurst 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 the Bank, entitled to the benefits of the Indenture, subject to applicable bankruptcy, insolvency, fraudulent transfer, reorganization, moratorium and similar laws of general applicability relating to or affecting creditors' rights and subject to general principles of equity, public policy considerations and the discretion of the court before which any suit or proceeding may be brought. 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 June 25, 2021, which has been filed as Exhibit 5.3 to the Bank's Form 6-K dated June 25, 2021.

Product Prospectus Supplement No. CCBN-1

To the Prospectus dated September 7, 2018 and the Prospectus Supplement dated September 7, 2018
Senior Global Medium-Term Notes, Series H



Contingent Coupon Barrier Notes Linked to Common Stock or Exchange Traded Fund Shares

- Royal Bank of Canada may offer and sell contingent coupon barrier notes linked to the common equity securities of an issuer, including American Depositary Receipts (“ADRs,” and when reference is made to an ADR, the term “issuer” refers to the issuer of the shares underlying the ADRs) or shares of an exchange traded fund (an “ETF,” and each such common equity security or ETF is referred to as a “Reference Stock”). We refer to these securities as the “notes.”
- The prospectus dated September 7, 2018, the prospectus supplement dated September 7, 2018 and this product prospectus supplement describe the terms that will apply generally to the notes. A separate term sheet, free writing prospectus or pricing supplement, as the case may be, will describe the terms that apply specifically to the notes, including any changes to the terms specified below. We refer to such term sheets, free writing prospectuses and pricing supplements generally as pricing supplements. If the terms described in the relevant pricing supplement are inconsistent with those described in this product prospectus supplement, the accompanying prospectus supplement or prospectus, the terms described in the relevant pricing supplement will control.
- The notes are senior unsecured debt obligations of Royal Bank of Canada. All payments on the notes are subject to our credit risk.
- We will pay a contingent coupon during the term of the notes, periodically in arrears on each Coupon Payment Date, if the closing price of the Reference Stock is equal to or greater than the applicable coupon barrier on the applicable Observation Date (including the final Observation Date). However, if the closing price of the Reference Stock is less than the coupon barrier on the applicable Observation Date, we will not pay you the contingent coupon applicable to that Observation Date.
- The notes will be automatically called if the closing price of the Reference Stock on any Observation Date is equal to or greater than the Initial Stock Price. In this case, you will receive a cash payment equal to your principal amount plus the contingent coupon otherwise due on the applicable Call Settlement Date under the contingent coupon feature.
- **The notes do not guarantee any return of principal at maturity.** If the notes have not been called, and the Reference Stock closes below the applicable Trigger Price on the final Observation Date, you will receive shares of the Reference Stock or an amount in cash with a value that reflects a loss of 1% of the principal amount for every 1% decrease in the price per share of the Reference Stock below the Initial Stock Price. **In this case, the value of shares or cash you will receive at maturity will be less than the principal amount of your notes and may be zero.**
- Subject to our creditworthiness, if you hold the notes to maturity, and the price of the Reference Stock is above or equal to the Trigger Price on the final Observation Date, we will pay you an amount in cash equal to the principal amount of your notes.
- The notes will be offered in minimum denominations that will be set forth in the relevant pricing supplement.
- Investing in the notes is not equivalent to investing in the Reference Stock, or any of the equity securities included in any ETF.
- The notes will not be listed on any securities exchange.

Your investment in the notes involves certain risks. The notes differ from ordinary debt securities in that the repayment of principal is not guaranteed. If the notes are not called on any Observation Date, you may lose some or all of your investment. Specifically, if the notes are not called and the Final Stock Price is less than the Trigger Price, you will lose 1% of your principal amount for each 1% that the underlying return is less than zero. Any payment on the notes, including any repayment of principal, is subject to our creditworthiness. See “Risk Factors” beginning on page PS-5 to read about investment risks relating to the notes.

The price at which you purchase the notes includes hedging costs and profits that Royal Bank of Canada or its affiliates expect to incur or realize. These costs and profits will reduce the secondary market price, if any secondary market develops, for the notes. As a result, you will experience an immediate and substantial decline in the value of your notes on the applicable issue date.

None of the Securities and Exchange Commission (the “SEC”), any state securities commission or any other regulatory body has approved or disapproved of the notes or passed upon the accuracy of this product prospectus supplement or the accompanying prospectus and prospectus supplement. Any representation to the contrary is a criminal offense.

We may use this product prospectus supplement in the initial sale of a note. In addition, RBC Capital Markets, LLC or one of our other affiliates may use this product prospectus supplement in a market-making transaction in a note after its initial sale. ***Unless we or our agent informs the purchaser otherwise in the confirmation of sale, this product prospectus supplement is being used in a market-making transaction.***

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. governmental agency or instrumentality.

RBC Capital Markets, LLC

Product Prospectus Supplement dated September 10, 2018

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In this product prospectus supplement, references to the “accompanying prospectus” mean the accompanying prospectus, dated September 7, 2018, as supplemented by the accompanying prospectus supplement, dated September 7, 2018, of Royal Bank of Canada. References to the “relevant pricing supplement” mean the pricing supplement that describes the specific terms of your notes.

SUMMARY

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

Key Terms

Underlying Equity: The Reference Stock specified in the relevant pricing supplement. Each Reference Stock will be either an equity security or a share of an ETF.

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

- If the closing price of the Reference Stock is equal to or greater than the coupon barrier on the applicable Observation Date, we will pay the contingent coupon applicable to that Observation Date.
- If the closing price of the Reference Stock is less than the coupon barrier on the applicable Observation Date, we will not pay you the contingent coupon applicable to that Observation Date.

The contingent coupon payments on the notes are not guaranteed. Royal Bank of Canada will not pay you the contingent coupon for any Observation Date on which the closing price of the Reference Stock is less than the coupon barrier.

The “contingent coupon” applicable to each Observation Date will be a fixed amount specified in the applicable pricing supplement and will be calculated based upon a rate per annum (the “contingent coupon rate”) specified in the applicable pricing supplement.

Coupon Barrier: A specified price of the Reference Stock that is below the Initial Stock Price, as set forth in the applicable pricing supplement (as may be adjusted in the case of certain adjustment events as described under “General Terms of the Notes—Anti-dilution Adjustments”).

Coupon Payment Dates: Each Coupon Payment Date will generally be two to five business days following the applicable Observation Date. The final Coupon Payment Date will be the maturity date. As described under “General Terms of the Notes—Observation Dates” below, the calculation agent may postpone any Observation Date, and therefore a Coupon Payment Date, if a market disruption event occurs or is continuing on a day that would otherwise be an Observation Date. We describe market disruption events under “General Terms of the Notes—Market Disruption Events” below.

Call Feature: The notes will be called automatically if the closing price of the Reference Stock on any Observation Date is at or above the Initial Stock Price. If the notes are called on any Observation Date, we will pay on the applicable Call Settlement Date a cash payment per security equal to your principal amount plus the contingent coupon otherwise due on that Call Settlement Date under the contingent coupon feature. Following an automatic call, no further amounts will be owed to you under the notes.

Call Settlement Dates: If the notes are called on any Observation Date, the Call Settlement Date will be the Coupon Payment Date corresponding to that Observation Date. As described under “General Terms of the Notes—Observation Dates” below, the calculation agent may postpone any Observation Date, and therefore a Call Settlement Date, if a market disruption event occurs or is continuing on a day that would otherwise be an Observation Date. We describe market disruption events under “General Terms of the Notes—Market Disruption Events” below.

Payment at Maturity: Unless otherwise specified in the relevant pricing supplement, if the notes are not called, we will pay you at maturity a cash payment based on the Final Stock Price, calculated as described below:

- If the Final Stock Price is above or equal to the Trigger Price (which, unless otherwise specified in the relevant pricing supplement, will equal the coupon barrier) on the final Observation Date, we will pay you a cash payment equal to the principal amount plus the contingent coupon otherwise due on the maturity date under the contingent coupon feature.
- If the Final Stock Price is below the Trigger Price on the final Observation Date, we will deliver to you the Physical Delivery Amount, or at our option, the Cash Delivery Amount (each as defined below). The value of the cash or shares that you receive will be less than your principal amount, if anything, resulting in a loss that is proportionate to the decline of the Reference Stock from the trade date to the final Observation Date, for a return equal to: principal amount x (1 + Underlying Return).

The repayment of your principal amount is not guaranteed. If the value of the Reference Stock decreases, you may lose some or all of your investment. Specifically, if the notes are not called and the Final Stock Price is below the Trigger Price on the final Observation Date, you will lose 1% of your principal amount for each 1% decrease in the price per share of the Reference Stock below the Initial Stock Price. Accordingly, if the Final Stock Price is below the Trigger Price on the final Observation Date, you may lose up to 100% of your principal amount.

Underlying Return: Unless otherwise specified in the relevant pricing supplement:

$$\frac{\text{Final Stock Price} - \text{Initial Stock Price}}{\text{Initial Stock Price}}$$

Initial Stock Price: Unless otherwise specified in the relevant pricing supplement, the closing price of one share of the Reference Stock on the trade date, or such other date as specified in the relevant pricing supplement. The Initial Stock Price may be subject to adjustment. See “General Terms of the Notes—Anti-dilution Adjustments.”

Final Stock Price: Unless otherwise specified in the relevant pricing supplement, the closing price of one share of the Reference Stock on the final Observation Date. The Final Stock Price is subject to adjustment upon the occurrence of certain corporate events affecting the Reference Stock. See “General Terms of the Notes—Payment at Maturity—Anti-dilution Adjustments.”

Trigger Price: A specified price of the Reference Stock that is below the Initial Stock Price, as set forth in the applicable pricing supplement. The Trigger Price may be subject to adjustment. See “General Terms of the Notes—Anti-dilution Adjustments.” Unless otherwise specified in the relevant pricing supplement, the Trigger Price will equal the coupon barrier.

Observation Date(s): One or more dates as specified in the relevant pricing supplement, subject to postponement in the event of certain market disruption events.

Physical Delivery Amount: Unless otherwise specified in the relevant pricing supplement, for each \$1,000 principal amount of notes, the Physical Delivery Amount shall be equal to the number of shares of the Reference Stock determined by dividing \$1,000 by the Initial Stock Price.

Cash Delivery Amount: The amount in cash equal to the value of the Physical Delivery Amount. Unless otherwise specified in the relevant pricing supplement, the Cash Delivery Amount will equal the product of the Physical Delivery Amount, as calculated above, multiplied by the Final Stock Price.

Issue Price: Unless otherwise specified in the relevant pricing supplement, \$1,000 per \$1,000 in principal amount of the notes.

Trade Date: As specified in the relevant pricing supplement.

Settlement Date: As specified in the relevant pricing supplement.

Maturity Date: As specified in the relevant pricing supplement. If not previously called, the notes will mature on the maturity date. The maturity date is subject to postponement in the event of certain market disruption events and as described under “General Terms of the Notes—Payment at Maturity.”

RISK FACTORS

*An investment in your notes is subject to the risks described below, as well as the risks described under “Risk Factors” in the prospectus and the prospectus supplement. Your notes are not secured debt and are riskier than ordinary unsecured debt securities. Also, investing in your notes is not equivalent to investing directly in the applicable Reference Stock. You should carefully consider whether the notes are suited to your particular circumstances. This product prospectus supplement should be read together with the prospectus, the prospectus supplement and the relevant pricing supplement. The information in the prospectus and prospectus supplement is supplemented by, and to the extent inconsistent therewith replaced and superseded by, the information in this product prospectus supplement and the relevant pricing supplement. **This section describes the most significant risks relating to the terms of the notes. We urge you to read the following information about these risks, together with the other information in this product prospectus supplement and the prospectus, the prospectus supplement and the relevant pricing supplement, before investing in the notes.***

Risks Relating to the Notes Generally

Your investment in the notes may result in a loss.

The notes do not guarantee any return of principal. The amount payable to you at maturity, if any, will be determined as described in this product prospectus supplement and the relevant pricing supplement. The return on the notes at maturity will depend on whether the notes are called on any Observation Date, or if the notes are not called, the extent to which the Final Stock Price is less than the applicable Trigger Price. If the notes are not called and the Final Stock Price is below the Trigger Price on the final Observation Date, you will lose 1% of the principal amount for every 1% decrease in the price per share of the Reference Stock below the Initial Stock Price.

Accordingly, you may lose the entire principal amount of your notes.

You may not receive any contingent coupons with respect to your notes.

Royal Bank of Canada will not necessarily make periodic coupon payments on the notes. If the closing price of the Reference Stock on an Observation Date is less than the coupon barrier, we will not pay you the contingent coupon applicable to that Observation Date. If the closing price of the Reference Stock is less than the coupon barrier on each of the Observation Dates, we will not pay you any contingent coupons during the term of, and you will not receive a positive return on, your notes. Generally, this non-payment of the contingent coupon on the final Observation Date will coincide with a greater risk of principal loss on your notes. Accordingly, if we do not pay the contingent coupon on the maturity date, you will incur a loss of principal, because the Final Stock Price will be less than the applicable Trigger Price.

Your potential return on the notes is limited.

The return on the notes is limited to the pre-specified contingent coupon rate, regardless of the appreciation of the Reference Stock. As a result, the return on an investment in the notes could be less than the return on a direct investment in the Reference Stock. In addition, the total return on the notes will vary based on the number of Observation Dates on which the contingent coupon becomes payable prior to maturity or an automatic call. Further, if the notes are called due to the automatic call feature, you will not receive any contingent coupons or any other payment in respect of any Observation Dates after the applicable Call Settlement Date. Since the notes could be called as early as the first Observation Date, the total return on the notes could be minimal. If the notes are not called, you will be subject to the Reference Stock's risk of decline.

The potential contingent repayment of principal represented by the Trigger Price applies only at maturity.

If your notes are not automatically called, you should be willing to hold your notes until maturity. If you are able to sell your notes in the secondary market prior to maturity, you may have to sell them for a loss relative to your principal amount, even if price of the Reference Stock is at or above the Trigger Price.

The notes may be called early and are subject to reinvestment risk.

If your notes are called early, the term of the notes will be reduced and you will not receive any payment on the notes after the applicable Call Settlement Date. There is no guarantee that you would be able to reinvest the

proceeds from an automatic call of the notes at a comparable rate of return for a similar level of risk. To the extent you are able to reinvest such proceeds in an investment comparable to the notes, you may incur transaction costs such as dealer discounts and hedging costs built into the price of the new notes. Because the notes may be called as early as the first Observation Date after issuance, you should be prepared in the event the notes are called early.

The contingent coupon rate will reflect in part the volatility of the Reference Stock and may not be sufficient to compensate you for the risk of loss at maturity.

“Volatility” refers to the frequency and magnitude of changes in the price of the Reference Stock. The greater the volatility of the applicable Reference Stock, the more likely it is that the Reference Stock price could close below the Trigger Price on the final Observation Date of the notes. This risk will generally be reflected in a higher contingent coupon rate for the notes than the interest rate payable on our conventional debt securities with a comparable term. However, while the contingent coupon rate is set on the trade date, the Reference Stock’s volatility can change significantly over the term of the notes, and may increase. The price of the Reference Stock could fall sharply as of the final Observation Date, which could result in a significant loss of your principal.

The notes are subject to the credit risk of Royal Bank of Canada.

The notes are subject to the credit risk of Royal Bank of Canada and our credit ratings and credit spreads may adversely affect the market value of the notes. Investors are dependent on Royal Bank of Canada’s ability to pay all amounts due on the notes on the applicable payment dates, and therefore investors are subject to our credit risk and to changes in the market’s view of our creditworthiness. Any decline in our credit ratings or increase in the credit spreads charged by the market for taking our credit risk is likely to adversely affect the value of the notes. Payment on the notes, including any repayment of principal, is subject to the creditworthiness of Royal Bank of Canada. If we were to default on our payment obligations, you may not receive any amounts owed to you under the notes and you could lose your entire investment.

Your return on the notes may be lower than the return on a conventional debt security of comparable maturity.

The return that you will receive on your notes, which could be negative, may be less than the return you could earn on other investments. Your investment may not reflect the full opportunity cost to you when you take into account factors that affect the time value of money, such as inflation.

Your return on the notes will not reflect dividends on the Reference Stock or the equity securities included in any ETF.

The return on the notes will not reflect the return you would realize if you actually owned the Reference Stock or the equity securities included in any applicable ETF and received the dividends paid on those equity securities. The Final Stock Price of the Reference Stock and the determination of the amount to be paid at maturity will not take into consideration the value of those dividends.

Owning the notes is not the same as owning the Reference Stock.

The return on your notes may not reflect the return you would realize if you actually owned the Reference Stock. For instance, the Reference Stock may appreciate substantially during the term of the notes, and you will not fully participate in that appreciation, because your positive return on the notes, if any, is limited to the contingent coupon. The following factors, among others, may cause the financial return on your notes to differ from the financial return you would receive by investing directly in the Reference Stock:

- the return on a direct investment in the Reference Stock would depend primarily upon the relative appreciation or depreciation of the Reference Stock during the term of the notes, and not on whether the closing price of the Reference Stock is equal to or greater than the Initial Stock Price or the coupon barrier on any Observation Date or is less than the Trigger Price on the final Observation Date;
- in the case of a direct investment in the Reference Stock, the return could include substantial dividend payments or other distributions, which you will not receive as an investor in the notes;
- in the case of a direct investment in the Reference Stock, the return could include rights, such as voting rights, that you will not have as an investor in the notes; and

- a direct investment in the Reference Stock is likely to have tax consequences that are different from an investment in the notes.

If the price of the shares of the Reference Stock changes, the market value of your notes may not change in the same manner.

Owning the notes is not the same as owning shares of the Reference Stock. Accordingly, changes in the price of the Reference Stock may not result in a comparable change of the market value of the notes. If the closing price of one share of the Reference Stock on any trading day increases above the Initial Stock Price or the coupon barrier, the value of the notes may not increase in a comparable manner, if at all. It is possible for the price of the shares of the Reference Stock to increase while the value of the notes declines.

The determination of the payments on the notes, and whether they are subject to an automatic call, does not take into account all developments in the price of the Reference Stock.

Changes in the price of the Reference Stock during the periods between each Observation Date may not be reflected in the determination as to whether the contingent coupon is payable to you on any Coupon Payment Date or whether the notes are subject to an automatic call, or the calculation of the amount payable, if any, at maturity of the notes. The calculation agent will determine whether (i) the contingent coupon is payable to you on any Coupon Payment Date or (ii) the notes are subject to an automatic call by observing only the closing price of the Reference Stock on each applicable Observation Date. The calculation agent will calculate the payment at maturity by comparing only the closing price of the Reference Stock on the final Observation Date relative to the closing price of the Reference Stock on the trade date (as the same may be adjusted upon the occurrence of certain adjustment events described in “General Terms of the Notes – Anti-dilution Adjustments”). No other prices or values will be taken into account. As a result, you may lose some or all of your principal amount even if the price of the Reference Stock has risen at certain times during the term of the notes before falling to a closing price below the Trigger Price on the final Observation Date.

In some circumstances, the payment you receive on the notes may be based on the notes issued by another issuer and not on the Reference Stock.

Following certain corporate events relating to the respective issuer of the Reference Stock where that issuer is not the surviving entity, the determination as to whether the contingent coupon is payable to you on any Coupon Payment Date or whether the notes are subject to an automatic call, or the amount you receive at maturity, may be based on the common stock of a successor to the respective Reference Stock issuer in combination with any cash or any other assets distributed to holders of the applicable Reference Stock in such corporate event, which may include securities issued by a non-U.S. company and quoted and traded in a foreign currency. If the issuer of any Reference Stock becomes subject to a Reorganization Event (as defined below) and the relevant Distribution Property (as defined below) consists solely of cash, these determinations may be based on a security issued by another issuer or a share of another ETF (as applicable). The occurrence of these events and the consequent adjustments, may materially and adversely affect the value of the notes. We describe the specific corporate events that may lead to these adjustments and the procedures for selecting Distribution Property in the section of this product prospectus supplement called “General Terms of the Notes—Anti-dilution Adjustments—Reorganization Events.”

If the Reference Stock is an ADR and the ADR is no longer listed or admitted to trading on a U.S. securities exchange registered under the Exchange Act nor included in the OTC Bulletin Board Service operated by FINRA, or if the ADR facility between the issuer of the underlying ADR stock and the ADR depository is terminated for any reason, the determination as to the payments on the notes, will be based on the common stock represented by the ADR. Such delisting of the ADR or termination of the ADR facility and the consequent adjustments may materially and adversely affect the value of the notes. We describe such delisting of the ADR or termination of the ADS facility and the consequent adjustments in the section of this product prospectus supplement called “General Terms of Notes—Delisting of ARDs or Termination of ADR Facility.”

If a Reference Stock or an ETF that is serving as the Reference Stock is discontinued, delisted or trading of such Reference Stock on its primary exchange is suspended, the determination as to the payments on the notes may be based on a security issued by another issuer or a share of another ETF (as applicable) and not the Reference Stock. Such discontinuance, delisting or suspension of trading of the Reference Stock and the consequent

adjustments may materially and adversely affect the value of the notes. We describe such discontinuance, delisting or suspension of trading of the Reference Stock and the consequent adjustments in the sections of this product prospectus supplement called “General Terms of the Notes—Anti-dilution Adjustments—Reorganization Events.”

The notes are not designed to be short-term trading instruments.

The price at which you will be able to sell your notes to us or our affiliates prior to maturity, if at all, may be at a substantial discount from the principal amount of the notes, even in cases where the closing price of the Reference Stock has appreciated since the trade date. In addition, you will not receive the benefit of any contingent repayment of principal represented by the Trigger Price if you sell your notes before the maturity date. The potential returns described in the relevant pricing supplement assume that your notes, which are not designed to be short-term trading instruments, are held to maturity.

You must rely on your own evaluation of the merits of an investment linked to the Reference Stock.

In the ordinary course of their business, our affiliates may have expressed views on expected movement in any Reference Stock, or the equity securities included in any ETF, and may do so in the future. These views or reports may be communicated to our clients and clients of our affiliates. However, these views are subject to change from time to time. Moreover, other professionals who transact business in markets relating to any Reference Stock may at any time have significantly different views from those of our affiliates. For these reasons, you are encouraged to derive information concerning the applicable Reference Stock from multiple sources, and you should not rely solely on views expressed by our affiliates.

Your anti-dilution protection is limited.

The calculation agent will make adjustments to the Initial Stock Price, the coupon barrier and the Trigger Price for certain events affecting the shares of the Reference Stock. See “General Terms of the Notes—Anti-dilution Adjustments.” The calculation agent is not required, however, to make such adjustments in response to all events that could affect the shares of the Reference Stock. If an event occurs that does not require the calculation agent to make an adjustment, such as an offering of common shares for cash, the value of the notes may be materially and adversely affected. In addition, all determinations and calculations concerning any such adjustment will be made by the calculation agent, which will be binding on you absent manifest error. You should be aware that the calculation agent may make any such adjustment, determination or calculation in a manner that differs from, or that is in addition to, that described in this product prospectus supplement or the applicable pricing supplement as necessary to achieve an equitable result. You should refer to “General Terms of the Notes—Anti-dilution Adjustments” for a description of the items that the calculation agent is responsible for determining.

Certain Considerations for Insurance Companies and Employee Benefit Plans.

Any insurance company or fiduciary of a pension plan or other employee benefit plan that is subject to the prohibited transaction rules of the Employee Retirement Income Security Act of 1974, as amended, which we call “ERISA,” or the Internal Revenue Code of 1986, as amended, including an IRA or a Keogh plan (or a governmental plan to which similar prohibitions apply), and that is considering purchasing the notes with the assets of the insurance company or the assets of such a plan, should consult with its counsel regarding whether the purchase or holding of the notes could become a “prohibited transaction” under ERISA, the Internal Revenue Code or any substantially similar prohibition in light of the representations a purchaser or holder in any of the above categories is deemed to make by purchasing and holding the notes. For additional information, please see the discussion under “Employee Retirement Income Security Act” below.

Risks Relating to Liquidity and Secondary Market Issues

Secondary trading in the notes may be limited.

Unless otherwise specified in the relevant pricing supplement, the notes will not be listed on a securities exchange. There may be little or no secondary market for the notes. Even if there is a secondary market, it may not provide enough liquidity to allow you to trade or sell the notes easily.

RBC Capital Markets, LLC, or RBCCM, may act as a market maker for the notes, but is not required to do so. Because we do not expect that other market makers will participate significantly in the secondary market for the notes, the price at which you may be able to trade the notes is likely to depend on the price, if any, at which RBCCM is willing to buy the notes. If at any time RBCCM or another entity does not act as a market maker, it is likely that there would be little or no secondary market for the notes. We expect that transaction costs in any secondary market would be high. As a result, the difference between the bid and asked prices for the notes in any secondary market could be substantial. If you sell the notes before maturity, you may have to do so at a substantial discount from the issue price, and as a result, you may suffer substantial losses.

The inclusion in the original issue price of each Agent's commission and the estimated cost of hedging our obligations under the notes through one or more of our affiliates is likely to adversely affect the value of the notes prior to maturity.

While the payment at maturity, if any, will be based on the principal amount of your notes as described in the relevant pricing supplement, the original issue price of the notes includes each Agent's commission and the estimated cost of hedging our obligations under the notes through one or more of our affiliates. Such estimated cost includes our affiliates' expected cost of providing such hedge, as well as the profit our affiliates expect to realize in consideration for assuming the risks inherent in providing such hedge. As a result, assuming no change in market conditions or any other relevant factors, the price, if any, at which RBCCM may be willing to purchase notes from you in secondary market transactions, if at all, will likely be lower than the original issue price. In addition, any such prices may differ from values determined by pricing models used by RBCCM, as a result of such compensation or other transaction costs.

Prior to maturity, the value of the notes will be influenced by many unpredictable factors.

Many economic and market factors will influence the value of the notes. We expect that, generally, the closing price of one share of the Reference Stock on any day will affect the value of the notes more than any other single factor. However, you should not expect the value of the notes in the secondary market to vary in proportion to changes in the closing price of one share of the Reference Stock. The value of the notes will be affected by a number of other factors that may either offset or magnify each other, including:

- the market price of the shares of the Reference Stock;
- whether the market price of the Reference Stock is below the coupon barrier or the Trigger Price;
- the expected volatility of the Reference Stock;
- the time to maturity of the notes;
- the dividend rate on the Reference Stock or on the equity securities held by the Reference Stock (if the Reference Stock is an ETF);
- interest and yield rates in the market generally, as well as in the markets of the equity securities held by the Reference Stock (if the Reference Stock is an ETF);
- the occurrence of certain events relating to the Reference Stock that may or may not require an adjustment to the Initial Stock Price, the coupon barrier and the Trigger Price;
- economic, financial, political, regulatory or judicial events that affect the Reference Stock or the equity securities held by the Reference Stock (if the Reference Stock is an ETF) or stock markets generally, and which may affect the closing price of shares of the Reference Stock on any Observation Date;
- if the applicable Reference Stock is an ETF that invests in securities that are traded in non-U.S. markets, the exchange rate and the volatility of the exchange rate between the U.S. dollar and the currencies in which the equity securities held by the Reference Stock are traded, and, if the net asset value of the Reference Stock is calculated in one currency and the equity securities held by the Reference Stock are traded in another currency or currencies, the correlation between those rates and the market price of the Reference Stock; and
- our creditworthiness, including actual or anticipated downgrades in our credit ratings.

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

Risks Relating to the Reference Stock

The issuer of the Reference Stock will not have any role or responsibilities with respect to the notes.

The issuer of the Reference Stock will not have authorized or approved the notes, and will not be involved in any offering. The issuer of the Reference Stock will not have any financial or legal obligation with respect to the notes or the amounts to be paid to you, including any obligation to take our needs or your needs into consideration for any reason, including taking any corporate actions that might affect the value of the Reference Stock or the notes. The issuer of the Reference Stock will not receive any of the proceeds from any offering of the notes. No issuer of a Reference Stock will be responsible for, or participate in, the determination or calculation of the amounts receivable by holders of the notes.

We and our affiliates have no affiliation with the issuer of any Reference Stock and are not responsible for its public disclosure of information or that of any other company.

Unless otherwise specified in the applicable pricing supplement, we and our affiliates are not affiliated with any respective Reference Stock issuer in any way and have no ability to control or predict its actions, including any corporate actions of the type that would require the calculation agent to adjust the determinations of the payments on the notes, and have no ability to control the public disclosure of these corporate actions or any events or circumstances affecting the Reference Stock issuer, unless (and only to the extent that) our securities or the securities of our affiliates are represented by that Reference Stock. The Reference Stock issuer will not be involved in the offering of the notes in any way and has no obligation to consider your interests as owner of the notes in taking any corporate actions that might affect the market value of your notes or the payment at maturity. A Reference Stock issuer may take actions that could adversely affect the market value of the notes.

The notes are unsecured debt obligations of Royal Bank of Canada only and are not obligations of the Reference Stock issuer or any other third party. No portion of the Issue Price you pay for the notes will be paid to the Reference Stock issuer or any other third party.

Unless otherwise specified in the applicable pricing supplement, we will have derived the information about the respective Reference Stock issuer and the Reference Stock from publicly available information, without independent verification. Neither we nor any of our affiliates assume any responsibility for the adequacy or accuracy of the information about the respective Reference Stock issuer or the Reference Stock. You, as an investor in the notes, should make your own investigation into the respective Reference Stock issuer and the Reference Stock for your notes. We urge you to review financial and other information filed periodically by the Reference Stock issuer with the SEC.

This product prospectus supplement and each pricing supplement relates only to the notes and does not relate to the Reference Stock or a Reference Stock issuer.

The issuer of the Reference Stock — and thus the Reference Stock — is subject to various market risks.

The issuer of the Reference Stock, is subject to various market risks or, if the Reference Stock is an ETF, each company whose securities constitute the ETF or each futures contract or commodity that constitutes the securities of the ETF, are subject to various market risks. Consequently, the prices of the Reference Stock may fluctuate depending on the respective markets in which the respective Reference Stock issuer operates or, if the Reference Stock is an ETF, the respective markets in which the assets held by such ETF trade. Market forces outside of our control could cause the contingent coupon not to be paid or could cause the price of the Reference Stock to be below the Trigger Price on the final Observation Date. The price of the Reference Stock can rise or fall sharply due to factors specific to that Reference Stock and the Reference Stock issuer, such as equity or commodity price volatility, earnings, financial conditions, corporate, industry and regulatory developments, management changes and decisions, and other events, and by general market factors, such as general securities and commodity market

volatility and levels, interest rates and economic and political conditions. The applicable pricing supplement will provide a brief description of the Reference Stock issuer and the Reference Stock to which the notes we offer are linked. We urge you to review financial and other information filed periodically by the Reference Stock issuer with the SEC.

The historical performance of the Reference Stock should not be taken as an indication of its future performance.

The price of the Reference Stock will determine the amount to be paid on the notes at maturity. The historical performance of the Reference Stock does not give an indication of its future performance. As a result, it is impossible to predict whether the price of the Reference Stock will rise or fall during the term of the notes. The price of the Reference Stock will be influenced by complex and interrelated political, economic, financial and other factors. The value of the Reference Stock may decrease such that you may not receive any return of your investment or any contingent coupon payments. There can be no assurance that the price of the Reference Stock will not decrease so that at maturity you will not lose some or all of your investment.

For notes linked to a non-U.S. Reference Stock, an investment in the notes is subject to risks associated with non-U.S. securities markets.

The Reference Stock, or shares held by an ETF to which the notes are linked, may have been issued by one or more non-U.S. companies. An investment in notes linked to the value of non-U.S. equity securities involves particular risks. Non-U.S. securities markets may be more volatile than U.S. securities markets, and market developments may affect non-U.S. securities markets differently from the U.S. securities markets. Direct or indirect government intervention to stabilize these non-U.S. securities markets, as well as cross shareholdings among non-U.S. companies, may affect trading prices and volumes in those markets. Also, there is generally less publicly available information in the U.S. about non-U.S. companies than about those U.S. companies that are subject to the reporting requirements of the SEC, and non-U.S. companies are subject to accounting, disclosure, auditing and financial reporting standards and requirements that differ from those applicable to U.S. reporting companies.

Prices of securities in non-U.S. countries are subject to political, economic, financial and social factors that may be unique to the particular country. These factors, which could negatively affect the non-U.S. securities markets, include the possibility of recent or future changes in the economic and fiscal policies of non-U.S. governments, the possible imposition of, or changes in, currency exchange laws or other non-U.S. laws or restrictions applicable to non-U.S. companies or investments in non-U.S. equity securities, 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, the economies of certain foreign countries may differ favorably or unfavorably from the U.S. economy in important respects, such as growth of gross national product, rate of inflation, trade surpluses or deficits, capital reinvestment, resources and self-sufficiency.

Fluctuations relating to exchange rates may affect the value of your investment.

Fluctuations in exchange rates may affect the value of your investment where: (1) the Reference Stock is an ADR, which is quoted and traded in U.S. dollars, but represents the underlying ADR stock that is quoted and traded in a foreign currency and that may trade differently from the ADR, (2) the Reference Stock is substituted or replaced by a security that is quoted and traded in a foreign currency, or (3) the Reference Stock is an ETF that invests in securities, futures contracts or commodities that are quoted and traded in a foreign currency. Such substitution or replacement of the Reference Stock by a security issued by a non-U.S. company may occur following certain corporate events affecting the Reference Stock (as described under “General Terms of the Notes—Anti-dilution Adjustments—Reorganization Events”) or in the event of delisting or termination of the Reference Stock that is an ADR (as described under “General Terms of the notes—Delisting of ADRs or Termination of ADR Facility”).

If the Reference Stock is an ETF that invests in securities, futures contracts or commodities that are traded on non-U.S. markets, the market price of such underlying assets generally will reflect the U.S. dollar value of those assets. Therefore, holders of notes based upon one or more ETFs that invests in non-U.S. markets will be exposed to currency exchange rate risk with respect to the currency in which such assets trade. An investor’s net exposure will depend on the extent to which the relevant non-U.S. currency strengthens or weakens against the U.S. dollar and the

relative weight of each non-U.S. asset in the relevant ETF's portfolio. If, taking into account such weighting, the dollar strengthens against the non-U.S. currency, the value of the non-U.S. securities, futures contracts or commodities in which an ETF invests will be adversely affected and the value of the notes may decrease.

In recent years, the exchange rates between the U.S. dollar and some other currencies have been highly volatile, and this volatility may continue in the future. Risks relating to exchange rate fluctuations generally depend on economic and political events over which we have no control. However, fluctuations in any particular exchange rate that have occurred in the past are not necessarily indicative of fluctuations that may occur during the term of the notes. Changes in the exchange rate between the U.S. dollar and a foreign currency may affect the U.S. dollar equivalent of the price of any relevant security, futures contract or commodity on non-U.S. markets and, as a result, may affect the value of the notes. In addition, foreign exchange rates can either be floating or fixed by sovereign governments. Exchange rates of the currencies used by most economically developed nations are permitted to fluctuate in value relative to the U.S. dollar and to each other. However, from time to time governments and, in the case of countries using the euro, the European Central Bank, may use a variety of techniques, such as intervention by a central bank in foreign exchange, money markets, sovereign debt or other financial markets, the imposition of regulatory controls or taxes or changes in interest rates to influence the exchange rates of their currencies. Governments may also issue a new currency to replace an existing currency or alter the exchange rate or relative exchange characteristics by a devaluation or revaluation of a currency. These governmental actions could change or interfere with currency valuations and currency fluctuations that would otherwise occur in response to economic forces, as well as in response to the movement of currencies across borders. As a consequence, these government actions could adversely affect the value of the notes.

We will not make any adjustment or change in the terms of the notes in the event that applicable exchange rates should become fixed, or in the event of any devaluation or revaluation or imposition of exchange or other regulatory controls or taxes, or in the event of other developments affecting the U.S. dollar or any relevant foreign currency.

Risks Relating to Reference Stocks that Are ADRs

The value of the Reference Stock may not accurately track the value of the underlying ADR stock represented by such ADR.

If the Reference Stock is an ADR, each share of the Reference Stock will represent shares of the relevant company (an "underlying company"). The trading patterns of the ADRs will generally reflect the characteristics and valuations of the underlying ADR stock; however, the value of the ADRs may not completely track the value of those shares. Trading volume and pricing on the applicable non-U.S. exchange may, but will not necessarily, have similar characteristics as the ADRs. For example, certain factors may increase or decrease the public float of the ADRs and, as a result, the ADRs may have less liquidity or lower market value than the underlying ADR stock.

Adverse trading conditions in the applicable non-U.S. market may negatively affect the value of the Reference Stock.

Holders of the underlying company's ADRs may usually surrender the ADRs in order to receive and trade the underlying ADR stock. This provision permits investors in the ADRs to take advantage of price differentials between markets. However, this provision may also cause the market prices of the Reference Stock to more closely correspond with the values of the common shares in the applicable non-U.S. markets. As a result, a market outside of the U.S. for the underlying ADR stock that is not liquid may also result in an illiquid market for the ADRs.

Additional Risks Relating to Exchange Traded Fund Reference Stocks

Changes that affect an underlying index will affect the market value of the notes and the payments on the notes.

The policies of the applicable index sponsor concerning the calculation of the applicable index, additions, deletions or substitutions of the components of that index and the manner in which changes affecting those components, such as stock dividends, reorganizations or mergers, may be reflected in the index and, therefore, could affect the amounts payable on the notes at maturity, and the market value of the notes prior to maturity. The amounts payable on the notes and their market value could also be affected if the index sponsor changes these

policies, for example, by changing the manner in which it calculates the index, or if the index sponsor discontinues or suspends calculation or publication of the index, in which case it may become difficult to determine the market value of the notes.

We have no affiliation with any index sponsor and will not be responsible for any actions taken by an index sponsor.

Unless otherwise specified in the relevant pricing supplement, no index sponsor is an affiliate of ours or will be involved in any offerings of the notes in any way. Consequently, we have no control of the actions of any index sponsor, including any actions of the type that might impact the value of the notes. No index sponsor has any obligation of any sort with respect to the notes. Thus, no index sponsor has any obligation to take your interests into consideration for any reason, including in taking any actions that might affect the value of the notes. None of our proceeds from any issuance of the notes will be delivered to any index sponsor.

There are liquidity and management risks associated with an ETF.

Although shares of an ETF that is a Reference Stock will be listed for trading on a securities exchange and a number of similar products have been traded on various exchanges for varying periods of time, there is no assurance that an active trading market will continue for the shares of the Reference Stock or that there will be liquidity in that trading market.

An ETF is subject to management risk, which is the risk that the investment adviser's investment strategy, the implementation of which is subject to a number of constraints, may not produce the intended results.

We cannot control actions by the investment adviser which may adjust the ETF in a way that could adversely affect the payments on the notes and their market value, and the investment adviser has no obligation to consider your interests.

The policies of the applicable investment adviser concerning the calculation of the ETF's net asset value, additions, deletions or substitutions of securities or other investments held by the ETF and the manner in which changes affecting the underlying index are reflected in the ETF could affect the market price per share of the Reference Stock and, therefore, the amounts payable on the notes and their market value. The amounts payable on the notes and their market value could also be affected if the investment adviser changes these policies, for example, by changing the manner in which it calculates the ETF's net asset value, or if the investment adviser discontinues or suspends calculation or publication of the ETF's net asset value, in which case it may become difficult to determine the value of your notes. If events such as these occur or if the closing price of the Reference Stock is not available on any Observation Date, the calculation agent may determine the closing price per share of the Reference Stock on such Observation Date in a manner the calculation agent considers appropriate, in its sole discretion.

The performance of the Reference Stock and the performance of the underlying index may vary.

The performance of the Reference Stock and that of its underlying index (or other underlying asset) generally will vary due to transaction costs, certain corporate actions and timing variances. If the Reference Stock maintains a "representative sampling" strategy as to an underlying index, the performance of the Reference Stock will differ to some degree from that of the underlying index.

In addition, because the shares of the Reference Stock are traded on a securities exchange and are subject to market supply and investor demand, the market value of one share of the Reference Stock may differ from its net asset value per share; shares of the Reference Stock may trade at, above, or below their net asset value per share.

For the foregoing reasons, the performance of the Reference Stock may not match the performance of the underlying index (or other underlying asset) over the same period. Because of this variance, the return on the notes, to the extent dependent on the return of the underlying asset may not be the same as an investment directly in the securities or other investments included in the underlying asset or the same as a debt security with a payment at maturity linked to the performance of the underlying asset.

Time zone differences between the cities where the underlying asset and the Reference Stock trade may create discrepancies in trading levels.

As a result of the time zone difference, if applicable, between the cities where the securities or commodities comprising the underlying asset trade and where the shares of the Reference Stock trade, there may be discrepancies between the values of the underlying asset and the market value of the notes. In addition, there may be periods when the foreign securities or commodities markets are closed for trading (for example, during holidays in a country other than the United States) that may result in the values of the underlying asset remaining unchanged for multiple trading days in the city where the shares of the Reference Stock trade. Conversely, there may be periods in which the applicable foreign securities or commodities markets are open, but the securities market on which the Reference Stock trades is closed.

Risks Relating to Hedging Activities and Conflicts of Interest

We or our affiliates may have adverse economic interests to the holders of the notes.

RBCCM and other affiliates of ours may trade the shares of the Reference Stock and the equity securities that may be held by a Reference Stock issuer that is an ETF, and other financial instruments related to the Reference Stock on a regular basis, for their accounts and for other accounts under their management. RBCCM and these affiliates may also issue or underwrite or assist unaffiliated entities in the issuance or underwriting of other securities or financial instruments linked to the Reference Stock or any equity securities held by a Reference Stock issuer that is an ETF. To the extent that we or one of our affiliates serves as issuer, agent or underwriter for such securities or financial instruments, our or their interests with respect to such products may be adverse to those of the holders of the notes. Any of these trading activities could potentially affect the performance of the Reference Stock and, accordingly, could affect the value of the notes and the amounts, if any, payable on the notes.

We or our affiliates may currently or from time to time engage in business with the issuer of the Reference Stock or issuers of securities held by a Reference Stock issuer that is an ETF, including extending loans to, or making equity investments in, or providing advisory services to them, including merger and acquisition advisory services. In the course of this business, we or our affiliates may acquire non-public information about these companies, and we will not disclose any such information to you. We do not make any representation or warranty to any purchaser of a note with respect to any matters whatsoever relating to our business with the issuer of any Reference Stock or future price movements of any Reference Stock or any equity securities that may be held by an ETF.

Additionally, we or one of 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 shares of the Reference Stock or the price of the equity securities or other assets held by a Reference Stock issuer that is an ETF. By introducing competing products into the marketplace in this manner, we or one or more of our affiliates 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 each Observation Date, which could have an impact on the return of your 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.

We or one of our affiliates may currently or from time to time engage in trading activities related to the currencies in which the non-U.S. equity securities or other assets held by a Reference Stock issuer that is an ETF are denominated. These trading activities could potentially affect the exchange rates with respect to such currencies and, if currency exchange rate calculations are involved in the calculation of the net asset value of that Reference Stock, could affect the closing prices of that Reference Stock and, accordingly, if the notes are linked to that Reference Stock, the value of the notes.

In the course of our or our affiliates' currency trading activities, we or our affiliates may acquire material nonpublic information with respect to currency exchange rates, and we will not disclose any such information to you. In addition, one or more of our affiliates may produce and/or publish research reports, or otherwise express

views, with respect to expected movements in currency exchange rates. We do not make any representation or warranty to any purchaser of the notes with respect to any matters whatsoever relating to future currency exchange rate movements and, if the notes are linked to a Reference Stock that is an ETF which invests in non-U.S. securities or other assets, any prospective purchaser of the notes should undertake an independent investigation of the currencies in which the assets held by that Reference Stock are denominated and their related exchange rates as, in its judgment, is appropriate to make an informed decision with respect to an investment in the notes.

The calculation agent will have significant discretion with respect to the notes, which may be exercised in a manner that is adverse to your interests.

Our wholly-owned subsidiary, RBCCM, will act as the calculation agent. The calculation agent will determine, among other things, the closing price of one share of the Reference Stock on each Observation Date; anti-dilution adjustments, if any; whether the notes are subject to an automatic call; the Final Stock Price; the coupon barrier; the underlying return; and the amount, if any, that we will pay to you at maturity. The calculation agent will also be responsible for determining whether a market disruption event has occurred, and may also make certain adjustments to a Reference Stock issuer that is an ETF, for example, if that ETF is delisted, or if material changes are made to its underlying index. The calculation agent may exercise its discretion in a manner which reduces your return on the notes. Since these determinations by the calculation agent will affect the payments on the notes, the calculation agent may have a conflict of interest if it needs to make a determination of this kind. Since these determinations by the calculation agent will affect the payments on the notes, the calculation agent may have a conflict of interest if it needs to make a determination of this kind.

Market disruptions may adversely affect your return.

The calculation agent may, in its sole discretion, determine that the markets have been affected in a manner that prevents it from properly determining the closing price of one share of the Reference Stock on any Observation Date or calculating the underlying return and the amount, if any, that we are required to pay you at maturity. These events may include disruptions or suspensions of trading in the markets as a whole. If the calculation agent, in its sole discretion, determines that any of these events prevents us or any of our affiliates from properly hedging our obligations under the notes, it is possible that one or more of the Observation Dates and the maturity date will be postponed, and your return will be adversely affected. See “General Terms of the Notes—Market Disruption Events.”

Risks Relating to Taxation Issues

Non-U.S. investors may be subject to certain additional risks.

This product prospectus supplement contains a general description of certain U.S. tax considerations relating to the notes. In the event you are a non-U.S. investor, you should consult your tax advisors as to the consequences, under the tax laws of the country where you are resident for tax purposes, of acquiring, holding and disposing of the notes and receiving the payments that might be due under the notes.

This product prospectus supplement also contains a general description of certain Canadian tax considerations relating to the notes. If you are not a Non-resident Holder (as that term is defined in “Tax Consequences—Canadian Taxation” in the accompanying prospectus) or if you acquire the notes in the secondary market, you should consult your tax advisors as to the consequences of acquiring, holding and disposing of the notes and receiving the payments that may be due under the notes.

Significant aspects of the income tax treatment of an investment in the notes may be uncertain.

The tax treatment of an investment in the notes is uncertain. We do not plan to request a ruling from the Internal Revenue Service or the Canada Revenue Agency regarding the tax treatment of an investment in the notes, and the Internal Revenue Service, the Canada Revenue Agency or a court may not agree with the tax treatment described in this product prospectus supplement.

The Internal Revenue Service has released a notice that may affect the taxation of holders of the notes. According to the notice, the Internal Revenue Service and the U.S. Treasury Department are actively considering whether the holder of an instrument similar to the notes should be required to accrue ordinary income on a current

basis irrespective of any contingent coupons. It is not possible to determine what guidance they will ultimately issue, if any. It is possible, however, that under such guidance, holders of the notes will ultimately be required to accrue income currently and this could be applied on a retroactive basis.

Please read carefully the sections entitled “Supplemental Discussion of U.S. Federal Income Tax Consequences” in this product prospectus supplement, the section “Tax Consequences” in the accompanying prospectus and the section entitled “Certain Income Tax Consequences” in the accompanying prospectus supplement. You should consult your tax advisor about your own tax situation.

For a more complete discussion of the Canadian federal income tax consequences of investing in the notes, please see “Tax Consequences—Canadian Taxation” in the accompanying prospectus. If you are not a Non-resident Holder (as that term is defined in “Tax Consequences—Canadian Taxation” in the accompanying prospectus) or if you acquire the notes in the secondary market, you should consult your tax advisors as to the consequences of acquiring, holding and disposing of the notes and receiving the payments that might be due under the notes.

A 30% U.S. federal withholding tax will be withheld on contingent coupons paid to non-U.S. holders.

While the U.S. federal income tax treatment of the notes (including proper characterization of the contingent coupons for U.S. federal income tax purposes) is uncertain, U.S. federal income tax at a 30% rate (or at a lower rate under an applicable income tax treaty) will be withheld in respect of the contingent coupons paid to a non-U.S. holder unless such payments are effectively connected with the conduct by the non-U.S. holder of a trade or business in the United States (in which case, to avoid withholding, the non-U.S. holder will be required to provide a Form W-8ECI). We will not pay any additional amounts in respect of such withholding.

Please read carefully the sections entitled “Supplemental Discussion of U.S. Federal Income Tax Consequences” in this product prospectus supplement, the section “Tax Consequences” in the accompanying prospectus and the section entitled “Certain Income Tax Consequences” in the accompanying prospectus supplement. You should consult your tax advisor about your own tax situation.

USE OF PROCEEDS AND HEDGING

Unless otherwise specified in the relevant pricing supplement, the net proceeds we receive from the sale of the notes will be used for general corporate purposes and, in part, by us or by one or more of our affiliates in connection with hedging our obligations under the notes. The original issue price of the notes includes each Agent's commissions (as shown on the cover page of the relevant pricing supplement) paid with respect to the notes and the estimated cost of hedging our obligations under the notes.

Unless otherwise specified in the relevant pricing supplement, the original issue price of the notes will include the reimbursement of certain issuance costs and the estimated cost of hedging our obligations under the notes. The estimated cost of hedging includes the projected profit that our affiliates expect to realize in consideration for assuming the risks inherent in hedging our obligations under the notes. Because hedging our obligations entails risk and may be influenced by market forces beyond our or our affiliates' control, the actual cost of such hedging may result in a profit that is more or less than expected, or could result in a loss. See also "Use of Proceeds" in the accompanying prospectus.

In anticipation of the sale of the notes, we expect to enter into hedging transactions with one or more of our affiliates, or with one or more of the Agents or their affiliates, involving purchases of shares of the Reference Stock, the equity securities or other assets held by the Reference Stock or included in the applicable ETF and/or listed and/or over-the-counter derivative instruments linked to any of those securities prior to or on the trade date. From time to time, including around the time of each Observation Date and the maturity date, we, the Agents, and our other affiliates may enter into additional hedging transactions or unwind those that we or they have entered into. In this regard, we, the Agents, and our affiliates may:

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

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

We, the Agents, and our respective affiliates may close out our or their hedges on or before any Observation Date. That step may involve sales or purchases of the Reference Stock or components of the ETF or over-the-counter derivative instruments linked to the Reference Stock.

GENERAL TERMS OF THE NOTES

Please note that in this section entitled “General Terms of the Notes,” references to “holders” mean those who own notes registered in their own names, on the books that we or the trustee maintain for this purpose, and not those who own beneficial interests in notes registered in street name or in notes issued in book-entry form through The Depository Trust Company (“DTC”) or another depository. Owners of beneficial interests in the notes should read the section entitled “Description of the Notes We May Offer—Legal Ownership” in the prospectus supplement and “Description of Debt Securities—Ownership and Book-Entry Issuance” in the prospectus.

General

The contingent coupon barrier notes are senior unsecured obligations of Royal Bank of Canada that are linked to either the common equity securities of an issuer, including an ADR, or shares of an ETF. We refer to the common stock represented by an ADR as the “underlying ADR stock.” The notes are a series of debt securities referred to in the accompanying prospectus supplement, prospectus and the relevant pricing supplement. The notes will be issued by Royal Bank of Canada under an indenture dated October 23, 2003, as it may be amended or supplemented from time to time, between Royal Bank of Canada and The Bank of New York Mellon, as trustee.

The notes are not insured or guaranteed by the Canada Deposit Insurance Corporation, the U.S. Federal Deposit Insurance Corporation, or any other governmental agency of Canada or the United States.

The notes are our unsecured and unsubordinated debt obligations and will rank *pari passu* with all of our other unsecured and unsubordinated obligations.

The notes will be issued in denominations of \$1,000 and integral multiples thereof, unless otherwise specified in the relevant pricing supplement. We refer to a note in the minimum denomination of the notes as “one note.” The notes will be represented by one or more permanent global notes registered in the name of The Depository Trust Company, or DTC, or its nominee, as described under “Description of Debt Securities—Ownership and Book-Entry Issuance” and “—Considerations Relating to DTC” in the prospectus.

The specific terms of the notes will be described in the relevant pricing supplement accompanying this product prospectus supplement. The terms described in that document supplement those described in this product prospectus supplement, the accompanying prospectus and prospectus supplement. If the terms described in the relevant pricing supplement are inconsistent with those described in this product prospectus supplement, the accompanying prospectus or prospectus supplement, the terms described in the relevant pricing supplement will control.

The Coupon Payment Dates and the maturity date for the notes will be set forth in the relevant pricing supplement. If a scheduled Coupon Payment Date or the maturity date is not a business day, then such date will be postponed to the next succeeding business day following the scheduled Coupon Payment Date or maturity date.

Contingent Coupon

The notes will pay a contingent coupon during the term of the notes, periodically in arrears on each Coupon Payment Date if the closing price of the Reference Stock is equal to or greater than the coupon barrier on the applicable Observation Date. However, if the closing price of the Reference Stock is less than the coupon barrier on the applicable Observation Date, we will not pay you the contingent coupon applicable to that Observation Date.

Contingent coupon payments on the notes are not guaranteed. We will not pay you the contingent coupon for any Observation Date on which the closing price of the Reference Stock is less than the coupon barrier.

Unless otherwise specified in the applicable pricing supplement, each contingent coupon will be paid to the holders of record of the notes at the close of business on the date that is one business day prior to the applicable Contingent Coupon Payment Date.

Payment Upon Automatic Call

The notes will be automatically called if the closing price of the Reference Stock on any Observation Date is equal to or greater than the Initial Stock Price. In this case, we will pay you a cash payment per note equal to your principal amount plus the contingent coupon otherwise due on the applicable Call Settlement Date under the contingent coupon feature. Following an automatic call, no further amounts will be owed to you under the notes.

Payment at Maturity

Unless otherwise specified in the relevant pricing supplement, if the notes are not called, we will pay you at maturity a cash payment per \$1,000 principal amount of the notes based on the Final Stock Price, calculated as described below:

- If the Final Stock Price is above or equal to the Trigger Price (which unless otherwise specified in the relevant pricing supplement will equal the coupon barrier) on the final Observation Date, we will pay you a cash payment per note equal to the principal amount plus the contingent coupon otherwise due on the maturity date under the contingent coupon feature.
- If the Final Stock Price is below the Trigger Price on the final Observation Date, we will deliver to you a number of shares of the Reference Stock equal to the Physical Delivery Amount, or at our option, the Cash Delivery Option. The value of the shares or 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 Reference Stock from the trade date to the final Observation Date, for a return equal to: principal amount x (1 + underlying return).

The repayment of your principal amount is not guaranteed. If the value of the Reference Stock decreases, you may lose some or all of your investment. Specifically, if the notes are not called and the Final Stock Price is below the Trigger Price on the final Observation Date, you will lose 1% (or a fraction thereof) of your principal amount for each 1% (or a fraction thereof) decrease in the price per share of the Reference Stock below the Initial Stock Price. Accordingly, if the Final Stock Price is below the Trigger Price on the final Observation Date, you may lose up to 100% of your principal amount.

Calculating the Physical Delivery Amount

In order to determine the number of shares of the Reference Stock to be delivered for each \$1,000 in principal amount of the notes, we will divide \$1,000 by the Initial Stock Price.

$$\text{Physical Delivery Amount} = \frac{\$1,000}{\text{Initial Stock Price}}$$

Any fractional shares will be paid in cash, in an amount equal to that fraction *multiplied* by the Final Stock Price. The number of shares or the amount of cash that we may deliver to you is subject to adjustment, as described below under “—Anti-dilution Adjustments.”

The cash or market price of the shares you receive in exchange for your notes at maturity likely will be less than the principal amount.

Cash Delivery Amount

At our election, instead of delivering to you shares of the Reference Stock equal to the Physical Delivery Amount, we may deliver to you the Cash Delivery Amount.

In order to determine the Cash Delivery Amount, we will multiply the Final Stock Price by the Physical Delivery Amount.

$$\text{Cash Delivery Amount} = \text{Final Stock Price} \times \text{Physical Delivery Amount}$$

The Final Stock Price will be the closing price of one share of the Reference Stock on the final Observation Date, subject to anti-dilution adjustment. The Initial Stock Price, which will be specified in the relevant pricing

supplement, may be adjusted, with respect to both the amount and type of consideration, as a result of dilution events, as we describe below under “—Anti-dilution Adjustments.”

Terms Applicable to the Notes Generally

The “contingent coupon” is a fixed amount specified in the applicable pricing supplement which is applicable to each Observation Date and calculated based upon a rate per annum (the “contingent coupon rate”) specified in the applicable pricing supplement.

The “coupon barrier” is a specified price of the Reference Stock that is below the Initial Stock Price as set forth in the applicable pricing supplement.

The “trade date” is the day on which we price the notes for initial sale to the public and will be specified in the relevant pricing supplement.

The “settlement date” is the day on which we issue the notes for initial delivery to investors and will be specified in the relevant pricing supplement.

Unless otherwise set forth in the applicable pricing supplement, the closing price for any Reference Stock on any trading day will equal the closing sale price or last reported sale price, regular way, for the Reference Stock, on a per-share or other unit basis:

- on the principal national securities exchange on which that Reference Stock is listed for trading on that day, or
- if that Reference Stock is not quoted on any national securities exchange on that day, on any other market system or quotation system that is the primary market for the trading of that Reference Stock.

If that Reference Stock is not listed or traded as described above, then the closing price for that Reference Stock on any day will be the average, as determined by the calculation agent, of the bid prices for the Reference Stock obtained from as many dealers in that Reference Stock selected by the calculation agent as will make those bid prices available to the calculation agent. The number of dealers need not exceed three and may include the calculation agent or any of its or our affiliates.

Unless otherwise specified in the relevant pricing supplement, a “trading day” is a day, as determined by the calculation agent, on which trading is generally conducted on the New York Stock Exchange (the “NYSE”), The Nasdaq Stock Market, the Chicago Mercantile Exchange Inc., the Chicago Board Options Exchange, Incorporated and in the over-the-counter market for equity securities in the United States or, with respect to a security issued by a foreign issuer that is not listed or admitted to trading on a U.S. securities exchange or market, a day, as determined by the calculation agent, on which trading is generally conducted on the primary non-U.S. securities exchange or market on which such security is listed or admitted to trading.

Unless otherwise specified in the relevant pricing supplement, the “underlying return,” as calculated by the calculation agent, is the percentage change in the closing price of one share of the Reference Stock calculated by comparing the Final Stock Price to the Initial Stock Price. The relevant pricing supplement will specify the manner in which the Initial Stock Price and the Final Stock Price are determined. The underlying return, unless otherwise specified in the relevant pricing supplement, is calculated as follows:

$$\text{Underlying Return} = \frac{\text{Final Stock Price} - \text{Initial Stock Price}}{\text{Initial Stock Price}}$$

Unless otherwise specified in the relevant pricing supplement, the “Initial Stock Price” means the closing price of one share of the Reference Stock on the trade date or such other date as specified in the relevant pricing supplement. The Initial Stock Price will be subject to adjustment as described under “—Anti-dilution Adjustments.”

Unless otherwise specified in the relevant pricing supplement, “Final Stock Price” means the closing price of one share of the Reference Stock on the final Observation Date.

The “Trigger Price” is a specified price of the Reference Stock that is below the Initial Stock Price as set forth in the applicable pricing supplement. Unless otherwise specified in the relevant pricing supplement, the Trigger Price will equal the coupon barrier.

The Observation Date(s) will be specified in the relevant pricing supplement, and each such date is subject to adjustment as described below. If an Observation Date is not a trading day or if there is a market disruption event on that day, the applicable Observation Date will be postponed to the immediately succeeding trading day during which no market disruption event shall have occurred or be continuing. In no event, however, will any Observation Date be postponed more than ten business days following the date originally scheduled to be that Observation Date. If the tenth business day following the date originally scheduled to be the applicable Observation Date is not a trading day, or if there is a market disruption event on that date, the calculation agent will determine the closing price for that Observation Date on such date in accordance with the calculation agent’s good faith estimate of the closing price that would have prevailed but for such suspension or limitation or non-trading day.

The maturity date will be specified in the relevant pricing supplement and is subject to adjustment as described below. If not previously called, the notes will mature on the maturity date. If the scheduled maturity date (as specified in the relevant pricing supplement) is not a business day, then the maturity date will be the next succeeding business day following the scheduled maturity date. If, due to a market disruption event or otherwise, the final Observation Date is postponed so that it falls less than three business days prior to the scheduled maturity date, the maturity date will be the third business day following the final Observation Date, as postponed, unless otherwise specified in the relevant pricing supplement. We describe market disruption events under “—Market Disruption Events” below.

Unless otherwise specified in the relevant pricing supplement, if the notes are called on any Observation Date (other than the final Observation Date), the Call Settlement Date will be three business days following such Observation Date, unless that day is not a business day, in which case the Call Settlement Date will be the next following business day. If the notes are called on the final Observation Date, the Call Settlement Date will be the maturity date. As described above, the calculation agent may postpone any Observation Date, and therefore a Call Settlement Date (by the same number of business days), if a market disruption event occurs or is continuing on a day that would otherwise be an Observation Date. We describe market disruption events under “—Market Disruption Events” below.

We will irrevocably deposit with DTC no later than the opening of business on the applicable date funds sufficient to make payments of the amount payable, if any, with respect to the notes on such date. We will give DTC irrevocable instructions and authority to pay such amount to the holders of the notes entitled thereto.

A “business day” is, unless otherwise specified in the relevant pricing supplement, any day other than a day on which banking institutions in The City of New York are authorized or required by law, regulation or executive order to close or a day on which transactions in dollars are not conducted.

Subject to the foregoing and to applicable law (including, without limitation, U.S. federal laws), we or our affiliates may, at any time and from time to time, purchase outstanding notes by tender, in the open market or by private agreement.

Calculation Agent

RBC Capital Markets, LLC will act as the calculation agent. The calculation agent will determine, among other things, the closing price of the Reference Stock on each Observation Date; the anti-dilution adjustments, if any; whether the contingent coupon is payable; whether the notes are called; the Final Stock Price, the underlying return, and the amount, if any, that we will pay you at maturity. In addition, the calculation agent will determine whether there has been a market disruption event as to the Reference Stock. All determinations made by the calculation agent will be at the sole discretion of the calculation agent and will, in the absence of manifest error, be

conclusive for all purposes and binding on you and on us. We may appoint a different calculation agent from time to time after the date of the relevant pricing supplement without your consent and without notifying you.

All calculations with respect to the closing price of one share of the Reference Stock, the Final Stock Price, or the underlying return will be rounded to the nearest one ten-thousandth, with five one-hundred-thousandth rounded upward (*e.g.*, .87645 would be rounded to .8765); all dollar amounts related to determination of the payment per \$1,000 in principal amount of the notes on any Observation Date or at maturity, if any, will be rounded to the nearest one ten-thousandth, with five one hundred-thousandths rounded upward (*e.g.*, .76545 would be rounded up to .7655); and all dollar amounts paid, if any, on the aggregate principal amount of notes per holder will be rounded to the nearest cent, with one-half cent rounded upward.

Market Disruption Events

Certain events may prevent the calculation agent from calculating the closing price of the Reference Stock on any Observation Date, and consequently, determining whether the contingent coupon will be paid, or whether the notes are subject to an automatic call, or determining the underlying return, or calculating the amount, if any, that we will pay to you at maturity. These events may include disruptions or suspensions of trading on the markets as a whole. We refer to each of these events individually as a “market disruption event.”

Any of the following will be a market disruption event:

- a suspension, absence or limitation of trading in (i) that security in its primary market, as determined by the calculation agent, or (ii) futures or options contracts relating to that security in the primary market for those contracts, as determined by the calculation agent;
- 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, the security in its primary market, or (ii) effect transactions in, or obtain market values for, futures or options contracts relating to the security in its primary market;
- the closure on any day of the primary market for that security on a scheduled trading day prior to the scheduled weekday closing time of that market (without regard to after hours or any other trading outside of the regular trading session hours) unless such earlier closing time is announced by the primary market at least one hour prior to the earlier of (i) the actual closing time for the regular trading session on such primary market on such scheduled trading day for such primary market and (ii) the submission deadline for orders to be entered into the relevant exchange system for execution at the close of trading on such scheduled trading day for such primary market;
- any scheduled trading day on which (i) the primary market for that security or (ii) the exchanges or quotation systems, if any, on which futures or options contracts on that security 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 as described below under “Use of Proceeds and Hedging” in this product prospectus supplement.

Anti-dilution Adjustments

The Initial Stock Price, the coupon barrier and the Trigger Price will be specified in the relevant pricing supplement. The calculation agent will adjust the Initial Stock Price, the coupon barrier and the Trigger Price if any of the dilution events described below occur with respect to the Reference Stock after the applicable trade date.

The calculation agent will adjust the Initial Stock Price, the coupon barrier and the Trigger Price as described below, but only if an event below under this section occurs with respect to the Reference Stock and only if the relevant event occurs during the period described under the applicable subsection. The Initial Stock Price, the coupon barrier and the Trigger Price will be subject to the adjustments described below, independently and separately, with respect to the dilution events that affect the Reference Stock.

If more than one anti-dilution event requiring adjustment occurs with respect to the Initial Stock Price, the coupon barrier and the Trigger Price, the calculation agent will adjust them for each event, sequentially, in the order in which the events occur, and on a cumulative basis. Therefore, having adjusted the Initial Stock Price, the coupon barrier and the Trigger Price for the first event, the calculation agent will adjust the Initial Stock Price, the coupon barrier and the Trigger Price for the second event, applying the required adjustment to the Initial Stock Price, the coupon barrier and the Trigger Price as already adjusted for the first event, and so on for each event. If an event requiring an anti-dilution adjustment occurs, the calculation agent will make the adjustment with a view to offsetting, to the extent practical, any change in the economic position of the holder and us, relative to your notes, that results solely from that event. The calculation agent may, in its sole discretion, modify the anti-dilution adjustments as necessary to ensure an equitable result.

Stock Splits and Stock Dividends

A stock split is an increase in the number of a corporation's outstanding shares of stock without any change in its stockholders' equity. When a corporation pays a stock dividend, it issues additional shares of its stock to all holders of its outstanding stock in proportion to the shares they own. Each outstanding share will be worth less as a result of a stock split or stock dividend.

If the Reference Stock is subject to a stock split or receives a stock dividend, then the calculation agent will adjust the Initial Stock Price, the coupon barrier and the Trigger Price by dividing the prior Initial Stock Price, the coupon barrier and the Trigger Price before the stock split or stock dividend — by the number equal to: (1) the number of shares of the Reference Stock outstanding immediately after the stock split or stock dividend becomes effective; divided by (2) the number of shares of the Reference Stock outstanding immediately before the stock split or stock dividend becomes effective. The Initial Stock Price, the coupon barrier and the Trigger Price will not be adjusted, however, unless:

- in the case of a stock split, the first day on which the Reference Stock trades without the right to receive the stock split occurs after the trade date and on or before the final Observation Date; or
- in the case of a stock dividend, the ex-dividend date occurs after the trade date and on or before the final Observation Date.

The ex-dividend date for any dividend or other distribution with respect to the Reference Stock is the first day on which the Reference Stock trades without the right to receive that dividend or other distribution.

Reverse Stock Splits

A reverse stock split is a decrease in the number of a corporation's outstanding shares of stock without any change in its stockholders' equity. Each outstanding share will be worth more as a result of a reverse stock split.

If the Reference Stock is subject to a reverse stock split, then the calculation agent will adjust the Initial Stock Price, the coupon barrier and the Trigger Price by multiplying the prior Initial Stock Price, the coupon barrier and the Trigger Price by a number equal to: (1) the number of shares of the Reference Stock outstanding immediately before the reverse stock split becomes effective; divided by (2) the number of shares of the Reference Stock outstanding immediately after the reverse stock split becomes effective. The Initial Stock Price, the coupon barrier and the Trigger Price will not be adjusted, however, unless the reverse stock split becomes effective after the trade date and on or before the final Observation Date.

Extraordinary Dividends

Any distribution or dividend on the Reference Stock determined by the calculation agent to be a distribution or dividend that is not in the ordinary course of the issuer's historical dividend practices will be deemed to be an extraordinary dividend. The calculation agent will determine if the dividend is an extraordinary dividend and, if so, the amount of the extraordinary dividend. Each outstanding share will be worth less as a result of an extraordinary dividend.

If any extraordinary dividend occurs with respect to the Reference Stock, the calculation agent will adjust the Initial Stock Price, the coupon barrier and the Trigger Price to equal the product of: (1) the prior Initial Stock

Price, the coupon barrier and the Trigger Price, times (2) a fraction, the numerator of which is the amount by which the closing price of one share of the Reference Stock on the business day before the ex-dividend date exceeds the extraordinary dividend amount and the denominator of which is the closing price of one share of the Reference Stock on the business day before the ex-dividend date. The Initial Stock Price, the coupon barrier and the Trigger Price will not be adjusted, however, unless the ex-dividend date occurs after the trade date and on or before the final Observation Date.

The extraordinary dividend amount with respect to an extraordinary dividend for the Reference Stock equals:

- for an extraordinary dividend that is paid in lieu of a regular quarterly dividend, the amount of the extraordinary dividend per share of the Reference Stock minus the amount per share of the immediately preceding dividend, if any, that was not an extraordinary dividend for the Reference Stock; or
- for an extraordinary dividend that is not paid in lieu of a regular quarterly dividend, the amount per share of the extraordinary dividend.

To the extent an extraordinary dividend is not paid in cash, the value of the non-cash component will be determined by the calculation agent. A distribution on the Reference Stock that is a stock dividend, an issuance of transferable rights or warrants or a spin-off event and also an extraordinary dividend will result in an adjustment to the Initial Stock Price, the coupon barrier and the Trigger Price only as described under “—Stock Splits and Stock Dividends” above, “—Transferable Rights and Warrants” below or “—Reorganization Events” below, as the case may be, and not as described here.

Transferable Rights and Warrants

If the issuer of the Reference Stock issues transferable rights or warrants to all holders of the Reference Stock to subscribe for or purchase the Reference Stock at an exercise price per share that is less than the closing price of one share of the Reference Stock on the business day before the ex-dividend date for the issuance, then the applicable Initial Stock Price, the coupon barrier and the Trigger Price will be adjusted by multiplying the prior Initial Stock Price, the coupon barrier and the Trigger Price by the following fraction:

- The numerator will be the number of shares of the Reference Stock outstanding at the close of business on the day before that ex-dividend date plus the number of additional shares of the Reference Stock that the aggregate offering price of the total number of shares of the Reference Stock so offered for subscription or purchase pursuant to the transferable rights or warrants could purchase at the closing price on the business day before the ex-dividend date, with that number of additional shares being determined by multiplying the total number of shares so offered by the exercise price of those transferable rights or warrants and dividing the resulting product by the closing price on the business day before that ex-dividend date.
- The denominator will be the number of shares of the Reference Stock outstanding at the close of business on the day before that ex-dividend date plus the number of additional shares of the Reference Stock offered for subscription or purchase under those transferable rights or warrants.

The Initial Stock Price, the coupon barrier and the Trigger Price will not be adjusted, however, unless the ex-dividend date described above occurs after the trade date and on or before the final Observation Date.

Reorganization Events

If the issuer of the Reference Stock undergoes a reorganization event in which property other than the Reference Stock—e.g., cash and securities of another issuer—is distributed in respect of the Reference Stock, then, for purposes of calculating the price of the Reference Stock, the calculation agent will determine the closing price of one share of the Reference Stock, or the Final Stock Price, on any Observation Date to equal the value of the cash, securities and other property distributed in respect of one share of the Reference Stock.

If the calculation agent determines that, by valuing such cash, securities and other property, a commercially reasonable result is not achieved, then the calculation agent will, in its sole discretion, substitute another stock for that Reference Stock.

Each of the following is a reorganization event with respect to the Reference Stock:

- the Reference Stock is reclassified or changed;
- the issuer of the Reference Stock has been subject to a merger, consolidation or other combination and either is not the surviving entity or is the surviving entity but all the outstanding stock is exchanged for or converted into other property;
- a statutory share exchange involving the outstanding stock and the securities of another entity occurs, other than as part of an event described in the two bullet points above;
- the issuer of the Reference Stock sells or otherwise transfers its property and assets as an entirety or substantially as an entirety to another entity;
- the issuer of the Reference Stock effects a spin-off—that is, issues to all holders of the Reference Stock securities of another issuer, other than as part of an event described in the four bullet points above;
- the issuer of the Reference Stock is liquidated, dissolved or wound up or is subject to a proceeding under any applicable bankruptcy, insolvency or other similar law; or
- another entity completes a tender or exchange offer for all of the outstanding stock of the issuer of the Reference Stock.

Valuation of Distribution Property

If a reorganization event occurs with respect to the Reference Stock, and the calculation agent does not substitute another stock for the Reference Stock as described in “—Substitution” below, then the calculation agent will determine the applicable closing price of the Reference Stock on any Observation Date so as to equal the value of the property — whether it be cash, securities or other property — distributed in the reorganization event in respect of one share of the Reference Stock, as the Reference Stock existed before the date of the reorganization. We refer to the property distributed in a reorganization event as distribution property, a term we describe in more detail below. The calculation agent will not make any determination for a reorganization event, however, unless the event becomes effective (or, if the event is a spin-off, unless the ex-dividend date for the spin-off occurs) after the trade date and on or before the final Observation Date.

For the purpose of making a determination required by a reorganization event, the calculation agent will determine the value of each type of distribution property, in its sole discretion. For any distribution property consisting of a security, the calculation agent will use the closing price for the security on the relevant date. The calculation agent may value other types of property in any manner it determines, in its sole discretion, to be appropriate. If a holder of the Reference Stock may elect to receive different types or combinations of types of distribution property in the reorganization event, the distribution property will consist of the types and amounts of each type distributed to a holder that makes no election, as determined by the calculation agent in its sole discretion.

If a reorganization event occurs and the calculation agent adjusts the closing price of the Reference Stock on any Observation Date to equal the value of the distribution property distributed in the event, as described above, the calculation agent will make further determinations for later events that affect the distribution property considered in determining the closing price. The calculation agent will do so to the same extent that it would make determinations if the Reference Stock were outstanding and were affected by the same kinds of events.

For example, if the issuer of the Reference Stock merges into another company and each share of the Reference Stock is converted into the right to receive two common shares of the surviving company and a specified amount of cash, then on any Observation Date, the closing price of one share of the Reference Stock, will be determined to equal the value of the two common shares of the surviving company plus the specified amount of cash. The calculation agent will further determine the common share component of such closing price to reflect any later stock split or other event, including any later reorganization event, that affects the common shares of the

surviving company, to the extent described in “—Anti-dilution Adjustments” or as described above in this “—Reorganization Events” section as if the common shares were the Reference Stock. In that event, the cash component will not be redetermined but will continue to be a component of the closing price.

When we refer to distribution property, we mean the cash, securities and other property distributed in a reorganization event in respect of the Reference Stock or in respect of whatever securities whose value determines the closing price of one share of the Reference Stock on any Observation Date if any adjustment resulting from a reorganization event has been made in respect of a prior event. In the case of a spin-off, the distribution property also includes the Reference Stock in respect of which the distribution is made.

If a reorganization event occurs, the distribution property distributed in the event will be substituted for the Reference Stock as described above. Consequently, in this product prospectus supplement, when we refer to the Reference Stock, we mean any distribution property that is distributed in a reorganization event in respect of the Reference Stock. Similarly, when we refer to the issuer of the Reference Stock, we mean any successor entity in a reorganization event.

Substitution

If the calculation agent determines that a commercially reasonable result is not achieved by valuing distribution property with respect to the Reference Stock upon becoming subject to a reorganization event, then the calculation agent will, in its sole discretion, substitute another stock for the Reference Stock. In such case, the adjustments described above in “—Valuation of Distribution Property” will not apply.

If the calculation agent so determines, it may choose, in its sole discretion, the stock of a different company listed on a national securities exchange or quotation system as a substitute for the Reference Stock. For all purposes, the substitute stock will be deemed to be a stock for purposes hereof.

The calculation agent will determine, in its sole discretion, the Initial Stock Price, the coupon barrier and the Trigger Price and/or the manner of valuation of the substitute stock. The calculation agent will have the right to make such adjustments to the calculation of the individual stock performance as it determines in its sole discretion are necessary to preserve as nearly as possible our and your relative economic position prior to the reorganization event.

Adjustments Relating to ADRs

The Reference Stock may consist of ADRs. As a result, for purposes of any adjustments relating to ADRs, the calculation agent will consider the effect of any of the relevant events on the holders of the Reference Stock. For example, if a holder of the Reference Stock receives an extraordinary dividend, the provisions described in this section would apply to the Reference Stock. On the other hand, if a spin-off occurs, and the Reference Stock represents both the spun-off security as well as the existing Reference Stock, the calculation agent may determine not to effect the anti-dilution adjustments set forth in this section. More particularly, the calculation agent may not make an adjustment (1) if holders of the Reference Stock are not eligible to participate in any of the events that would otherwise require anti-dilution adjustments as set forth in this section or (2) to the extent that the calculation agent determines that the underlying company or the depository for the ADRs has adjusted the number of common shares of the underlying company represented by each share of Reference Stock so that the market price of the Reference Stock would not be affected by the corporate event in question.

If the underlying company or the depository for the ADRs, in the absence of any of the events described in this section, elects to adjust the number of common shares of the underlying company represented by each share of Reference Stock, then the calculation agent may make the appropriate anti-dilution adjustments to reflect such change. The depository for the ADRs may also make adjustments in respect of the ADRs for share distributions, rights distributions, cash distributions and distributions other than shares, rights, and cash. Upon any such adjustment by the depository, the calculation agent may adjust such terms and conditions of the notes as the calculation agent determines appropriate to account for that event.

Other Events and Adjustments

The calculation agent may make such adjustments to the terms of the notes with respect to any of the events described above, as it deems in its discretion is necessary to ensure an equitable result.

Regardless of any of the events discussed above, your payment upon an automatic call or at maturity will be made by Royal Bank of Canada as issuer of the notes, subject to its ability to pay its obligations when due.

Delisting of ADRs or Termination of ADR Facility

If an ADS serving as the applicable Reference Stock is no longer listed or admitted to trading on a U.S. securities exchange registered under the Exchange Act nor included in the OTC Bulletin Board Service operated by FINRA, or if the ADR facility between the issuer of the underlying common shares and the ADS depository is terminated for any reason, then, on and after the date such ADR is no longer so listed or admitted to trading or the date of such termination, as applicable (the "Change Date"), the underlying ADS stock will be deemed to be the applicable Reference Stock. The Initial Stock Price, the coupon barrier and the Trigger Price will be adjusted by dividing the prior applicable starting price, coupon barrier and trigger price by, the number of shares of the underlying ADR stock represented by a single ADR. On and after the Change Date, for all purposes, including the determination of the closing price, or the Final Stock Price, of the underlying ADR stock and whether the Final Stock Price of the underlying ADR stock is below the Trigger Price, the closing price of the underlying ADR stock will be expressed in U.S. dollars, converted using the applicable exchange rate as described below, unless otherwise specified in the applicable pricing supplement.

On any date of determination, the applicable exchange rate will be the WM/Reuters Closing spot rate of the local currency of the underlying ADR stock relative to the U.S. dollar as published by Thompson Reuters PLC ("Reuters") on the relevant page for such rate, or Bloomberg page WMCO, in each case at approximately 4:15 P.M., London time, for such date of determination. However, if such rate is not displayed on the relevant Reuters page or Bloomberg page WMCO on any date of determination, the applicable exchange rate on such day will equal the average (mean) of the bid quotations in New York City received by the calculation agent at approximately 3:00 P.M., New York City time, on such date of determination, from as many recognized foreign exchange dealers (provided that each such dealer commits to execute a contract at its applicable bid quotation), but not exceeding three, as will make such bid quotations available to the calculation agent for the purchase of the applicable foreign currency for U.S. dollars for settlement on the applicable Observation Date in the aggregate amount of the applicable foreign currency payable to holders of the notes. If the calculation agent is unable to obtain at least one such bid quotation, the calculation agent will determine the exchange rate in its sole discretion.

Discretion of the Calculation Agent

The calculation agent will have the ability to modify the anti-dilution provisions set forth in this section if, in its sole discretion, such action is needed to ensure an equitable result, based upon the terms of the applicable notes.

Payment of Additional Amounts

We will pay any amounts to be paid by us on the notes without deduction or withholding for, or on account of, any and all present or future income, stamp and other taxes, levies, imposts, duties, charges, fees, deductions, or withholdings ("taxes") now or hereafter imposed, levied, collected, withheld, or assessed by or on behalf of Canada or any Canadian political subdivision or authority that has the power to tax, unless the deduction or withholding is required by law or by the interpretation or administration thereof by the relevant governmental authority. At any time a Canadian taxing jurisdiction requires us to deduct or withhold for or on account of taxes from any payment made under or in respect of the notes, we will pay such additional amounts ("Additional Amounts") as may be necessary so that the net amounts received by each holder (including Additional Amounts), after such deduction or withholding, shall not be less than the amount the holder would have received had no such deduction or withholding been required.

However, no Additional Amounts will be payable with respect to a payment made to a holder of a note or of a right to receive payments in respect thereto (a "Payment Recipient"), which we refer to as an "Excluded Holder," in respect of a beneficial owner or Payment Recipient:

- (i) with whom we do not deal at arm's length (within the meaning of the Income Tax Act (Canada)) at the time of making such payment;
- (ii) who is subject to such taxes by reason of the holder being connected presently or formerly with Canada or any province or territory thereof otherwise than by reason of the holder's activity in connection with purchasing the notes, the holding of the notes or the receipt of payments thereunder;
- (iii) who is, or who does not deal at arm's length with a person who is, a "specified shareholder" (within the meaning of subsection 18(5) of the Income Tax Act (Canada)) of Royal Bank of Canada (generally a person will be a "specified shareholder" for this purpose if that person, either alone or together with persons with whom the person does not deal at arm's length, owns 25% or more of (a) our voting shares, or (b) the fair market value of all of our issued and outstanding shares);
- (iv) who presents such note for payment (where presentation is required, such as if a note is issued in definitive form) more than 30 days after the relevant date; for this purpose, the "relevant date" in relation to any payments on any note means:
 - (a) the due date for payment thereof (whether at maturity or upon an earlier acceleration), or
 - (b) if the full amount of the monies payable on such date has not been received by the Trustee on or prior to such due date, the date on which the full amount of such monies has been received and notice to that effect is given to holders of the notes in accordance with the Indenture;
- (v) who could lawfully avoid (but has not so avoided) such withholding or deduction by complying, or procuring that any third party comply with, any statutory requirements necessary to establish qualification for an exemption from withholding or by making, or procuring that any third party make, a declaration of non-residence or other similar claim for exemption to any relevant tax authority; or
- (vi) who is subject to deduction or withholding on account of any tax, assessment, or other governmental charge that is imposed or withheld by reason of the application of Section 1471 through 1474 of the United States Internal Revenue Code of 1986, as amended (the "Code") (or any successor provisions), any regulation, pronouncement, or agreement thereunder, official interpretations thereof, or any law implementing an intergovernmental approach thereto, whether currently in effect or as published and amended from time to time.

For purposes of clause (iii) above, if a note is presented for payment more than 30 days after the relevant date, we shall only be required to pay such Additional Amounts as shall have accrued as of such 30th day, and no further Additional Amounts shall accrue or become payable after such date.

For the avoidance of doubt, we will not have any obligation to pay any holders Additional Amounts on any tax which is payable otherwise than by deduction or withholding from payments made under or in respect of the notes.

We will also make such withholding or deduction and remit the full amount deducted or withheld to the relevant authority in accordance with applicable law. We will furnish to the trustee, within 30 days after the date the payment of any taxes is due pursuant to applicable law, certified copies of tax receipts evidencing that such payment has been made or other evidence of such payment satisfactory to the trustee. We will indemnify and hold harmless each holder of the notes (other than an Excluded Holder) and upon written request reimburse each such holder for the amount of (x) any taxes so levied or imposed and paid by such holder as a result of payments made under or with respect to the notes and (y) any taxes levied or imposed and paid by such holder with respect to any reimbursement under (x) above, but excluding any such taxes on such holder's net income or capital.

For additional information, see the section entitled "Supplemental Discussion of Canadian Tax Consequences."

Events of Default

Under the heading "Description of Debt Securities—Events of Default" in the accompanying prospectus is a description of events of default relating to debt securities including the notes.

Payment upon an Event of Default

Unless otherwise specified in the relevant pricing supplement, in case an event of default with respect to the notes shall have occurred and be continuing, the amount declared due and payable per \$1,000 in principal amount of the notes upon any acceleration of the notes will be determined by the calculation agent and will be an amount in cash equal to the amount payable at maturity per \$1,000 in principal amount of the notes as described under the caption “—Payment at Maturity,” calculated as if the date of acceleration were the final Observation Date.

If the maturity of the notes is accelerated because of an event of default as described above, we will, or will cause the calculation agent to, provide written notice to the trustee at its New York office, on which notice the trustee may conclusively rely, and to DTC of the cash amount due with respect to the notes as promptly as possible and in no event later than two business days after the date of acceleration.

Modification

Under the heading “Description of Debt Securities—Modification and Waiver of the Debt notes” in the accompanying prospectus is a description of when the consent of each affected holder of debt securities is required to modify the senior indenture.

Defeasance

The provisions described in the accompanying prospectus under the heading “Description of Debt Securities—Defeasance” are not applicable to the notes.

Listing

The notes will not be listed on any securities exchange, unless otherwise specified in the relevant pricing supplement.

Book-Entry Only Issuance — The Depository Trust Company

DTC will act as securities depository for the notes. The notes will be issued only as fully-registered securities registered in the name of Cede & Co. (DTC’s nominee). One or more fully-registered global note certificates, representing the total aggregate principal amount of the notes, will be issued and will be deposited with DTC. See the descriptions contained in the accompanying prospectus under the headings “Description of Debt Securities—Ownership and Book-Entry Issuance” and “—Considerations Relating to DTC.”

Registrar, Transfer Agent and Paying Agent

Payment of amounts due at maturity or upon automatic call on the notes will be payable and the transfer of the notes will be registrable at the principal corporate trust office of The Bank of New York Mellon in The City of New York.

The Bank of New York Mellon or one of its affiliates will act as registrar and transfer agent for the notes. The Bank of New York Mellon will also act as paying agent and may designate additional paying agents.

Registration of transfers of the notes will be effected without charge by or on behalf of The Bank of New York Mellon, but upon payment (with the giving of such indemnity as The Bank of New York Mellon may require) in respect of any tax or other governmental charges that may be imposed in relation to it.

Governing Law

The notes will be governed by and interpreted in accordance with the laws of the State of New York.

REFERENCE STOCK ISSUERS

In the relevant pricing supplement, we will provide summary information on the business of the issuers of the Reference Stocks based on their publicly available documents.

The Reference Stocks will be registered under the United States Securities Exchange Act of 1934, as amended (“Exchange Act”). Companies with securities registered under the Exchange Act are required to periodically file financial and other information specified by the SEC. This information is filed with the SEC and can be inspected and copied by you at the SEC’s Public Reference Room located at 100 F Street, N.E., Washington, D.C. 20549, at prescribed rates. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. In addition, information filed by the Reference Stock issuers with the SEC electronically is available to the public over the Internet at the SEC’s website at <http://www.sec.gov>. Information filed with the SEC by the Reference Stock issuers under the Exchange Act can be located by referencing their SEC file numbers, which may be specified in the relevant pricing supplement. In addition, information about the Reference Stock issuers may be obtained from other sources including, but not limited to, press releases, newspaper articles and other publicly disseminated information. We will not independently verify the accuracy or completeness of any such information.

HISTORICAL REFERENCE STOCK PRICE INFORMATION

We may provide historical level information on the Reference Stocks in the relevant pricing supplement. You should not take any of those historical levels as an indication of the future performance. We cannot give you any assurance that the level of the Reference Stocks will not decrease, thus causing you to receive an amount that is less than the principal amount of your notes at maturity.

SUPPLEMENTAL DISCUSSION OF CANADIAN TAX CONSEQUENCES

An investor should read carefully the description of material Canadian federal income tax considerations relevant to a Non-resident Holder owning debt securities under “Tax Consequences—Canadian Taxation” in the accompanying prospectus.

SUPPLEMENTAL DISCUSSION OF U.S. FEDERAL INCOME TAX CONSEQUENCES

The following is a general description of the material U.S. tax considerations relating to the notes. It does not purport to be a complete analysis of all tax considerations relating to the notes. Prospective purchasers of the notes should consult their tax advisors as to the consequences under the tax laws of the country of which they are resident for tax purposes and the tax laws of Canada and the U.S. of acquiring, holding and disposing of the notes and receiving payments under the notes. This summary is based upon the law as in effect on the date of this product prospectus supplement and is subject to any change in law that may take effect after such date.

Supplemental U.S. Tax Considerations

The following disclosure—including the opinion of Morrison & Foerster LLP—has been prepared without regard to any particular note that you may purchase in the future and, therefore, is provided solely as a matter of general information. You should not rely upon the following disclosure (including the opinion of Morrison & Foerster LLP), or the disclosure under “Tax Consequences—United States Taxation” in the Prospectus or “Certain Income Tax Consequences—United States Taxation” in the prospectus supplement, with regard to an investment in any particular note because this disclosure (including the opinion of Morrison & Foerster LLP) does not take into account the terms of any particular note or the tax consequences of investing in or holding any particular note unless the pricing supplement applicable to your notes expressly indicates that you may rely on the following disclosure and expressly states that you may rely on the opinion of Morrison & Foerster LLP. Any note that you purchase may have terms that would result in a tax treatment that is significantly different from the treatment described below. For example, the discussion below assumes that an investor in the notes will be subject to a significant risk that it will lose a significant amount of its investment in the notes. If an investor in the notes is not subject to a significant risk that it will lose a significant amount of its investment in the notes, the tax treatment of that note may differ substantially from that described in the discussion below. There may be other features or terms of your notes that will cause this tax section to be inapplicable to your notes. Further, this discussion does not address the tax consequences applicable to any holders under Section 451(b) of the U.S. Internal Revenue Code of 1986, as amended (the “Code”).

Consequently, any tax disclosure relevant to any note you may purchase will be set forth only in the pricing supplement relating to your note, and, unless the pricing supplement indicates otherwise, you should not rely on the tax disclosure below or in the prospectus supplement or prospectus in deciding whether to invest in any note. Moreover, in all cases, you should consult with your own tax advisor concerning the consequences of investing in and holding any particular note you propose to purchase.

The following section supplements the discussion of U.S. federal income taxation in the accompanying prospectus and prospectus supplement. It applies only to initial holders who are not excluded from the discussion of U.S. federal income taxation in the accompanying prospectus.

NO STATUTORY, JUDICIAL OR ADMINISTRATIVE AUTHORITY DIRECTLY DISCUSSES HOW THE NOTES SHOULD BE TREATED FOR U.S. FEDERAL INCOME TAX PURPOSES. AS A RESULT, THE U.S. FEDERAL INCOME TAX CONSEQUENCES OF AN INVESTMENT IN THE NOTES ARE UNCERTAIN. BECAUSE OF THE UNCERTAINTY, YOU SHOULD CONSULT YOUR TAX ADVISOR IN DETERMINING THE U.S. FEDERAL INCOME TAX AND OTHER TAX CONSEQUENCES OF YOUR INVESTMENT IN THE NOTES, INCLUDING THE APPLICATION OF STATE, LOCAL OR OTHER TAX LAWS AND THE POSSIBLE EFFECTS OF CHANGES IN FEDERAL OR OTHER TAX LAWS.

We will not attempt to ascertain whether the issuer of a Reference Stock or any of the entities whose stock is included in an ETF, as applicable, would be treated as a “passive foreign investment company” within the meaning of Section 1297 of the Internal Revenue Code or a “U.S. real property holding corporation” within the meaning of Section 897 of the Internal Revenue Code. If the issuer of the Reference Stock or any of the entities whose stock is included in an ETF were so treated, certain adverse U.S. federal income tax consequences could possibly apply to a holder. You should refer to any available information filed with the SEC or other authorities by the issuer of the Reference Stock or the entities included in an ETF, as applicable, and consult your tax advisor regarding the possible consequences to you in this regard, if any.

In the opinion of our counsel, Morrison & Foerster LLP, it would generally be reasonable to treat a note with terms described in this product prospectus supplement as a callable pre-paid cash-settled contingent income-bearing derivative contract linked to the Reference Stock 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. In addition, we intend to treat the contingent coupons as U.S. source income for U.S. federal income tax purposes. The following discussion assumes that the treatment described in this paragraph is proper and will be respected.

Although the U.S. federal income tax treatment of the contingent coupons is uncertain, we intend to take the position, and the following discussion assumes, that such contingent coupons (including any coupon paid on or with respect to the call or maturity date) constitute taxable ordinary income to a U.S. holder at the time received or accrued in accordance with the holder's regular method of accounting. If the notes are treated as described above, subject to the discussion below concerning the potential application of the "constructive ownership" rules under Section 1260 of the Code, a U.S. holder should generally recognize capital gain or loss upon the call, sale or maturity of the notes in an amount equal to the difference between the cash amount a holder receives at such time (other than amounts properly attributable to any contingent coupon, which would be taxed, as described above, as ordinary income) and the holder's tax basis in the notes. In general, a U.S. holder's tax basis in the notes will be equal to the price the holder paid for the notes. Capital gain recognized by an individual U.S. holder is generally taxed at preferential rates where the property is held for more than one year and is generally taxed at ordinary income rates where the property is held for one year or less. The ordinary income treatment of the contingent coupons, in conjunction with the capital loss treatment of any loss recognized upon the sale or maturity of the notes, could result in adverse tax consequences to a holder because the deductibility of capital losses is subject to limitations. The holding period for notes of a U.S. holder who acquires the notes upon issuance will generally begin on the date after the issue date (i.e., the settlement date) of the notes. If the notes are held by the same U.S. holder until maturity, that holder's holding period will generally include the maturity date. It is possible that the Internal Revenue Service could assert that a U.S. holder's holding period in respect of the notes should end on the date on which the amount the holder is entitled to receive upon the call or maturity of the notes is determined, even though the holder will not receive any amounts from the issuer in respect of the notes prior to the call or maturity of the notes. In such case, if that date is not in excess of one year from the issue date, a U.S. holder may be treated as having a holding period in respect of the notes that is one year or less even if the holder receives cash upon the call or maturity of the notes at a time that is more than one year after the beginning of its holding period.

If the notes are settled by physical delivery of a number of shares of the Reference Stock at maturity, although no assurances can be provided in this regard, a U.S. holder may generally expect not to recognize gain or loss upon maturity. However, a U.S. holder would generally be required to recognize gain or loss, if any, with respect to any cash received in lieu of fractional shares, equal to the difference between the cash received and the pro rata portion of the tax basis allocable to those fractional shares. Any such gain or loss would be treated as capital gain or loss, subject to the discussion below concerning the potential application of the "constructive ownership" rules under Section 1260 of the Code. A U.S. holder's tax basis in the shares of the Reference Stock delivered would generally equal its tax basis in the notes, other than any amount allocable to a fractional share. A U.S. holder's holding period for the shares of the Reference Stock delivered would begin on the day after the shares of the Reference Stock are received.

Potential Application of Section 1260 of the Internal Revenue Code. If the Reference Stock is the type of financial asset described under Section 1260 of the Code (including, among others, any equity interest in pass-thru entities such as ETFs, regulated investment companies, real estate investment trusts, partnerships, and passive foreign investment companies, each a "Section 1260 Financial Asset"), while the matter is not entirely clear, unless otherwise specified in the applicable pricing supplement, there exists a substantial risk that an investment in a note is, in whole or in part, a "constructive ownership transaction" to which Section 1260 of the Code applies. If Section 1260 of the Code applies, all or a portion of any long-term capital gain recognized by a U.S. holder in respect of a note will be recharacterized as ordinary income (the "Excess Gain"). In addition, an interest charge will also apply to any deemed underpayment of tax in respect of any Excess Gain to the extent such gain would have resulted in gross income inclusion for the U.S. holder in taxable years prior to the taxable year of the call, sale, or maturity (assuming such income accrued at a constant rate equal to the applicable federal rate as of the date of call, sale, or maturity).

If an investment in a note is treated as a constructive ownership transaction, it is not clear to what extent any long-term capital gain of a U.S. holder in respect of the note will be recharacterized as ordinary income. It is possible, for example, that the amount of the Excess Gain (if any) that would be recharacterized as ordinary income in respect of the note will equal the excess of (i) any long-term capital gain recognized by the U.S. holder in respect of the note and attributable to Section 1260 Financial Assets, over (ii) the “net underlying long-term capital gain” (as defined in Section 1260 of the Internal Revenue Code) such U.S. holder would have had if such U.S. holder had acquired an amount of the corresponding Section 1260 Financial Assets at fair market value on the original issue date for an amount equal to the portion of the issue price of the note attributable to the corresponding Section 1260 Financial Assets and sold such amount of Section 1260 Financial Assets upon the date of call, sale, or maturity of the note at fair market value. To the extent any gain is treated as long-term capital gain after application of the recharacterization rules of Section 1260 of the Code, such gain would be subject to U.S. federal income tax at the rates that would have been applicable to the net underlying long-term capital gain. However, unless otherwise established by clear and convincing evidence, the net underlying long-term capital gain is treated as zero. U.S. holders should consult their tax advisors regarding the potential application of Section 1260 of the Code to an investment in the note.

Alternative Treatments. Alternative tax treatments of the notes are also possible and the Internal Revenue Service might assert that a treatment other than that described above is more appropriate. For example, it is possible to treat the notes, and the Internal Revenue Service might assert that the notes should be treated, as a single debt instrument. If the notes have a term that exceeds one year, such a debt instrument would be subject to the special tax rules governing contingent payment debt instruments. If the notes are so treated, a holder would generally be required to accrue interest currently over the term of the notes irrespective of the amount of contingent coupons, if any, made on the notes. In addition, any gain a holder might recognize upon the call, sale or maturity of the notes would generally be ordinary income and any loss recognized by a holder at such time would be ordinary loss to the extent of interest that same holder included in income in the current or previous taxable years in respect of the notes, and thereafter, would be capital loss. If the notes are treated as a single debt instrument that has a term of no more than one year, the notes would be treated as a single contingent short-term debt instrument, which would also result in tax consequences that are different from those described above.

Because of the absence of authority regarding the appropriate tax characterization of the notes, it is also possible that the Internal Revenue Service could seek to characterize the notes in a manner that results in other tax consequences that are different from those described above. For example, the Internal Revenue Service could possibly assert that any gain or loss that a holder may recognize upon the call, sale or maturity of the notes should be treated as ordinary gain or loss.

The Internal Revenue Service has released a notice that may affect the taxation of holders of the notes. According to the notice, the Internal Revenue Service and the U.S. Treasury Department are actively considering whether the holder of an instrument similar to the notes should be required to accrue ordinary income on a current basis irrespective of any contingent coupons. It is not possible to determine what guidance they will ultimately issue, if any. It is possible, however, that under such guidance, holders of the notes will ultimately be required to accrue income currently and this could be applied on a retroactive basis. The Internal Revenue Service and the U.S. Treasury Department are also considering other relevant issues, including whether additional gain or loss from such instruments should be treated as ordinary or capital and whether the special “constructive ownership rules” of Section 1260 of the Code, which generally operate to recharacterize certain long-term capital gains as ordinary income and impose an interest charge, might be applied to such instruments. Holders are urged to consult their tax advisors concerning the significance, and the potential impact, of the above considerations. Unless stated otherwise in the applicable pricing supplement, we intend to treat the notes for U.S. federal income tax purposes in accordance with the treatment described in this product prospectus supplement unless and until such time as the U.S. Treasury Department and Internal Revenue Service determine that some other treatment is more appropriate.

Backup Withholding and Information Reporting. Payments made with respect to the notes and proceeds from the sale or maturity of the notes may be subject to a backup withholding tax unless, in general, the holder complies with certain procedures or is an exempt recipient. Any amounts so withheld generally will be refunded by the Internal Revenue Service or allowed as a credit against the holder's U.S. federal income tax liability, provided the holder makes a timely filing of an appropriate tax return or refund claim to the Internal Revenue Service.

Reports will be made to the Internal Revenue Service and to holders that are not exempted from the reporting requirements.

Non-U.S. Holders. The following discussion applies to non-U.S. holders of the notes. A non-U.S. holder is a beneficial owner of a note that, for U.S. federal income tax purposes, is a non-resident alien individual, a foreign corporation, or a foreign estate or trust.

While the U.S. federal income tax treatment of the notes (including proper characterization of the contingent coupons for U.S. federal income tax purposes) is uncertain, U.S. federal income tax at a 30% rate (or at a lower rate under an applicable income tax treaty) will be withheld in respect of the contingent coupons paid to a non-U.S. holder unless such payments are effectively connected with the conduct by the non-U.S. holder of a trade or business in the U.S. (in which case, to avoid withholding, the non-U.S. holder will be required to provide a Form W-8ECI). We will not pay any additional amounts in respect of such withholding. To claim benefits under an income tax treaty, a non-U.S. holder must obtain a taxpayer identification number and certify as to its eligibility under the appropriate treaty's limitations on benefits article, if applicable (which certification may generally be made on a Form W-8BEN or W-8BEN-E, or a substitute or successor form). In addition, special rules may apply to claims for treaty benefits made by corporate non-U.S. holders. A non-U.S. holder that is eligible for a reduced rate of U.S. federal withholding tax pursuant to an income tax treaty may obtain a refund of any excess amounts withheld by filing an appropriate claim for refund with the Internal Revenue Service. The availability of a lower rate of withholding or an exemption from withholding under an applicable income tax treaty will depend on the proper characterization of the contingent coupons under U.S. federal income tax laws and whether such treaty rate or exemption applies to such contingent coupon payments. No assurance can be provided on the proper characterization of the contingent coupons for U.S. federal income tax purposes and, accordingly, no assurance can be provided on the availability of benefits under any income tax treaty. Non-U.S. holders should consult their tax advisors in this regard.

Except as discussed below, a non-U.S. holder will generally not be subject to U.S. federal income or withholding tax on any gain (not including for the avoidance of doubt any amounts properly attributable to any contingent coupon which would be subject to the rules discussed in the previous paragraph) upon the call, sale or maturity of the notes, provided that (i) the holder complies with any applicable certification requirements (which certification may generally be made on a Form W-8BEN or W-8BEN-E, or a substitute or successor form), (ii) the payment is not effectively connected with the conduct by the holder of a U.S. trade or business, and (iii) if the holder is a non-resident alien individual, such holder is not present in the U.S. for 183 days or more during the taxable year of the call, sale or maturity of the notes. In the case of (ii) above, the holder generally would be subject to U.S. federal income tax with respect to any income or gain in the same manner as if the holder were a U.S. holder and, in the case of a holder that is a corporation, the holder may also be subject to a branch profits tax equal to 30% (or such lower rate provided by an applicable U.S. income tax treaty) of a portion of its earnings and profits for the taxable year that are effectively connected with its conduct of a trade or business in the U.S., subject to certain adjustments. Payments made to a non-U.S. holder may be subject to information reporting and to backup withholding unless the holder complies with applicable certification and identification requirements as to its foreign status.

A "dividend equivalent" payment is treated as a dividend from sources within the United States and such payments generally would be subject to a 30% U.S. withholding tax if paid to a non-U.S. holder. Under U.S. Treasury Department regulations, payments (including deemed payments) with respect to equity-linked instruments ("ELIs") that are "specified ELIs" may be treated as dividend equivalents if such specified ELIs reference an interest in an "underlying security," which is generally any interest in an entity taxable as a corporation for U.S. federal income tax purposes if a payment with respect to such interest could give rise to a U.S. source dividend. However, the IRS has issued guidance that states that the U.S. Treasury Department and the IRS intend to amend the effective dates of the U.S. Treasury Department regulations to provide that withholding on dividend equivalent payments will not apply to specified ELIs that are not delta-one instruments and that are issued before January 1, 2019. Accordingly, if the securities are not delta-one instruments and are issued before January 1, 2019, non-U.S. holders should not be subject to withholding on dividend equivalent payments, if any, under the securities. However, it is possible that the securities could be treated as deemed reissued for U.S. federal income tax purposes upon the occurrence of certain events affecting the underlying or the securities, and following such occurrence the securities 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 underlying or the securities should consult their tax advisors as to

the application of the dividend equivalent withholding tax in the context of the securities and their other transactions. If any payments are treated as dividend equivalents subject to withholding, we (or the applicable paying agent) would be entitled to withhold taxes without being required to pay any additional amounts with respect to amounts so withheld. As discussed above, alternative characterizations of the notes for U.S. federal income tax purposes are possible. Should an alternative characterization, by reason of change or clarification of the law, by regulation or otherwise, cause payments as to the notes to become subject to withholding tax in addition to the withholding tax described above, we will withhold tax at the applicable statutory rate. The Internal Revenue Service has also indicated that it is considering whether income in respect of instruments such as the notes should be subject to withholding tax. We will not be required to pay any additional amounts in respect of such withholding. Prospective investors should consult their own tax advisors in this regard.

Foreign Account Tax Compliance Act. The Foreign Account Tax Compliance Act (“FATCA”) imposes a 30% U.S. withholding tax on certain U.S. source payments, including interest (and original issue discount), dividends, other fixed or determinable annual or periodical gain, profits, and income, and on the gross proceeds from a disposition of property of a type which can produce U.S. source interest or dividends (“Withholdable Payments”), if paid to a foreign financial institution (including amounts paid to a foreign financial institution on behalf of a holder), unless such institution enters into an agreement with the U.S. Treasury Department to collect and provide to the U.S. Treasury Department certain information regarding U.S. financial account holders, including certain account holders that are foreign entities with U.S. owners, with such institution, or otherwise complies with the legislation. In addition, the notes may constitute a “financial account” for these purposes and, thus, be subject to information reporting requirements pursuant to FATCA. FATCA also generally imposes a withholding tax of 30% on Withholdable Payments made to a non-financial foreign entity unless such entity provides the withholding agent with a certification that it does not have any substantial U.S. owners or a certification identifying the direct and indirect substantial U.S. owners of the entity. Under certain circumstances, a holder may be eligible for refunds or credits of such taxes.

The U.S. Treasury Department and the IRS have announced that withholding on payments of gross proceeds from a sale or redemption of the notes will only apply to payments made after December 31, 2018. If we determine withholding is appropriate with respect to the notes, we will withhold tax at the applicable statutory rate, and we will not pay any additional amounts in respect of such withholding. Foreign financial institutions and non-financial foreign entities located in jurisdictions that have an intergovernmental agreement with the United States governing FATCA may be subject to different rules. Prospective investors are urged to consult with their own tax advisors regarding the possible implications of FATCA on their investment in the notes.

SUPPLEMENTAL PLAN OF DISTRIBUTION

With respect to each note to be issued, Royal Bank will agree to sell to RBC Capital Markets, LLC, and RBC Capital Markets, LLC will agree to purchase from Royal Bank, the principal amount of the note specified, at the price specified under “Net proceeds to the issuer,” in the relevant pricing supplement. RBC Capital Markets, LLC intends to resell each note it purchases at the original issue price specified in the relevant pricing supplement. In the future, RBC Capital Markets, LLC or one of our other affiliates may repurchase and resell the notes in market-making transactions, with resales being made at prices related to prevailing market prices at the time of resale or at negotiated prices. For more information about the plan of distribution, the distribution agreement and possible market-making activities, see “Supplemental Plan of Distribution” in the accompanying prospectus supplement.

No Prospectus (as defined in Directive 2003/71/EC (as amended, the “Prospectus Directive”)) will be prepared in connection with these notes. Accordingly, these notes may not be offered to the public in any member state of the European Economic Area (the “EEA”), and any purchaser of these notes who subsequently sells any of these notes in any EEA member state must do so only in accordance with the requirements of the Prospectus Directive, as implemented in that member state.

The notes are not intended to be offered, sold or otherwise made available to, and should not be offered, sold or otherwise made available to, any retail investor in the 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 Insurance Distribution 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 the Prospectus Directive. 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.

EMPLOYEE RETIREMENT INCOME SECURITY ACT

This section is only relevant to you if you are an insurance company or the fiduciary of a pension plan or an employee benefit plan (including a governmental plan, an IRA or a Keogh Plan) proposing to invest in the notes.

The Employee Retirement Income Security Act of 1974, as amended (“ERISA”), imposes certain requirements on “employee benefit plans” (as defined in Section 3(3) of ERISA) subject to ERISA, including entities such as collective investment funds and separate accounts whose underlying assets include the assets of such plans (collectively, “ERISA Plans”) and on those persons who are fiduciaries with respect to ERISA Plans. Each fiduciary of an ERISA Plan should consider the fiduciary standards of ERISA in the context of the ERISA Plan’s particular circumstances before authorizing an investment in the covered bonds. Accordingly, among other factors, the fiduciary should consider whether the investment would satisfy the prudence and diversification requirements of ERISA and would be consistent with the documents and instruments governing the ERISA Plan.

In addition, Section 406 of ERISA and Section 4975 of the Internal Revenue Code prohibit certain transactions involving the assets of an ERISA Plan, as well as those plans that are not subject to ERISA but which are subject to Section 4975 of the Internal Revenue Code, such as individual retirement accounts, including entities whose underlying assets include the assets of such plans (together with ERISA Plans, “Plans”) and certain persons (referred to as “parties in interest” or “disqualified persons”) having certain relationships to such Plans, unless a statutory or administrative exemption is applicable to the transaction. Governmental plans may be subject to similar prohibitions. Therefore, a plan fiduciary considering purchasing notes should consider whether the purchase or holding of such instruments might constitute a “prohibited transaction.”

Royal Bank and certain of its affiliates each may be considered a “party in interest” or a “disqualified person” with respect to many employee benefit plans by reason of, for example, Royal Bank (or its affiliate) providing services to such plans. Prohibited transactions within the meaning of ERISA or the Internal Revenue Code may arise, for example, if notes are acquired by or with the assets of a Plan, and with respect to which Royal Bank or any of its affiliates is a “party in interest” or a “disqualified person,” unless those notes are acquired under an exemption for transactions effected on behalf of that Plan by a “qualified professional asset manager” or an “in-house asset manager,” for transactions involving insurance company general accounts, for transactions involving insurance company pooled separate accounts, for transactions involving bank collective investment funds, or under another available exemption. Section 408(b)(17) provides an additional exemption for the purchase and sale of securities and related lending transactions where neither the issuer of the securities nor any of its affiliates have or exercise any discretionary authority or control or render any investment advice with respect to the assets of any Plan involved in the transaction and the Plan pays no more than “adequate consideration” in connection with the transaction. The person making the decision on behalf of a Plan or a governmental plan shall be deemed, on behalf of itself and any such plan, by purchasing and holding the notes, or exercising any rights related thereto, to represent that (a) such purchase, holding and exercise of the notes will not result in a non-exempt prohibited transaction under ERISA or the Internal Revenue Code (or, with respect to a governmental plan, under any similar applicable law or regulation) and (b) neither Royal Bank nor any of its affiliates is a “fiduciary” (within the meaning of Section 3(21) of ERISA) with respect to the purchaser or holder in connection with such person’s acquisition, disposition or holding of the notes, or any exercise related thereto or as a result of any exercise by Royal Bank or any of its affiliates of any rights in connection with the notes, and no advice provided by Royal Bank or any of its affiliates has formed a primary basis for any investment decision by or on behalf of such purchaser or holder in connection with the notes and the transactions contemplated with respect to the notes.

If you are an insurance company or the fiduciary of a pension plan or an employee benefit plan, and propose to invest in notes, you should consult your legal counsel.



Royal Bank of Canada
US\$ 40,000,000,000
Senior Global Medium-Term Notes, Series H
Terms of Sale

Royal Bank of Canada may from time to time offer and sell notes, which we refer to as the “notes” in this prospectus supplement, with various terms, including the following:

- stated maturity of nine months or longer, except that indexed notes may have maturities of less than nine months
- fixed or floating interest rate, zero-coupon or issued with original issue discount; a floating interest rate may be based on:
 - commercial paper rate
 - U.S. prime rate
 - LIBOR
 - EURIBOR
 - Treasury rate
 - CMT rate
 - CMS rate
 - federal funds rate
- ranked as senior indebtedness of Royal Bank of Canada
- amount of principal and/or interest may be determined by reference to an index or formula
- book-entry form only through The Depository Trust Company
- redemption at the option of Royal Bank of Canada or the option of the holder
- interest on notes paid monthly, quarterly, semi-annually or annually
- unless otherwise set forth in the applicable pricing supplement, minimum denominations of \$1,000 and integral multiples of \$1,000 in excess thereof (except that non-U.S. investors may be subject to higher minimums)
- denominated in a currency other than U.S. dollars or in a composite currency
- settlement in immediately available funds

The final terms of each note will be included in a pricing supplement together with, in some cases, an applicable product prospectus supplement. We refer to pricing supplements and applicable product prospectus supplements, if any, as “pricing supplements.” If we sell all of the notes through agents and in the form of fixed or floating rate notes, we expect to receive between \$40,000,000,000 and \$39,800,000,000 of the proceeds from the sale of the notes, after paying the agents’ commissions of between \$0 and \$200,000,000. If we sell all of the notes through agents and in the form of indexed or other structured notes, we expect to receive between \$39,600,000,000 and \$38,000,000,000 of the proceeds from the sale of such notes, after paying the agents’ commission of between \$400,000,000 and \$2,000,000,000. See “Supplemental Plan of Distribution” for additional information about the agents’ commissions. The aggregate initial offering price of the notes is subject to reduction as a result of the sale by Royal Bank of Canada of other debt securities pursuant to another prospectus supplement to the accompanying prospectus.

See “Risk Factors” beginning on page S-1 to read about factors you should consider before investing in any notes.

Neither the Securities and Exchange Commission nor any state securities commission has approved or disapproved of the securities or passed upon the adequacy or accuracy of this prospectus supplement and the accompanying prospectus. Any representation to the contrary is a criminal offense.

The notes will not constitute deposits insured under the Canada Deposit Insurance Corporation Act or by the United States Federal Deposit Insurance Corporation or any other Canadian or United States governmental agency or instrumentality.

Notes that are bail-inable notes (as defined herein) are subject to conversion in whole or in part – by means of a transaction or series of transactions and in one or more steps – into common shares of the Bank or any of its affiliates under subsection 39.2(2.3) of the Canada Deposit Insurance Corporation Act (the “CDIC Act”) and to variation or extinguishment in consequence, and subject to the application of the laws of the Province of Ontario and the federal laws of Canada applicable therein in respect of the operation of the CDIC Act with respect to the bail-inable notes.

Royal Bank of Canada may sell the notes directly or through one or more agents or dealers, including the agents referred to under “Supplemental Plan of Distribution.” The agents are not required to sell any particular amount of the notes.

Royal Bank of Canada may use this prospectus supplement in the initial sale of any notes. In addition, Royal Bank of Canada, RBC Capital Markets, LLC or certain other affiliates of Royal Bank of Canada (the “Market-Makers”) may use this prospectus supplement and accompanying prospectus in market-making or other transactions in any note after its initial sale. A Market-Maker may engage in market-making transactions only in those jurisdictions in which it has all necessary governmental and regulatory authorizations for such activity.

Unless Royal Bank of Canada or its agent informs the purchaser otherwise in the confirmation of sale or pricing supplement, this prospectus supplement and accompanying prospectus are being used in a market-making transaction.

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ABOUT THIS PROSPECTUS SUPPLEMENT

This prospectus supplement and the accompanying prospectus and, if applicable, a product prospectus supplement, provide you with a general description of the notes we may offer. Each time we sell notes we will provide a pricing supplement containing specific information about the terms of the notes being offered. Each pricing supplement may include a discussion of any risk factors or other special considerations that apply to those notes. The pricing supplement may also add, update or change the information in this prospectus supplement and any applicable product prospectus supplement. If there is any inconsistency between the information in this prospectus supplement or any applicable product prospectus supplement and any pricing supplement, you should rely on the information in that pricing supplement. In this prospectus supplement when we refer to this prospectus supplement we are also referring to any applicable product prospectus supplement unless the context otherwise requires.

RISK FACTORS

An investment in the notes is subject to the risks described below, as well as the risks described under “Risk Factors” in the accompanying prospectus. You should carefully consider whether the notes are suited to your particular circumstances. This prospectus supplement should be read together with the accompanying prospectus, any applicable product prospectus supplement and the relevant pricing supplement. The information in the accompanying prospectus is supplemented by, and to the extent inconsistent therewith replaced and superseded by, the information in this prospectus supplement, any applicable product prospectus supplement and the relevant pricing supplement. This section describes the most significant risks relating to the terms of the notes. We urge you to read the following information about these risks, together with the other information in this prospectus supplement, the accompanying prospectus, any applicable product prospectus supplement and the relevant pricing supplement, before investing in the notes.

General Risks Relating to the Notes

An Investment in the Notes Is Subject to Our Credit Risk

Any payment to be made on the notes depends on our ability to pay all amounts due on the notes on the interest payment dates, upon redemption and at maturity. Therefore, an investment in any of the notes issued under our medium-term note program is subject to our credit risk. The existence of a trading market for, and the market value of, any of the notes may be impacted by market perception of our creditworthiness. If market perception of our creditworthiness were to decline for any reason, the market value of your notes, and availability of the trading markets generally, may be adversely affected.

There May Be No Market through which the Notes May Be Sold, and Holders May Not Be Able to Sell the Notes

Unless otherwise specified in the relevant pricing supplement or any applicable product prospectus supplement, there may be no market through which the notes may be sold, and holders may not be able to sell the notes. This may affect the pricing of the notes in the secondary market, the transparency and availability of trading prices and the liquidity of the notes. 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.

If you are able to sell your notes before maturity, you may have to do so at a substantial discount from the issue price, and as a result, you may suffer substantial losses.

The Notes are Structurally Subordinated to the Liabilities of Our Subsidiaries

If we become insolvent, our governing legislation provides that priorities among payments of our deposit liabilities and payments of all of our other liabilities (including payments in respect of the notes) are to be determined in accordance with the laws governing priorities and, where applicable, by the terms of the indebtedness and liabilities. Because we have subsidiaries, your right to participate in any distribution of the assets of our banking or non-banking subsidiaries, upon a subsidiary's dissolution, winding-up, liquidation or reorganization or otherwise, and thus your ability to benefit indirectly from such distribution, is subject to the prior claims of creditors of that subsidiary, except to the extent that we may be a creditor of that subsidiary and our claims are recognized. There are legal limitations on the extent to which some of our subsidiaries may extend credit, pay dividends or otherwise supply funds to, or engage in transactions with, us or some of our other subsidiaries. Accordingly, the notes will be structurally subordinated to all existing and future liabilities of our subsidiaries, and holders of notes should look only to the assets of the Bank and not those of our subsidiaries for payments on the notes.

The Notes will be Subject to Risks, Including Non-Payment in Full or, in the Case of Bail-Inable Notes, Conversion In Whole Or In Part – By Means of a Transaction or Series Of Transactions and in One or More Steps – Into Common Shares of the Bank or any of its Affiliates, Under Canadian Bank Resolution Powers

Under Canadian bank resolution powers, the Canada Deposit Insurance Corporation (“CDIC”) may, in circumstances where the Bank has ceased, or is about to cease, to be viable, assume temporary control or ownership of the Bank and may be granted broad powers by one or more orders of the Governor in Council (Canada), each of which we refer to as an “Order,” including the power to sell or dispose of all or a part of the assets of the Bank, and the power to carry out or cause the Bank to carry out a transaction or a series of transactions the purpose of which is to restructure the business of the Bank. As part of the Canadian bank resolution powers, certain provisions of and regulations under the Bank Act (Canada) (the “Bank Act”), the Canada Deposit Insurance Corporation Act (the “CDIC Act”) and certain other Canadian federal

statutes pertaining to banks, which we refer to collectively as the “bail-in regime,” provide for a bank recapitalization regime for banks designated by the Superintendent of Financial Institutions (Canada) (the “Superintendent”) as domestic systemically important banks, which include the Bank. We refer to those domestic systemically important banks as “D-SIBs.” See “Description of Debt Securities — Canadian Bank Resolution Powers” in the accompanying prospectus for a description of the Canadian bank resolution powers, including the bail-in regime.

If the CDIC were to take action under the Canadian bank resolution powers with respect to the Bank, this could result in holders or beneficial owners of the notes being exposed to losses and, in the case of bail-inable notes, conversion of the notes in whole or in part – by means of a transaction or series of transactions and in one or more steps – into common shares of the Bank or any of its affiliates, which we refer to as a “bail-in conversion.” Subject to certain exceptions discussed in the accompanying prospectus under “Description of Debt Securities — Canadian Bank Resolution Powers,” including for certain structured notes, senior debt issued on or after September 23, 2018, with an initial or amended term to maturity (including explicit or embedded options) greater than 400 days, that is unsecured or partially secured and that has been assigned a CUSIP or ISIN or similar identification number, is subject to bail-in conversion. We refer to notes that are subject to bail-in conversion as “bail-inable notes.”

Upon a bail-in conversion, if your bail-inable notes or any portion thereof are converted into common shares of the Bank or any of its affiliates, you will be obligated to accept those common shares, even if you do not at the time consider the common shares to be an appropriate investment for you, and despite any change in the Bank or any of its affiliates, or the fact that the common shares may be issued by an affiliate of the Bank, or any disruption to or lack of a market for the common shares or disruption to capital markets generally.

As a result, you should consider the risk that you may lose all of your investment, including the principal amount plus any accrued interest, if the CDIC were to take action under the Canadian bank resolution powers, including the bail-in regime, and that any remaining outstanding notes, or common shares of the Bank or any of its affiliates into which bail-inable notes are converted, may be of little value at the time of a bail-in conversion and thereafter.

The Indenture will Provide Only Limited Acceleration and Enforcement Rights for the Notes and Includes Other Provisions Intended to Qualify Bail-Inable Notes as TLAC

In connection with the bail-in regime, the Office of the Superintendent of Financial Institutions’ (“OSFI”) guideline (the “TLAC Guideline”) on Total Loss Absorbing Capacity (“TLAC”) applies to and establishes standards for D-SIBs, including the Bank, effective September 23, 2018. Under the TLAC Guideline, beginning November 1, 2021, the Bank is required to maintain a minimum capacity to absorb losses composed of unsecured external long-term debt that meets the prescribed criteria or regulatory capital instruments to support recapitalization in the event of a failure. Bail-inable notes and regulatory capital instruments that meet certain prescribed criteria, which are discussed in the accompanying prospectus under “Description of Debt Securities — Canadian Bank Resolution Powers,” will constitute TLAC of the Bank.

In order to comply with the TLAC Guideline, our indenture under which the notes may be issued provides that, for any notes of a series issued on or after September 23, 2018 (including notes that are not subject to bail-in conversion), acceleration will only be permitted (i) if we default in the payment of the principal of, or interest on, any note of that series and, in each case, the default continues for a period of 30 business days, or (ii) certain bankruptcy, insolvency or reorganization events occur.

Holders and beneficial owners of bail-inable notes may only exercise, or direct the exercise of, the rights described in the accompanying prospectus under “Description of Debt Securities — Events of Default — Remedies If an Event of Default Occurs” where an Order has not been made under Canadian bank resolution powers pursuant to subsection 39.13(1) of the CDIC Act in respect of the Bank. Notwithstanding the exercise of those rights, bail-inable notes will continue to be subject to bail-in conversion until repaid in full.

The indenture also provides that holders or beneficial owners of bail-inable notes will not be entitled to exercise, or direct the exercise of, any set-off or netting rights with respect to bail-inable notes. In addition, where an amendment, modification or other variance that can be made to the indenture or the bail-inable notes as described in the accompanying prospectus under “Description of Debt Securities — Modification and Waiver of the Debt Securities” would affect the recognition of those bail-inable notes by the Superintendent as TLAC, that amendment, modification or variance will require the prior approval of the Superintendent.

The Circumstances Surrounding a Bail-In Conversion are Unpredictable and can be Expected to Have an Adverse Effect on the Market Price of Bail-Inable Notes

The decision as to whether the Bank has ceased, or is about to cease, to be viable is a subjective determination by the Superintendent that is outside the control of the Bank. Upon a bail-in conversion, the interests of depositors and holders of liabilities and securities of the Bank that are not converted will effectively all rank in priority to the portion of bail-inable notes that are converted. In addition, except as provided for under the compensation process, the rights of holders in respect of the bail-inable notes that have been converted will rank on parity with other holders of common shares of the Bank (or, as applicable, common shares of the affiliate whose common shares are issued on the bail-in conversion).

There is no limitation on the type of Order that may be made where it has been determined that the Bank has ceased, or is about to cease, to be viable. As a result, you may be exposed to losses through the use of Canadian bank resolution powers other than bail-in conversion or in liquidation. See “The Notes will be Subject to Risks, Including Non-Payment in Full or, in the Case of Bail-Inable Notes, Conversion In Whole Or In Part – By Means of a Transaction or Series Of Transactions and in One or More Steps – Into Common Shares of the Bank or any of its Affiliates, Under Canadian Bank Resolution Powers” above.

Because of the uncertainty regarding when and whether an Order will be made and the type of Order that may be made, it will be difficult to predict when, if at all, bail-inable notes could be converted into common shares of the Bank or any of its affiliates, and there is not likely to be any advance notice of an Order. As a result of this uncertainty, trading behavior in respect of the bail-inable notes may not follow trading behavior associated with convertible or exchangeable securities or, in circumstances where the Bank is trending towards ceasing to be viable, other senior debt. Any indication, whether real or perceived, that the Bank is trending towards ceasing to be viable can be expected to have an adverse effect on the market price of the bail-inable notes, whether or not the Bank has ceased, or is about to cease, to be viable. Therefore, in those circumstances, you may not be able to sell your bail-inable notes easily or at prices comparable to those of senior debt securities not subject to bail-in conversion.

The Number of Common Shares to be Issued in Connection with, and the Number of Common Shares that will be Outstanding Following, a Bail-In Conversion are Unknown. It is also Unknown Whether the Shares to be Issued will be Those of the Bank or One of its Affiliates

Under the bail-in regime there is no fixed and pre-determined contractual conversion ratio for the conversion of the bail-inable notes, or other shares or liabilities of the Bank that are subject to a bail-in conversion, into common shares of the Bank or any of its affiliates, nor are there specific requirements regarding whether liabilities subject to a bail-in conversion are converted into common shares of the Bank or any of its affiliates. CDIC determines the timing of the bail-in conversion, the portion of bail-inable shares and liabilities to be converted and the terms and conditions of the conversion, subject to parameters set out in the bail-in regime, which are discussed under “Description of Debt Securities — Canadian Bank Resolution Powers” in the accompanying prospectus.

As a result, it is not possible to anticipate the potential number of common shares of the Bank or its affiliates that would be issued in respect of any bail-inable note converted in a bail-in conversion, the aggregate number of such common shares that will be outstanding following the bail-in conversion, the effect of dilution on the common shares received from other issuances under or in connection with an Order or related actions in respect of the Bank or its affiliates or the value of any common shares you may receive for your converted bail-inable notes, which could be significantly less than the principal amount of those bail-inable notes. It is also not possible to anticipate whether shares of the Bank or shares of its affiliates would be issued in a bail-in conversion. There may be an illiquid market, or no market at all, in the common shares issued upon a bail-in conversion and you may not be able to sell those common shares at a price equal to the value of your converted bail-inable notes and as a result may suffer significant losses that may not be offset by compensation, if any, received as part of the compensation process. Fluctuations in exchange rates may exacerbate those losses.

By Acquiring Bail-Inable Notes, You are Deemed to Agree to be Bound by a Bail-In Conversion and so will have No Further Rights in respect of Bail-Inable Notes that are Converted in a Bail-In Conversion other than those Provided Under the Bail-In Regime. Any Potential Compensation to be Provided through the Compensation Process under the CDIC Act is Unknown

The CDIC Act provides for a compensation process for holders of bail-inable notes who immediately prior to the making of an Order, directly or through an intermediary, own bail-inable notes that are converted in a bail-in conversion. Given the considerations involved in determining the amount of compensation, if any, that a holder that held bail-inable notes may be entitled to following an Order, it is not possible to anticipate what, if any, compensation would be payable in such

circumstances. By acquiring an interest in any bail-inable note, you are deemed to agree to be bound by a bail-in conversion and so will have no further rights in respect of your bail-inable notes to the extent those bail-inable notes are converted in a bail-in conversion, other than those provided under the bail-in regime. See “Description of Debt Securities — Canadian Bank Resolution Powers” in the accompanying prospectus for a description of the compensation process under the CDIC Act.

Following a Bail-In Conversion, Holders or Beneficial Owners that Held Bail-Inable Notes that have been Converted will No Longer have Rights Against the Bank as Creditors

Upon a bail-in conversion, the rights, terms and conditions of the portion of bail-inable notes that are converted, including with respect to priority and rights on liquidation, will no longer apply as the portion of converted bail-inable notes will have been converted on a full and permanent basis into common shares of the Bank or any of its affiliates ranking on parity with all other outstanding common shares of that entity. If a bail-in conversion occurs, then the interest of the depositors, other creditors and holders of liabilities of the Bank not bailed in as a result of the bail-in conversion will all rank in priority to those common shares.

Given the nature of the bail-in conversion, holders or beneficial owners of bail-inable notes that are converted will become holders or beneficial owners of common shares at a time when the Bank’s and potentially its affiliates’ financial condition has deteriorated. They may also become holders or beneficial owners of common shares at a time when the relevant entity may have received or may receive a capital injection or equivalent support with terms that may rank in priority to the common shares issued in a bail-in conversion with respect to payment of dividends, rights on liquidation or other terms although there is no certainty that any such capital injection or support will be forthcoming.

We May Redeem Bail-Inable Notes after the Occurrence of a TLAC Disqualification Event

If a TLAC Disqualification Event (as defined herein) is specified in the applicable pricing supplement, we may, at our option, with the prior approval of the Superintendent, redeem all but not less than all of the particular bail-inable notes prior to their stated maturity date after the occurrence of the TLAC Disqualification Event, at the time and at the redemption price or prices specified in that pricing supplement, together with unpaid interest accrued thereon to, but excluding, the date fixed for redemption. If we redeem bail-inable notes, you may not be able to reinvest the redemption proceeds in securities offering a comparable anticipated rate of return. Additionally, although the terms of the bail-inable notes are anticipated to be established to satisfy the TLAC criteria within the meaning of the TLAC Guideline to which the Bank is subject, it is possible that any bail-inable notes may not satisfy the criteria in future rulemakings or interpretations.

Risks Relating to Indexed Notes

We use the term “indexed notes” to mean notes whose value is linked to an underlying property or index. Indexed notes may present a high level of risk, and those who invest in indexed notes may lose their entire investment. Indexed notes are complex and involve risks not associated with an investment in ordinary debt securities. You should thoroughly review each of an indexed note’s offering documents for a comprehensive description of the risks associated with the offering. In addition, the treatment of indexed notes for U.S. federal income tax purposes is often unclear due to the absence of any authority specifically addressing the issues presented by any particular indexed note. Thus, if you propose to invest in indexed notes, you should independently evaluate the federal income tax consequences of purchasing an indexed note that apply in your particular circumstances. You should read “Tax Consequences —United States Taxation” in the accompanying prospectus and “Certain Income Tax Consequences—United States Taxation” in this prospectus supplement, for a discussion of U.S. tax matters.

The Return on Indexed Notes May Be Less Than the Return on Notes With a Similar Term that Are Not Indexed

Certain indexed notes provide for the repayment of principal at maturity, subject to our credit risk. Depending on the terms of such an indexed note, as specified in the relevant pricing supplement, you may not receive any periodic interest payments or receive only very low payments on such indexed note. As a result, the overall return on such indexed note may be less, and possibly significantly less, than the amount you would have earned by investing the principal or other amount you invest in such indexed note in a non-indexed debt security that bears interest at a prevailing market fixed or floating rate. For indexed notes that do not provide for the repayment of principal at maturity, see “—Investors in Indexed Notes Could Lose Their Investment” below.

Investors in Indexed Notes Could Lose Their Investment

The amount of principal and/or interest payable on an indexed note and the cash value or physical settlement value of a physically settled note will be determined by reference to the price, value or level of one or more securities, currencies, commodities or other properties, any other financial, economic or other measure or instrument, including the occurrence or non-occurrence of any event or circumstance, and/or one or more indices or baskets of any of these items. We refer to each of these as an “index.” The direction and magnitude of the change in the price, value or level of the relevant index will determine the amount of principal and/or interest payable on the indexed note, and the cash value or physical settlement value of a physically settled note. The terms of a particular indexed note may or may not provide for the return of a percentage of the face amount at maturity or a minimum interest rate. Thus, if you purchase an indexed note, you may lose all or a portion of the principal or other amount you invest and may receive no interest on your investment.

The Issuer of a Security or Currency That Serves as an Index Could Take Actions That May Adversely Affect an Indexed Note

The issuer of a security that serves as an index or part of an index for an indexed note will have no involvement in the offer and sale of the indexed note and no obligations to the holder of the indexed note. The issuer may take actions, such as a merger or sale of assets, without regard to the interests of the holder. Any of these actions could adversely affect the value of a note indexed to that security or to an index of which that security is a component.

If the index for an indexed note includes a non-U.S. dollar currency or other asset denominated in a non-U.S. dollar currency, the government that issues that currency will also have no involvement in the offer and sale of the indexed note and no obligations to the holder of the indexed note. That government may take actions that could adversely affect the value of the note. See “—Risks Relating to Notes Denominated or Payable in or Linked to a Non-U.S. Dollar Currency” below for more information about these kinds of government actions.

An Indexed Note May Be Linked to a Volatile Index, Which Could Hurt the Value of Your Investment

Some indices are highly volatile, which means that their value may change significantly, up or down, over a short period of time. The amount of principal and/or interest that can be expected to become payable on an indexed note may vary substantially from time to time. Because the amounts payable with respect to an indexed note are generally calculated based on the price, value or level of the relevant index on a specified date or over a limited period of time, volatility in the index increases the risk that the return on the indexed note may be adversely affected by a fluctuation in the level of the relevant index. The volatility of an index may be affected by political or economic events, including governmental actions, or by the activities of participants in the relevant markets. Any of these events or activities could adversely affect the value of an indexed note.

An Index to Which a Note Is Linked Could Be Changed or Become Unavailable

Some indices compiled by us or our affiliates or third parties may consist of or refer to several or many different securities, commodities or currencies or other instruments or measures. The compiler of such an index typically reserves the right to alter the composition of the index and the manner in which the value or level of the index is calculated. An alteration may result in a decrease in the value of or return on an indexed note that is linked to the index. The indices for our indexed notes may include published indices of this kind or customized indices developed by us or our affiliates in connection with particular issues of indexed notes.

A published index may become unavailable, or a customized index may become impossible to calculate in the normal manner, due to events such as war, natural disasters, cessation of publication of the index or a suspension or disruption of trading in one or more securities, commodities or currencies or other instruments or measures on which the index is based. If an index becomes unavailable or impossible to calculate in the normal manner, the terms of a particular indexed note may allow us to delay determining the amount payable as principal or interest on an indexed note, or we may use an alternative method to determine the value of the unavailable index. Alternative methods of valuation are generally intended to produce a value similar to the value resulting from reference to the relevant index. However, it is unlikely that any alternative method of valuation we use will produce a value identical to the value that the actual index would have produced. If we use an alternative method of valuation for a note linked to an index of this kind, the value of the note, or the rate of return on it, may be lower than it otherwise would be.

Some indexed notes are linked to indices that are not commonly used or that have been developed only recently. The lack of trading history may make it difficult to anticipate the volatility or other risks associated with an indexed note of this

kind. In addition, trading in these indices or their underlying stocks, commodities or currencies or other instruments or measures, or options or futures contracts on these stocks, commodities or currencies or other instruments or measures, may be limited, which could increase their volatility and decrease the value of the related indexed notes or the rates of return on them.

Pricing Information About the Property Underlying a Relevant Index May Not Be Available

Special risks may also be presented because of differences in time zones between the United States and the market for the property underlying the relevant index, such that the underlying property is traded on a foreign exchange that is not open when the trading market for the notes in the United States, if any, is open or where trading occurs in the underlying property during times when the trading market for the notes in the United States, if any, is closed. In such cases, holders of the notes may have to make investment decisions at a time when current pricing information regarding the property underlying the relevant index is not available.

We May Engage in Hedging Activities That Could Adversely Affect an Indexed Note

In order to hedge an exposure on a particular indexed note, we may, directly or through our affiliates or other agents, enter into transactions involving the securities, commodities or currencies or other instruments or measures that underlie the index for the note, or involving derivative instruments, such as swaps, options or futures, on the index or any of its component items. To the extent that we enter into hedging arrangements with a non-affiliate, including a non-affiliated agent, such non-affiliate may enter into similar transactions. Engaging in transactions of this kind could adversely affect the value of an indexed note. It is possible that we or a hedging counterparty could achieve substantial returns from our hedging transactions while the value of the indexed note may decline.

Information About Indices Will Not Be Indicative of Future Performance

If we issue an indexed note, we may include historical information about the relevant index in the relevant pricing supplement. Any information about indices that we may provide will be furnished as a matter of information only, and you should not regard the information as indicative of the range of, or trends in, fluctuations in the relevant index that may occur in the future.

We May Have Conflicts of Interest Regarding an Indexed Note

RBC Capital Markets, LLC and our other affiliates and unaffiliated agents may have conflicts of interest with respect to some indexed notes. RBC Capital Markets, LLC and our other affiliates and unaffiliated agents may engage in trading, including trading for hedging purposes, for their proprietary accounts or for other accounts under their management, in indexed notes and in the securities, commodities or currencies or other instruments or measures on which the index is based or in other derivative instruments related to the index or its component items. These trading activities could adversely affect the value of indexed notes. We and our affiliates and unaffiliated agents may also issue or underwrite securities or derivative instruments that are linked to the same index as one or more indexed notes. Introducing competing products into the marketplace in this manner could adversely affect the value of a particular indexed note.

RBC Capital Markets, LLC or another of our affiliates or an unaffiliated entity that provides us a hedge in respect of indexed notes may serve as calculation agent and/or exchange rate agent for the indexed notes and may have considerable discretion in calculating the amounts payable in respect of the notes. To the extent that RBC Capital Markets, LLC or another of our affiliates or such an unaffiliated entity sponsors, calculates or compiles a particular index, it may also have considerable discretion in performing the calculation or compilation of the index. For example, it may be permitted to change the methodology of the index or discontinue the publication of the index. Exercising discretion in this manner could adversely affect the value of an indexed note based on the index or the rate of return on the security.

Risks Relating to Floating Rate Notes

Floating Rates of Interest are Uncertain and Could be 0.0%

If your notes are floating rate notes or otherwise directly linked to a floating rate for some portion of the notes' term, no interest will accrue on the notes with respect to any interest period for which the applicable floating rate specified in the applicable pricing supplement is zero on the related interest rate reset date. Floating interest rates, by their very nature, fluctuate, and may be as low as 0.0%. Also, in certain economic environments, floating rates of interest may be less than

fixed rates of interest for instruments with a similar credit quality and term. As a result, the return you receive on your notes may be less than a fixed rate security issued for a similar term by a comparable issuer.

Notes that bear interest at rates based on LIBOR and/or EURIBOR may be adversely affected by changes in our LIBOR or EURIBOR reporting practices or the method in which LIBOR and/or EURIBOR is determined or circumstances where LIBOR or EURIBOR is no longer determined or published

Regulators and law enforcement agencies from a number of governments have been conducting investigations relating to the calculation of the London Interbank Offered Rate (“LIBOR”) across a range of maturities and currencies, and certain financial institutions that were member banks surveyed by the British Bankers’ Association (the “BBA”) in setting daily LIBOR have entered into agreements with the U.S. Department of Justice, the U.S. Commodity Futures Trading Commission and/or the U.K. Financial Services Authority in order to resolve the investigations. In addition, in September 2012, the U.K. government published the results of its review of LIBOR, which is commonly referred to as the “Wheatley Review”. The Wheatley Review made a number of recommendations for changes with respect to LIBOR, including the introduction of statutory regulation of LIBOR, the transfer of responsibility for LIBOR from the BBA to an independent administrator, changes to the method of compilation of lending rates, new regulatory oversight and enforcement mechanisms for rate-setting and the corroboration of LIBOR, as far as possible, by transactional data. Based on the Wheatley Review, on March 25, 2013, final rules for the regulation and supervision of LIBOR by the U.K. Financial Conduct Authority (the “FCA”) were published and came into effect on April 2, 2013 (the “FCA Rules”). In particular, the FCA Rules include requirements that (1) an independent LIBOR administrator monitor and survey LIBOR submissions to identify breaches of practice standards and/or potentially manipulative behavior, and (2) firms submitting data to LIBOR establish and maintain a clear conflicts of interest policy and appropriate systems and controls. The FCA Rules took effect on April 2, 2013.

In addition, in response to the Wheatley Review recommendations, ICE Benchmark Administration Limited (“IBA”) was appointed as the independent LIBOR administrator, from February 1, 2014.

The European Money Markets Institute (formerly Euribor-EBF) has continued in its role as administrator of EURIBOR but has also undertaken a number of reforms in relation to its governance and technical framework since January 2013 pursuant to recommendations by the European Securities and Markets Authority and the European Banking Authority.

On July 27, 2017, the FCA announced its intention to stop persuading or compelling banks to submit rates for the calculation of LIBOR by the end of 2021.

It is not possible to predict the further effect of the FCA Rules or the anticipated discontinuance of LIBOR after 2021, any changes in the methods pursuant to which the LIBOR or EURIBOR rates are determined, or any other reforms to LIBOR, EURIBOR or any other relevant benchmarks that will be enacted in the U.K., the European Union (the “EU”) and elsewhere, each of which may adversely affect the trading market for securities based on LIBOR, EURIBOR or any other relevant benchmark, including any notes that bear interest at rates based on LIBOR and/or EURIBOR and may cause such benchmarks to perform differently than in the past, or cease to exist. In addition, any legal or regulatory changes made by the FCA (including the FCA’s July 2017 announcement), IBA, the European Money Markets Institute, the European Commission or any other successor governance or oversight body, or future changes adopted by such body, in the method pursuant to which the LIBOR, EURIBOR or any other relevant benchmarks are determined or the transition from LIBOR to a successor benchmark may result in, among other things, a sudden or prolonged increase or decrease in the reported benchmark, a delay in the publication of any such benchmark rates, trigger changes in the rules or methodologies in certain benchmarks discouraging market participants from continuing to administer or to participate in certain benchmarks, and, in certain situations, could result in a benchmark rate no longer being determined and published. Accordingly, in respect of a note referencing LIBOR, EURIBOR or any other relevant benchmark, such proposals for reform and changes in applicable regulation could have a material adverse effect on the trading market for, the value of and return on such a note (including potential rates of interest thereon).

If LIBOR has been permanently discontinued, the calculation agent may use a substitute for LIBOR and make other adjustments to the terms of notes referencing LIBOR, after consultation with the Bank, as described further in this prospectus supplement. The calculation agent is our affiliate and may have a conflict of interest in taking such actions, which could adversely affect the value of such notes.

Risks Relating to Notes Denominated or Payable in or Linked to a Non-U.S. Dollar Currency

If you intend to invest in a non-U.S. dollar note—e.g., a note whose principal and/or interest is payable in a currency other than U.S. dollars or that may be settled by delivery of or reference to a non-U.S. dollar currency or property

denominated in or otherwise linked to a non-U.S. dollar currency—you should consult your own financial and legal advisors as to the currency risks entailed by your investment. Notes of this kind may not be an appropriate investment for investors who are unsophisticated with respect to non-U.S. dollar currency transactions. The information in this prospectus supplement is directed primarily at investors who are U.S. residents. Investors who are not U.S. residents should consult their own financial and legal advisors about currency-related risks particular to their investments.

An Investment in a Non-U.S. Dollar Note Involves Currency-Related Risks

An investment in a non-U.S. dollar note entails significant risks that are not associated with a similar investment in a note that is payable solely in U.S. dollars and where settlement value is not otherwise based on a non-U.S. dollar currency. These risks include the possibility of significant changes in rates of exchange between the U.S. dollar and the various non-U.S. dollar currencies or composite currencies and the possibility of the imposition or modification of foreign exchange controls or other conditions by either the United States or non-U.S. governments. These risks generally depend on factors over which we have no control, such as economic and political events and the supply of and demand for the relevant currencies in the global markets.

Changes in Currency Exchange Rates Can Be Volatile and Unpredictable

Rates of exchange between the U.S. dollar and many other currencies have been highly volatile, and this volatility may continue and perhaps spread to other currencies in the future. Fluctuations in currency exchange rates could adversely affect an investment in a note denominated in, or where value is otherwise linked to, a specified currency other than U.S. dollars. Depreciation of the specified currency against the U.S. dollar could result in a decrease in the U.S. dollar-equivalent value of payments on the note, including the principal payable at maturity. That in turn could cause the market value of the note to fall. Depreciation of the specified currency against the U.S. dollar could result in a loss to the investor on a U.S. dollar basis.

In courts outside of New York, investors may not be able to obtain judgment in a specified currency other than U.S. dollars. For example, a judgment for money in an action based on a non-U.S. dollar note in many other U.S. federal or state courts ordinarily would be enforced in the United States only in U.S. dollars. The date used to determine the rate of conversion of the currency in which any particular note is denominated into U.S. dollars will depend upon various factors, including which court renders the judgment.

Government Policy Can Adversely Affect Foreign Currency Exchange Rates and an Investment in a Non-U.S. Dollar Note

Foreign currency exchange rates can either float or be fixed by sovereign governments. From time to time, governments use a variety of techniques, such as intervention by a country's central bank or imposition of regulatory controls or taxes, to affect the exchange rate of their currencies. Governments may also issue a new currency to replace an existing currency or alter the exchange rate or exchange characteristics by devaluation or revaluation of a currency. Thus, a special risk in purchasing non-U.S. dollar notes is that their yields or payouts could be significantly and unpredictably affected by governmental actions. Even in the absence of governmental action directly affecting currency exchange rates, political or economic developments in the country issuing the specified currency for a non-U.S. dollar note or elsewhere could lead to significant and sudden changes in the exchange rate between the U.S. dollar and the specified currency. These changes could affect the value of the note as participants in the global currency markets move to buy or sell the specified currency or U.S. dollars in reaction to these developments.

Governments have imposed from time to time and may in the future impose exchange controls or other conditions, including taxes, with respect to the exchange or transfer of a specified currency that could affect exchange rates as well as the availability of a specified currency for a note at its maturity or on any other payment date. In addition, the ability of a holder to move currency freely out of the country in which payment in the currency is received or to convert the currency at a freely determined market rate could be limited by governmental actions.

Information About Exchange Rates Will Not Be Indicative of Future Performance

If we issue a non-U.S. dollar note, we may include in the relevant pricing supplement a currency supplement that provides information about historical exchange rates for the relevant non-U.S. dollar currency or currencies. Any information about exchange rates that we may provide will be furnished as a matter of information only, and you should not regard the

information as indicative of the range of, or trends in, fluctuations in currency exchange rates that may occur in the future. That rate will likely differ from the exchange rate used under the terms that apply to a particular note.

Non-U.S. Investors May Be Subject to Certain Additional Risks

If we issue a U.S. dollar note and you are a non-U.S. investor who purchased such notes with a currency other than U.S. dollars, changes in rates of exchange may have an adverse effect on the value, price or income of your investment.

This prospectus supplement contains a general description of certain U.S. and Canadian tax consequences relating to the notes. If you are a non-U.S. investor, you should consult your tax advisors as to the consequences, under the tax laws of the country where you are resident for tax purposes, of acquiring, holding and disposing of notes and receiving payments of principal or other amounts under the notes.

Risks Relating to Changes in Canadian Law

No assurance can be given as to the impact of any possible judicial decision or change to the laws of the Provinces of Ontario and Québec and the federal laws of Canada applicable therein or administrative practice after the date of this prospectus supplement and before the date on which the notes are issued. Any such change could materially adversely impact the value of any notes affected by it. Such changes in law may include, but are not limited to, changes to the “bail-in” regime, described above, which may affect the rights of holders of securities issued by the Bank, including the notes.

Risks Relating to United States Tax Law

U.S. Foreign Account Tax Compliance Act Withholding May Affect Payments on the Notes

The new reporting regime and potential withholding tax imposed by sections 1471 through 1474 of the U.S. Internal Revenue Code of 1986, as amended (“FATCA”) may affect payments made to custodians or intermediaries in the payment chain leading to the ultimate investor if any such custodian or intermediary generally is unable to receive payments free of FATCA withholding. It also may affect payment to any ultimate investor that is a financial institution that is not entitled to receive payments free of withholding under FATCA, or an ultimate investor that fails to provide its broker (or other custodian or intermediary from which it receives payment) with any information, forms, other documentation or consents that may be necessary for the payments to be made free of FATCA withholding. Investors should choose the custodians or intermediaries with care (to ensure each is compliant with FATCA or other laws or agreements related to FATCA) and provide each custodian or intermediary with any information, forms, other documentation or consents that may be necessary for such custodian or intermediary to make a payment free of FATCA withholding. Investors should consult their own tax adviser to obtain a more detailed explanation of FATCA and how FATCA may affect them. The Bank’s obligations under the notes are discharged once it has made payment to, or to the order of, the common depository or common safekeeper for the clearing systems (as bearer or registered holder of the notes) and the Bank has therefore no responsibility for any amount thereafter transmitted through the clearing systems and custodians or intermediaries.

USE OF PROCEEDS

Except as otherwise set forth in a pricing supplement, the net proceeds from the sale of any notes will be added to our general funds and will be used for general banking purposes.

DESCRIPTION OF THE NOTES WE MAY OFFER

You should carefully read the description of the terms and provisions of our debt securities and our senior indenture under “Description of Debt Securities” in the accompanying prospectus. That section, together with this prospectus supplement, the relevant pricing supplement and any applicable product prospectus supplement, summarizes all the material terms of our senior indenture, our form of subordinated indenture and your note, as applicable. They do not, however, describe every aspect of our senior indenture, our form of subordinated indenture and your note, as applicable. For example, in this section entitled “Description of the Notes We May Offer”, the accompanying prospectus, the relevant pricing supplement and any applicable product prospectus supplement, we use terms that have been given special meanings in our senior indenture, but we describe the meanings of only the more important of those terms. The specific terms of any series of notes will be described in the relevant pricing supplement. As you read this section, please remember that the specific terms of your note as described in your pricing supplement will supplement and, if applicable, may modify or replace the general terms described in this section. If your pricing supplement is inconsistent with this prospectus supplement or the product

prospectus supplement or the accompanying prospectus, your pricing supplement will control with regard to your note. Thus, the statements we make in this section may not apply to your note.

General

The notes will be issued under our senior indenture, dated as of October 23, 2003, between Royal Bank of Canada and The Bank of New York Mellon, as successor to the corporate trust business of JPMorgan Chase Bank, N.A., as trustee, as supplemented by a first supplemental indenture, dated as of July 21, 2006, by the second supplemental indenture, dated as of February 28, 2007, and by the third supplemental indenture, dated as of September 7, 2018 and as further amended from time to time, which we may refer to as the Indenture. The notes constitute a single series of debt securities of Royal Bank of Canada issued under the indenture. The term “debt securities”, as used in this prospectus supplement, refers to all debt securities, including the notes, issued and issuable from time to time under the indenture. The indenture is subject to, and governed by, the Trust Indenture Act of 1939, as amended. The indenture is more fully described below in this section. Whenever we refer to specific provisions or defined terms in the indenture, those provisions or defined terms are incorporated in this prospectus supplement by reference. Section references used in this discussion are references to the indenture. Capitalized terms which are not otherwise defined shall have the meanings given to them in the indenture.

The notes will be limited to an aggregate initial offering price of US\$40,000,000,000 or at our option if so specified in the relevant pricing supplement, the equivalent of this amount in any other currency or currency unit, and will be our direct, unsecured obligations. This aggregate initial offering price is subject to reduction as a result of the sale by us of other debt securities pursuant to another prospectus supplement to the accompanying prospectus. The notes will not constitute deposits insured under the Canada Deposit Insurance Corporation Act or by the United States Federal Deposit Insurance Corporation or any other Canadian or United States governmental agency or instrumentality.

We will offer the notes on a continuous basis through one or more agents listed in the section entitled “Supplemental Plan of Distribution” in this prospectus supplement. The indenture does not limit the aggregate principal amount of senior notes that we may issue. We may, from time to time, without the consent of the holders of the notes, provide for the issuance of notes or other debt securities under the indenture in addition to the US\$40,000,000,000 aggregate initial offering price of notes noted on the cover of this prospectus supplement. Each note issued under this prospectus supplement will have a stated maturity that will be specified in the applicable pricing supplement and may be subject to redemption or repayment before its stated maturity. As a general matter, each note will mature nine months or more from its date of issue, except that indexed notes may have a maturity of less than nine months. Notes may be issued at significant discounts from their principal amount due on the stated maturity (or on any prior date on which the principal or an installment of principal of a note becomes due and payable, whether by the declaration of acceleration, call for redemption at our option, repayment at the option of the holder or otherwise), and some notes may not bear interest. We may from time to time, without the consent of the existing holders of the relevant notes, create and issue further notes having the same terms and conditions as such notes in all respects, except for the issue date, issue price and, if applicable, the first payment of interest thereon.

Unless we specify otherwise in the relevant pricing supplement, currency amounts in this prospectus supplement are expressed in U.S. dollars. Unless we specify otherwise in any note and pricing supplement, the notes will be denominated in U.S. dollars and payments of principal, premium, if any, and any interest on the notes will be made in U.S. dollars. If any note is to be denominated other than exclusively in U.S. dollars, or if the principal of, premium, if any, or any interest on the note is to be paid in one or more currencies (or currency units or in amounts determined by reference to an index or indices) other than that in which that note is denominated, additional information (including authorized denominations and related exchange rate information) will be provided in the relevant pricing supplement. Unless we specify otherwise in any pricing supplement, notes denominated in U.S. dollars will be issued in minimum denominations of \$1,000 and integral multiples of \$1,000 in excess thereof (except that non-U.S. investors may be subject to higher minimums).

Interest rates that we offer on the notes may differ depending upon, among other factors, the aggregate principal amount of notes purchased in any single transaction. Notes with different variable terms other than interest rates may also be offered concurrently to different investors. We may change interest rates or formulas and other terms of notes from time to time, but no change of terms will affect any note we have previously issued or as to which we have accepted an offer to purchase.

Each note will be issued as a book-entry note in fully registered form without coupons. Each note issued in book-entry form may be represented by a global note that we deposit with and register in the name of a financial institution or its nominee, that we select. The financial institution that we select for this purpose is called the depository. Unless we specify otherwise in the applicable pricing supplement, The Depository Trust Company, New York, New York, will be the depository for all notes in global form. Except as discussed in the accompanying prospectus under “Description of Debt

Securities—Ownership and Book-Entry Issuance”, owners of beneficial interests in book-entry notes will not be entitled to physical delivery of notes in certificated form. We will make payments of principal of, and premium, if any and interest, if any, on the notes through the applicable trustee to the depository for the notes.

Legal Ownership

Street Name and Other Indirect Holders

Investors who hold their notes in accounts at brokers, banks or other financial institutions will generally not be recognized by us as legal holders of notes. This is called holding in street name. Instead, we would recognize only the bank or broker, or the financial institution the bank or broker uses to hold its notes. These intermediary banks, brokers and other financial institutions pass along principal, interest and other payments on the notes, either because they agree to do so in their customer agreements or because they are legally required to do so. If you hold your notes in street name, you should check with your own institution to find out:

- how it handles note payments and notices;
- whether it imposes fees or charges;
- how it would handle voting if it were ever required;
- whether and how you can instruct it to send you notes registered in your own name so you can be a direct holder as described below; and
- how it would pursue rights under the notes if there were a default or other event triggering the need for holders to act to protect their interests.

Direct Holders

Our obligations, as well as the obligations of the trustee and those of any third parties employed by us or the trustee, under the notes run only to persons who are registered as holders of notes. As noted above, we do not have obligations to you if you hold in street name or other indirect means, either because you choose to hold your notes in that manner or because the notes are issued in the form of global notes as described below. For example, once we make payment to the registered holder we have no further responsibility for the payment even if that holder is legally required to pass the payment along to you as a street name customer but does not do so.

Global Notes

A global note is a special type of indirectly held security, as described above under “—Street Name and Other Indirect Holders.” If we choose to issue notes in the form of global notes, the ultimate beneficial owners of global notes can only be indirect holders. We require that the global note be registered in the name of a financial institution we select.

We also require that the notes included in the global note not be transferred to the name of any other direct holder except in the special circumstances described in the accompanying prospectus in the section “Description of Debt Securities—Ownership and Book-Entry Issuance.” The financial institution that acts as the sole direct holder of the global note is called the depository. Any person wishing to own a global note must do so indirectly by virtue of an account with a broker, bank or other financial institution, known as a “participant”, that in turn has an account with the depository. The pricing supplement indicates whether your series of notes will be issued only in the form of global notes.

Further details of legal ownership are discussed in the accompanying prospectus in the section “Ownership and Book-Entry Issuance.”

In the remainder of this description, “you” or “holder” means direct holders and not street name or other indirect holders of notes. Indirect holders should read the previous subsection titled “—Street Name and Other Indirect Holders.”

Types of Notes

We may issue the following three types of notes:

- *Fixed Rate Notes.* A note of this type will bear interest at a fixed rate described in the applicable pricing supplement. This type includes zero-coupon notes, which bear no interest and are instead issued at a price lower than the principal amount.
- *Floating Rate Notes.* A note of this type will bear interest at rates that are determined by reference to an interest rate formula. In some cases, the rates may also be adjusted by adding or subtracting a spread or multiplying by a spread multiplier and may be subject to a minimum rate or a maximum rate. The various interest rate formulas and these other features are described below under “—Interest Rates—Floating Rate Notes.” If your note is a floating rate note, the formula and any adjustments that apply to the interest rate will be specified in your pricing supplement.
- *Indexed Notes.* A note of this type provides that the principal amount payable at its maturity, and/or the amount of interest payable on an interest payment date, will be determined by reference to:
 - one or more securities;
 - one or more currencies;
 - one or more commodities;
 - any other financial, economic or other measures or instruments, including the occurrence or non-occurrence of any event or circumstance; and/or
 - indices or baskets of any of these items.

If you are a holder of an indexed note, you may receive a principal amount at maturity that is greater than or less than the face amount of your note depending upon the value of the applicable index at maturity. That value may fluctuate over time. If you purchase an indexed note, your pricing supplement will include information about the relevant index and how amounts that are to become payable will be determined by reference to that index. In addition, your pricing supplement will specify whether your note will be exchangeable for, or payable in cash, securities of an issuer other than Royal Bank of Canada or other property. Before you purchase any indexed note, you should read carefully the section entitled “Risk Factors—Risks Relating to Indexed Notes” above.

Original Issue Discount Notes

A fixed rate note, a floating rate note or an indexed note may be an original issue discount note. A note of this type is issued at a price lower than its principal amount and provides that, upon redemption or acceleration of its maturity, an amount less than its principal amount will be payable. An original issue discount note may be a zero-coupon note. A note issued at a discount to its principal may, for U.S. federal income tax purposes, be considered an original issue discount note, regardless of the amount payable upon redemption or acceleration of maturity. See “Tax Consequences—United States Taxation—Original Issue Discount” in the accompanying prospectus for a brief description of the U.S. federal income tax consequences of owning an original issue discount note.

Information in the Pricing Supplement

Your pricing supplement will describe one or more of the following terms of your note:

- the stated maturity;
- the specified currency or currencies for principal and interest, if not U.S. dollars;
- the price at which we originally issue your note, expressed as a percentage of the principal amount, and the original issue date;

- whether or not your note is a bail-inable note;
- whether your note is a fixed rate note, a floating rate note or an indexed note;
- if your note is a fixed rate note, the yearly rate at which your note will bear interest, if any, and the interest payment dates;
- if your note is a floating rate note, the interest rate basis, which may be one of the eight interest rate bases described under “—Interest Rates—Floating Rate Notes” below; any applicable index currency or maturity, spread or spread multiplier or initial, maximum or minimum rate; and the interest reset, determination, calculation and payment dates, all of which we describe under “—Interest Rates—Floating Rate Notes” below;
- if your note is an indexed note, the principal amount, if any, we will pay you at maturity, the amount of interest, if any, we will pay you on an interest payment date or the formula we will use to calculate these amounts, if any, and whether your note will be exchangeable in cash, securities of an issuer other than Royal Bank of Canada or other property;
- if your note is an original issue discount note, the yield to maturity;
- if applicable, the circumstances under which your note may be redeemed at our option before the stated maturity, including any redemption commencement date, redemption price(s) and redemption period(s);
- if applicable, the circumstances under which you may demand repayment of your note before the stated maturity, including any repayment commencement date, repayment price(s) and repayment period(s);
- any special Canadian or United States federal income tax consequences of the purchase, ownership or disposition of a particular issuance of notes;
- the use of proceeds, if materially different than those discussed in this prospectus supplement; and
- any other terms of your note, which could be different from those described in this prospectus supplement.

Market-Making Transactions

If you purchase your note in a market-making transaction, you will receive information about the price you pay and your trade and settlement dates in a separate confirmation of sale. A market-making transaction is one in which an agent or other person resells a note that it has previously acquired from another holder. A market-making transaction in a particular note occurs after the original sale of the note.

If you purchase notes issued before September 23, 2018 in a market-making transaction, those notes will not be bail-inable notes, even though the applicable pricing supplement may not specify that your note is not a bail-inable note.

Redemption at the Option of Royal Bank of Canada; No Sinking Fund

If an initial redemption date is specified in the applicable pricing supplement, we may redeem the particular notes prior to their stated maturity date at our option on any date on or after that initial redemption date in whole or from time to time in part in increments of \$1,000 or any other integral multiple of an authorized denomination specified in the applicable pricing supplement (provided that any remaining principal amount thereof shall be at least \$1,000 or other minimum authorized denomination applicable thereto), at the redemption price or prices specified in that pricing supplement, together with unpaid interest accrued thereon to the date of redemption. Unless otherwise specified in the applicable pricing supplement, we must give written notice to registered holders of the particular notes to be redeemed at our option not more than 60 nor less than 30 calendar days prior to the date of redemption.

The notes will not be subject to, or entitled to the benefit of, any sinking fund.

Repayment at the Option of the Holder

If one or more optional repayment dates are specified in the applicable pricing supplement, registered holders of the particular notes may require us to repay those notes prior to their stated maturity date on any optional repayment date in whole or from time to time in part in increments of \$1,000 or any other integral multiple of an authorized denomination specified in the applicable pricing supplement (provided that any remaining principal amount thereof shall be at least \$1,000 or other minimum authorized denomination applicable thereto), at the repayment price or prices specified in that pricing supplement, together with unpaid interest accrued thereon to the date of repayment. A registered holder's exercise of the repayment option will be irrevocable.

For any note to be repaid, the applicable trustee must receive, at its corporate trust office in the Borough of Manhattan, The City of New York, not more than 60 nor less than 30 calendar days prior to the date of repayment, the particular notes to be repaid and, in the case of a book-entry note, repayment instructions from the applicable beneficial owner to the depositary and forwarded by the depositary. Only the depositary may exercise the repayment option in respect of global notes representing book-entry notes. Accordingly, beneficial owners of global notes that desire to have all or any portion of the book-entry notes represented thereby repaid must instruct the participant through which they own their interest to direct the depositary to exercise the repayment option on their behalf by forwarding the repayment instructions to the applicable trustee as aforesaid. In order to ensure that these instructions are received by the applicable trustee on a particular day, the applicable beneficial owner must so instruct the participant through which it owns its interest before that participant's deadline for accepting instructions for that day. Different firms may have different deadlines for accepting instructions from their customers. Accordingly, beneficial owners should consult their participants for the respective deadlines. In addition, at the time repayment instructions are given, each beneficial owner shall cause the participant through which it owns its interest to transfer the beneficial owner's interest in the global note representing the related book-entry notes, on the depositary's records, to the applicable trustee.

If applicable, we will comply with the requirements of Section 14(e) of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), and the rules promulgated thereunder, and any other securities laws or regulations in connection with any repayment of notes at the option of the registered holders thereof.

We may at any time purchase notes at any price or prices in the open market or otherwise. Notes so purchased by us may, at our discretion, be held, resold or surrendered to the applicable trustee for cancellation.

Interest

Each interest-bearing note will bear interest from its date of issue at the rate per annum, in the case of a fixed rate note, or pursuant to the interest rate formula, in the case of a floating rate note, in each case as specified in the applicable pricing supplement, until the principal thereof is paid. We will make interest payments in respect of fixed rate notes and floating rate notes in an amount equal to the interest accrued from and including the immediately preceding interest payment date in respect of which interest has been paid or from and including the date of issue, if no interest has been paid, to but excluding the applicable interest payment date or the maturity date, as the case may be (each, an "interest period").

Interest on fixed rate notes and floating rate notes will be payable in arrears on each interest payment date and on the maturity date. The first payment of interest on any note originally issued between a regular record date and the related interest payment date will be made on the interest payment date immediately following the next succeeding record date to the registered holder on the next succeeding record date. The "regular record date" shall be the fifteenth calendar day, whether or not a "business day", immediately preceding the related interest payment date. "Business day" is defined below under "—Interest Rates—Special Rate Calculation Terms." For the purpose of determining the holder at the close of business on a regular record date when business is not being conducted, the close of business will mean 5:00 P.M., New York City time, on that day.

Interest Rates

This subsection describes the different kinds of interest rates that may apply to your note, if it bears interest.

Fixed Rate Notes

The relevant pricing supplement will specify the interest payment dates for a fixed rate note as well as the maturity date. Interest on fixed rate notes will be computed on the basis of a 360-day year consisting of twelve 30-day months or such other day count fraction set forth in the pricing supplement.

If any interest payment date, redemption date, repayment date or maturity date of a fixed rate note falls on a day that is not a business day, we will make the required payment of principal, premium, if any, and/or interest on the next succeeding business day, and no additional interest will accrue in respect of the payment made on that next succeeding business day.

Floating Rate Notes

In this subsection, we use several specialized terms relating to the manner in which floating interest rates are calculated. These terms appear in bold, italicized type the first time they appear, and we define these terms under “—Special Rate Calculation Terms” at the end of this subsection.

The following will apply to floating rate notes:

Interest Rate Basis. We currently expect to issue floating rate notes that bear interest at rates based on one or more of the following interest rate bases:

- commercial paper rate;
- U.S. prime rate;
- LIBOR;
- EURIBOR;
- treasury rate;
- CMT rate;
- CMS rate; and/or
- federal funds rate.

We describe each of the interest rate bases in further detail below in this subsection. If you purchase a floating rate note, your pricing supplement will specify the interest rate basis that applies to your note.

Calculation of Interest. Calculations relating to floating rate notes will be made by the calculation agent, an institution that we appoint as our agent for this purpose. That institution may include any affiliate of ours, such as RBC Capital Markets, LLC. The pricing supplement for a particular floating rate note will name the institution that we have appointed to act as the calculation agent for that note as of its original issue date. We may appoint a different institution to serve as calculation agent from time to time after the original issue date of the note without your consent and without notifying you of the change.

For each floating rate note, the calculation agent will determine, on the corresponding interest calculation date or on the interest determination date, as described below, the interest rate that takes effect on each interest reset date. In addition, the calculation agent will calculate the amount of interest that has accrued during each interest period—that is, the period from and including the original issue date, or the last date to which interest has been paid or made available for payment, to but excluding the payment date. For each interest period, the calculation agent will calculate the amount of accrued interest by multiplying the face or other specified amount of the floating rate note by an accrued interest factor for the interest period. This factor will equal the sum of the interest factors calculated for each day during the interest period. The interest factor for each day will be expressed as a decimal and will be calculated by dividing the interest rate, also expressed as a decimal, applicable to that day by 360 or by the actual number of days in the year, as specified in the relevant pricing supplement.

Upon the request of the holder of any floating rate note, the calculation agent will provide for that note the interest rate then in effect—and, if determined, the interest rate that will become effective on the next interest reset date. The calculation agent's determination of any interest rate, and its calculation of the amount of interest for any interest period, will be final and binding in the absence of manifest error.

All percentages resulting from any calculation relating to a note will be rounded upward or downward, as appropriate, to the next higher or lower one hundred-thousandth of a percentage point, *e.g.*, 9.876541% (or .09876541) being rounded down to 9.87654% (or .0987654) and 9.876545% (or .09876545) being rounded up to 9.87655% (or .0987655). All amounts used in or resulting from any calculation relating to a floating rate note will be rounded upward or downward, as appropriate, to the nearest cent, in the case of U.S. dollars, or to the nearest corresponding hundredth of a unit, in the case of a currency other than U.S. dollars, with one-half cent or one-half of a corresponding hundredth of a unit or more being rounded upward.

In determining the interest rate basis that applies to a floating rate note during a particular interest period, the calculation agent may obtain rate quotes from various banks or dealers active in the relevant market, as discussed below. Those reference banks and dealers may include the calculation agent itself and its affiliates, as well as any agent participating in the distribution of the relevant floating rate notes and its affiliates, and they may include our affiliates.

Initial Interest Rate. For any floating rate note, the interest rate in effect from the original issue date to the first interest reset date will be the initial interest rate. We will specify the initial interest rate or the manner in which it is determined in the relevant pricing supplement.

Spread or Spread Multiplier. In some cases, the interest rate basis for a floating rate note may be adjusted:

- by adding or subtracting a specified number of basis points, called the spread, with one basis point being 0.01%; or
- by multiplying the interest rate basis by a specified percentage, called the spread multiplier.

If you purchase a floating rate note, your pricing supplement will indicate whether a spread or spread multiplier will apply to your note and, if so, the amount of the spread or spread multiplier.

Maximum and Minimum Rates. The actual interest rate, after being adjusted by the spread or spread multiplier, may also be subject to either or both of the following limits:

- a maximum rate—*i.e.*, a specified upper limit that the actual interest rate in effect at any time may not exceed; and/or
- a minimum rate—*i.e.*, a specified lower limit that the actual interest rate in effect at any time may not fall below.

If you purchase a floating rate note, your pricing supplement will indicate whether a maximum rate and/or minimum rate will apply to your note and, if so, what those rates are.

Whether or not a maximum rate applies, the interest rate on a floating rate note will in no event be higher than the maximum rate permitted by New York law, as it may be modified by U.S. law of general application and the *Criminal Code* (Canada). Under current New York law, the maximum rate of interest, with some exceptions, for any loan in an amount less than \$250,000 is 16% and for any loan in the amount of \$250,000 or more but less than \$2,500,000 is 25% per year on a simple interest basis. These limits do not apply to loans of \$2,500,000 or more, except for the *Criminal Code* (Canada), which limits the rate to 60%.

The rest of this subsection describes how the interest rate and the interest payment dates will be determined, and how interest will be calculated, on a floating rate note.

Interest Reset Dates. The rate of interest on a floating rate note will be reset, by the calculation agent described below, daily, weekly, monthly, quarterly, semi-annually or annually. The date on which the interest rate resets and the reset

rate becomes effective is called the interest reset date. Except as otherwise specified in the applicable pricing supplement, the interest reset date will be as follows:

- for floating rate notes that reset daily, each business day;
- for floating rate notes that reset weekly and are not treasury rate notes, the Wednesday of each week;
- for treasury rate notes that reset weekly, the Tuesday of each week;
- for floating rate notes that reset monthly, the third Wednesday of each month;
- for floating rate notes that reset quarterly, the third Wednesday of each of four months of each year as indicated in the relevant pricing supplement;
- for floating rate notes that reset semi-annually, the third Wednesday of each of two months of each year as indicated in the relevant pricing supplement; and
- for floating rate notes that reset annually, the third Wednesday of one month of each year as indicated in the relevant pricing supplement.

For a floating rate note, the interest rate in effect on any particular day will be the interest rate determined with respect to the latest interest reset date that occurs on or before that day. There are several exceptions, however, to the reset provisions described above.

If any interest reset date for a floating rate note would otherwise be a day that is not a business day, the interest reset date will be postponed to the next day that is a business day. For a LIBOR or EURIBOR note, however, if that business day is in the next succeeding calendar month, the interest reset date will be the immediately preceding business day.

Interest Determination Dates. The interest rate that takes effect on an interest reset date will be determined by the calculation agent by reference to a particular date called an interest determination date. Except as otherwise indicated in the relevant pricing supplement:

- for commercial paper rate, federal funds rate and U.S. prime rate notes, the interest determination date relating to a particular interest reset date will be the business day preceding the interest reset date;
- for LIBOR notes, the interest determination date relating to a particular interest reset date will be the second **London business day** preceding the interest reset date, unless the **index currency** is pounds sterling, in which case the interest determination date will be the interest reset date. We refer to an interest determination date for a LIBOR note as a LIBOR interest determination date;
- for EURIBOR notes, the interest determination date relating to a particular interest reset date will be the second **euro business day** preceding the interest reset date. We refer to an interest determination date for a EURIBOR note as a EURIBOR interest determination date;
- for treasury rate notes, the interest determination date relating to a particular interest reset date, which we refer to as a treasury interest determination date, will be the day of the week in which the interest reset date falls on which treasury bills—*i.e.*, direct obligations of the U.S. government—would normally be auctioned. Treasury bills are usually sold at auction the Monday of each week, unless that day is a legal holiday, in which case the auction is usually held on the following Tuesday, except that the auction may be held on the preceding Friday. If as the result of a legal holiday an auction is held the preceding Friday, that Friday will be the treasury interest determination date relating to the interest reset date occurring in the next succeeding week; and
- for CMT rate and CMS rate notes, the interest determination date relating to a particular interest reset date will be the second business day preceding the interest reset date.

The interest determination date pertaining to a floating rate note the interest rate of which is determined with reference to two or more interest rate bases will be the latest business day which is at least two business days before the related interest reset date for the applicable floating rate note on which each interest rate basis is determinable.

Interest Calculation Dates. As described above, the interest rate that takes effect on a particular interest reset date will be determined by reference to the corresponding interest determination date. Except for LIBOR notes and EURIBOR notes, however, the determination of the rate will actually be made on a day no later than the corresponding interest calculation date. The interest calculation date will be the earlier of the following:

- the tenth calendar day after the interest determination date or, if that tenth calendar day is not a business day, the next succeeding business day; and
- the business day immediately preceding the interest payment date or the maturity, whichever is the day on which the next payment of interest will be due.

The calculation agent need not wait until the relevant interest calculation date to determine the interest rate if the rate information it needs to make the determination is available from the relevant sources sooner.

Interest Payment Dates. The interest payment dates for a floating rate note will depend on when the interest rate is reset and, unless we specify otherwise in the relevant pricing supplement, will be as follows:

- for floating rate notes that reset daily, weekly or monthly, the third Wednesday of each month;
- for floating rate notes that reset quarterly, the third Wednesday of the four months of each year specified in the relevant pricing supplement;
- for floating rate notes that reset semi-annually, the third Wednesday of the two months of each year specified in the relevant pricing supplement; or
- for floating rate notes that reset annually, the third Wednesday of the month specified in the relevant pricing supplement.

Regardless of these rules, if a note is originally issued after the regular record date and before the date that would otherwise be the first interest payment date, the first interest payment date will be the date that would otherwise be the second interest payment date.

In addition, the following special provision will apply to a floating rate note with regard to any interest payment date other than one that falls on the maturity. If the interest payment date would otherwise fall on a day that is not a business day, then the interest payment date will be the next day that is a business day. However, if the floating rate note is a LIBOR note or a EURIBOR note and the next business day falls in the next calendar month, then the interest payment date will be advanced to the next preceding day that is a business day. If the maturity date of a floating rate note falls on a day that is not a business day, we will make the required payment of principal, premium, if any, and interest on the next succeeding business day, and no additional interest will accrue in respect of the payment made on that next succeeding business day.

Calculation Agent. We have initially appointed RBC Capital Markets, LLC as our calculation agent for the notes. See “—Calculation of Interest” above for details regarding the role of the calculation agent.

Commercial Paper Rate Notes

If you purchase a commercial paper rate note, your note will bear interest at an interest rate equal to the commercial paper rate and adjusted by the spread or spread multiplier, if any, indicated in your pricing supplement.

The commercial paper rate will be the *money market yield* of the rate, for the relevant interest determination date, for commercial paper having the *index maturity* indicated in your pricing supplement, as published in **H.15(519)** under the heading “Commercial Paper—Nonfinancial.” If the commercial paper rate cannot be determined as described above, the following procedures will apply:

- If the rate described above does not appear in H.15(519) by 3:00 P.M., New York City time, on the relevant interest calculation date, unless the calculation is made earlier and the rate is available from that source at that

time, then the commercial paper rate will be the rate, for the relevant interest determination date, for commercial paper having the index maturity specified in your pricing supplement, as published in **H.15 daily update** or any other recognized electronic source used for displaying that rate, under the heading “Commercial Paper—Nonfinancial.”

- If the rate described above does not appear in H.15(519), H.15 daily update or another recognized electronic source by 3:00 P.M., New York City time, on the relevant interest calculation date, unless the calculation is made earlier and the rate is available from one of those sources at that time, the commercial paper rate will be the money market yield of the arithmetic mean of the following offered rates for U.S. dollar commercial paper that has the relevant index maturity and is placed for an industrial issuer whose bond rating is “Aa”, or the equivalent, from a nationally recognized rating agency: the rates offered as of 11:00 A.M., New York City time, on the relevant interest determination date, by three leading U.S. dollar commercial paper dealers in New York City selected by the calculation agent.
- If fewer than three dealers selected by the calculation agent are quoting as described above, the commercial paper rate for the new interest period will be the commercial paper rate in effect for the prior interest period. If the initial interest rate has been in effect for the prior interest period, however, it will remain in effect for the new interest period.

U.S. Prime Rate Notes

If you purchase a U.S. prime rate note, your note will bear interest at an interest rate equal to the U.S. prime rate and adjusted by the spread or spread multiplier, if any, indicated in your pricing supplement.

The U.S. prime rate will be the rate, for the relevant interest determination date, published in H.15(519) opposite the heading “Bank prime loan.” If the U.S. prime rate cannot be determined as described above, the following procedures will apply:

- If the rate described above does not appear in H.15(519) by 3:00 P.M., New York City time, on the relevant interest calculation date, unless the calculation is made earlier and the rate is available from that source at that time, then the U.S. prime rate will be the rate, for the relevant interest determination date, as published in H.15 daily update or another recognized electronic source used for the purpose of displaying that rate, under the heading “Bank prime loan.”
- If the rate described above does not appear in H.15(519), H.15 daily update or another recognized electronic source by 3:00 P.M., New York City time, on the relevant interest calculation date, unless the calculation is made earlier and the rate is available from one of those sources at that time, then the U.S. prime rate will be the arithmetic mean of the following rates as they appear on the **Reuters screen US PRIME 1 page**: the rate of interest publicly announced by each bank appearing on that page as that bank’s prime rate or base lending rate, as of 11:00 A.M., New York City time, on the relevant interest determination date.
- If fewer than four of these rates appear on the Reuters screen US PRIME 1 page, the U.S. prime rate will be the arithmetic mean of the prime rates or base lending rates, as of the close of business on the relevant interest determination date, of three major banks in New York City selected by the calculation agent. For this purpose, the calculation agent will use rates quoted on the basis of the actual number of days in the year divided by a 360-day year.
- If fewer than three banks selected by the calculation agent are quoting as described above, the U.S. prime rate for the new interest period will be the U.S. prime rate in effect for the prior interest period. If the initial interest rate has been in effect for the prior interest period, however, it will remain in effect for the new interest period.

LIBOR Notes

If you purchase a LIBOR note, your note will bear interest at an interest rate equal to LIBOR, which will be the London interbank offered rate for deposits in U.S. dollars or any other index currency, as noted in your pricing supplement. In addition, when LIBOR is the interest rate basis the applicable LIBOR rate will be adjusted by the spread or spread multiplier, if any, indicated in your pricing supplement. LIBOR will be determined in the following manner:

- LIBOR will be the offered rate appearing on the *Reuters screen LIBOR Page* as of 11:00 A.M., London time, on the relevant LIBOR interest determination date, for deposits of the relevant index currency having the relevant index maturity beginning on the relevant interest reset date. Your pricing supplement will indicate the index currency, the index maturity and the reference page that apply to your LIBOR note. If no index currency is mentioned in your pricing supplement, the index currency for your LIBOR note will be U.S. dollars, and if no reference page is mentioned in your pricing supplement, Reuters Page LIBOR01 will apply to your LIBOR note.
- If the rate described above does not appear on that page, then LIBOR will be determined on the basis of the rates, at approximately 11:00 A.M., London time, on the relevant LIBOR interest determination date, at which deposits of the following kind are offered to prime banks in the London interbank market by four major banks in that market selected by the calculation agent: deposits of the index currency having the relevant index maturity, beginning on the relevant interest reset date, and in a *representative amount*. The calculation agent will request the principal London office of each of these banks to provide a quotation of its rate. If at least two quotations are provided, LIBOR for the relevant LIBOR interest determination date will be the arithmetic mean of the quotations.
- If fewer than two quotations are provided as described above, LIBOR for the relevant interest reset date will be the arithmetic mean of the rates for loans of the following kind to leading European banks quoted, at approximately 11:00 A.M., in the applicable *principal financial center*, on that LIBOR interest determination date, by three major banks in that financial center selected by the calculation agent: loans of the index currency having the relevant index maturity, beginning on the relevant interest reset date and in a representative amount.
- If fewer than three banks selected by the calculation agent are quoting as described above, LIBOR for the new interest period will be LIBOR in effect for the prior interest period. If the initial interest rate has been in effect for the prior interest period, however, it will remain in effect for the new interest period.

Notwithstanding the foregoing, if we, in consultation with the calculation agent, determine that LIBOR has been permanently discontinued, the calculation agent will use, as a substitute for LIBOR and for each future interest determination date, the *alternative rate*. As part of such substitution, the calculation agent will, after consultation with the Bank, make such adjustments to the alternative rate or the spread thereon, as well as the business day convention, interest determination dates and related provisions and definitions, in each case that are consistent with accepted market practice for the use of such alternative rate for debt obligations such as the Notes; provided however that if the calculation agent determines, and following consultation with the Bank, that there is no clear market consensus as to whether any rate has replaced LIBOR in customary market usage, we will appoint in our sole discretion an investment bank of national standing in the United States (which may be an affiliate of the Bank) to determine an appropriate alternative rate, and the decision of such investment bank will be binding on us, the calculation agent and the holders. If, however, the calculation agent determines that LIBOR has been discontinued, but for any reason an alternative rate has not been determined, LIBOR will be equal to such rate on the interest determination date when LIBOR was last available on the Reuters LIBOR01 Page, as determined by the calculation agent.

EURIBOR Notes

If you purchase a EURIBOR note, your note will bear interest at an interest rate equal to the interest rate for deposits in euro, designated as “EURIBOR” and sponsored jointly by the European Banking Federation and ACI—the Financial Market Association, or any company established by the joint sponsors for purposes of compiling and publishing that rate. In addition, when EURIBOR is the interest rate basis the EURIBOR base rate will be adjusted by the spread or spread multiplier, if any, specified in your pricing supplement. EURIBOR will be determined in the following manner:

- EURIBOR will be the offered rate for deposits in euros having the index maturity specified in your pricing supplement, beginning on the second euro business day after the relevant EURIBOR interest determination date, as that rate appears on **Reuters page EURIBOR01** as of 11:00 A.M., Brussels time, on the relevant EURIBOR interest determination date.
- If the rate described above does not appear on Reuters page EURIBOR01, EURIBOR will be determined on the basis of the rates, at approximately 11:00 A.M., Brussels time, on the relevant EURIBOR interest determination date, at which deposits of the following kind are offered to prime banks in the **euro-zone** interbank market by the principal euro-zone office of each of four major banks in that market selected by the calculation agent: euro deposits having the relevant index maturity, beginning on the relevant interest reset date, and in a representative amount. The

calculation agent will request the principal euro-zone office of each of these banks to provide a quotation of its rate. If at least two quotations are provided, EURIBOR for the relevant EURIBOR interest determination date will be the arithmetic mean of the quotations.

- If fewer than two quotations are provided as described above, EURIBOR for the relevant EURIBOR interest determination date will be the arithmetic mean of the rates for loans of the following kind to leading euro-zone banks quoted, at approximately 11:00 A.M., Brussels time on that EURIBOR interest determination date, by three major banks in the euro-zone selected by the calculation agent: loans of euros having the relevant index maturity, beginning on the relevant interest reset date, and in a representative amount.
- If fewer than three banks selected by the calculation agent are quoting as described above, EURIBOR for the new interest period will be EURIBOR in effect for the prior interest period. If the initial interest rate has been in effect for the prior interest period, however, it will remain in effect for the new interest period.

Treasury Rate Notes

If you purchase a treasury rate note, your note will bear interest at an interest rate equal to the treasury rate and adjusted by the spread or spread multiplier, if any, indicated in your pricing supplement.

The treasury rate will be the rate for the auction, on the relevant treasury interest determination date, of treasury bills having the index maturity specified in your pricing supplement, as that rate appears on *Reuters page USAUCTION 10* or *Reuters page USAUCTION11* under the heading “INVEST RATE”. If the treasury rate cannot be determined in this manner, the following procedures will apply:

- If the rate described above does not appear on either page by 3:00 P.M., New York City time, on the relevant interest calculation date, unless the calculation is made earlier and the rate is available from that source at that time, the treasury rate will be the ***bond equivalent yield*** of the rate, for the relevant interest determination date, for the type of treasury bill described above, as announced by the U.S. Department of the Treasury.
- If the auction rate described in the prior paragraph is not so announced by 3:00 P.M., New York City time, on the relevant interest calculation date, or if no such auction is held for the relevant week, then the treasury rate will be the bond equivalent yield of the rate, for the relevant treasury interest determination date and for treasury bills having the specified index maturity, as published in H.15(519) under the heading “U.S. government securities/Treasury bills (secondary market).”
- If the rate described in the prior paragraph does not appear in H.15(519) by 3:00 P.M., New York City time, on the relevant interest calculation date, unless the calculation is made earlier and the rate is available from one of those sources at that time, then the treasury rate will be the rate, for the relevant treasury interest determination date and for treasury bills having the specified index maturity, as published in H.15 daily update, or another recognized electronic source used for displaying that rate, under the heading “U.S. government securities/Treasury bills (secondary market).”
- If the rate described in the prior paragraph does not appear in H.15 daily update or another recognized electronic source by 3:00 P.M., New York City time, on the relevant interest calculation date, unless the calculation is made earlier and the rate is available from one of those sources at that time, the treasury rate will be the ***bond equivalent yield*** of the arithmetic mean of the following secondary market bid rates for the issue of treasury bills with a remaining maturity closest to the specified index maturity: the rates bid as of approximately 3:30 P.M., New York City time, on the relevant treasury interest determination date, by three primary U.S. government securities dealers in New York City selected by the calculation agent.
- If fewer than three dealers selected by the calculation agent are quoting as described in the prior paragraph, the treasury rate in effect for the new interest period will be the treasury rate in effect for the prior interest period. If the initial interest rate has been in effect for the prior interest period, however, it will remain in effect for the new interest period.

CMT Rate Notes

If you purchase a CMT rate note, your note will bear interest at an interest rate equal to the CMT rate and adjusted by the spread or spread multiplier, if any, indicated in your pricing supplement.

The CMT rate will be the following rate as published in H.15(519) opposite the heading “Treasury constant maturities,” as that rate is displayed on the *designated CMT Reuters page* under the heading “. . . Treasury Constant Maturities”, under the column for the *designated CMT index maturity*:

- if the designated CMT Reuters page is Reuters page FRBCMT, the rate for the relevant interest determination date; or
- if the designated CMT Reuters page is Reuters page FEDCMT, the weekly or monthly average, as specified in your pricing supplement, for the week that ends immediately before the week in which the relevant interest determination date falls, or for the month that ends immediately before the month in which the relevant interest determination date falls, as applicable.

If the CMT rate cannot be determined in this manner, the following procedures will apply:

- If the applicable rate described above is not displayed on the relevant designated CMT Reuters page at 3:00 P.M., New York City time, on the relevant interest determination date, unless the calculation is made earlier and the rate is available from that source at that time, then the CMT rate will be the applicable treasury constant maturity rate described above—*i.e.*, for the designated CMT index maturity and for either the relevant interest determination date or the weekly or monthly average, as applicable—as published in H.15(519) opposite the caption “Treasury constant maturities”.
- If the designated CMT Reuters page is FRBCMT and the applicable rate described above does not appear in H.15(519) by 3:00 P.M., New York City time, on the relevant interest determination date, unless the calculation is made earlier and the rate is available from one of those sources at that time, then the CMT rate will be the treasury constant maturity rate for the designated CMT index maturity and with reference to the relevant interest determination date, that:
 - is published by the Board of Governors of the Federal Reserve System, or the U.S. Department of the Treasury; and
 - is determined by the calculation agent to be comparable to the rate that would otherwise have been published in H.15(519).
- If the designated CMT Reuters page is FEDCMT and the applicable rate described above does not appear in H.15(519) by 3:00 P.M., New York City time, on the relevant interest determination date, unless the calculation is made earlier and the rate is available from that source at that time, the CMT rate will be the treasury constant maturity rate for the one-week or one-month rate, as applicable, for the designated CMT index maturity and with reference to the relevant interest determination date, that is otherwise announced by the Federal Reserve Bank of New York for the week or month, as applicable, immediately preceding that interest determination date.
- If the designated CMT Reuters page is FRBCMT the rate described in the second preceding paragraph does not appear by 3:00 P.M., New York City time, on the relevant interest determination date, unless the calculation is made earlier and the rate is available from one of those sources at that time, then the CMT rate will be the yield to maturity of the arithmetic mean of the following secondary market bid rates for the most recently issued treasury notes having an original maturity equal to the designated CMT index maturity and a remaining term to maturity of not less than the designated CMT index maturity minus one year, and in a representative amount: the bid rates, as of approximately 3:30 P.M., New York City time, on the relevant interest determination date, of three primary U.S. government securities dealers in New York City selected by the calculation agent. In selecting these bid rates, the calculation agent will request quotations from five of these primary dealers and will disregard the highest quotation—or, if there is equality, one of the highest—and the lowest quotation—or, if there is equality, one of the lowest. If fewer than five but more than two such offered rates are provided, the CMT rate will be based on the arithmetic mean of the bid prices provided, and neither the highest nor lowest of

such quotations will be eliminated. Treasury notes are direct, non-callable, fixed rate obligations of the U.S. government.

- If the designated CMT Reuters screen page is FEDCMT and the Federal Reserve Bank of New York does not publish a one-week or one-month rate, as applicable, for U.S. Treasury securities on the relevant interest determination date, unless the calculation is made earlier and the rate is available from one of those sources at that time, then the CMT rate will be the yield to maturity of the arithmetic mean of the following secondary market offered rates for the most recently issued treasury notes having an original maturity of approximately the designated CMT index maturity and a remaining term to maturity of not less than the designated CMT index maturity minus one year, and in a representative amount: the offered rates, as of approximately 3:30 P.M., New York City time, on the relevant interest determination date, of three primary U.S. government securities dealers in New York City selected by the calculation agent. In selecting these offered rates, the calculation agent will request quotations from five of these primary dealers and will disregard the highest quotation — or, if there is equality, one of the highest — and the lowest quotation — or, if there is equality, one of the lowest. If fewer than five but more than two such offered rates are provided, the CMT rate will be based on the arithmetic mean of the bid prices provided, and neither the highest nor lowest of such quotations will be eliminated.
- If the calculation agent is unable to obtain three quotations of the kind described in the prior two paragraphs, the CMT rate will be the yield to maturity of the arithmetic mean of the following secondary market bid rates for treasury notes with an original maturity longer than the designated CMT index maturity, with a remaining term to maturity closest to the designated CMT index maturity and in a representative amount: the bid rates, as of approximately 3:30 P.M., New York City time, on the relevant interest determination date, of three primary U.S. government securities dealers in New York City selected by the calculation agent. In selecting these bid rates, the calculation agent will request quotations from five of these primary dealers and will disregard the highest quotation (or, if there is equality, one of the highest) and the lowest quotation (or, if there is equality, one of the lowest).
- If fewer than five but more than two of these primary dealers are quoting as described in the prior paragraph, then the CMT rate for the relevant interest determination date will be based on the arithmetic mean of the bid rates so obtained, and neither the highest nor the lowest of those quotations will be disregarded. If two treasury notes with an original maturity longer than the designated CMT index maturity have remaining terms to maturity that are equally close to the designated CMT index maturity, the calculation agent will obtain quotations for the treasury note with the shorter remaining term to maturity.
- If two or fewer primary dealers selected by the calculation agent are quoting as described above, the CMT rate in effect for the new interest period will be the CMT rate in effect for the prior interest period. If the initial interest rate has been in effect for the prior interest period, however, it will remain in effect for the new interest period.

CMS Rate Notes

If you purchase a CMS rate note, your note will bear interest at an interest rate equal to the CMS rate and adjusted by the spread or spread multiplier, if any, indicated in your pricing supplement.

The CMS rate will be the rate for U.S. dollar swaps with a maturity for a specified number of years, expressed as a percentage in the relevant pricing supplement, which appears on the *Reuters page ISDAFIX1* as of 11:00 a.m., New York City time, on the interest rate determination date.

- If the applicable rate described above does not appear by 11:00 a.m., New York City time, on the interest determination date, then the CMS rate will be a percentage determined on the basis of the mid-market, semi-annual swap rate quotations provided by five leading swap dealers in the New York City interbank market at approximately 11:00 a.m., New York City time, on the interest determination date. For this purpose, the semi-annual swap rate means the mean of the bid and offered rates for the semi-annual fixed leg, calculated on a 30/360 day count basis, of a fixed-for-floating U.S. dollar interest rate swap transaction with a term equal to the index maturity designated in the relevant pricing supplement commencing on the reset date and in a representative amount with an acknowledged dealer of good credit in the swap market, where the floating leg, calculated on an Actual/360 day count basis, as such rate may be determined in accordance with the provisions set forth below under “— LIBOR Notes” with an index maturity of three months. The calculation agent will select the five swap dealers after consultation with us and will request the principal New York City office of

each of those dealers to provide a quotation of its rate. If at least three quotations are provided, the CMS rate for that interest determination date will be the arithmetic mean of the quotations, eliminating the highest and lowest quotations or, in the event of equality, one of the highest and one of the lowest quotations.

- If fewer than three leading swap dealers selected by the calculation agent are quoting as described above, the CMS rate will remain the CMS rate in effect on that interest rate determination date or, if that interest rate determination date is the first reference rate determination date, the initial interest rate.

Federal Funds Rate Notes

If you purchase a federal funds rate note, your note will bear interest at an interest rate equal to the federal funds rate and adjusted by the spread or spread multiplier, if any, indicated in your pricing supplement.

The federal funds rate will be the rate for U.S. dollar federal funds as of the relevant interest determination date, as published in H.15(519) under the heading “Federal Funds (effective)”, as that rate is displayed on **Reuters page FEDFUNDS1** under the heading “EFFECT”. If the federal funds rate cannot be determined in this manner, the following procedures will apply:

- If the rate described above is not displayed on Reuters page FEDFUNDS1 by 3:00 P.M., New York City time, on the relevant interest calculation date, unless the calculation is made earlier and the rate is available from that source at that time, then the federal funds rate, as of the relevant interest determination date, will be the rate described above as published in H.15 daily update, or another recognized electronic source used for displaying that rate, under the heading “Federal Funds (Effective).”
- If the rate described above is not displayed on Reuters page FEDFUNDS1 and does not appear in H.15(519), H.15 daily update or another recognized electronic source by 3:00 P.M., New York City time, on the relevant interest calculation date, unless the calculation is made earlier and the rate is available from one of those sources at that time, the federal funds rate will be the arithmetic mean of the rates for the last transaction in overnight, U.S. dollar federal funds arranged, before 9:00 A.M., New York City time, on the business day following the relevant interest determination date, by three leading brokers of U.S. dollar federal funds transactions in New York City selected by the calculation agent.
- If fewer than three brokers selected by the calculation agent are quoting as described above, the federal funds rate in effect for the new interest period will be the federal funds rate in effect for the prior interest period. If the initial interest rate has been in effect for the prior interest period, however, it will remain in effect for the new interest period.

Special Rate Calculation Terms

In this subsection entitled “—Interest Rates”, we use several terms that have special meanings relevant to calculating floating interest rates. We define these terms as follows:

The term the “alternative rate” means the alternative reference rate selected by the central bank, reserve bank, monetary authority or any similar institution (including any committee or working group thereof) in the jurisdiction of the applicable index currency that is consistent with accepted market practice in the event that LIBOR is permanently discontinued.

The term “bond equivalent yield” means a yield expressed as a percentage and calculated in accordance with the following formula:

$$\text{bond equivalent yield} = \frac{D \times N}{360 - (D \times M)} \times 100$$

where

“D” means the annual rate for treasury bills quoted on a bank discount basis and expressed as a decimal;

“N” means 365 or 366, as the case may be; and

“M” means the actual number of days in the applicable interest reset period.

The term “business day” means, for any note, a day that meets all the following applicable requirements:

- for all notes, is a Monday, Tuesday, Wednesday, Thursday or Friday that is neither a legal holiday nor a day on which banking institutions are authorized or required by law to close in New York City or Toronto, and, in the case of a floating rate note, London;
- if the note has a specified currency other than U.S. dollars or euros, is also a day on which banking institutions are not authorized or obligated by law, regulation or executive order to close in the applicable principal financial center; and
- if the note is a EURIBOR note or has a specified currency of euros, or is a LIBOR note for which the index currency is euros, is also a euro business day.

The term “designated CMT index maturity” means the index maturity for a CMT rate note and will be the original period to maturity of a U.S. treasury security—either 1, 2, 3, 5, 7, 10, 20 or 30 years—specified in the applicable pricing supplement.

The term “designated CMT Reuters page” means the Reuters page mentioned in the relevant pricing supplement that displays treasury constant maturities as reported in H.15(519). If no Reuters page is so specified, then the applicable page will be Reuters page FEDCMT. If Reuters page FEDCMT applies but the relevant pricing supplement does not specify whether the weekly or monthly average applies, the weekly average will apply.

The term “euro business day” means any day on which the Trans-European Automated Real-Time Gross Settlement Express Transfer (TARGET2) System, or any successor system, is open for business.

The term “euro-zone” means, at any time, the region comprised of the member states of the European Economic and Monetary Union that, as of that time, have adopted a single currency in accordance with the Treaty on European Union of February 1992.

“H.15(519)” means the weekly statistical release entitled “Statistical Release H.15(519)”, or any successor publication, published by the Board of Governors of the Federal Reserve System.

“H.15 daily update” means the daily update of H.15(519) available through the worldwide website of the Board of Governors of the Federal Reserve System, at <http://www.federalreserve.gov/releases/h15/update>, or any successor site or publication.

The term “index currency” means, with respect to a LIBOR note, the currency specified as such in the relevant pricing supplement. The index currency may be U.S. dollars or any other currency, and will be U.S. dollars unless another currency is specified in the relevant pricing supplement.

The term “index maturity” means, with respect to a floating rate note, the period to maturity of the instrument or obligation on which the interest rate formula is based, as specified in the applicable pricing supplement.

“London business day” means any day on which dealings in the relevant index currency are transacted in the London interbank market.

The term “money market yield” means a yield expressed as a percentage and calculated in accordance with the following formula:

$$\text{money market yield} = \frac{D \times 360}{360 - (D \times M)} \times 100$$

where

“D” means the annual rate for commercial paper quoted on a bank discount basis and expressed as a decimal; and

“M” means the actual number of days in the relevant interest reset period.

The term “principal financial center” means the capital city of the country to which an index currency relates (or the capital city of the country issuing the specified currency, as applicable), except that with respect to U.S. dollars, Australian dollars, Canadian dollars, South African rands and Swiss francs, the “principal financial center” means The City of New York, Sydney, Toronto, Johannesburg and Zurich, respectively, and with respect to euros the principal financial center means London.

The term “representative amount” means an amount that, in the calculation agent’s judgment, is representative of a single transaction in the relevant market at the relevant time.

“Reuters screen LIBOR Page” means the display on the Reuters screen LIBOR01 page or LIBOR02 page, as specified in applicable pricing supplement, on the Reuters 3000 Xtra service (or any successor service) (or any replacement page or pages on the Reuters 3000 Xtra service or any successor service on which London interbank rates of major banks for the relevant index currency are displayed).

“Reuters screen US PRIME 1 page” means the display on the “US PRIME 1” page on the Reuters 3000 Xtra service, or any successor service, or any replacement page or pages on that service, for the purpose of displaying prime rates or base lending rates of major U.S. banks.

“Reuters page” means the display on the Reuters 3000 Xtra service, or any successor service, on the page or pages specified in this prospectus supplement or the relevant pricing supplement, or any replacement page or pages on that service.

If, when we use the terms designated CMT Reuters page, H.15(519), H.15 daily update, Reuters screen US PRIME 1 page, Reuters screen LIBOR Page or Reuters page, we refer to a particular heading or headings on any of those pages, those references include any successor or replacement heading or headings as determined by the calculation agent.

Special Provisions Related to Bail-inable Notes

The indenture provides for certain provisions applicable to bail-inable notes. The applicable pricing supplement will specify whether or not your note is a bail-inable note.

Agreement with Respect to the Exercise of Canadian Bail-in Powers

By its acquisition of an interest in any bail-inable note, each holder or beneficial owner of that note is deemed to (i) agree to be bound, in respect of the bail-inable notes, by the CDIC Act, including the conversion of the bail-inable notes, in whole or in part – by means of a transaction or series of transactions and in one or more steps – into common shares of the Bank or any of its affiliates under subsection 39.2(2.3) of the CDIC Act and the variation or extinguishment of the bail-inable notes in consequence, and by the application of the laws of the Province of Ontario and the federal laws of Canada applicable therein in respect of the operation of the CDIC Act with respect to the bail-inable notes; (ii) attorn and submit to the jurisdiction of the courts in the Province of Ontario with respect to the CDIC Act and those laws; and (iii) acknowledge and agree that the terms referred to in clauses (i) and (ii) above are binding on that holder or beneficial owner despite any provisions in the indenture or the bail-inable notes, any other law that governs the bail-inable notes and any other agreement, arrangement or understanding between that holder or beneficial owner and the Bank with respect to the bail-inable notes.

Holders and beneficial owners of bail-inable notes will have no further rights in respect of their bail-inable notes to the extent those bail-inable notes are converted in a bail-in conversion, other than those provided under the bail-in regime, and by its acquisition of an interest in any bail-inable note, each holder or beneficial owner of that note is deemed to

irrevocably consent to the principal amount of that note and any accrued and unpaid interest thereon being deemed paid in full by the Bank by the issuance of common shares of the Bank (or, if applicable, any of its affiliates) upon the occurrence of a bail-in conversion, which bail-in conversion will occur without any further action on the part of that holder or beneficial owner or the trustee; provided that, for the avoidance of doubt, this consent will not limit or otherwise affect any rights that holders or beneficial owners may have under the bail-in regime.

TLAC Disqualification Event Redemption

If a TLAC Disqualification Event (as defined below) is specified in the applicable pricing supplement, we may, at our option, with the prior approval of the Superintendent, redeem all but not less than all of the particular bail-inable notes prior to their stated maturity date after the occurrence of the TLAC Disqualification Event at the time and at the redemption price or prices specified in that pricing supplement, together with unpaid interest accrued thereon to, but excluding, the date fixed for redemption.

A “TLAC Disqualification Event” means OSFI has advised the Bank in writing that the bail-inable notes issued under the applicable pricing supplement will no longer be recognized in full as TLAC under the TLAC Guideline as interpreted by the Superintendent, provided that a TLAC Disqualification Event will not occur where the exclusion of those bail-inable notes from the Bank’s TLAC requirements is due to the remaining maturity of those bail-inable notes being less than any period prescribed by any relevant eligibility criteria applicable as of the issue date of those bail-inable notes.

No Set-Off or Netting Rights

Holders and beneficial owners of bail-inable notes will not be entitled to exercise, or direct the exercise of, any set-off or netting rights with respect to their bail-inable notes.

Approval of Redemption, Repurchases and Defeasance; Amendments and Modifications

Where the redemption, repurchase or any defeasance or covenant defeasance with respect to bail-inable notes would result in the Bank not meeting the TLAC requirements applicable to it pursuant to the TLAC Guideline, that redemption, repurchase, defeasance or covenant defeasance will be subject to the prior approval of the Superintendent.

Where an amendment, modification or other variance that can be made to the indenture or the bail-inable notes as described in the accompanying prospectus under “Description of Debt Securities — Modification and Waiver of the Debt Securities” would affect the recognition of those bail-inable notes by the Superintendent as TLAC, that amendment, modification or variance will require the prior approval of the Superintendent.

Remedies If an Event of Default Occurs

Holders and beneficial owners of bail-inable notes may only exercise, or direct the exercise of, the rights described in the accompanying prospectus under “Description of Debt Securities — Events of Default — Remedies If an Event of Default Occurs” if the Governor in Council (Canada) has not made an order under Canadian bank resolution powers pursuant to subsection 39.13(1) of the CDIC Act in respect of the Bank. Notwithstanding the exercise of those rights, bail-inable notes will continue to be subject to bail-in conversion until repaid in full.

Subsequent Holders’ Agreement

Each holder or beneficial owner of a bail-inable note that acquires an interest in the bail-inable note in the secondary market and any successors, assigns, heirs, executors, administrators, trustees in bankruptcy and legal representatives of any holder or beneficial owner is deemed to acknowledge, accept, agree to be bound by and consent to the same provisions specified herein to the same extent as the holders or beneficial owners that acquired an interest in the bail-inable notes upon their initial issuance, including, without limitation, with respect to the acknowledgement and agreement to be bound by and consent to the terms of the bail-inable notes related to the bail-in regime.

Governing Law; Submission to Jurisdiction

The indenture and the notes are governed by and construed in accordance with the laws of the State of New York, except that the provisions relating to the bail-in acknowledgment of holders and beneficial owners of bail-inable notes described in the first paragraph under “— Agreement with Respect to the Exercise of Canadian Bail-in Powers” above, are governed by and construed in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable

therein. By its acquisition of an interest in any bail-inable note, each holder or beneficial owner of that bail-inable note is deemed to attorn and submit to the jurisdiction of the courts in the Province of Ontario with respect to actions, suits and proceedings arising out of or relating to the operation of the CDIC Act and the laws of the Province of Ontario and the federal laws of Canada applicable therein in respect of the indenture and the bail-inable note.

Other Provisions; Addenda

Any provisions relating to the notes, including the determination of the interest rate basis, calculation of the interest rate applicable to a floating rate note, its interest payment dates, any redemption or repayment provisions, or any other term relating thereto, may be modified and/or supplemented by the terms as specified under “Other Provisions” on the face of the applicable notes or in an Addendum relating to the applicable notes, if so specified on the face of the applicable notes, and, in each case, in the relevant pricing supplement.

CERTAIN INCOME TAX CONSEQUENCES

United States Taxation

For a general overview of the tax consequences of owning debt securities that we offer, please see the discussion in the accompanying prospectus under “Tax Consequences—United States Taxation.”

However, the tax consequences of any particular note depend on its terms, and the tax treatment of each note will be described in the applicable pricing supplement. Consequently, except to the extent the pricing supplement indicates otherwise, you should not rely on the general overview of tax consequences in the accompanying prospectus in deciding whether to invest in any note. Moreover, in all cases, you should consult with your own tax advisor concerning the consequences of investing in and holding any particular note you propose to purchase.

Canadian Taxation

In the opinion of our Canadian tax counsel, Norton Rose Fulbright Canada LLP, the following summary describes, as of the date hereof, the principal Canadian federal income tax consequences under the Income Tax Act (Canada) (the “Tax Act”), generally applicable to a holder of notes who acquires, as beneficial owner, notes in an initial offering or common shares of the Bank or an affiliate of the Bank on a bail-in conversion, and who, at all relevant times and for the purposes of the Tax Act: (i) deals at arm’s length and is not affiliated with the Bank, and (ii) acquires and holds the notes and common shares as capital property and (ii) is entitled to receive all payments of interest and principal under the notes (a “noteholder”). Generally, the notes and common shares, as applicable, will constitute capital property to a noteholder provided that the noteholder does not hold the notes or common shares, as applicable, in the course of carrying on a business of buying and selling securities and does not acquire them as part of an adventure or concern in the nature of trade.

This summary is not applicable to a noteholder: (i) that is a “financial institution” as defined in the Tax Act for purposes of the “mark-to-market” rules; (ii) an interest in which is or for whom a note or common share would be a “tax shelter investment” as defined in the Tax Act; (iii) that is a “specified financial institution” (as defined in the Tax Act); (iv) that has elected to report its “Canadian tax results” in a currency other than the Canadian currency, (v) that has entered or will enter into, with respect to the notes or common shares, a “derivative forward agreement” as that term is defined in the Tax Act; or (vi) that carries or is deemed to carry on an insurance business in Canada and elsewhere. Such noteholders should consult their own tax advisors.

This summary is based upon the current provisions of the Tax Act and the regulations thereunder (the “Regulations”), all specific proposals to amend the Tax Act or such Regulations publicly announced by the federal Minister of Finance (Canada) prior to the date hereof (the “Proposals”) and our understanding of the current administrative policies and assessing practices of the Canada Revenue Agency (“CRA”) published in writing by it. This summary assumes that the Proposals will be enacted as currently proposed, but no assurance can be given that this will be the case. This summary is not exhaustive of all possible Canadian federal income tax considerations and, except for the Proposals, this summary does not take into account or anticipate any changes in the law or the administrative policies or assessing practices of the CRA, whether by judicial, regulatory, governmental or legislative action, nor does it take into account tax laws of any province or territory of Canada, or of any jurisdiction outside Canada.

This summary assumes that any affiliate of the Bank the shares of which are acquired by a noteholder pursuant to a bail-in conversion is a resident of Canada for purposes of the Tax Act.

This summary is of a general nature only and is not intended to be, nor should it be construed to be, legal or tax advice to any particular noteholder. Accordingly, prospective noteholders should consult their own tax advisors with respect to their particular circumstances. In addition, the tax consequences relevant to the holding or disposition of any particular note depends on its terms. To the extent such tax consequences are materially different than those described herein, the tax treatment of such particular note will be described in the applicable pricing supplement. You should consult with your own tax advisor concerning the consequences of investing in and holding any particular note you propose to purchase.

Currency

All amounts relating to the acquisition, holding or disposition of the notes must be converted into Canadian dollars based on the relevant exchange rate quoted by the Bank of Canada on the relevant day or such other rate or rates of exchange acceptable to the Ministry of Finance (Canada). A noteholder may realize a capital gain or capital loss by virtue of exchange

rate fluctuations. The amount of interest required to be included in computing the noteholder's income for a taxation year will also be affected by fluctuations in the relevant exchange rate.

Noteholders Not Resident in Canada

An investor who is a Non-resident Holder as defined in the accompanying prospectus should read carefully the description of material Canadian federal income tax considerations relevant to a Non-resident Holder owning debt securities under "Tax Consequences—Canadian Taxation" in the accompanying prospectus.

Noteholders Resident in Canada

The following discussion applies to a noteholder who, at all relevant times, for the purposes of the Tax Act and any applicable income tax treaty or convention, is or is deemed to be resident in Canada (a "Resident Holder").

Certain Resident Holders who might not otherwise be considered to hold their notes as capital property may, in certain circumstances, be entitled to have the notes, common shares, and all other "Canadian securities" (as defined in the Tax Act) owned by such Resident Holders, treated as capital property by making the irrevocable election permitted by subsection 39(4) of the Tax Act.

Interest

A Resident Holder that is a corporation, partnership, unit trust or a trust of which a corporation or partnership is a beneficiary will be required to include in computing its income for a taxation year the entire amount of any interest (or amount considered to be interest) on the notes that accrues or is deemed to accrue to it to the end of that taxation year or becomes receivable or is received by it before the end of that taxation year, to the extent that such amount was not included in computing the Resident Holder's income for a preceding taxation year.

Any other Resident Holder, including an individual (other than a trust described in the preceding paragraph), will be required to include in computing its income for a taxation year the amount of any interest (or amount considered to be interest) on the notes that is received or receivable by such Resident Holder in that year (depending on the method regularly followed by the Resident Holder in computing its income) to the extent that such amount was not included in computing the Resident Holder's income for a preceding taxation year. In addition, if at any time a note becomes an "investment contract" (as defined in the Tax Act) in relation to the Resident Holder, such Resident Holder will be required to include in computing income for a taxation year any interest that accrues to the Resident Holder on the note up to any "anniversary date" (as defined in the Tax Act) in that year to the extent such interest was not otherwise included in the Resident Holder's income for that or a preceding taxation year.

Redemption or other Disposition of Notes

On a disposition or a deemed disposition of a note (including a redemption or a repayment at maturity), a Resident Holder will generally be required to include in computing its income for the taxation year in which the disposition or deemed disposition occurs all interest (or amount considered to be interest) that accrued or is deemed to accrue on the note from the date of the last interest payment to the date of disposition or deemed disposition, except to the extent that such interest has otherwise been included in the Resident Holder's income for that or a preceding taxation year.

A Resident Holder who disposes or is deemed to have disposed of a note (including on maturity of the notes, pursuant to a redemption, as a result of a bail-in conversion or other acquisition by us) should realize a capital gain (or a capital loss) to the extent that the proceeds of disposition, net of amounts included in income as interest and any reasonable costs of disposition, exceed (or are less than) the Resident Holder's adjusted cost base of the notes. Resident Holders who dispose of notes prior to the maturity date thereof, particularly those who dispose of notes shortly prior to the maturity date thereof, should consult their own tax advisors with respect to their particular circumstances.

With respect to an assignment or transfer of an Indexed Note by a Resident Holder (other than as a consequence of a repayment or redemption of the Indexed Note), the Resident Holder may be required to include in its income as accrued interest, an amount equal to the amount, if any, by which the price for which the Indexed Note was assigned or transferred exceeds the amount by which the price (converted to Canadian dollars using the exchange rate prevailing at the time of the assignment or transfer, if the Indexed Note is denominated in a currency other than Canadian dollars) for which the Indexed Note was issued exceeds the portion, if any, of the principal amount of the Indexed Note (converted to Canadian dollars using the exchange rate prevailing at the time of the assignment or transfer, if the Indexed Note is denominated in a currency other

than Canadian dollars) that was repaid by the Bank on or before the time of the assignment or transfer. **Resident Holders who dispose of Indexed Notes other than as a consequence of the repayment or redemption of the Indexed Notes by the Bank should consult their tax advisors with respect to their particular circumstances.**

Dividends on Common Shares

A Resident Holder will be required to include in computing its income for a taxation year any taxable dividends received or deemed to be received on the Common Shares. In the case of a Resident Holder that is an individual (other than certain trusts), such dividend will be subject to the gross-up and dividend tax credit rules normally applicable under the Tax Act to taxable dividends received from taxable Canadian corporations. Taxable dividends received from a taxable Canadian corporation that are designated by the corporation as “eligible dividends” will be subject to an enhanced gross-up and tax credit regime in accordance with the rules in the Tax Act. There may be limitations on the ability of the Corporation to designate dividends as eligible dividends. In the case of a Resident Holder that is a corporation, the amount of any such taxable dividend that is included in its income for a taxation year will generally be deductible in computing its taxable income for that taxation year. In certain circumstances, subsection 55(2) of the Tax Act will treat a taxable dividend received or deemed to be received by a Resident Holder that is a corporation as proceeds of disposition or a capital gain. Resident Holders that are corporations should consult their own tax advisors having regard to their own circumstances.

Dispositions of Common Shares

A Resident Holder who disposes of, or is deemed for the purposes of the Tax Act to have disposed of, a common share acquired on a bail-in conversion will generally realize a capital gain (or capital loss) in the taxation year of the disposition equal to the amount by which the proceeds of disposition are greater (or are less) than the total of: (i) the adjusted cost base to the Resident Holder of the common share immediately before the disposition or deemed disposition, and (ii) any reasonable costs of disposition. The adjusted cost base to a Resident Holder of common shares acquired pursuant to a bail-in conversion will be determined by averaging the cost of such common shares with the adjusted cost base of all other common shares (if any) held by the Resident Holder as capital property at that time.

Treatment of Capital Gains and Losses

One-half of any capital gain realized will constitute a taxable capital gain that must be included in the calculation of the Resident Holder’s income. One-half of any capital loss incurred will constitute an allowable capital loss that is deductible against taxable capital gains of the Resident Holder, subject to and in accordance with the provisions of the Tax Act.

If a Resident Holder is a corporation, any capital loss realized on a disposition or deemed disposition of common shares may, in certain circumstances, be reduced by the amount of any dividends which have been received or which are deemed to have been received on such common shares (or a share for which a common share has been substituted). Similar rules may apply where a Resident Holder that is a corporation is a member of a partnership or a beneficiary of a trust that owns common shares directly or indirectly through a partnership or a trust. Resident Holders to whom these rules may be relevant should consult their own tax advisors.

Other Taxes

A Resident Holder that is throughout the relevant taxation year a “Canadian controlled private corporation” (as defined in the Tax Act) may be liable to pay an additional tax of 10 2/3% on its “aggregate investment income” (as defined in the Tax Act) for the year, including interest and taxable capital gains. Such additional tax may be refundable in certain circumstances. Resident Holders should consult their own tax advisors in this regard.

Interest, capital gains and taxable dividends received by a Resident Holder who is an individual (including certain trusts) may result in such Resident Holder being liable for alternative minimum tax under the Tax Act. Such resident Holders should consult their own tax advisors in this regard.

SUPPLEMENTAL PLAN OF DISTRIBUTION

We and RBC Capital Markets, LLC, Barclays Capital Inc., Citigroup Global Markets Inc., Credit Suisse Securities (USA) LLC, Deutsche Bank Securities Inc., Goldman, Sachs & Co., Incapital LLC, J.P. Morgan Securities LLC, Merrill Lynch, Pierce, Fenner & Smith Incorporated, Morgan Stanley & Co. LLC, UBS Financial Services Inc., UBS Securities LLC and Wells Fargo Securities, LLC, as agents, have entered into a distribution agreement with respect to the notes. The agent or agents through whom the notes will be offered will be identified in the applicable pricing supplement. Subject to certain conditions, the agents have agreed to use their reasonable efforts to solicit purchases of the notes. We have the right to accept offers to purchase notes and may reject any proposed purchase of the notes. The agents may also reject any offer to purchase notes. We will pay the agents a commission on any notes sold through the agents. The commission is expected to range from 0% to 0.5% of the principal amount of the notes, depending on the stated maturity of the notes, for fixed rate and floating rate notes. The commission is expected to range from 1% to 5% of the principal amount of the notes for indexed and other structured notes, or in such other amount as may be agreed between the agents and Royal Bank of Canada.

We may also sell notes to the agents, who will purchase the notes as principal for their own accounts. In that case, the agent will purchase the notes at a price equal to the issue price specified in the applicable pricing supplement, less a discount to be agreed with us at the time of the offering.

The agents may resell any notes they purchase as principal to other brokers or dealers at a discount, which may include all or part of the discount the agents received from us. If all the notes are not sold at the initial offering price, the agents may change the offering price and the other selling terms.

We may also sell notes directly to investors. We will not pay commissions on notes we sell directly.

We have reserved the right to withdraw, cancel or modify the offer made by this prospectus supplement without notice and may reject orders in whole or in part whether placed directly with us or with an agent. No termination date has been established for the offering of the notes.

The agents, whether acting as agent or principal, may be deemed to be “underwriters” within the meaning of the Securities Act of 1933, as amended (the “Securities Act”). We have agreed to indemnify the agents against certain liabilities, including liabilities under the Securities Act, or to contribute to payments made in respect of those liabilities.

If the agents sell notes to dealers who resell to investors and the agents pay the dealers all or part of the discount or commission they receive from us, those dealers may also be deemed to be “underwriters” within the meaning of the Securities Act.

Unless otherwise indicated in any pricing supplement, payment of the purchase price of notes, other than notes denominated in a non-U.S. dollar currency, will be required to be made in funds immediately available in The City of New York. The notes will be the Same Day Funds Settlement System at DTC and, to the extent the secondary market trading in the notes is effected through the facilities of such depository, such trades will be settled in immediately available funds.

We may appoint additional agents with respect to the notes. Any other agents will be named in the applicable pricing supplements and those agents will enter into the distribution agreement referred to above. The agents referred to above and any additional agents may engage in commercial banking and investment banking and other transactions with and perform services for Royal Bank of Canada and our affiliates in the ordinary course of business. RBC Capital Markets, LLC is an affiliate of the Royal Bank of Canada and may resell notes to or through another of our affiliates, as selling agent.

The notes are a new issue of securities, and there will be no established trading market for any note before its original issue date. We do not plan to list the notes on a securities exchange or quotation system. We have been advised by each of the agents named above that they may make a market in the notes offered through them. However, neither RBC Capital Markets, LLC nor any of our other affiliates nor any other agent named in your pricing supplement that makes a market is obligated to do so, and any of them may stop doing so at any time without notice. No assurance can be given as to the liquidity or trading market for the notes.

This prospectus supplement may be used by RBC Capital Markets, LLC and any other agent in connection with offers and sales of the notes in market-making transactions. In a market-making transaction, an agent or other person resells a note it acquires from other holders after the original offering and sale of the note. Resales of this kind may occur in the open market or may be privately negotiated, at prevailing market prices at the time of resale or at related or negotiated prices. In these transactions, such agent may act as principal or agent, including as agent for the counterparty in a transaction in which

RBC Capital Markets, LLC or another agent acts as principal, or as agent for both counterparties in a transaction in which RBC Capital Markets, LLC does not act as principal. The agents may receive compensation in the form of discounts and commissions, including from both counterparties in some cases. Other affiliates of Royal Bank of Canada (in addition to RBC Capital Markets, LLC) and the Bank may also engage in transactions of this kind and may use this prospectus supplement for this purpose. The Bank and any of its affiliates may engage in market-making transactions only in those jurisdictions in which it has all necessary governmental and regulatory authorizations for such activity.

The aggregate initial offering price specified on the cover of this prospectus supplement relates to the initial offering of new notes we may issue on and after the date of this prospectus supplement. This amount does not include notes that may be resold in market-making transactions. The latter includes notes that we may issue going forward as well as notes we have previously issued.

Royal Bank of Canada does not expect to receive any proceeds from market-making transactions, except to the extent it is entitled to proceeds of its own sales of notes in such transactions. Royal Bank of Canada does not expect that any agent that engages in these transactions will pay any proceeds from its market-making resales to Royal Bank of Canada.

Information about the trade and settlement dates, as well as the purchase price, for a market-making transaction will be provided to the purchaser in a separate confirmation of sale.

Unless Royal Bank of Canada or an agent informs you in your confirmation of sale that your note is being purchased in its original offering and sale, you may assume that you are purchasing your note in a market-making transaction.

In this prospectus supplement, the term “this offering” means the initial offering of the notes made in connection with their original issuance. This term does not refer to any subsequent resales of notes in market-making transactions.

The agents may engage in over-allotment, stabilizing transactions, syndicate covering transactions and penalty bids in accordance with Regulation M under the Exchange Act. Over-allotment involves syndicate sales in excess of the offering size, which creates a syndicate short position. Stabilizing transactions permit bids to purchase the underlying security so long as the stabilizing bids do not exceed a specified maximum. Syndicate covering transactions involve purchases of the notes in the open market after the distribution has been completed in order to cover syndicate short positions. Penalty bids permit reclaiming a selling concession from a syndicate member when the notes originally sold by such syndicate member are purchased in a syndicate covering transaction to cover syndicate short positions. Such stabilizing transactions, syndicate covering transactions and penalty bids may stabilize, maintain or otherwise affect the market price of the notes, which may be higher than it would otherwise be in the absence of such transactions. The agents are not required to engage in these activities, and may end any of these activities at any time.

In addition to offering notes through the agents as discussed above, other medium-term notes that have terms substantially similar to the terms of the notes offered by this prospectus supplement may in the future be offered, concurrently with the offering of the notes, on a continuing basis by Royal Bank of Canada. Any of these notes sold pursuant to the distribution agreement or sold by Royal Bank of Canada directly to investors will reduce the aggregate amount of notes which may be offered by this prospectus supplement.

DOCUMENTS FILED AS PART OF THE REGISTRATION STATEMENT

In addition to the documents specified in the accompanying prospectus under “Documents Incorporated by Reference,” the following documents were filed with the Securities and Exchange Commission and incorporated by reference as part of the registration statement to which this prospectus supplement relates (the “Registration Statement”): (i) the Distribution Agreement, dated September 7, 2018, between us and the agents, (ii) the Calculation Agency Agreement, dated as of September 7, 2018, between us and RBC Capital Markets, LLC, and (iii) the Exchange Rate Agency Agreement, dated as of September 7, 2018, between us and RBC Capital Markets, LLC. Such documents will not be incorporated by reference into this prospectus supplement or the accompanying prospectus. Additional exhibits to the Registration Statement to which this prospectus supplement relates may be subsequently filed in reports on Form 40-F or on Form 6-K that specifically state that such materials are incorporated by reference as exhibits in Part II of the Registration Statement.

No dealer, salesperson or other person has been authorized to give any information or to make any representation not contained in this prospectus supplement, the accompanying prospectus or any pricing supplement and, if given or made, such information or representation must not be relied upon as having been authorized by Royal Bank of Canada or the agents. This prospectus supplement, the accompanying prospectus and any pricing supplement do not constitute an offer to sell or a solicitation of an offer to buy any securities other than the securities described in the relevant pricing supplement nor do they constitute an offer to sell or a solicitation of an offer to buy the securities in any jurisdiction to any person to whom it is unlawful to make such offer or solicitation in such jurisdiction. The delivery of this prospectus supplement, the accompanying prospectus and any pricing supplement at any time does not imply that the information they contain is correct as of any time subsequent to their respective dates.

US\$ 40,000,000,000



Royal Bank of Canada

Senior Global

Medium-Term Notes, Series H

September 7, 2018

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ROYAL BANK OF CANADA
Senior Debt Securities

Subordinated Debt Securities

Common Shares

Warrants

up to an aggregate initial offering price of U.S. \$40 billion or the equivalent thereof in other currencies.

This prospectus describes some of the general terms that may apply to these securities and the general manner in which they may be offered. We will give you the specific prices and other terms of the securities we are offering in supplements to this prospectus. You should read this prospectus and the applicable supplement(s) carefully before you invest. We may sell the securities to or through one or more underwriters, dealers or agents. The names of the underwriters, dealers or agents will be set forth in supplements to this prospectus.

NEITHER THE SECURITIES AND EXCHANGE COMMISSION NOR ANY STATE SECURITIES COMMISSION HAS APPROVED OR DISAPPROVED OF THESE SECURITIES OR DETERMINED THAT THIS PROSPECTUS IS TRUTHFUL OR COMPLETE. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE.

Prospective investors should be aware that the acquisition of the securities described herein may have tax consequences both in the United States and in Canada. Such consequences for investors who are resident in, or citizens of, the United States may not be described fully herein or in any applicable prospectus supplement.

The enforcement by investors of civil liabilities under United States federal securities laws may be affected adversely by the fact that Royal Bank of Canada is a Canadian bank, that many of its officers and directors are residents of Canada, that some or all of the underwriters or experts named in the Registration Statement may reside outside of the United States, and that all or a substantial portion of the assets of Royal Bank of Canada and said persons may be located outside the United States.

Our common shares trade under the symbol “RY” on the Toronto Stock Exchange and the New York Stock Exchange. The common shares may be offered pursuant to this prospectus solely in connection with an offering of subordinated debt securities that provide for the full and permanent conversion of such securities into common shares of Royal Bank of Canada upon the occurrence of certain trigger events relating to financial viability, as further described herein.

The securities described herein will not constitute deposits that are insured under the Canada Deposit Insurance Corporation Act or by the United States Federal Deposit Insurance Corporation.

Securities that are bail-inable debt securities (as defined herein) are subject to conversion in whole or in part – by means of a transaction or series of transactions and in one or more steps – into common shares of the Bank or any of its affiliates under subsection 39.2(2.3) of the Canada Deposit Insurance Corporation Act (the “CDIC Act”) and to variation or extinguishment in consequence, and subject to the application of the laws of the Province of Ontario and the federal laws of Canada applicable therein in respect of the operation of the CDIC Act with respect to the bail-inable debt securities.

Investing in the securities described herein involves a number of risks. See “Risk Factors” on page 1 of this prospectus.

TM Trademark of Royal Bank of Canada

The date of this prospectus is September 7, 2018

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In this prospectus, unless the context otherwise indicates, the “Bank”, “we”, “us” or “our” means Royal Bank of Canada and its subsidiaries. In this prospectus and any prospectus supplement, currency amounts are stated in Canadian dollars (“\$”), unless specified otherwise.

DOCUMENTS INCORPORATED BY REFERENCE

The Securities and Exchange Commission (the “SEC”) allows us to “incorporate by reference” the information we file with it, which means we can disclose important information to you by referring you to those documents. Copies of the documents incorporated herein by reference may be obtained upon written or oral request without charge from Investor Relations, Royal Bank of Canada, 155 Wellington Street West, 13th Floor, Toronto, Ontario, Canada M5V 3K7 (telephone: (416) 955-7802). The documents incorporated by reference are available over the Internet at www.sec.gov.

We incorporate by reference the documents listed below:

- Annual Report on Form 40-F for the fiscal year ended October 31, 2017 (the “2017 Annual Report”);
- Report on Form 6-K filed on February 23, 2018 (Accession no: 1193125-18-54869);
- Report on Form 6-K filed on May 24, 2018;
- Report on Form 6-K filed on July 19, 2018; and
- Report on Form 6-K filed on August 22, 2018.

In addition, we will incorporate by reference into this prospectus all documents that we file under Section 13(a), 13(c), 14 or 15(d) of the United States Securities Exchange Act of 1934, as amended (the “Exchange Act”) and, to the extent, if any, we designate therein, reports on Form 6-K we furnish to the SEC after the date of this prospectus and prior to the termination of any offering contemplated in this prospectus.

Any statement contained in this prospectus or in a document incorporated or deemed to be incorporated by reference herein shall be deemed to be modified or superseded, for purposes of this prospectus, to the extent that a statement contained herein or in any other subsequently-filed or furnished document that also is or is deemed to be incorporated by reference herein modifies or supersedes such statement. The modifying or superseding statement need not state that it has modified or superseded a prior statement or include any other information set forth in the document that it modifies or supersedes. The making of a modifying or superseding statement shall not be deemed an admission for any purposes that the modified or superseded statement, when made, constituted a misrepresentation, an untrue statement of a material fact or an omission to state a material fact that is required to be stated or that is necessary to make a statement not misleading in light of the circumstances in which it was made. Any statement so modified or superseded shall not be deemed, except as so modified or superseded, to constitute a part of this prospectus.

Upon a new Annual Report and the related annual financial statements being filed by us with, and, where required, accepted by, the SEC, the previous Annual Report shall be deemed no longer to be incorporated by reference into this prospectus for purposes of future offers and sales of securities hereunder.

All documents incorporated by reference, or to be incorporated by reference, have been filed with or furnished to, or will be filed with or furnished to, the SEC.

WHERE YOU CAN FIND MORE INFORMATION

In addition to our continuous disclosure obligations under the securities laws of the Provinces and Territories of Canada, we are subject to the information reporting requirements of the Exchange Act and in accordance therewith file reports and other information with the SEC. As the Bank is a “foreign private issuer” under the rules adopted under the Exchange Act, we are exempt from certain of the requirements of the Exchange Act, including the proxy and information provisions of Section 14 of the Exchange Act and the reporting and liability provisions applicable to officers, directors and significant shareholders under Section 16 of the Exchange Act. Under the multijurisdictional disclosure system adopted by the United States, reports and other information filed with the SEC may be prepared in accordance with the disclosure requirements of Canada, which requirements are different from those of the United States. Such reports and other information, when filed by us in accordance with such requirements, can be inspected and copied by you at the SEC’s Public Reference Room located at 100 F Street, N.E., Washington, D.C. 20549. The public may obtain information on the operation of the Public Reference Room by calling the SEC at 1-800-SEC-0330. Our SEC filings are also available to the public over the Internet at the SEC’s website at www.sec.gov. Our common shares are listed on the New York Stock Exchange, and reports and other information concerning us can be inspected at the offices of the New York Stock Exchange, 11 Wall Street, New York, New York 10005. Information about us can be located at our website at www.rbc.com. All Internet references in this prospectus are inactive textual references and we do not incorporate website contents into this prospectus.

FURTHER INFORMATION

We have filed with the SEC a Registration Statement on Form F-3 under the United States Securities Act of 1933, as amended (the “Securities Act”), with respect to the securities offered with this prospectus. This prospectus is a part of that Registration Statement, and it does not contain all of the information set forth in the Registration Statement. You can access the Registration Statement together with its exhibits at the SEC’s website at www.sec.gov or inspect these documents at the offices of the SEC in order to obtain more information about us and about the securities offered with this prospectus.

ABOUT THIS PROSPECTUS

This prospectus provides you with a general description of the securities we may offer. Each time we sell securities, we will provide a prospectus supplement containing specific information about the terms of the securities being offered thereunder. A prospectus supplement may include a discussion of any risk factors or other special considerations applicable to those securities or to us. A prospectus supplement may also add, update or change information in this prospectus. If there is any inconsistency between the information in this prospectus and the applicable prospectus supplement, you should rely on the information in the prospectus supplement. You should read both this prospectus and any applicable prospectus supplement together with additional information described under the heading “Where You Can Find More Information” above.

We may sell securities to underwriters who will sell the securities to the public on terms fixed at the time of sale. In addition, the securities may be sold by us directly or through dealers or agents designated from time to time. If we, directly or through agents, solicit offers to purchase the securities, we reserve the sole right to accept and, together with any agents, to reject, in whole or in part, any of those offers.

Any prospectus supplement will contain the names of the underwriters, dealers or agents, if any, together with the terms of the offering, the compensation of those underwriters and the net proceeds to us. Any underwriters, dealers or agents participating in the offering may be deemed “underwriters” within the meaning of the Securities Act.

We publish our consolidated financial statements in Canadian dollars. As indicated in the table below, the Canadian dollar has fluctuated in value compared to the U.S. dollar over the last five years.

The tables below set forth the exchange rate at each period end, the average yearly exchange rate and the low and high exchange rates between Canadian dollars and U.S. dollars (in Canadian dollars per U.S. dollar) for the five-year period ended October 31, 2017, and the low and high exchange rates for the nine months ended July 31, 2018, August, 2018 and September 1 through September 6, 2018. On September 6, 2018 the daily average exchange rate was \$1.3188. In the case of the rates for the years ended October 31, 2013, 2014, 2015 and 2016, this information is based on the noon rates as reported by the Bank of Canada at approximately noon each trading day. In the case of the year ended October 31, 2017, this information is based on the daily average exchange rate as reported by the Bank of Canada as being in effect at approximately 4:30 PM EST on a specified date (on April 29, 2017, the Bank of Canada stopped reporting the noon rate).

YEAR ENDED OCTOBER 31 (\$ per US\$)	AT PERIOD END	AVERAGE RATE¹	LOW	HIGH
2013	1.0429	1.0233	0.9839	1.0576
2014	1.1275	1.0934	1.0415	1.1289
2015	1.3083	1.2562	1.1236	1.3413
2016	1.3403	1.3258	1.2544	1.4589
2017	1.2893	1.3082	1.2128	1.3743
ADDITIONAL PERIODS (\$ per US\$)			LOW	HIGH
Nine months ended July 31, 2018			1.2288	1.3310
August 2018			1.2917	1.3041
September 2018 (through September 6, 2018)			1.3182	1.3188

¹ In the case of the rates for the years ended October 31, 2013, 2014, 2015 and 2016, the average noon buying rates on the last business day of each full month during the relevant period. In the case of the year ended October 31, 2017, the average of the daily average exchange rates on the last business day of each full month during the relevant period.

RISK FACTORS

Investment in these securities is subject to various risks including those risks inherent in investing in an issuer involved in conducting the business of a diversified financial institution. Before deciding whether to invest in any securities, you should consider carefully the risks described in the documents incorporated by reference in this prospectus (including subsequently filed documents incorporated by reference) and, if applicable, those described in a prospectus supplement, as the case may be, relating to a specific offering of securities. You should consider the categories of risks identified and discussed in the risk sections of the Bank's management's discussion and analysis included in the 2017 Annual Report (the "2017 Management's Discussion and Analysis") and the Risk management section of the Q3 2018 Report to Shareholders, including those summarized under "Caution Regarding Forward-Looking Statements" beginning on page 1 of this prospectus as well as any risks described in subsequently filed documents incorporated by reference.

ROYAL BANK OF CANADA

Business

Royal Bank of Canada and its subsidiaries operate under the master brand name of RBC. We are a global financial institution with a purpose-driven, principles-led approach to delivering leading performance. Our success comes from the 84,000+ employees who bring our vision, values and strategy to life so we can help our clients thrive and communities prosper. As Canada's biggest bank, and one of the largest in the world based on market capitalization, we have a diversified business model with a focus on innovation and providing exceptional experiences to our 16 million clients in Canada, the U.S. and 34 other countries.

Our business segments are Personal & Commercial Banking, Wealth Management, Insurance, Investor & Treasury Services and Capital Markets. Our business segments are supported by Corporate Support. Additional information about our business and each segment (including segment results) can be found under "Overview and outlook" beginning on page 12 and under "Business segment results" beginning on page 21 of the 2017 Management's Discussion and Analysis, which is incorporated by reference in this prospectus.

Our common shares trade under the symbol "RY" on the Toronto Stock Exchange and the New York Stock Exchange. Additional information about RBC can be found on our website at www.rbc.com. Additional information about RBC and its subsidiaries is included in documents incorporated by reference into this document. For more information, see the section entitled "Where You Can Find More Information".

We are a Schedule I bank under the *Bank Act* (Canada), which constitutes our charter. Our corporate headquarters are located at 200 Bay Street, Toronto, Ontario, Canada M5J 2J5 and our head office is located at 1 Place Ville Marie, Montréal, Québec, Canada H3C 3A9.

PRESENTATION OF FINANCIAL INFORMATION

We prepare our consolidated financial statements in accordance with International Financial Reporting Standards ("IFRS") as issued by the International Accounting Standards Board.

CAUTION REGARDING FORWARD-LOOKING STATEMENTS

From time to time, we make written or oral forward-looking statements within the meaning of certain securities laws, including the "safe harbor" provisions of the *United States Private Securities Litigation Reform Act of 1995* and any applicable Canadian securities legislation. We may make forward-looking statements in this prospectus, in the documents incorporated by reference herein, in other filings with Canadian regulators or the SEC, in other reports to shareholders and in other communications. Forward-looking statements in this prospectus and the documents incorporated by reference herein include, but are not limited to, statements relating to our financial performance objectives, vision and strategic goals, the Economic, market, and regulatory review and outlook for Canadian, U.S., European and global economies, the regulatory environment in which we operate, the "Strategic priorities" and "Outlook" sections for each of our business segments in our 2017 Management's Discussion and Analysis and the risk environment including our liquidity and funding risk. The forward-looking information contained in this document and the documents incorporated by reference herein is presented for the purpose of assisting the holders of our securities and financial analysts in understanding our financial position and results of operations as at and for the periods ended on the dates presented, as well as our financial performance objectives, vision and strategic goals, and may not be appropriate for other purposes. Forward-looking statements are typically identified by words such as "believe", "expect", "foresee", "forecast", "anticipate", "intend", "estimate", "goal", "plan" and "project" and similar expressions of future or conditional verbs such as "will", "may", "should", "could" or "would".

By their very nature, forward-looking statements require us to make assumptions and are subject to inherent risks and uncertainties, which give rise to the possibility that our predictions, forecasts, projections, expectations or conclusions will not prove to be accurate, that our assumptions may not be correct and that our financial performance objectives, vision and strategic goals will not be achieved. We caution readers not to place undue reliance on these statements as a number of risk factors could cause our actual results to differ materially from the expectations expressed in such forward-looking statements. These factors – many of which are beyond our control and the effects of which can be difficult to predict – include: credit, market, liquidity and funding, insurance, operational, regulatory compliance, strategic, reputation, legal and regulatory environment, competitive and systemic risks and other risks discussed in the risk sections of our 2017 Annual Report and the Risk management section of our Q3 2018 Report to Shareholders; including global uncertainty and volatility, elevated Canadian housing prices and household indebtedness, information technology and cyber risk, including the risk of cyber-attacks or other information security events at or impacting our service providers or other third parties with whom we interact, regulatory change, technological innovation and non-traditional competitors, global environmental policy and climate change, changes in consumer behaviour, the end of quantitative easing, the business and economic conditions in the geographic regions in which we operate, the effects of changes in government fiscal, monetary and other policies, tax risk and transparency, and environmental and social risk.

We caution that the foregoing list of risk factors is not exhaustive and other factors could also adversely affect our results. When relying on our forward-looking statements to make decisions with respect to us, investors and others should carefully consider the foregoing factors and other uncertainties and potential events. Material economic assumptions underlying the forward-looking statements contained in this prospectus and the documents incorporated by reference herein are set out in the “Overview and outlook” section and for each business segment under the “Strategic priorities” and “Outlook” sections in our 2017 Annual Report, as updated by the “Overview and outlook” section of our Q3 2018 Report to Shareholders and the other filings made by us with the SEC that are incorporated by reference in this prospectus. Except as required by law, we do not undertake to update any forward-looking statement, whether written or oral, that may be made from time to time by us or on our behalf.

Additional information about these and other factors can be found in the risk sections of our 2017 Annual Report, the Risk management section of our Q3 2018 Report to Shareholders and the other filings made by us with the SEC that are incorporated by reference in this prospectus.

Information contained in or otherwise accessible through the websites mentioned in this prospectus does not form part of this prospectus and is not incorporated herein by reference. All references in this prospectus to websites are inactive textual references and are for your information only.

USE OF PROCEEDS

Except as otherwise set forth in a prospectus supplement, the net proceeds from the sale of securities will be added to our general funds and will be used for general banking purposes. In addition, except as otherwise set forth in a prospectus supplement, the purpose of the sale of the subordinated debt securities will be to enlarge our capital base.

CONSOLIDATED RATIOS OF EARNINGS TO FIXED CHARGES

The table below sets forth the Bank's consolidated ratios of earnings to fixed charges for the nine months ended July 31, 2018 and for the fiscal years ended October 31, 2013, 2014, 2015, 2016 and 2017:

	Nine Months Ended July 31,	Years Ended October 31,				
	2018	2017	2016	2015	2014	2013⁽¹⁾
Excluding Interest on Deposits	4.03	5.17	5.90	6.14	6.23	5.34
Including Interest on Deposits	2.10	2.43	2.61	2.53	2.43	2.28

⁽¹⁾ Figures restated to reflect adoption of new accounting standards.

For purposes of computing these ratios, earnings represent net income plus income taxes and fixed charges (excluding capitalized interest). Fixed charges represent (i) estimated interest within rental expense, (ii) amortization of debt issuance costs and (iii) interest (including capitalized interest), including or excluding deposit interest as indicated.

CONSOLIDATED CAPITALIZATION AND INDEBTEDNESS

The following table sets forth our consolidated capitalization as at July 31, 2018 and as at October 31, 2017. This table should be read in conjunction with the Bank's Q3 2018 Report to Shareholders and our 2017 Annual Report, which are incorporated by reference in this prospectus.

	As at July 31, 2018	As at October 31, 2017
	(in millions of dollars)	(in millions of dollars)
Subordinated debentures	9,129	9,265 ⁽¹⁾
Equity attributable to shareholders		
Preferred shares	6,306	6,413
Common shares	17,533	17,703
Retained earnings	49,424	45,359
Other components of equity	4,518	4,354
Total equity attributable to shareholders	77,781	73,829
Non-controlling interests	91	599
Total Equity	77,872	74,428
Total Capitalization	87,001	83,693

(1) For more information, refer to "Note 19 – Subordinated debentures" to the annual consolidated financial statements for the year ended October 31, 2017 in our 2017 Annual Report.

COMPARATIVE PER SHARE MARKET PRICE

The Bank's common shares are listed on the TSX and the NYSE under the trading symbol "RY". The table below sets forth, for the periods indicated, the per share high and low closing sales prices for the Bank's common shares as reported on the TSX and the U.S. markets. TSX closing prices are presented in Canadian dollars, and U.S. markets closing prices are presented in U.S. dollars.

	Common shares TSX (in C\$)		Common shares U.S. markets (in US\$)	
	High	Low	High	Low
Annual information for the past five fiscal years				
2013	70.75	54.51	68.02	54.41
2014	83.20	67.65	76.08	61.00
2015	83.87	68.05	73.80	51.27
2016	84.70	64.52	64.31	44.37
2017	102.15	81.82	80.98	60.92
Quarterly information for the past two fiscal years and subsequent quarters				
2016, quarter ended				
January 31	77.67	64.95	58.45	44.37
April 30	78.93	64.52	62.78	46.08
July 31	80.97	74.64	62.39	57.01
October 31	84.70	78.24	64.31	59.88
2017, quarter ended				
January 31	94.90	81.82	72.25	60.92
April 30	99.90	93.11	76.01	68.19
July 31	96.20	90.73	75.86	66.66
October 31	102.15	90.13	80.98	72.61
2018, quarter ended				
January 31	108.52	99.30	87.10	77.67
April 30	105.15	96.00	85.39	74.75
July 31	102.46	96.25	79.80	73.92
Monthly information for the most recent six months				
March 2018	102.92	98.33	79.84	76.08
April 2018	99.59	96.00	78.27	74.75
May 2018	102.03	96.25	79.80	74.02
June 2018	101.51	97.47	77.27	73.92
July 2018	102.46	98.70	78.26	74.37
August 2018	104.98	100.33	81.06	76.79
September 2018 (through September 6, 2018)	104.24	103.09	79.31	78.18

Fluctuations in the exchange rate between the Canadian dollar and the U.S. dollar will affect any comparisons of the Bank's common shares traded on the TSX and the Bank's common shares traded on the U.S. markets.

DESCRIPTION OF DEBT SECURITIES

We may issue senior or subordinated debt securities. Neither the senior debt securities nor the subordinated debt securities will be secured by any of our property or assets or the property or assets of our subsidiaries. Thus, by owning a debt security, you are one of our unsecured creditors.

The senior debt securities will be issued under our senior debt indenture, dated as of October 23, 2003, between Royal Bank of Canada and The Bank of New York Mellon, as successor to the corporate trust business of JPMorgan Chase Bank, N.A., as trustee, as supplemented by a first supplemental indenture, dated as of July 21, 2006, by a second supplemental indenture, dated as of February 28, 2007, and by a third supplemental indenture, and as further amended from time to time (collectively, the "senior debt indenture"), and will be unsubordinated obligations that rank equally with all of our other unsecured and unsubordinated debt, including deposit liabilities, other than certain governmental claims in accordance with applicable law.

The subordinated debt securities will be issued under our subordinated debt indenture, dated as of January 27, 2016, between Royal Bank of Canada and The Bank of New York Mellon, as trustee, as supplemented by a first supplemental indenture, dated as of January 27, 2016 and as further amended from time to time (collectively, the “subordinated debt indenture”), and will be subordinate in right of payment to all of our “senior indebtedness”, as defined in the subordinated debt indenture. Neither indenture limits our ability to incur additional indebtedness.

In the event we become insolvent, our governing legislation provides that priorities among payments of our deposit liabilities (including payments in respect of the senior debt securities) and payments of all of our other liabilities (including payments in respect of the subordinated debt securities) are to be determined in accordance with the laws governing priorities and, where applicable, by the terms of the indebtedness and liabilities. Because we have subsidiaries, our right to participate in any distribution of the assets of our banking or non-banking subsidiaries, upon a subsidiary’s dissolution, winding-up, liquidation or reorganization or otherwise, and thus your ability to benefit indirectly from such distribution, is subject to the prior claims of creditors of that subsidiary, except to the extent that we may be a creditor of that subsidiary and our claims are recognized. There are legal limitations on the extent to which some of our subsidiaries may extend credit, pay dividends or otherwise supply funds to, or engage in transactions with, us or some of our other subsidiaries. Accordingly, the debt securities will be structurally subordinated to all existing and future liabilities of our subsidiaries, and holders of debt securities should look only to our assets for payments on the debt securities.

Neither the senior debt securities nor the subordinated debt securities will constitute deposits insured under the Canada Deposit Insurance Corporation Act or by the United States Federal Deposit Insurance Corporation or any other Canadian or United States governmental agency or instrumentality.

When we refer to “debt securities” in this prospectus, we mean both the senior debt securities and the subordinated debt securities.

The Senior and Subordinated Debt Indentures

The senior debt securities are governed by the senior debt indenture, and the subordinated debt securities are governed by the subordinated debt indenture. When we refer to the “indentures”, we mean both the senior debt indenture and the subordinated debt indenture, and when we refer to the “indenture”, we mean either the senior debt indenture or the subordinated debt indenture. The senior debt indenture is a contract between us and The Bank of New York Mellon, as successor to the corporate trust business of JPMorgan Chase Bank, N.A., which acts as trustee. The indentures are substantially identical, except for (i) the provisions relating to events of default, which are more limited in the subordinated debt indenture, (ii) the provisions relating to subordination, which are included only in the subordinated debt indenture, and (iii) the provisions relating to possible conversions or exchanges, which are only included in the senior debt indenture.

Reference to the indenture or the trustee, with respect to any debt securities, means the indenture under which those debt securities are issued and the trustee under that indenture.

The trustee has two main roles:

- The trustee can enforce the rights of holders against us if we default on our obligations under the terms of the indenture or the debt securities. There are some limitations on the extent to which the trustee acts on behalf of holders, described below under “— Events of Default — Remedies If an Event of Default Occurs”.
- The trustee performs administrative duties for us, such as sending interest payments and notices to holders and transferring a holder’s debt securities to a new buyer if a holder sells.

Governing Law. The indentures and their associated documents contain the full legal text of the matters described in this section. The indentures and the debt securities will be governed by New York law, except that the subordination provisions and provisions related to non-viability contingent capital automatic conversion in the subordinated debt indenture, certain provisions relating to the status of the senior debt securities under Canadian law and provisions relating to the bail-in acknowledgment of holders and beneficial owners of bail-inable debt securities in the senior debt indenture will be governed by the laws of the Province of Ontario and the laws of Canada applicable therein. A copy of each of the senior debt indenture, the supplements to the senior debt indenture, the subordinated debt indenture and the supplement to the subordinated debt indenture is an exhibit to our Registration Statement. See “Where You Can Find More Information” above for information on how to obtain a copy.

General

We may issue as many distinct series of debt securities under either indenture as we wish. The provisions of the senior debt indenture and the subordinated debt indenture allow us not only to issue debt securities with terms different from those previously issued under the applicable indenture, but also to “re-open” a previous issue of a series of debt securities and issue additional debt securities of that series. We do not intend to re-open a previous issue of a series of debt securities where such re-opening would have the effect of making the relevant debt securities of such series subject to bail-in conversion (as defined under “— Special Provisions Related to Bail-inable Debt Securities”). We may issue debt securities in amounts that exceed the total amount specified on the cover of your prospectus supplement at any time without your consent and without notifying you.

This section summarizes the material terms of the debt securities that are common to all series, although the prospectus supplement that describes the terms of each series of debt securities may also describe differences from the material terms summarized here.

Because this section is a summary, it does not describe every aspect of the debt securities. This summary is subject to and qualified in its entirety by reference to all the provisions of the indentures, including definitions of certain terms used in the indentures. In this summary, we describe the meaning of only some of the more important terms. For your convenience, we also include references in parentheses to certain sections of the indentures. Whenever we refer to particular sections or defined terms of the indentures in this prospectus or in the prospectus supplement, such sections or defined terms are incorporated by reference here or in the prospectus supplement. You must look to the indentures for the most complete description of what we describe in summary form in this prospectus.

This summary is also subject to and qualified by reference to the description of the particular terms of your series described in the prospectus supplement. Those terms may vary from the terms described in this prospectus. The prospectus supplement relating to each series of debt securities will be attached to the front of this prospectus. There may also be a further prospectus supplement, known as a pricing supplement, which describes additional terms of debt securities you are offered.

We may issue the debt securities as original issue discount securities, which will be offered and sold at a substantial discount below their stated principal amount. (Indenture Section 101) The prospectus supplement relating to the original issue discount securities will describe U.S. federal income tax consequences and other special considerations applicable to them. The debt securities may also be issued as indexed securities or securities denominated in foreign currencies or currency units, as described in more detail in the prospectus supplement relating to any of the particular debt securities. The prospectus supplement relating to specific debt securities will also describe any special considerations and any material additional tax considerations applicable to such debt securities.

In addition, the specific financial, legal and other terms particular to a series of debt securities will be described in the prospectus supplement and, if applicable, a pricing supplement relating to the series. The prospectus supplement and/or, if applicable, the pricing supplement relating to a series of debt securities will describe the following terms of the series:

- the title of the series of debt securities;
- whether it is a series of senior debt securities or a series of subordinated debt securities;
- any limit on the aggregate principal amount of the series of debt securities;
- the person to whom interest on a debt security is payable, if other than the holder on the regular record date;
- the date or dates on which the series of debt securities will mature;
- the rate or rates, which may be fixed or variable per annum, at which the series of debt securities will bear interest, if any, and the date or dates from which that interest, if any, will accrue;
- the place or places where the principal of, premium, if any, and interest on the debt securities is payable;
- the terms, if any, on which any securities may or shall be converted into or exchanged at the option of the Bank or otherwise for shares or other securities of the Bank or another entity or other entities, into the cash

value thereof or into any combination of the foregoing, any specific terms relating to the adjustment thereof and the period during which such securities may or shall be so converted or exchanged;

- the specific terms of any bail-inable debt securities (as defined below under “— Special Provisions Related to Bail-inable Debt Securities”);
- the specific terms of any Non-Viability Contingent Capital Provisions (as defined below under “— Special Provisions Related to the Subordinated Debt Securities — Non-Viability Contingent Capital Provisions”);
- the dates on which interest, if any, on the series of debt securities will be payable and the regular record dates for the interest payment dates;
- any mandatory or optional sinking funds or similar provisions or provisions for redemption at our option or the option of the holder;
- the date, if any, after which, and the price or prices at which, the series of debt securities may, in accordance with any optional or mandatory redemption provisions, be redeemed and the other detailed terms and provisions of those optional or mandatory redemption provisions, if any;
- if other than denominations of \$1,000 and any integral multiples thereof, the denominations in which the series of debt securities will be issuable;
- the currency of payment of principal, premium, if any, and interest on the series of debt securities;
- if the currency of payment for principal, premium, if any, and interest on the series of debt securities is subject to our election or that of a holder, the currency or currencies in which payment can be made and the period within which, and the terms and conditions upon which, the election can be made;
- any index, formula or other method used to determine the amount of payment of principal or premium, if any, and interest on the series of debt securities;
- the applicability of the provisions described under “— Defeasance” below;
- any event of default under the series of debt securities if different from those described under “— Events of Default” below;
- if the debt securities will be issued in bearer form, any special provisions relating to bearer securities;
- if the series of debt securities will be issuable only in the form of a global security, the depositary or its nominee with respect to the series of debt securities and the circumstances under which the global security may be registered for transfer or exchange in the name of a person other than the depositary or the nominee; and
- any other special feature of the series of debt securities.

We will offer debt securities that are convertible or exchangeable into securities of another entity or other entities only under circumstances that do not require registration of the underlying securities under the Securities Act at the time we offer such debt securities.

Overview of Remainder of this Description

The remainder of this description summarizes:

- additional mechanics relevant to the debt securities under normal circumstances, such as how holders record the transfer of ownership and where we make payments;

- holders' rights in several special situations, such as if we merge with another company or if we want to change a term of the debt securities;
- subordination provisions in the subordinated debt indenture that may prohibit us from making payment on those securities;
- our right to release ourselves from all or some of our obligations under the debt securities and the indenture by a process called defeasance; and
- holders' rights if we default or experience other financial difficulties.

Form, Exchange and Transfer

Unless we specify otherwise in the prospectus supplement, the debt securities will be issued:

- only in fully-registered form;
- without interest coupons; and
- in denominations that are even multiples of \$1,000. (Indenture Section 302)

If a debt security is issued as a registered global debt security, only the depository — *e.g.*, DTC, Euroclear, Clearstream and CDS, each as defined below under “—Ownership and Book-Entry Issuance” — will be entitled to transfer and exchange the debt security as described in this subsection because the depository will be the sole registered holder of the debt security and is referred to below as the “holder”. Those who own beneficial interests in a global security do so through participants in the depository’s securities clearance system, and the rights of these indirect owners will be governed by the applicable procedures of the depository and its participants. We describe book-entry procedures below under “—Ownership and Book-Entry Issuance”.

Holders of securities issued in fully-registered form may have their debt securities broken into more debt securities of smaller denominations of not less than \$1,000, or combined into fewer debt securities of larger denominations, as long as the total principal amount is not changed. (Indenture Section 305) This is called an exchange.

Holders may exchange or register the transfer of debt securities at the office of the trustee. Debt securities may be transferred by endorsement. Holders may also replace lost, stolen or mutilated debt securities at that office. The trustee has been appointed as our agent for registering debt securities in the names of holders and registering the transfer of debt securities. We may change this appointment to another entity or perform these tasks ourselves. The entity performing the role of maintaining the list of registered holders is called the security registrar. It also records transfers. (Indenture Section 305) The trustee may require an indemnity before replacing any debt securities.

Holders will not be required to pay a service charge to register the transfer or exchange of debt securities, but holders may be required to pay for any tax or other governmental charge associated with the exchange or transfer. The registration of a transfer or exchange will only be made if the security registrar is satisfied with your proof of ownership.

If we designate additional transfer agents, they will be named in the prospectus supplement. We may cancel the designation of any particular transfer agent. We may also approve a change in the office through which any transfer agent acts. (Indenture Section 1002)

If the debt securities are redeemable and we redeem less than all of the debt securities of a particular series, we may block the registration of transfer or exchange of debt securities during the period beginning 15 days before the day we mail the notice of redemption and ending on the day of that mailing, in order to freeze the list of holders entitled to receive the mailing. We may also refuse to register transfers or exchanges of debt securities selected for redemption, except that we will continue to permit registration of transfers and exchanges of the unredeemed portion of any debt security being partially redeemed. (Indenture Section 305)

Payment and Paying Agents

We will pay interest to the person listed in the trustee’s records at the close of business on a particular day in advance of each due date for interest, even if that person no longer owns the debt security on the interest due date. That

particular day, usually about two weeks in advance of the interest due date, is called the regular record date and will be stated in the prospectus supplement. (Indenture Section 307) Holders buying and selling debt securities must work out between them how to compensate for the fact that we will pay all the interest for an interest period to the one who is the registered holder on the regular record date. The most common manner is to adjust the sale price of the securities to prorate interest fairly between buyer and seller. This prorated interest amount is called accrued interest.

We will pay interest, principal and any other money due on the debt securities at the corporate trust office of the trustee in the City of New York. That office is currently located at 240 Greenwich Street - Floor 4E, New York, NY 10007. Holders must make arrangements to have their payments picked up at or wired from that office. We may also choose to pay interest by mailing checks.

Book-entry and other indirect holders should consult their banks, brokers or other financial institutions for information on how they will receive payments.

We may also arrange for additional payment offices and may cancel or change these offices, including our use of the trustee's corporate trust office. These offices are called paying agents. We may also choose to act as our own paying agent or choose one of our subsidiaries to do so. We must notify holders of changes in the paying agents for any particular series of debt securities. (Indenture Section 1002)

Conversion or Exchange of Senior Debt Securities

If and to the extent mentioned in the relevant prospectus supplement, any senior debt securities series may be optionally or mandatorily convertible or exchangeable for stock or other securities of the Bank or another entity or entities, into the cash value therefor or into any combination of the above, the specific terms on which any senior debt securities series may be so converted or exchanged will be described in the relevant prospectus supplement. These terms may include provisions for conversion or exchange, either mandatorily, at the holder's option or at our option, in which case the amount or number of securities the senior debt securities holders would receive would be calculated at the time and manner described in the relevant prospectus supplement. (Indenture Section 301)

Notices

We and the trustee will send notices regarding the debt securities only to registered holders, using their addresses as listed in the trustee's records. (Indenture Sections 101 and 106) With respect to who is a registered "holder" for this purpose, see "Ownership and Book-Entry Issuance".

Regardless of who acts as paying agent, all money paid by us to a paying agent that remains unclaimed at the end of two years after the amount is due to holders will be repaid to us. After that two-year period, holders may look to us for payment and not to the trustee or any other paying agent. (Indenture Section 1003)

Mergers and Similar Events

Under the indentures, we are generally permitted to consolidate or merge with another entity. We are also permitted to sell or lease substantially all of our assets to another entity, or to buy or lease substantially all of the assets of another entity. However, we may not take any of these actions unless all the following conditions are met:

- When we merge, amalgamate, consolidate or otherwise are combined with, or acquired by, another entity or sell or lease substantially all of our assets, the surviving, resulting or acquiring entity must be a properly organized entity and must be legally responsible for the debt securities, whether by agreement, operation of law or otherwise.
- The merger, amalgamation, consolidation, other combination, sale or lease of assets must not cause a default on the debt securities. A default for this purpose would include any event that would be an event of default if the requirements for giving us default notice or our default having to exist for a specific period of time were disregarded.

If the conditions described above are satisfied with respect to any series of debt securities, we will not need to obtain the approval of the holders of those debt securities in order to merge or consolidate or to sell our assets. Also, these conditions will apply only if we wish to merge or consolidate with another entity or sell substantially all of our assets to another entity. We will not need to satisfy these conditions if we enter into other types of transactions, including any

transaction in which we acquire the stock or assets of another entity, any transaction that involves a change of control but in which we do not merge or consolidate and any transaction in which we sell less than substantially all of our assets. It is possible that this type of transaction may result in a reduction in our credit rating, may reduce our operating results or may impair our financial condition. Holders of our debt securities, however, will have no approval right with respect to any transaction of this type.

Modification and Waiver of the Debt Securities

There are four types of changes we can make to either indenture and the debt securities issued under that indenture.

1. *Changes Requiring Approval of All Holders.* First, there are changes that cannot be made to the indenture or the debt securities without specific approval of each holder of a debt security affected in any material respect by the change under a particular debt indenture. The following is a list of those types of changes:

- change the stated maturity of the principal or reduce the interest on a debt security;
- reduce any amounts due on a debt security;
- reduce the amount of principal payable upon acceleration of the maturity of a debt security (including the amount payable on an original issue discount security) following a default;
- change the currency of payment on a debt security;
- change the place of payment for a debt security;
- impair a holder's right to sue for payment;
- impair the holder's right to require repurchase on the original terms of those debt securities that provide a right of repurchase;
- reduce the percentage of holders of debt securities whose consent is needed to modify or amend the indenture;
- reduce the percentage of holders of debt securities whose consent is needed to waive compliance with certain provisions of the indenture or to waive certain defaults; or
- modify any other aspect of the provisions dealing with modification and waiver of the indenture. (Indenture Section 902)

2. *Changes Requiring a Majority Vote.* The second type of change to the indenture and the debt securities is the kind that requires a vote in favor of the change by holders of debt securities owning not less than a majority of the principal amount of the particular series affected. Most changes, including any change or elimination of any provision of the indenture and any modification of any right of the noteholders, require a majority vote. A smaller class of changes does not require a majority vote including clarifying changes and other changes that would not adversely affect in any material respect holders of the debt securities. (Indenture Section 901) We may also obtain a waiver of a past default from the holders of debt securities owning a majority of the principal amount of the particular series affected. However, we cannot obtain a waiver of a payment default or any other aspect of the indenture or the debt securities listed in the first category described above under “— Changes Requiring Approval of All Holders” unless we obtain the individual consent of each holder to the waiver. (Indenture Section 513)

3. *Changes Not Requiring Approval.* The third type of change to the indenture and the debt securities does not require any vote by holders of debt securities. This type is limited to clarifications and certain other changes that would not adversely affect in any material respect holders of the debt securities. (Indenture Section 901)

4. We may also make changes or obtain waivers that do not adversely affect in any material respect a particular debt security, even if they affect other debt securities. In those cases, we do not need to obtain the approval of the holder of that debt security; we need only obtain any required approvals from the holders of the affected debt securities.

Modification of Bail-inable Debt Securities. Where an amendment, modification or other variance that can be made to the indenture or the bail-inable debt securities would affect the recognition of those bail-inable debt securities by the Superintendent of Financial Institutions (Canada) (the “Superintendent”) as TLAC (as defined below under “— Canadian Bank Resolution Powers”), that amendment, modification or variance will require the prior approval of the Superintendent. (Indenture Section 907)

Modification of Subordination Provisions. We may not modify the subordination provisions of the subordinated debt indenture in a manner that would adversely affect in any material respect the outstanding subordinated debt securities of any one or more series without the consent of the holders of a majority of the principal amount of all affected series, voting together as one class. We may not modify the subordinated debt indenture or any terms of any outstanding subordinated debt securities in a manner that would affect the regulatory capital classification of the subordinated debt securities under the guidelines for capital adequacy requirements for banks in Canada without the consent of the Superintendent.

Further Details Concerning Voting. When taking a vote, we will use the following rules to decide how much principal amount to attribute to a debt security:

- For original issue discount securities, we will use the principal amount that would be due and payable on the voting date if the maturity of the debt securities were accelerated to that date because of a default.
- For debt securities whose principal amount is not known (for example, because it is based on an index), we will use a special rule for that debt security described in the prospectus supplement.
- For debt securities denominated in one or more non-U.S. currencies or currency units, we will use the U.S. dollar equivalent.

Debt securities will not be considered outstanding, and therefore not eligible to vote, if we have given a notice of redemption and deposited or set aside in trust for the holders money for the payment or redemption of the debt securities. Debt securities will also not be eligible to vote if they have been fully defeased as described below under “— Defeasance — Full Defeasance”. (Indenture Section 1402)

We will generally be entitled to set any day as a record date for the purpose of determining the holders of outstanding debt securities that are entitled to vote or take other action under the indenture. In certain limited circumstances, the trustee will be entitled to set a record date for action by holders. If the trustee or we set a record date for a vote or other action to be taken by holders of a particular series, that vote or action may be taken only by persons who are holders of outstanding securities of that series on the record date. We or the trustee, as applicable, may shorten or lengthen this period from time to time. This period, however, may not extend beyond the 180th day after the record date for the action. (Indenture Sections 104 and 512)

Book-entry and other indirect holders should consult their banks, brokers or other financial institutions for information on how approval may be granted or denied if we seek to change the indenture or the debt securities or request a waiver.

Special Provisions Related to Bail-inable Debt Securities

The senior debt indenture provides for certain provisions applicable to bail-inable debt securities. The prospectus supplement and, if applicable, the relevant pricing supplement will describe the specific terms of bail-inable debt securities we may issue and specify whether or not your debt security is a bail-inable debt security.

Subject to certain exceptions discussed under “— Canadian Bank Resolution Powers,” including for certain structured notes, senior debt issued on or after September 23, 2018, with an initial or amended term to maturity (including explicit or embedded options) greater than 400 days, that is unsecured or partially secured and that has been assigned a CUSIP or ISIN or similar identification number, is subject to conversion in whole or in part – by means of a transaction or series of transactions and in one or more steps – into common shares of the Bank or any of its affiliates under the bail-in regime (as defined below under “— Canadian Bank Resolution Powers”), which we refer to as a “bail-in conversion.” We refer to debt securities that are subject to bail-in conversion as “bail-inable debt securities.”

By its acquisition of an interest in any bail-inable debt security, each holder or beneficial owner of that debt security is deemed to (i) agree to be bound, in respect of the bail-inable debt securities, by the CDIC Act, including the conversion of the bail-inable debt securities, in whole or in part – by means of a transaction or series of transactions and in one or more

steps – into common shares of the Bank or any of its affiliates under subsection 39.2(2.3) of the CDIC Act and the variation or extinguishment of the bail-inable debt securities in consequence, and by the application of the laws of the Province of Ontario and the federal laws of Canada applicable therein in respect of the operation of the CDIC Act with respect to the bail-inable debt securities; (ii) attorn and submit to the jurisdiction of the courts in the Province of Ontario with respect to the CDIC Act and those laws; and (iii) acknowledge and agree that the terms referred to in clauses (i) and (ii) above, are binding on that holder or beneficial owner despite any provisions in the indenture or the bail-inable debt securities, any other law that governs the bail-inable debt securities and any other agreement, arrangement or understanding between that holder or beneficial owner and the Bank with respect to the bail-inable debt securities. (Indenture Section 1601(a))

Holders and beneficial owners of bail-inable debt securities will have no further rights in respect of their bail-inable debt securities to the extent those bail-inable debt securities are converted in a bail-in conversion, other than those provided under the bail-in regime, and by its acquisition of an interest in any bail-inable debt security, each holder or beneficial owner of that debt security is deemed to irrevocably consent to the principal amount of that debt security and any accrued and unpaid interest thereon being deemed paid in full by the Bank by the issuance of common shares of the Bank (or, if applicable, any of its affiliates) upon the occurrence of a bail-in conversion, which bail-in conversion will occur without any further action on the part of that holder or beneficial owner or the trustee; provided that, for the avoidance of doubt, this consent will not limit or otherwise affect any rights that holders or beneficial owners may have under the bail-in regime. (Indenture Section 1601(b))

Each holder or beneficial owner of a bail-inable debt security that acquires an interest in the bail-inable debt security in the secondary market and any successors, assigns, heirs, executors, administrators, trustees in bankruptcy and legal representatives of any holder or beneficial owner is deemed to acknowledge, accept, agree to be bound by and consent to the same provisions specified herein to the same extent as the holders or beneficial owners that acquired an interest in the bail-inable debt securities upon their initial issuance, including, without limitation, with respect to the acknowledgement and agreement to be bound by and consent to the terms of the bail-inable debt securities related to the bail-in regime. (Indenture Article Seventeen)

Trustee and Trustee's Duties

The trustee will undertake certain procedures and seek certain remedies in the event of an event of default or a default. See “— Events of Default”. However, by its acquisition of an interest in any bail-inable debt security, each holder or beneficial owner of that debt security is deemed to acknowledge and agree that the bail-in conversion will not give rise to a default or event of default for purposes of Section 315(b) (*Notice of Defaults*) and Section 315(c) (*Duties of the Trustee in Case of Default*) of the Trust Indenture Act of 1939 (the “Trust Indenture Act”).

By its acquisition of an interest in any bail-inable debt security, each holder or beneficial owner of that debt security, to the extent permitted by the Trust Indenture Act, is deemed to waive any and all claims, in law and/or in equity, against the trustee, for, agrees not to initiate a suit against the trustee in respect of, and agrees that the trustee will not be liable for, any action that the trustee takes, or abstains from taking, in either case in accordance with the bail-in regime.

Additionally, by its acquisition of an interest in any bail-inable debt security, each holder or beneficial owner of that debt security is deemed to acknowledge and agree that, upon a bail-in conversion, or other action pursuant to the bail-in regime with respect to bail-inable debt securities,

- the trustee will not be required to take any further directions from holders of those bail-inable debt securities under Section 512 of the senior debt indenture, which section authorizes holders of a majority in aggregate outstanding principal amount of the debt securities to direct certain actions relating to the debt securities; and
- the indenture will not impose any duties upon the trustee whatsoever with respect to a bail-in conversion or such other action pursuant to the bail-in regime. (Indenture Section 1601(c))

Notwithstanding the foregoing, if, following the completion of a bail-in conversion, the relevant bail-inable debt securities remain outstanding (for example, if not all bail-inable debt securities are converted), then the trustee's duties under the indenture will remain applicable with respect to those bail-inable debt securities following such completion to the extent that the Bank and the trustee will agree pursuant to a supplemental indenture or an amendment to the indenture; provided, however, that notwithstanding the bail-in conversion, there will at all times be a trustee for the bail-inable debt securities in accordance with the indenture, and the resignation and/or removal of the trustee, the appointment of a successor trustee and the rights of the trustee or any successor trustee will continue to be governed by the indenture, including to the extent no

additional supplemental indenture or amendment to the indenture is agreed upon in the event the relevant bail-inable debt securities remain outstanding following the completion of the bail-in conversion. (Indenture Section 1601(d))

DTC —Bail-in Conversion

Upon a bail-in conversion, we will provide a written notice to The Depository Trust Company (“DTC”) and the holders of bail-inable debt securities through DTC as soon as practicable regarding such bail-in conversion. The Bank will also deliver a copy of such notice to the trustee for information purposes. (Indenture Section 1601(e))

By its acquisition of an interest in any bail-inable debt security, each holder or beneficial owner of that debt security is deemed to have authorized, directed and requested DTC and any direct participant in DTC or other intermediary through which it holds such bail-inable debt security to take any and all necessary action, if required, to implement the bail-in conversion or other action pursuant to the bail-in regime with respect to the bail-inable debt security as it may be imposed on it, without any further action or direction on the part of that holder or beneficial owner, the trustee or the paying agent. (Indenture Section 1601(d))

Special Provisions Related to the Subordinated Debt Securities

The subordinated debt securities issued under the subordinated debt indenture will be our direct unsecured obligations constituting subordinated indebtedness for the purpose of the *Bank Act* (Canada) and will therefore rank subordinate to our deposits. Holders of subordinated debt securities should recognize that contractual provisions in the subordinated debt indenture may prohibit us from making payments on these securities.

If we become insolvent or are wound-up, the subordinated debt securities will rank equally and ratably with, but not prior to, all other subordinated debt and subordinate in right of payment to the prior payment in full of (i) our indebtedness then outstanding, other than subordinated indebtedness, and (ii) all indebtedness to which our other subordinated indebtedness is subordinate in right of payment to the same extent as such other subordinated indebtedness. As of July 31, 2018, we had approximately \$1,205 billion of senior indebtedness, including deposits, outstanding, which would rank ahead of the subordinated debt securities. The only outstanding subordinated indebtedness issued to date has been issued pursuant to:

- our indentures with Computershare Trust Company of Canada, dated October 1, 1984, June 6, 1986 and June 18, 2004, as supplemented from time to time;
- our amended and restated issue and paying agency agreement with Royal Bank of Canada, London branch, Fortis Banque Luxembourg S.A., ING Belgium S.A./N.V., Royal Bank of Canada (Suisse) and Royal Bank of Canada, Toronto branch, dated July 14, 2006, as supplemented from time to time;
- a trust deed between RBC Royal Bank (Trinidad & Tobago) Limited and RBC Trust (Trinidad & Tobago) Limited dated November 1, 2012 in respect of the issuance of debentures by our subsidiary; and
- the subordinated debt indenture.

For these purposes, “indebtedness” at any time means:

- (i) the deposit liabilities of the Bank at such time; and
- (ii) all other liabilities and obligations of the Bank to third parties (other than fines or penalties which pursuant to the *Bank Act* (Canada) are a last charge on the assets of the Bank in the case of insolvency of such bank and obligations to shareholders of such bank) which would entitle such third parties to participate in a distribution of the Bank’s assets in the event of the insolvency or winding-up of the Bank.

For these purposes, “subordinated indebtedness” at any time means:

- (i) the liability of the Bank in respect of the principal of and premium, if any, and interest on its outstanding subordinated indebtedness outlined above;
- (ii) any indebtedness which ranks equally with and not prior to the outstanding subordinated indebtedness, in right of payment in the event of the insolvency or winding-up of the Bank and which, pursuant to the terms of the instrument

evidencing or creating the same, is expressed to be subordinate in right of payment to all indebtedness to which the outstanding subordinated indebtedness is subordinate in right of payment to at least the same extent as the outstanding subordinated indebtedness is subordinated thereto pursuant to the terms of the instrument evidencing or creating the same;

(iii) any indebtedness which ranks subordinate to and not equally with or prior to the outstanding subordinated indebtedness, in right of payment in the event of the insolvency or winding-up of the Bank and which, pursuant to the terms of the instrument evidencing or creating the same, is expressed to be subordinate in right of payment to all indebtedness to which the outstanding subordinated indebtedness is subordinate in right of payment to at least the same extent as the outstanding subordinated indebtedness is subordinated pursuant to the terms of the instrument evidencing or creating the same; and

(iv) the subordinated debt securities, which will rank equally to the Bank's outstanding subordinated indebtedness.

The subordination provisions of the subordinated debt indenture will be governed by the laws of the Province of Ontario and the federal laws of Canada applicable therein.

Non-Viability Contingent Capital Provisions

In accordance with capital adequacy requirements adopted by the Office of the Superintendent of Financial Institutions Canada ("OSFI"), in order to qualify as regulatory capital, non-common capital instruments issued after January 1, 2013, including subordinated debt securities, must include terms providing for the full and permanent conversion of such securities into common shares of the Bank upon the occurrence of a "Non-Viability Trigger Event" ("Non-Viability Contingent Capital Provisions").

"Non-Viability Trigger Event" has the meaning set out in the OSFI Guideline for Capital Adequacy Requirements (CAR), Chapter 2 – Definition of Capital, effective January 2013, as such term may be amended or superseded by OSFI from time to time, which term currently provides that each of the following constitutes a Non-Viability Trigger Event:

- the Superintendent publicly announces that the Bank has been advised, in writing, that the Superintendent is of the opinion that the Bank has ceased, or is about to cease, to be viable and that, after the conversion of all contingent instruments and taking into account any other factors or circumstances that are considered relevant or appropriate, it is reasonably likely that the viability of the Bank will be restored or maintained; or
- a federal or provincial government in Canada publicly announces that the Bank has accepted or agreed to accept a capital injection, or equivalent support, from the federal government or any provincial government or political subdivision or agent or agency thereof without which the Bank would have been determined by the Superintendent to be non-viable.

The specific terms of any Non-Viability Contingent Capital Provisions for any subordinated debt securities that we issue under this prospectus will be described in one or more prospectus supplements relating to such securities. If subordinated debt securities issued under the subordinated debt indenture are converted into common shares in accordance with Non-Viability Contingent Capital Provisions, the rights, terms and conditions of such securities, including with respect to priority and rights on liquidation, will no longer be relevant as all such securities will have been converted on a full and permanent basis into common shares ranking on parity with all other outstanding common shares of the Bank. The Non-Viability Contingent Capital Provisions do not apply to senior debt securities offered under this prospectus.

The Non-Viability Contingent Capital Provisions of the subordinated indenture will be governed by the laws of the Province of Ontario and the federal laws of Canada applicable therein.

Defeasance

Unless otherwise specified in the applicable prospectus supplement, the following discussion of full defeasance and covenant defeasance will be applicable to each series of debt securities that is denominated in U.S. dollars and has a fixed rate of interest and will apply to other series of debt securities if we so specify in the prospectus supplement. Any defeasance or covenant defeasance with respect to bail-inable debt securities that would result in the Bank not meeting the TLAC

requirements applicable to it pursuant to the TLAC Guideline (as defined under “—Canadian Bank Resolution Powers”) will be subject to the prior approval of the Superintendent. (Indenture Sections 1401, 1404)

Full Defeasance. If there is a change in U.S. federal tax law, as described below, we can legally release ourselves from any payment or other obligations on the debt securities, called full defeasance, if we put in place the following other arrangements for holders to be repaid:

- We must deposit in trust for the benefit of all holders of the debt securities a combination of money and notes or bonds of the U.S. government or a U.S. government agency or U.S. government-sponsored entity (the obligations of which are backed by the full faith and credit of the U.S. government) that will generate enough cash to make interest, principal and any other payments on the debt securities on their various due dates.
- There must be a change in current U.S. federal tax law or an Internal Revenue Service (“IRS”) ruling that lets us make the above deposit without causing the holders to be taxed on the debt securities any differently than if we did not make the deposit and just repaid the debt securities ourselves. (Under current federal tax law, the deposit and our legal release from the obligations pursuant to the debt securities would be treated as though we took back your debt securities and gave you your share of the cash and notes or bonds deposited in trust. In that event, you could recognize gain or loss on the debt securities you give back to us.)
- We must deliver to the trustee a legal opinion of our counsel confirming the tax-law change described above and that the holders of the debt securities will not recognize income, gain or loss for federal income tax purposes as a result of such deposit, defeasance and discharge and will be subject to federal income tax on the same amounts and in the same manner and at the same times as would be the case if such deposit, defeasance and discharge had not occurred. (Indenture Sections 1402 and 1404)
- In the case of the subordinated debt securities, the following requirement must also be met:
 - No event or condition may exist that, under the provisions described under “— Subordination Provisions” above, would prevent us from making payments of principal, premium or interest on those subordinated debt securities on the date of the deposit referred to above or during the 90 days after that date.

If we ever did accomplish full defeasance, as described above, you would have to rely solely on the trust deposit for repayment on the debt securities. You could not look to us for repayment in the event of any shortfall. Subject to the foregoing conditions, and notwithstanding that a full defeasance may be authorized pursuant to the subordinated debt indenture in respect of a series of subordinated debt securities, the Bank will not take such action in respect of a series of subordinated debt securities until at least the fifth anniversary of the date of issuance of such series.

Covenant Defeasance. Even without a change in current U.S. federal tax law, we can make the same type of deposit as described above, and we will be released from the restrictive covenants under the debt securities that may be described in the prospectus supplement. This is called covenant defeasance. In that event, you would lose the protection of these covenants but would gain the protection of having money and U.S. government or U.S. government agency notes or bonds set aside in trust to repay the debt securities. In order to achieve covenant defeasance, we must do the following:

- We must deposit in trust for the benefit of all holders of the debt securities a combination of money and notes or bonds of the U.S. government or a U.S. government agency or U.S. government sponsored entity (the obligations of which are backed by the full faith and credit of the U.S. government) that will generate enough cash to make interest, principal and any other payments on the debt securities on their various due dates.
- We must deliver to the trustee a legal opinion of our counsel confirming that the holders of the debt securities will not recognize income, gain or loss for federal income tax purposes as a result of such deposit and covenant defeasance and will be subject to federal income tax on the same amounts and in the same manner and at the same times as would be the case if such deposit and covenant defeasance had not occurred.

If we accomplish covenant defeasance, certain provisions of the indenture and the debt securities would no longer apply:

- Covenants applicable to the series of debt securities and described in the prospectus supplement.
- Any events of default relating to breach of those covenants.

If we accomplish covenant defeasance, you can still look to us for repayment of the debt securities if there were a shortfall in the trust deposit. In fact, if one of the remaining events of default occurs (such as a bankruptcy) and the debt securities become immediately due and payable, there may be such a shortfall. (Indenture Sections 1403 and 1404)

Events of Default

You will have special rights if an event of default occurs and is not cured, as described later in this subsection.

What is an Event of Default?

Under the senior debt indenture, for debt securities of a series issued on or after September 23, 2018, “event of default” means any of the following:

1. We default in the payment of the principal of, or interest on, any note of that series and, in each case, the default continues for a period of 30 business days; or
2. We become insolvent or bankrupt or subject to the provisions of the *Winding-Up and Restructuring Act* (Canada), we go into liquidation either voluntarily or under an order of a court of competent jurisdiction, or we otherwise acknowledge our insolvency; or
3. Any other event of default described in an applicable supplement occurs. (Indenture Section 501)

An event of default regarding one series of debt securities will not cause an event of default regarding any other series of debt securities. For purposes of this section “— Events of Default”, with respect to debt securities issued on or after September 23, 2018, “series” refers to debt securities having identical terms, except as to issue date, principal amount and, if applicable, the date from which interest begins to accrue.

Notwithstanding the foregoing, if you purchase debt securities issued before September 23, 2018, or debt securities that are part of a series created before the date of this prospectus, “event of default” means any of the following:

- We do not pay the principal of or any premium on a debt security.
- We do not pay interest on a debt security within 30 days of its due date.
- We become insolvent or bankrupt or subject to the provisions of the *Winding-Up and Restructuring Act* (Canada), we go into liquidation either voluntarily or under an order of a court of competent jurisdiction, or we otherwise acknowledge our insolvency.
- Any other event of default described in the prospectus supplement occurs. (Indenture Section 501)

A bail-in conversion will not constitute a default or an event of default under the senior debt indenture.

Under the subordinated debt indenture, the term “Event of Default” means any of the following:

- We become insolvent or bankrupt or subject to the provisions of the *Winding-Up and Restructuring Act* (Canada), we go into liquidation either voluntarily or under an order of a court of competent jurisdiction, or we otherwise acknowledge our insolvency.
- Any other event of default described in the prospectus supplement occurs. (Indenture Section 501)

A non-viability contingent capital conversion or a bail-in conversion will not constitute a default or an event of default under the subordinated debt indenture.

Remedies If an Event of Default Occurs. If an Event of Default occurs, the trustee will have special duties. In that situation, the trustee will be obligated to use its rights and powers under the indentures, and to use the same degree of care and skill in doing so that a prudent person would use in that situation in conducting his or her own affairs. If an Event of Default has occurred and has not been cured, the trustee or the holders of at least 25% in principal amount of the debt securities of the affected series may declare the entire principal amount of all the debt securities of that series (or, in the case of original issue discount securities, the portion of the principal amount that is specified in the terms of the affected debt security) to be due and immediately payable. This is called a declaration of acceleration of maturity. However, a declaration of acceleration of maturity may be cancelled, but only before a judgment or decree based on the acceleration has been obtained, by the holders of at least a majority in principal amount of the debt securities of the affected series. If you are the holder of a subordinated debt security, the principal amount of the subordinated debt security will not be paid and may not be required to be paid at any time prior to the relevant maturity date, except in the event of our insolvency or winding-up. (Indenture Section 502)

Holders or beneficial owners of bail-inable debt securities may only exercise, or direct the exercise of, the rights described in this section if the Governor in Council (*Canada*) has not made an order under Canadian bank resolution powers pursuant to subsection 39.13(1) of the CDIC Act in respect of the Bank. Notwithstanding the exercise of those rights, bail-inable debt securities will continue to be subject to bail-in conversion until repaid in full. (Indenture Section 502)

You should read carefully the prospectus supplement relating to any series of debt securities which are original issue discount securities for the particular provisions relating to acceleration of the maturity of a portion of the principal amount of original issue discount securities upon the occurrence of an event of default and its continuation.

Except in cases of default in which the trustee has the special duties described above, the trustee is not required to take any action under the indenture at the request of any holders unless the holders offer the trustee reasonable protection from expenses and liability called an indemnity. (Indenture Section 603) If reasonable indemnity is provided, the holders of a majority in principal amount of the outstanding securities of the relevant series may direct the time, method and place of conducting any lawsuit or other formal legal action seeking any remedy available to the trustee. These majority holders may also direct the trustee in performing any other action under the applicable indenture with respect to the debt securities of that series. (Indenture Section 512)

Before you bypass the trustee and bring your own lawsuit or other formal legal action or take other steps to enforce your rights or protect your interests relating to the debt securities, the following must occur:

- the holder of the debt security must give the trustee written notice that an event of default has occurred and remains uncured;
- the holders of 25% in principal amount of all outstanding securities of the relevant series must make a written request that the trustee take action because of the default, and must offer reasonable indemnity to the trustee against the cost and other liabilities of taking that action; and
- the trustee must have not taken action for 90 days after receipt of the above notice and offer of indemnity. (Indenture Section 507)

However, you are entitled at any time to bring a lawsuit for the payment of money due on your debt security on or after its due date. (Indenture Section 508)

Book-entry and other indirect holders should consult their banks, brokers or other financial institutions for information on how to give notice or direction to or make a request of the trustee and to make or cancel a declaration of acceleration.

We will give to the trustee every year a written statement of certain of our officers certifying that to their knowledge we are in compliance with the applicable indenture and the debt securities issued under it, or else specifying any default. (Indenture Section 1004)

Ownership and Book-Entry Issuance

In this section, we describe special considerations that will apply to registered securities issued in global *i.e.*, book-entry, form. First we describe the difference between registered ownership and indirect ownership of registered securities. Then we describe special provisions that apply to global securities.

Who is the Registered Owner of a Security?

Each debt security will be represented either by a certificate issued in definitive form to a particular investor or by one or more global securities representing securities. We refer to those who have securities registered in their own names, on the books that we or the trustee maintain for this purpose, as the “registered holders” of those securities. Subject to limited exceptions, we and the trustee are entitled to treat the registered holder of a security as the person exclusively entitled to vote, to receive notices, to receive any interest or other payment in respect of the security and to exercise all the rights and powers as an owner of the security. We refer to those who own beneficial interests in securities that are not registered in their own names as indirect owners of those securities. As we discuss below, indirect owners are not registered holders, and investors in securities issued in book-entry form or in street name will be indirect owners.

Book-Entry Owners. Unless otherwise noted in your prospectus supplement, we will issue each security in book-entry form only. This means securities will be represented by one or more global securities registered in the name of a financial institution that holds them as depository on behalf of other financial institutions that participate in the depository’s book-entry system. These participating institutions, in turn, hold beneficial interests in the securities on behalf of themselves or their customers.

Under each indenture (and the *Bank Act* (Canada) in the case of subordinated indebtedness), subject to limited exceptions, only the person in whose name a security is registered is recognized as the holder of that security. Consequently, for securities issued in global form, we will recognize only the depository as the holder of the securities and we will make all payments on the securities, including deliveries of any property other than cash, to the depository. The depository passes along the payments it receives to its participants, which in turn pass the payments along to their customers who are the beneficial owners. The depository and its participants do so under agreements they have made with one another or with their customers; they are not obligated to do so under the terms of the securities.

As a result, investors will not own securities directly. Instead, they will own beneficial interests in a global security, through a bank, broker or other financial institution that participates in the depository’s book-entry system or holds an interest through a participant. As long as the securities are issued in global form, investors will be indirect owners, and not registered holders, of the securities.

Street Name Owners. We may terminate an existing global security or issue securities initially in non-global form. In these cases, investors may choose to hold their securities in their own names or in street name. Securities held by an investor in street name would be registered in the name of a bank, broker or other financial institution that the investor chooses, and the investor would hold only a beneficial interest in those securities through an account he or she maintains at that institution.

For securities held in street name, we will, subject to limited exceptions, recognize only the intermediary banks, brokers and other financial institutions in whose names the securities are registered as the holders of those securities, and we will make all payments on those securities, including deliveries of any property other than cash, to them. These institutions pass along the payments they receive to their customers who are the beneficial owners, but only because they agree to do so in their customer agreements or because they are legally required to do so. Investors who hold securities in street name will be indirect owners, not registered holders, of those securities.

Registered Holders. Subject to limited exceptions, our obligations, as well as the obligations of the trustee under any indenture and the obligations, if any, of any other third parties employed by us, run only to the registered holders of the securities. We do not have obligations to investors who hold beneficial interests in global securities, in street name or by any other indirect means. This will be the case whether an investor chooses to be an indirect owner of a security or has no choice because we are issuing the securities only in global form.

For example, once we make a payment or give a notice to the registered holder, we have no further responsibility for that payment or notice even if that holder is required, under agreements with depository participants or customers or by law, to pass it along to the indirect owners but does not do so. Similarly, if we want to obtain the approval of the holders for any purpose — for example, to amend the indenture for a series of debt securities or to relieve us of the consequences of a default or of our obligation to comply with a particular provision of an indenture — we would seek the approval only from the

registered holders, and not the indirect owners, of the relevant securities. Whether and how the registered holders contact the indirect owners is up to the registered holders.

When we refer to “you” in this prospectus, we mean all purchasers of the securities being offered by this prospectus, whether they are the registered holders or only indirect owners of those securities. When we refer to “your securities” in this prospectus, we mean the securities in which you will hold a direct or indirect interest.

Special Considerations for Indirect Owners. If you hold securities through a bank, broker or other financial institution, either in book-entry form or in street name, you should check with your own institution to find out:

- how it handles securities payments and notices;
- whether it imposes fees or charges;
- how it would handle a request for the holders’ consent, if ever required;
- how it would exercise rights under the securities if there were a default or other event triggering the need for holders to act to protect their interests; and
- if the securities are in book-entry form, how the depository’s rules and procedures will affect these matters.

What is a Global Security?

Unless otherwise noted in the applicable prospectus supplement, we will issue each security in book-entry form only. Each security issued in book-entry form will be represented by a global security that we deposit with and register in the name of one or more financial institutions or clearing systems, or their nominees, which we select. A financial institution or clearing system that we select for any security for this purpose is called the “depository” for that security. A security will usually have only one depository but it may have more. Each series of securities will have one or more of the following as the depositories:

- DTC;
- Euroclear System, which is known as “Euroclear”;
- Clearstream Banking, *société anonyme*, Luxembourg, which is known as “Clearstream”;
- CDS Clearing and Depository Services Inc., which is known as “CDS”; and
- any other clearing system or financial institution named in the prospectus supplement.

The depositories named above may also be participants in one another’s systems. Thus, for example, if DTC is the depository for a global security, investors may hold beneficial interests in that security through Euroclear, Clearstream or CDS, as DTC participants. The depository or depositories for your securities will be named in your prospectus supplement; if none is named, the depository will be DTC.

A global security may represent one or any other number of individual securities. Generally, all securities represented by the same global security will have the same terms. We may, however, issue a global security that represents multiple securities of the same kind, such as debt securities, that have different terms and are issued at different times. We call this kind of global security a master global security. Your prospectus supplement will not indicate whether your securities are represented by a master global security.

A global security may not be transferred to or registered in the name of anyone other than the depository or its nominee, unless special termination situations arise. We describe those situations below under “— Holder’s Option to Obtain a Non-Global Security; Special Situations When a Global Security Will Be Terminated”. As a result of these arrangements, the depository, or its nominee, will be the sole registered owner and holder of all securities represented by a global security, and investors will be permitted to own only indirect interests in a global security. Indirect interests must be held by means of an account with a broker, bank or other financial institution that in turn has an account with the depository or with another

institution that does. Thus, an investor whose security is represented by a global security will not be a holder of the security, but only an indirect owner of an interest in the global security.

If the prospectus supplement for a particular security indicates that the security will be issued in global form only, then the security will be represented by a global security at all times unless and until the global security is terminated. We describe the situations in which this can occur below under “— Holder’s Option to Obtain a Non-Global Security; Special Situations When a Global Security Will Be Terminated”. If termination occurs, we may issue the securities through another book-entry clearing system or decide that the securities may no longer be held through any book-entry clearing system.

Special Considerations for Global Securities. As an indirect owner, an investor’s rights relating to a global security will be governed by the account rules of the depository and those of the investor’s bank, broker, financial institution or other intermediary through which it holds its interest (e.g., Euroclear, Clearstream or CDS, if DTC is the depository), as well as general laws relating to securities transfers. We do not recognize this type of investor or any intermediary as a holder of securities and instead deal only with the depository that holds the global security.

If securities are issued only in the form of a global security, an investor should be aware of the following:

- an investor cannot cause the securities to be registered in his or her own name, and cannot obtain non-global certificates for his or her interest in the securities, except in the special situations we describe below;
- an investor will be an indirect holder and must look to his or her own bank, broker or other financial institution for payments on the securities and protection of his or her legal rights relating to the securities, as we describe above under “— Who Is the Registered Owner of a Security?”;
- an investor may not be able to sell interests in the securities to some insurance companies and other institutions that are required by law to own their securities in non-book-entry form;
- an investor may not be able to pledge his or her interest in a global security in circumstances in which certificates representing the securities must be delivered to the lender or other beneficiary of the pledge in order for the pledge to be effective;
- the depository’s policies will govern payments, deliveries, transfers, exchanges, notices and other matters relating to an investor’s interest in a global security, and those policies may change from time to time. We and the trustee will have no responsibility for any aspect of the depository’s policies, actions or records of ownership interests in a global security. We and the trustee also do not supervise the depository in any way;
- the depository may require that those who purchase and sell interests in a global security within its book-entry system use immediately available funds and your bank, broker or other financial institution may require you to do so as well; and
- financial institutions that participate in the depository’s book-entry system and through which an investor holds its interest in the global securities, directly or indirectly, may also have their own policies affecting payments, deliveries, transfers, exchanges, notices and other matters relating to the securities, and those policies may change from time to time. For example, if you hold an interest in a global security through Euroclear, Clearstream or CDS, when DTC is the depository, Euroclear, Clearstream or CDS, as applicable, may require those who purchase and sell interests in that security through them to use immediately available funds and comply with other policies and procedures, including deadlines for giving instructions as to transactions that are to be effected on a particular day. There may be more than one financial intermediary in the chain of ownership for an investor. We do not monitor and are not responsible for the policies or actions or records of ownership interests of any of those intermediaries.

Holder’s Option to Obtain a Non-Global Security; Special Situations When a Global Security Will Be Terminated. If we issue any series of securities in book-entry form but we choose to give the beneficial owners of that series the right to obtain non-global securities, any beneficial owner entitled to obtain non-global securities may do so by following the applicable procedures of the depository, any transfer agent or registrar for that series and that owner’s bank, broker or other financial institution through which that owner holds its beneficial interest in the securities. If you are entitled to request a non-global certificate and wish to do so, you will need to allow sufficient lead time to enable us or our agent to prepare the requested certificate.

In addition, in a few special situations described below, a global security will be terminated and interests in it will be exchanged for certificates in non-global form representing the securities it represented. After that exchange, the choice of whether to hold the securities directly or in street name will be up to the investor. Investors must consult their own banks, brokers or other financial institutions to find out how to have their interests in a global security transferred on termination to their own names, so that they will be holders. We have described the rights of holders and street name investors above under “— Who Is the Registered Owner of a Security?”.

The special situations for termination of a global security are as follows:

- if the depository notifies us that it is unwilling, unable or no longer qualified to continue as depository for that global security and we do not appoint another institution to act as depository within 60 days;
- if we notify the trustee that we wish to terminate that global security; or
- if an event of default has occurred with regard to these debt securities and has not been cured or waived.

DTC’s current rules provide that it would notify its participants of a request by us to terminate a global security, but will withdraw beneficial interests from the global security only at the request of each DTC participant.

If a global security is terminated, only the depository, and neither we nor the trustee for any debt securities is responsible for deciding the names of the institutions in whose names the securities represented by the global security will be registered and, therefore, who will be the registered holders of those securities.

Considerations Relating to DTC

DTC has informed us as follows:

DTC is a limited-purpose trust company organized under the New York Banking Law, a “banking organization” within the meaning of the New York Banking Law, a member of the Federal Reserve System, a “clearing corporation” within the meaning of the New York Uniform Commercial Code and a “clearing agency” registered pursuant to the provisions of Section 17A of the Exchange Act. DTC holds securities that DTC participants deposit with DTC. DTC also facilitates the post-trade settlement among DTC participants of sales and other securities transactions in deposited securities, through electronic computerized book-entry transfers and pledges between DTC participants’ accounts. This eliminates the need for physical movement of securities certificates. DTC participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is a wholly owned subsidiary of The Depository Trust & Clearing Corporation (“DTCC”). DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. brokers and dealers, banks, trust companies and clearing corporations that clear through or maintain a custodial relationship with a DTC participant, either directly or indirectly. The rules applicable to DTC and DTC participants are on file with the SEC.

Purchases of securities within the DTC system must be made by or through DTC participants, which will receive a credit for the securities on DTC’s records. The ownership interest of each actual acquirer of new securities is in turn to be recorded on the direct and indirect participants’ records. Beneficial owners will not receive written confirmation from DTC of their purchase. Beneficial owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the direct or indirect participant through which the beneficial owner entered into the transaction. Transfers of ownership interests in the securities are to be accomplished by entries made on the books of direct and indirect participants acting on behalf of beneficial owners. Beneficial owners will not receive certificates representing their ownership interests in securities, except in the event that use of the book-entry system for the securities is discontinued.

To facilitate subsequent transfers, the securities deposited by direct participants with DTC will be registered in the name of DTC’s partnership nominee, Cede & Co., or such other name as may be requested by an authorized representative of DTC. The deposit of securities with DTC and their registration in the name of Cede & Co. or such other nominee will not effect any change in beneficial ownership. DTC has no knowledge of the actual beneficial owners of the securities; DTC’s records reflect only the identity of the direct participants to whose accounts the securities are credited, which may or may not be the beneficial owners. The participants are responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to its direct participants, by its direct participants to indirect participants, and by its direct and indirect participants to beneficial owners of the securities will be governed by arrangements among them, respectively, subject to any statutory or regulatory requirements as may be in effect from time to time.

Redemption notices will be sent to DTC. If less than all of the securities are being redeemed, DTC will determine the amount of the interest of each direct participant to be redeemed in accordance with its then current procedures.

Neither DTC nor Cede & Co. (nor any other DTC nominee) will consent or vote with respect to securities unless authorized by a direct participant in accordance with DTC's procedures. Under its usual procedures, DTC mails an omnibus proxy to the issuer as soon as possible after the record date. The omnibus proxy assigns Cede & Co.'s consenting or voting rights to those direct participants to whose accounts such securities are credited on the record date (identified in a listing attached to the omnibus proxy).

Distribution payments on the securities will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's usual practice is to credit direct participants' accounts upon DTC's receipt of funds and corresponding detail information from the issuer or agent on the relevant payment date in accordance with their respective holdings shown on DTC's records. Payments by DTC participants to beneficial owners will be governed by standing instructions and customary practices and will be the responsibility of such participants and not of DTC, the agent or the issuer, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of distributions to Cede & Co. (or other nominee as may be requested by an authorized representative of DTC) is the responsibility of the issuer or agent, disbursements of such payments to direct participants are the responsibility of DTC, and disbursements of such payments to the beneficial owners are the responsibility of direct and indirect participants.

DTC may discontinue providing its services as depository with respect to the securities at any time by giving reasonable notice to the issuer or agent. Under such circumstances, in the event that a successor depository is not obtained, security certificates are required to be printed and delivered.

The Bank may decide to discontinue use of the system of book-entry-only transfers through DTC (or a successor securities depository). In that event, security certificates will be printed and delivered to DTC.

The information in this section concerning DTC and DTC's book-entry system has been obtained from sources that we believe to be reliable, but we take no responsibility for the accuracy thereof.

Considerations Relating to Euroclear and Clearstream

Euroclear and Clearstream are securities clearing systems in Europe. Both systems clear and settle securities transactions between their participants through electronic, book-entry delivery of securities against payment.

Euroclear and Clearstream may be depositaries for a global security. In addition, if DTC is the depository for a global security, Euroclear and Clearstream may hold interests in the global security as participants in DTC.

As long as any global security is held by Euroclear or Clearstream, as depository, you may hold an interest in the global security only through an organization that participates, directly or indirectly, in Euroclear or Clearstream. If Euroclear or Clearstream is the depository for a global security and there is no depository in the United States, you will not be able to hold interests in that global security through any securities clearance system in the United States.

Payments, deliveries, transfers, exchanges, notices and other matters relating to the securities made through Euroclear or Clearstream must comply with the rules and procedures of those systems. Those clearing systems could change their rules and procedures at any time. We have no control over those systems or their participants, and we take no responsibility for their activities. Transactions between participants in Euroclear or Clearstream, on one hand, and participants in DTC, on the other hand, when DTC is the depository, would also be subject to DTC's rules and procedures.

Special Timing Considerations Relating to Transactions in Euroclear and Clearstream. Investors will be able to make and receive through Euroclear and Clearstream payments, deliveries, transfers, exchanges, notices and other transactions involving any securities held through those clearing systems only on days when those systems are open for business. These clearing systems may not be open for business on days when banks, brokers and other institutions are open for business in the United States.

In addition, because of time-zone differences, U.S. investors who hold their interests in the securities through these clearing systems and wish to transfer their interests, or to receive or make a payment or delivery or exercise any other right with respect to their interests, on a particular day may find that the transaction will not be effected until the next business day in Luxembourg or Brussels, as applicable. Thus, investors who wish to exercise rights that expire on a particular day may need to act before the expiration date. In addition, investors who hold their interests through both DTC and Euroclear or Clearstream may need to make special arrangements to finance any purchases or sales of their interests between the U.S. and European clearing systems, and those transactions may settle later than would be the case for transactions within one clearing system.

Considerations Relating to CDS

The information concerning CDS has been taken from, or is based upon, publicly available documents. CDS is Canada's national securities clearing and depository services organization. Functioning as a service utility for the Canadian financial community, CDS provides a variety of computer automated services for financial institutions and investment dealers active in Canadian and international capital markets. CDS participants ("CDS Participants") include banks, investment dealers and trust companies, and may include underwriters which participate in the distribution of the securities. Indirect access to CDS is available to other organizations that clear through or maintain a custodial relationship with a CDS Participant. Payments, deliveries, transfers, exchanges, notices and other actions relating to the securities made through CDS may only be processed through CDS Participants and must be completed in accordance with existing CDS rules and procedures. CDS operates in Montreal, Toronto, Calgary and Vancouver to centralize securities clearing functions through a central securities depository.

CDS is wholly owned by The Canadian Depository for Securities Limited, a private corporation owned by TMX Group Limited, a reporting issuer in Canada. CDS is the clearing house for equity trading on both the Toronto and Montreal stock exchanges and also clears a substantial volume of "over-the-counter" trading in equities and bonds.

CDS may be a depository for a global security. In addition, if DTC is the depository for a global security, CDS may, on behalf of CDS Participants, hold an interest in the global security.

As long as any global security is held by CDS, as depository, you may hold an interest in the global security only through an organization that participates, directly or indirectly, in CDS. If CDS is the depository for a global security and there is no depository in the United States, you will not be able to hold interests in that global security through any securities clearance system in the United States.

CDS could change its rules and procedures at any time. We have no control over CDS or its participants, and we take no responsibility for its activities. Transactions between participants in CDS, on one hand, and participants in DTC, on the other hand, when DTC is the depository, would also be subject to DTC's rules and procedures.

The Trustee

The Bank of New York Mellon, as successor to the corporate trust business of JPMorgan Chase Bank, N.A., serves as the trustee for our senior debt securities and our subordinated debt securities and will serve as the trustee for the warrants issued under our warrant indenture. Consequently, if an actual or potential event of default occurs with respect to any of these securities, the trustee may be considered to have a conflicting interest for purposes of the Trust Indenture Act. In that case, the trustee may be required to resign under one or both of the indentures, and we would be required to appoint a successor trustee. For this purpose, a "potential" event of default means an event that would be an event of default if the requirements for giving us default notice or for the default having to exist for a specific period of time were disregarded. From time to time, we and our affiliates have conducted commercial banking, financial and other transactions with The Bank of New York Mellon and its respective affiliates for which fees have been paid in the ordinary course of business. We may conduct these types of transactions with each other in the future and receive fees for services performed.

Canadian Bank Resolution Powers

General

Under Canadian bank resolution powers, the CDIC may, in circumstances where the Bank has ceased, or is about to cease, to be viable, assume temporary control or ownership of the Bank and may be granted broad powers by one or more Orders, including the power to sell or dispose of all or a part of the assets of the Bank, and the power to carry out or cause the Bank to carry out a transaction or a series of transactions the purpose of which is to restructure the business of the Bank. As

part of the Canadian bank resolution powers, certain provisions of and regulations under the Bank Act, the CDIC Act and certain other Canadian federal statutes pertaining to banks, which we refer to collectively as the “bail-in regime,” provide for a bank recapitalization regime for banks designated by the Superintendent as “domestic systemically important banks”, or “D-SIBs”, which include the Bank.

The expressed objectives of the bail-in regime include reducing government and taxpayer exposure in the unlikely event of a failure of a D-SIB, reducing the likelihood of such a failure by increasing market discipline and reinforcing that bank shareholders and creditors are responsible for the D-SIBs’ risks and not taxpayers, and preserving financial stability by empowering the CDIC to quickly restore a failed D-SIB to viability and allow it to remain open and operating, even where the D-SIB has experienced severe losses.

Under the CDIC Act, in circumstances where the Superintendent is of the opinion that the Bank has ceased, or is about to cease, to be viable and viability cannot be restored or preserved by exercise of the Superintendent’s powers under the Bank Act, the Superintendent, after providing the Bank with a reasonable opportunity to make representations, is required to provide a report to CDIC. Following receipt of the Superintendent’s report, CDIC may request the Minister of Finance for Canada (the “Minister of Finance”) to recommend that the Governor in Council (Canada) make an Order and, if the Minister of Finance is of the opinion that it is in the public interest to do so, the Minister of Finance may recommend that the Governor in Council (Canada) make, and on that recommendation, the Governor in Council (Canada) may make, one or more of the following Orders:

- vesting in CDIC, the shares and subordinated debt of the Bank specified in the Order, which we refer to as a “vesting order”;
- appointing CDIC as receiver in respect of the Bank, which we refer to as a “receivership order”;
- if a receivership order has been made, directing the Minister of Finance to incorporate a federal institution designated in the Order as a bridge institution wholly owned by CDIC and specifying the date and time as of which the Bank’s deposit liabilities are assumed, which we refer to as a “bridge bank order”; or
- if a vesting order or receivership order has been made, directing CDIC to carry out a conversion, by converting or causing the Bank to convert, in whole or in part – by means of a transaction or series of transactions and in one or more steps – the shares and liabilities of the Bank that are subject to the bail-in regime into common shares of the Bank or any of its affiliates, which we refer to as a “conversion order”.

Following a vesting order or receivership order, CDIC will assume temporary control or ownership of the Bank and will be granted broad powers under that Order, including the power to sell or dispose of all or a part of the assets of the Bank, and the power to carry out or cause the Bank to carry out a transaction or a series of transactions the purpose of which is to restructure the business of the Bank.

Under a bridge bank order, CDIC has the power to transfer the Bank’s insured deposit liabilities and certain assets and other liabilities of the Bank to a bridge institution. Upon the exercise of that power, any assets and liabilities of the Bank that are not transferred to the bridge institution would remain with the Bank, which would then be wound up. In such a scenario, any liabilities of the Bank, including any outstanding debt securities (whether or not such debt securities are bail-inable debt securities), that are not assumed by the bridge institution could receive only partial or no repayment in the ensuing wind-up of the Bank.

Upon the making of a conversion order, prescribed shares and liabilities under the bail-in regime that are subject to that conversion order will, to the extent converted, be converted into common shares of the Bank or any of its affiliates, as determined by CDIC. Subject to certain exceptions discussed below, senior debt issued on or after September 23, 2018, with an initial or amended term to maturity (including explicit or embedded options) greater than 400 days, that is unsecured or partially secured and that has been assigned a CUSIP or ISIN or similar identification number are subject to a bail-in conversion. Shares, other than common shares, and subordinated debt of the Bank are also subject to a bail-in conversion, unless they are non-viability contingent capital.

Shares and liabilities which would otherwise be bail-inable but were issued before September 23, 2018 are not subject to a bail-in conversion unless, in the case of any such liability, including any debt securities, the terms of that liability are amended to increase the principal amount or to extend the term to maturity on or after September 23, 2018, and that liability, as amended, meets the requirements to be subject to a bail-in conversion. Covered bonds, certain derivatives and certain structured notes (as such term is used under the bail-in regime) are expressly excluded from a bail-in conversion. To

the extent that any debt securities constitute structured notes (as such term is used under the bail-in regime) they will not be bail-inable debt securities. As a result, claims of some creditors whose claims would otherwise rank equally with those of the holders holding bail-inable debt securities would be excluded from a bail-in conversion and thus the holders and beneficial owners of bail-inable debt securities will have to absorb losses ahead of these other creditors as a result of the bail-in conversion. The terms and conditions of the bail-in conversion will be determined by CDIC in accordance with and subject to certain requirements discussed below.

Bail-in Conversion

Under the bail-in regime there is no fixed and pre-determined contractual conversion ratio for the conversion of the bail-inable debt securities, or other shares or liabilities of the Bank that are subject to a bail-in conversion, into common shares of the Bank or any of its affiliates nor are there specific requirements regarding whether liabilities subject to a bail-in conversion are converted into common shares of the Bank or any of its affiliates. CDIC determines the timing of the bail-in conversion, the portion of bail-inable shares and liabilities to be converted and the terms and conditions of the conversion, subject to parameters set out in the bail-in regime. Those parameters include that:

- in carrying out a bail-in conversion, CDIC must take into consideration the requirement in the Bank Act for banks to maintain adequate capital;
- CDIC must use its best efforts to ensure that shares and liabilities subject to a bail-in conversion are only converted after all subordinate ranking shares and liabilities that are subject to a bail-in conversion and any subordinate non-viability contingent capital instruments have been previously converted or are converted at the same time;
- CDIC must use its best efforts to ensure that the converted part of the liquidation entitlement of a share subject to a bail-in conversion, or the converted part of the principal amount and accrued and unpaid interest of a liability subject to a bail-in conversion, is converted on a pro rata basis for all shares or liabilities subject to a bail-in conversion of equal rank that are converted during the same restructuring period;
- holders of shares and liabilities that are subject to a bail-in conversion must receive a greater number of common shares per dollar of the converted part of the liquidation entitlement of their shares, or the converted part of the principal amount and accrued and unpaid interest of their liabilities, than holders of any subordinate shares or liabilities subject to a bail-in conversion that are converted during the same restructuring period or of any subordinate non-viability contingent capital that is converted during the same restructuring period;
- holders of shares or liabilities subject to a bail-in conversion of equal rank that are converted during the same restructuring period must receive the same number of common shares per dollar of the converted part of the liquidation entitlement of their shares or the converted part of the principal amount and accrued and unpaid interest of their liabilities; and
- holders of shares or liabilities subject to a bail-in conversion must receive, if any non-viability contingent capital of equal rank to the shares or liabilities is converted during the same restructuring period, a number of common shares per dollar of the converted part of the liquidation entitlement of their shares, or the converted part of the principal amount and accrued and unpaid interest of their liabilities, that is equal to the largest number of common shares received by any holder of the non-viability contingent capital per dollar of that capital.

Compensation Regime

The CDIC Act provides for a compensation process for holders of bail-inable debt securities who immediately prior to the making of an Order, directly or through an intermediary, own bail-inable debt securities that are converted in a bail-in conversion. While this process applies to successors of those holders it does not apply to assignees or transferees of the holder following the making of the Order and does not apply if the amounts owing under the relevant bail-inable debt securities are paid in full.

Under the compensation process, the compensation to which such holders are entitled is the difference, to the extent it is positive, between the estimated liquidation value and the estimated resolution value of the relevant bail-inable debt

securities. The liquidation value is the estimated value the bail-inable holders would have received if an order under the *Winding-up and Restructuring Act* (Canada) had been made in respect of the Bank, as if no Order had been made and without taking into consideration any assistance, financial or otherwise, that is or may be provided to the Bank, directly or indirectly, by CDIC, the Bank of Canada, the Government of Canada or a province of Canada, after any order to wind up the Bank has been made.

The resolution value in respect of relevant bail-inable debt securities is the aggregate estimated value of the following: (a) the relevant bail-inable debt securities, if they are not held by CDIC and they are not converted, after the making of an Order, into common shares under a bail-in conversion; (b) common shares that are the result of a bail-in conversion after the making of an Order; (c) any dividend or interest payments made, after the making of the Order, with respect to the relevant bail-inable debt securities to any person other than CDIC; and (d) any other cash, securities or other rights or interests that are received or to be received with respect to the relevant bail-inable debt securities as a direct or indirect result of the making of the Order and any actions taken in furtherance of the Order, including from CDIC, the Bank, the liquidator of the Bank, if the Bank is wound up, the liquidator of a CDIC subsidiary incorporated or acquired by order of the Governor in Council for the purposes of facilitating the acquisition, management or disposal of real property or other assets of the Bank that CDIC may acquire as the result of its operations that is liquidated or the liquidator of a bridge institution if the bridge institution is wound up.

In connection with the compensation process, CDIC is required to estimate the liquidation value and the resolution value in respect of the portion of converted bail-inable debt securities and is required to consider the difference between the estimated day on which the liquidation value would be received and the estimated day on which the resolution value is, or would be, received.

CDIC must, within a reasonable period following a bail-in conversion, make an offer of compensation by notice to the relevant holders that held bail-inable debt securities equal to, or in value estimated to be equal to, the amount of compensation to which such holders are entitled or provide a notice stating that such holders are not entitled to any compensation. In either case, such offer or notice is required to include certain prescribed information, including important information regarding the rights of such holders to seek to object and have the compensation to which they are entitled determined by an assessor (a Canadian Federal Court judge) where holders of liabilities representing at least 10% of the principal amount and accrued and unpaid interest of the liabilities of the same class object to the offer or absence of compensation. The period for objecting is limited (45 days following the day on which a summary of the notice is published in the *Canada Gazette*) and failure by holders holding a sufficient principal amount plus accrued and unpaid interest of affected bail-inable debt securities to object within the prescribed period will result in the loss of any ability to object to the offered compensation or absence of compensation, as applicable. CDIC will pay the relevant holders the offered compensation within 135 days after the date on which a summary of the notice is published in the *Canada Gazette* if the offer of compensation is accepted, the holder does not notify CDIC of acceptance or objection to the offer or if the holder objects to the offer but the 10% threshold described above is not met within the aforementioned 45-day period.

Where an assessor is appointed, the assessor could determine a different amount of compensation payable, which could either be higher or lower than the original amount. The assessor is required to provide holders, whose compensation it determines, notice of its determination. The assessor's determination is final and there are no further opportunities for review or appeal. CDIC will pay the relevant holders the compensation amount determined by the assessor within 90 days of the assessor's notice.

By its acquisition of an interest in any bail-inable debt securities, each holder or beneficial owner of that debt security is deemed to be bound by a bail-in conversion and so will have no further rights in respect of its bail-inable notes to the extent those bail-inable notes are converted in a bail-in conversion, other than those provided under the bail-in regime.

A similar compensation process to the one set out above applies, in certain circumstances, where as a result of CDIC's exercise of bank resolution powers, notes are assigned to an entity which is then wound-up.

TLAC Guidelines

In connection with the bail-in regime, the OSFI guideline (the "TLAC Guideline") on Total Loss Absorbing Capacity ("TLAC") applies to and establishes standards for D-SIBs, including the Bank. Under the TLAC Guideline, beginning November 1, 2021, the Bank is required to maintain a minimum capacity to absorb losses composed of unsecured external long-term debt that meets the prescribed criteria or regulatory capital instruments to support recapitalization in the

event of a failure. Bail-inable debt securities and regulatory capital instruments that meet the prescribed criteria will constitute TLAC of the Bank.

In order to comply with the TLAC Guideline, our indenture provides for terms and conditions for the bail-inable debt securities necessary to meet the prescribed criteria and qualify at their issuance as TLAC instruments of the Bank under the TLAC Guideline. Those criteria include the following:

- the Bank cannot directly or indirectly have provided financing to any person for the express purpose of investing in the bail-inable debt securities;
- the bail-inable debt security is not subject to set-off or netting rights;
- the bail-inable debt security must not provide rights to accelerate repayment of principal or interest payments outside of bankruptcy, insolvency, wind-up or liquidation, except that events of default relating to the non-payment of scheduled principal and/or interest payments will be permitted where they are subject to a cure period of no less than 30 business days and clearly disclose to investors that: (i) acceleration is only permitted where an Order has not been made in respect of the Bank; and (ii) notwithstanding any acceleration, the instrument continues to be subject to a bail-in conversion prior to its repayment;
- the bail-inable debt security may be redeemed or purchased for cancellation only at the initiative of the Bank and, where the redemption or purchase would lead to a breach of the Bank's TLAC requirements, that redemption or purchase would be subject to the prior approval of the Superintendent;
- the bail-inable debt security does not have credit-sensitive dividend or coupon features that are reset periodically based in whole or in part on the Bank's credit standing; and
- where an amendment or variance of the bail-inable debt security's terms and conditions would affect its recognition as TLAC, that amendment or variance will only be permitted with the prior approval of the Superintendent.

DESCRIPTION OF COMMON SHARES

Set forth below is a summary of the material terms of the Bank's common shares and certain provisions of the *Bank Act (Canada)* and the Bank's amended and restated by-laws as they relate to the Bank's common shares. The following summary is not complete and is qualified in its entirety by the *Bank Act (Canada)*, the Bank's amended and restated by-laws and the actual terms and conditions of such shares.

Authorized Share Capital

The Bank's authorized share capital consists of an unlimited number of common shares without nominal or par value and an unlimited number of first preferred shares and second preferred shares without nominal or par value, issuable in series, which classes may be issued for a maximum consideration of C\$20 billion and C\$5 billion, respectively. As of August 17, 2018, the Bank had issued and outstanding 1,439,948,844 common shares and 250,989,449 first preferred shares. There are no second preferred shares currently outstanding.

Voting, Dividend and Winding Up Rights of Holders of Common Shares

The holders of the Bank's common shares are entitled to vote at all meetings of shareholders, except meetings at which only holders of a specified class, other than common shares, or series of shares are entitled to vote. The holders of common shares are entitled to receive dividends as and when declared by the board of directors, subject to the preference of the preferred shares. After payment to the holders of the preferred shares of the amount or amounts to which they may be entitled, and after payment of all outstanding debts, the holders of the common shares will be entitled to receive any remaining property upon liquidation, dissolution or winding-up of the Bank.

Limitations Affecting Holders of Common Shares

The *Bank Act (Canada)* contains restrictions (which are subject to any orders that may be issued by the Governor in Council of Canada) on the issue, transfer, acquisition, beneficial ownership and voting of all shares of a chartered bank. The following is a summary of such restrictions.

Subject to certain exceptions contained in the *Bank Act (Canada)*, no person may be a major shareholder of a bank having equity of \$12 billion or more (which includes the Bank). A person is a major shareholder if:

- (a) the aggregate of the shares of any class of voting shares of the bank beneficially owned by that person, by entities controlled by that person and by any person associated or acting jointly or in concert with that person is more than 20% of that class of voting shares, or
- (b) the aggregate of shares of any class of non-voting shares of the bank beneficially owned by that person, by entities controlled by that person and by any person associated or acting jointly or in concert with that person is more than 30% of that class of non-voting shares.

Additionally, no person may have a significant interest in any class of shares of a bank (including the Bank) unless the person first receives the approval of the Minister of Finance of Canada. For purposes of the *Bank Act (Canada)*, a person has a significant interest in a class of shares of a bank where the aggregate of any shares of the class beneficially owned by that person, by entities controlled by that person and by any person associated or acting jointly or in concert with that person exceeds 10% of all of the outstanding shares of that class of shares of such bank.

In addition, the *Bank Act (Canada)* prohibits a bank from purchasing or redeeming any of its shares or paying any dividends if there are reasonable grounds for believing the bank is, or the payment would cause the bank to be, in contravention of the *Bank Act (Canada)* requirement to maintain, in relation to its operations, adequate capital and appropriate forms of liquidity and to comply with any regulations or directions of the Superintendent of Financial Institutions (Canada) in relation thereto.

Subject to any orders that may be issued by the Governor in Council of Canada, the *Bank Act (Canada)* also prohibits the registration of a transfer or issue of any shares of a Canadian bank to any government or governmental agency of Canada or any province of Canada, or to any government of any foreign country, or any political subdivision, or agency of any foreign country. Under the *Bank Act (Canada)*, the Bank cannot redeem or purchase any shares for cancellation unless the prior consent of the Superintendent has been obtained.

Amendments to the Rights, Privileges, Restrictions and Conditions of Common Shares

Under the *Bank Act* (Canada), the rights of holders of the Bank's shares can be changed by the board of directors of the Bank by making, amending or repealing the by-laws of the Bank. The board of directors of the Bank must submit such a by-law, or amendment to or repeal of a by-law, to the shareholders of the Bank in accordance with the procedures of the *Bank Act* (Canada) and the by-laws of the Bank, and the shareholders must approve the by-law, amendment to or repeal of the by-law, by special resolution to be effective. Under the *Bank Act* (Canada), a special resolution is a resolution passed by not less than two-thirds of the votes cast by or on behalf of the shareholders who voted in respect of that resolution or signed by all the shareholders entitled to vote on that resolution. In some circumstances, the *Bank Act* (Canada) mandates that holders of shares of a class or a series are entitled to vote separately as a class or series on a proposal to amend the by-laws of the Bank.

DESCRIPTION OF WARRANTS

Our obligations under the warrants will not be secured by any of our property or assets or the property or assets of our subsidiaries. Thus, by owning a warrant, you are one of our unsecured creditors.

The warrants will be issued under a warrant indenture between Royal Bank of Canada and The Bank of New York Mellon, as trustee, as it may be amended from time to time (collectively, the “warrant indenture”), described below. The warrants will be unsubordinated obligations that rank equally with all of our other unsecured and unsubordinated debt, including deposit liabilities, other than certain governmental claims in accordance with applicable law.

In the event we become insolvent, our governing legislation provides that priorities among payments of our deposit liabilities (including payments in respect of the warrants) and payments of all of our other liabilities are to be determined in accordance with the laws governing priorities and, where applicable, by the terms of the indebtedness and liabilities. Because we have subsidiaries, our right to participate in any distribution of the assets of our banking or non-banking subsidiaries, upon a subsidiary’s dissolution, winding-up, liquidation or reorganization or otherwise, and thus your ability to benefit indirectly from such distribution, is subject to the prior claims of creditors of that subsidiary, except to the extent that we may be a creditor of that subsidiary and our claims are recognized. There are legal limitations on the extent to which some of our subsidiaries may extend credit, pay dividends or otherwise supply funds to, or engage in transactions with, us or some of our other subsidiaries. Accordingly, the warrants will be structurally subordinated to all existing and future liabilities of our subsidiaries, and holders of the warrants should look only to our assets for payments on those securities.

The warrants will not constitute deposits insured under the Canada Deposit Insurance Corporation Act or by the United States Federal Deposit Insurance Corporation or any other Canadian or United States governmental agency or instrumentality.

The Warrant Indenture

The warrants will be governed by the warrant indenture. The warrant indenture will be a contract between us and The Bank of New York Mellon, which will act as trustee.

The trustee has two main roles:

- The trustee can enforce the rights of holders against us if we default on our obligations under the terms of the warrant indenture or the warrants. There are some limitations on the extent to which the trustee acts on behalf of holders, described below under “—Events of Default—Remedies If an Event of Default Occurs”.
- The trustee performs administrative duties for us, such as sending payments and notices to holders and transferring a holder’s warrants to a new buyer if a holder sells.

Governing Law. The warrant indenture and its associated documents contain the full legal text of the matters described in this section. The warrant indenture and the warrants will be governed by New York law, except that certain provisions relating to the status of the warrants under Canadian law in the warrant indenture will be governed by the laws of the Province of Ontario and the laws of Canada applicable therein. A copy of the form of the warrant indenture is an exhibit to our Registration Statement. See “Where You Can Find More Information” above for information on how to obtain a copy.

The Underlying Assets

We may issue warrants, on terms to be determined at the time of sale, for the purchase or sale of, or whose cash value is determined by reference to the performance, level or value of, one or more of the following:

- the securities of one or more issuers other than us or our affiliates, which may include one or more common stocks, or the shares of one or more exchange traded funds;
- one or more indices;
- one or more currencies;
- any other financial, economic or other measure or instrument; or
- a basket of any of the items described above. (Indenture Section 101)

We refer to each property described above as an “underlying asset.”

We may satisfy our obligations, if any, and the holder of a warrant may satisfy its obligations, if any, with respect to any warrants by delivering:

- the cash value of the underlying asset; or
- the cash value of the warrants determined by reference to the performance, level or value of the underlying asset.

The applicable prospectus supplement or pricing supplement will describe what we may deliver to satisfy our obligations, if any, and what the holder of a warrant may deliver to satisfy its obligations, if any, with respect to any warrants.

General

We may issue as many distinct series of warrants under the warrant indenture as we wish. The provisions of the warrant indenture allow us not only to issue warrants with terms different from those previously issued under that indenture, but also to “re-open” a previous issue of a series of warrants and issue additional warrants of that series. We may issue warrants in amounts that exceed the total amount specified on the cover of the prospectus supplement relating to warrants you have acquired at any time without your consent and without notifying you.

This section summarizes the material terms of the warrants that are common to all series, although the prospectus supplement that describes the terms of each series of warrants may also describe differences from the material terms summarized here.

Because this section is a summary, it does not describe every aspect of the warrants. This summary is subject to and qualified in its entirety by reference to all the provisions of the warrant indenture, including definitions of certain terms used in the warrant indenture. In this summary, we describe the meaning of only some of the more important terms. For your convenience, we also include references in parentheses to certain sections of the warrant indenture. Whenever we refer to particular sections or defined terms of the warrant indenture in this prospectus or in the prospectus supplement, such sections or defined terms are incorporated by reference here or in the prospectus supplement. You must look to the warrant indenture for the most complete description of what we describe in summary form in this prospectus.

This summary is also subject to and qualified by reference to the description of the particular terms of your series of warrants described in the prospectus supplement. Those terms may vary from the terms described in this prospectus. The prospectus supplement relating to each series of warrants will be attached to the front of this prospectus. There may also be a further prospectus supplement, known as a pricing supplement, which describes additional terms of warrants you are offered.

In addition, the specific financial, legal and other terms particular to a series of warrants will be described in the prospectus supplement and, if applicable, a pricing supplement relating to the series. The prospectus supplement and, if applicable, the pricing supplement relating to a series of warrants will describe the following terms of the series:

- the title of the series of warrants;
- any limit on the aggregate number of the series of warrants;
- the date on which the right to exercise the warrants will begin and the date on which that right will expire or, if you may not continuously exercise the warrants throughout that period, the specific date or dates on which you may exercise the warrants;
- whether the warrants are put warrants or call warrants, whether you or we will have the right to exercise the warrants and any conditions or restrictions on the exercise of the warrants;
- the specific underlying asset, and the amount or the method for determining the amount of the underlying asset, purchasable or saleable upon exercise of each warrant;
- the price at which and the currency with which the underlying asset may be purchased or sold upon the exercise of each warrant, or the method of determining that price;
- the method of exercising the warrants;
- the date or dates on which the series of warrants will expire;
- the place or places where the payments on the warrants are payable;
- the terms, if any, on which any securities may or shall be converted into or exchanged at the option of the Bank or otherwise for shares or other securities, into the cash value thereof or into any combination of the foregoing, any specific terms relating to the adjustment thereof and the period during which such securities may or shall be so converted or exchanged;
- any provisions for redemption of the warrants at our option or the option of the holder;

- the date, if any, after which, and the price or prices at which, the series of warrants may, in accordance with any optional or mandatory redemption provisions, be redeemed and the other detailed terms and provisions of those optional or mandatory redemption provisions, if any;
- if other than denominations of 100 warrants and any integral multiples thereof, the denominations in which the series of warrants will be issuable;
- the currency of payment on the series of warrants;
- if the currency of payment for any payments on the series of warrants is subject to our election or that of a holder, the currency or currencies in which payment can be made and the period within which, and the terms and conditions upon which, the election can be made;
- any index, formula or other method used to determine the amount of any payment on the series of warrants;
- any event of default under the series of warrants if different from those described under “—Events of Default” below;
- if the warrants will be issued in bearer form, any special provisions relating to bearer securities;
- if the series of warrants will be issuable only in the form of a global security, the depositary or its nominee with respect to the series of warrants and the circumstances under which the global security may be registered for transfer or exchange in the name of a person other than the depositary or the nominee; and
- any other special feature of the series of warrants.

We will offer warrants that are convertible or exchangeable into securities of another entity or other entities only under circumstances that do not require registration of the underlying securities under the Securities Act at the time we offer such warrants.

Expiration Date and Payment or Settlement Date

The term “expiration date” with respect to any warrant means the date on which the right to exercise the warrant expires. (Indenture Section 101)

The term “payment or settlement date” with respect to any warrant means the date when any money with respect to that warrant becomes payable upon exercise or redemption of that warrant in accordance with its terms. (Indenture Section 101)

Overview of Remainder of this Description

The remainder of this description summarizes:

- additional mechanics relevant to the warrants under normal circumstances, such as how holders record the transfer of ownership and where we make payments;
- holders’ rights in several special situations, such as if we merge with another company or if we want to change a term of the warrants; and
- holders’ rights if we default or experience other financial difficulties.

Form, Exchange and Transfer

Unless we specify otherwise in the prospectus supplement, the warrants will be issued:

- only in fully-registered form;
- without interest coupons; and
- in denominations that are even multiples of 100 warrants. (Indenture Section 302)

If a warrant is issued as a registered global warrant, only the depositary—*e.g.*, DTC, Euroclear, Clearstream and CDS, each as defined below under “—Ownership and Book-Entry Issuance”—will be entitled to transfer and exchange the warrant as described in this subsection, because the depositary will be the sole registered holder of the warrant and is referred to below as the “holder”. Those who own beneficial interests in a global security do so through participants in the depositary’s securities clearance system, and the rights of these indirect owners will be governed by the applicable procedures of the depositary and its participants. We describe book-entry procedures below under “—Ownership and Book-Entry Issuance”.

Holders of securities issued in fully-registered form may have their warrants broken into more warrants of smaller denominations of not less than 100 warrants, or combined into fewer warrants of larger denominations, as long as the total amount of warrants is not changed. (Indenture Section 305) This is called an exchange.

Holders may exchange or register the transfer of warrants at the office of the trustee. Warrants may be transferred by endorsement. Holders may also replace lost, stolen or mutilated warrants at that office. The trustee has been appointed as our agent for registering warrants in the names of holders and registering the transfer of warrants. We may change this appointment to another entity or perform these tasks ourselves. The entity performing the role of maintaining the list of registered holders is called the security registrar. It also records transfers. (Indenture Section 305) The trustee may require an indemnity before replacing any warrants.

Holders will not be required to pay a service charge to register the transfer or exchange of warrants, but holders may be required to pay for any tax or other governmental charge associated with the exchange or transfer. The registration of a transfer or exchange will only be made if the security registrar is satisfied with your proof of ownership.

If we designate additional transfer agents, they will be named in the prospectus supplement. We may cancel the designation of any particular transfer agent. We may also approve a change in the office through which any transfer agent acts. (Indenture Section 1002)

If the warrants are redeemable and we redeem less than all of the warrants of a particular series, we may block the registration of transfer or exchange of warrants during the period beginning 15 days before the day we mail the notice of redemption and ending on the day of that mailing, in order to freeze the list of holders entitled to receive the mailing. We may also refuse to register transfers or exchanges of warrants selected for redemption, except that we will continue to permit registration of transfers and exchanges of the unredeemed portion of any warrant being partially redeemed. (Indenture Section 305)

Payment and Paying Agents

We will pay amounts due on the warrants at the corporate trust office of the trustee in the City of New York. That office is currently located at 240 Greenwich Street - Floor 4E, New York, NY 10007. Holders must make arrangements to have their payments picked up at or wired from that office.

Book-entry and other indirect holders should consult their banks, brokers or other financial institutions for information on how they will receive payments.

We may also arrange for additional payment offices and may cancel or change these offices, including our use of the trustee's corporate trust office. These offices are called paying agents. We may also choose to act as our own paying agent or choose one of our subsidiaries to do so. We must notify holders of changes in the paying agents for any particular series of warrants. (Indenture Section 1002)

Notices

We and the trustee will send notices regarding the warrants only to registered holders, using their addresses as listed in the trustee's records. (Indenture Sections 101 and 106) With respect to who is a registered "holder" for this purpose, see "Ownership and Book-Entry Issuance".

Regardless of who acts as paying agent, all money paid by us to a paying agent that remains unclaimed at the end of two years after the amount is due to holders will be repaid to us. After that two-year period, holders may look to us for payment and not to the trustee or any other paying agent. (Indenture Section 1003)

Mergers and Similar Events

Under the warrant indenture, we are generally permitted to consolidate or merge with another entity. We are also permitted to sell or lease substantially all of our assets to another entity, or to buy or lease substantially all of the assets of another entity. However, we may not take any of these actions unless all the following conditions are met:

- When we merge, amalgamate, consolidate or otherwise are combined with, or acquired by, another entity or sell or lease substantially all of our assets, the surviving, resulting or acquiring entity must be a properly organized entity and must be legally responsible for the warrants, whether by agreement, operation of law or otherwise.
- The merger, amalgamation, consolidation, other combination, sale or lease of assets must not cause a default on the warrants. A default for this purpose would include any event that would be an event of default if the requirements for giving us default notice or our default having to exist for a specific period of time were disregarded.

If the conditions described above are satisfied with respect to any series of warrants, we will not need to obtain the approval of the holders of those warrants in order to merge or consolidate or to sell our assets. Also, these conditions will apply only if we wish to merge or consolidate with another entity or sell substantially all of our assets to another entity. We will not need to satisfy these conditions if we enter into other types of transactions, including any transaction in which we acquire the stock or assets of another entity, any transaction that involves a change of control but in which we do not merge or consolidate and any transaction in which we sell less than substantially all of our assets. It is possible that this type of transaction may result in a reduction in our credit rating, may reduce our operating results or may impair our financial condition. Holders of our warrants, however, will have no approval right with respect to any transaction of this type.

Modification and Waiver of the Warrants

There are four types of changes we can make to the warrant indenture and the warrants issued thereunder.

1. *Changes Requiring Approval of All Holders.* First, there are changes that cannot be made to the warrant indenture or the warrants without specific approval of each holder of a warrant affected in any material respect by the change. The following is a list of those types of changes:

- change the payment dates of a warrant;
- change the exercise price of a warrant;
- reduce any amounts due on a warrant;
- shorten the period of time during which a warrant may be exercised;
- reduce the amount of the payment payable upon acceleration of the maturity of a warrant following a default;
- change the currency of payment on a warrant;
- change the place of payment for a warrant;
- impair a holder's right to sue for payment;
- impair the holder's right to require repurchase on the original terms of those warrants that provide a right of repurchase;
- reduce the percentage of holders of warrants whose consent is needed to modify or amend the warrant indenture;
- reduce the percentage of holders of warrants whose consent is needed to waive compliance with certain provisions of the warrant indenture or to waive certain defaults; or
- modify any other aspect of the provisions dealing with modification and waiver of the warrant indenture. (Indenture Section 902)

2. *Changes Requiring a Majority Vote.* The second type of change to the warrant indenture and the warrants is the kind that requires a vote in favor of the change by holders of warrants owning not less than a majority of the warrants of the particular series affected. Most changes, including any change or elimination of any provision of the warrant indenture and any modification of any right of the warrant holders, require a majority vote. A smaller class of changes does not require a majority vote including clarifying changes and other changes that would not adversely affect in any material respect holders of the warrants. (Indenture Section 901) We may also obtain a waiver of a past default from the holders of warrants owning a majority of the warrants of the particular series affected. However, we cannot obtain a waiver of a payment default or any other aspect of the warrant indenture or the warrants listed in the first category described above under “—Changes Requiring Approval of All Holders” unless we obtain the individual consent of each holder to the waiver. (Indenture Section 513)

3. *Changes Not Requiring Approval.* The third type of change to the warrant indenture and the warrants does not require any vote by holders of warrants. This type is limited to clarifications and certain other changes that would not adversely affect in any material respect holders of the warrants, including changes made to conform the warrant indenture or the warrants of any series to any provision described under “Description of Warrants” in this prospectus, as may be supplemented by the prospectus supplement, and/or, if applicable, the pricing supplement relating to an offering of such series of warrants. (Indenture Section 901)

4. We may also make changes or obtain waivers that do not adversely affect in any material respect a particular warrant, even if they affect other warrants. In those cases, we do not need to obtain the approval of the holder of that warrant; we need only obtain any required approvals from the holders of the affected warrants.

5. *Further Details Concerning Voting.*

Warrants will not be considered outstanding, and therefore not eligible to vote, if we have given a notice of redemption and deposited or set aside in trust for the holders money for the payment, or redemption or settlement of the warrants.

We will generally be entitled to set any day as a record date for the purpose of determining the holders of outstanding warrants that are entitled to vote or take other action under the warrant indenture. In certain limited circumstances, the trustee will be entitled to set a record date for action by holders. If the trustee or we set a record date for a vote or other action to be taken by holders of a particular series, that vote or action may be taken only by persons who are holders of outstanding warrants of that series on the record date. We or the trustee, as applicable, may shorten or lengthen this period from time to time. This period, however, may not extend beyond the 180th day after the record date for the action. (Indenture Sections 104 and 512)

Book-entry and other indirect holders should consult their banks, brokers or other financial institutions for information on how approval may be granted or denied if we seek to change the warrant indenture or the warrants or request a waiver.

Events of Default

You will have special rights if an event of default occurs and is not cured, as described later in this subsection.

What is an Event of Default?

Under the warrant indenture, the term “Event of Default” means any of the following:

- We do not pay any payment due on a warrant.
- We become insolvent or bankrupt or subject to the provisions of the *Winding-Up and Restructuring Act* (Canada), we go into liquidation either voluntarily or under an order of a court of competent jurisdiction, or we otherwise acknowledge our insolvency.
- Any other event of default described in the prospectus supplement occurs. (Indenture Section 501)

Remedies If an Event of Default Occurs.

The trustee is not required to take any action under the warrant indenture at the request of any holders unless the holders offer the trustee reasonable protection from expenses and liability called an indemnity. (Indenture Section 603) If reasonable indemnity is provided, the holders of a majority of the outstanding warrants of the relevant series may direct the time, method and place of conducting any lawsuit or other formal legal action seeking any remedy available to the trustee. These majority holders may also direct the trustee in performing any other action under the warrant indenture with respect to the warrants of that series. (Indenture Section 512)

Before you bypass the trustee and bring your own lawsuit or other formal legal action or take other steps to enforce your rights or protect your interests relating to the warrants, the following must occur:

- the holder of the warrant must give the trustee written notice that an event of default has occurred and remains uncured;
- the holders of 25% of all outstanding warrants of the relevant series must make a written request that the trustee take action because of the default, and must offer reasonable indemnity to the trustee against the cost and other liabilities of taking that action; and
- the trustee must have not taken action for 90 days after receipt of the above notice and offer of indemnity. (Indenture Section 507)

However, you are entitled at any time to bring a lawsuit for the payment of money due on your warrant on or after its due date. (Indenture Section 508)

Book-entry and other indirect holders should consult their banks, brokers or other financial institutions for information on how to give notice or direction to or make a request of the trustee and to make or cancel a declaration of acceleration.

We will give to the trustee every year a written statement of certain of our officers certifying that to their knowledge we are in compliance with the warrant indenture and the warrants issued under it, or else specifying any default. (Indenture Section 1004)

TAX CONSEQUENCES

UNITED STATES TAXATION

This section describes the material United States federal income tax consequences of owning and disposing of debt securities that we will offer. However, this section is only applicable to debt securities that are not subject to Non-Viability Contingent Capital Provisions of the type discussed above under “Special Provisions Related to the Subordinated Debt Securities.” The tax treatment of debt securities that are subject to such a provision will be discussed in the applicable prospectus supplement or pricing supplement.

This section is the opinion of Sullivan & Cromwell LLP, our United States federal income tax counsel. It applies to you only if you acquire debt securities in an offering and you hold debt securities as capital assets for tax purposes. This section does not address the tax consequences of owning or disposing of common shares, warrants, or debt securities that are issued in bearer form. In addition, this section does not apply to persons other than U.S. holders (as defined below). The ownership of debt securities that pay interest from sources within the United States may give rise to material United States federal income tax consequences to persons other than U.S. holders. If a particular offering of debt securities is expected to pay interest from sources within the United States, the applicable supplement will specify that fact and may discuss the material United States federal income tax consequences to persons other than U.S. holders of owning such debt securities. This section does not apply to you if you are a member of a special class of holders subject to special rules, including:

- a dealer in securities or currencies;
- a trader in securities that elects to use a mark-to-market method of accounting for your securities holdings;
- a tax-exempt organization;
- a life insurance company;
- a person that owns debt securities that are a hedge or that are hedged against interest rate or currency risks;
- a person that holds debt securities as part of a straddle or conversion transaction;
- a person that purchases or sells debt securities as part of a wash sale for tax purposes;
- a person whose functional currency is not the U.S. dollar;
- a person subject to the alternative minimum tax; or
- a bank.

This section is based on the Internal Revenue Code of 1986, as amended (the “Internal Revenue Code”), its legislative history, existing and proposed regulations, published rulings and court decisions, as well as on the income tax treaty between the United States of America and Canada. These laws are subject to change, possibly on a retroactive basis.

If a partnership holds the debt securities, the United States federal income tax treatment of a partner will generally depend on the status of the partner and the tax treatment of the partnership. A partner in a partnership holding the debt securities should consult its tax advisor with regard to the United States federal income tax treatment of an investment in the debt securities.

You are urged to consult your own tax advisor regarding the United States federal, state and local and other tax consequences of owning and disposing of debt securities offered under the prospectus in your particular circumstances.

This section describes the material United States federal income tax consequences of owning and disposing of debt securities to a U.S. holder. You are a U.S. holder if you are a beneficial owner of debt securities and you are:

- a citizen or resident of the United States;

- a domestic corporation, or other entity taxable as a corporation for United States federal income tax purposes, created or organized in or under the laws of the United States or of any subdivision thereof;
- an estate whose income is subject to United States federal income tax regardless of its source; or
- a trust if a United States court can exercise primary supervision over the trust's administration and one or more United States persons are authorized to control all substantial decisions of the trust.

This section deals only with debt securities that are due to mature 30 years or less from the date on which they are issued. The United States federal income tax consequences of owning and disposing of debt securities with a term of more than 30 years will be discussed in the applicable supplement and will not, unless otherwise specified in the applicable supplement, be taxed in accordance with the discussion in this section.

Under recently enacted legislation, U.S. holders that use an accrual method of accounting for tax purposes generally will be required to include certain amounts in income no later than the time such amounts are reflected on certain financial statements. The application of this rule thus may require the accrual of income earlier than would be the case under the general tax rules described below, although the precise application of this rule is unclear at this time. This rule generally will be effective for tax years beginning after December 31, 2017 or, for debt securities issued with original issue discount ("OID"), for tax years beginning after December 31, 2018. U.S. holders that use an accrual method of accounting should consult with their tax advisors regarding the potential applicability of this legislation to their particular situation.

Classification of Debt Securities

All of the debt securities other than the bail-inable debt securities will be classified as debt instruments for United States federal income tax purposes, and the bail-inable debt securities should be classified as debt instruments for United States federal income tax purposes. The discussion herein assumes that the debt securities will be so treated.

Payments of Interest

Except as described below in the case of interest on a discount debt security that is not qualified stated interest, each as defined below under "— Original Issue Discount — General," you will be taxed on any interest on your debt securities, whether payable in U.S. dollars or a foreign currency, including a composite currency or basket of currencies other than U.S. dollars, as ordinary income at the time you receive the interest or when it accrues, depending on your method of accounting for United States tax purposes.

Unless the applicable supplement states otherwise, debt securities will, for United States federal income tax purposes, be accounted for as being issued by the Bank or one of its non-U.S. affiliates, rather than by a U.S. branch or subsidiary. Assuming this treatment is respected, interest paid by us on such debt securities and original issue discount, if any, included in income with respect to such debt securities (as described below under "— Original Issue Discount") will generally be income from sources outside the United States, subject to the rules regarding the foreign tax credit allowable to a U.S. holder. Under the foreign tax credit rules, interest and original issue discount included in income from sources outside the United States will generally be "passive" income for purposes of computing the foreign tax credit. If, on the contrary, a particular offering of debt securities is expected to pay interest from sources within the United States, the applicable supplement will state that fact. Interest from sources within the United States is not foreign source income for purposes of computing the foreign tax credit.

Cash Basis Taxpayers. If you are a taxpayer that uses the cash receipts and disbursements method of accounting for tax purposes and you receive an interest payment that is denominated in, or determined by reference to, a foreign currency, you would recognize income equal to the U.S. dollar value of the interest payment, based on the exchange rate in effect on the date of receipt, regardless of whether you actually convert the payment into U.S. dollars.

Accrual Basis Taxpayers. If you are a taxpayer that uses an accrual method of accounting for tax purposes, you may determine the amount of income that you recognize with respect to an interest payment denominated in, or determined by reference to, a foreign currency by using one of two methods. Under the first method, you would determine the amount of income accrued based on the average exchange rate in effect during the interest accrual period or, with respect to an accrual period that spans two taxable years, that part of the period within the taxable year.

If you elect the second method, you would determine the amount of income accrued on the basis of the exchange rate in effect on the last day of the accrual period, or, in the case of an accrual period that spans two taxable years, the

exchange rate in effect on the last day of the part of the period within the taxable year. Additionally, under this second method, if you receive a payment of interest within five business days of the last day of your accrual period or taxable year, you may instead translate the interest accrued into U.S. dollars at the exchange rate in effect on the day that you actually receive the interest payment. If you elect the second method, it would apply to all foreign currency debt instruments that you hold at the beginning of the first taxable year to which the election applies and to all foreign currency debt instruments that you subsequently acquire. You may not revoke this election without the consent of the IRS.

When you actually receive an interest payment, including a payment attributable to accrued but unpaid interest upon the sale or retirement of your debt security, denominated in, or determined by reference to, a foreign currency for which you accrued an amount of income, you will recognize ordinary income or loss measured by the difference, if any, between the exchange rate that you used to accrue interest income and the exchange rate in effect on the date of receipt, regardless of whether you actually convert the payment into U.S. dollars.

Original Issue Discount

General. If you own a debt security, other than a debt security with a term of one year or less, it would be treated as a discount debt security issued at an OID if the amount by which the debt security's stated redemption price at maturity exceeds its issue price equals or is more than a *de minimis* amount. Generally, a debt security's issue price will be the first price at which a substantial amount of debt securities included in the issue of which the debt security is a part is sold to persons other than bond houses, brokers, or similar persons or organizations acting in the capacity of underwriters, placement agents, or wholesalers. A debt security's stated redemption price at maturity is the total of all payments provided by the debt security that are not payments of qualified stated interest. Generally, an interest payment on a debt security is qualified stated interest if it is one of a series of stated interest payments on a debt security that are unconditionally payable in cash or property, other than debt instruments of the Bank, at least annually at a single fixed rate, with certain exceptions for lower rates paid during some periods, applied to the outstanding principal amount of the debt security. There are special rules for variable rate debt securities that are discussed under "— Variable Rate Debt Securities".

In general, your debt security is not a discount debt security if the amount by which its stated redemption price at maturity exceeds its issue price is less than the *de minimis* amount of 1/4 of 1 percent of its stated redemption price at maturity multiplied by the number of complete years to its maturity. Your debt security will have *de minimis* original issue discount if the amount of the excess is less than the *de minimis* amount. If your debt security has *de minimis* original issue discount, you would include the *de minimis* amount in income as stated principal payments are made on the debt security, unless you make the election described below under "— Election to Treat All Interest as Original Issue Discount". You can determine the includible amount with respect to each such payment by multiplying the total amount of your debt security's *de minimis* original issue discount by a fraction equal to:

- the amount of the principal payment made
- divided by:
- the stated principal amount of the debt security.

Generally, if your discount debt security matures more than one year from its date of issue, you would include OID in income before you receive cash attributable to that income. The amount of OID that you would include in income is calculated using a constant-yield method, and generally you would include increasingly greater amounts of OID in income over the life of your debt security. More specifically, you can calculate the amount of OID that you would include in income by adding the daily portions of OID with respect to your discount debt security for each day during the taxable year or portion of the taxable year that you hold your discount debt security. You can determine the daily portion by allocating to each day in any accrual period a pro rata portion of the OID allocable to that accrual period. You may select an accrual period of any length with respect to your discount debt security and you may vary the length of each accrual period over the term of your discount debt security. However, no accrual period may be longer than one year and each scheduled payment of interest or principal on the discount debt security must occur on either the first or final day of an accrual period.

You can determine the amount of OID allocable to an accrual period by:

- multiplying your discount debt security's adjusted issue price at the beginning of the accrual period by your debt security's yield to maturity; and then

- subtracting from this figure the sum of the payments of qualified stated interest on your debt security allocable to the accrual period.

You must determine the discount debt security's yield to maturity on the basis of compounding at the close of each accrual period and adjusting for the length of each accrual period. Further, you determine your discount debt security's adjusted issue price at the beginning of any accrual period by:

- adding your discount debt security's issue price and any accrued OID for each prior accrual period; and then
- subtracting any payments previously made on your discount debt security that were not qualified stated interest payments.

If an interval between payments of qualified stated interest on your discount debt security contains more than one accrual period, then, when you determine the amount of OID allocable to an accrual period, you would allocate the amount of qualified stated interest payable at the end of the interval, including any qualified stated interest that is payable on the first day of the accrual period immediately following the interval, pro rata to each accrual period in the interval based on their relative lengths. In addition, you would increase the adjusted issue price at the beginning of each accrual period in the interval by the amount of any qualified stated interest that has accrued prior to the first day of the accrual period but that is not payable until the end of the interval. You may compute the amount of OID allocable to an initial short accrual period by using any reasonable method if all other accrual periods, other than a final short accrual period, are of equal length.

The amount of OID allocable to the final accrual period is equal to the difference between:

- the amount payable at the maturity of your debt security, other than any payment of qualified stated interest; and
- your debt security's adjusted issue price as of the beginning of the final accrual period.

Acquisition Premium. If you purchase your debt security for an amount that is less than or equal to the sum of all amounts, other than qualified stated interest, payable on your debt security after the purchase date but is greater than the amount of your debt security's adjusted issue price, as determined above under "— General", the excess is acquisition premium. If you do not make the election described below under "— Election to Treat All Interest as Original Issue Discount", then you would reduce the daily portions of OID by a fraction equal to:

- the excess of your adjusted basis in the debt security immediately after purchase over the adjusted issue price of the debt security

divided by:

- the excess of the sum of all amounts payable, other than qualified stated interest, on the debt security after the purchase date over the debt security's adjusted issue price.

Pre-Issuance Accrued Interest. An election may be made to decrease the issue price of your debt security by the amount of pre-issuance accrued interest if:

- a portion of the initial purchase price of your debt security is attributable to pre-issuance accrued interest;
- the first stated interest payment on your debt security is to be made within one year of your debt security's issue date; and
- the payment would equal or exceed the amount of pre-issuance accrued interest.

If this election is made, a portion of the first stated interest payment will be treated as a return of the excluded pre-issuance accrued interest and not as an amount payable on your debt security.

Debt Securities Subject to Contingencies, Including Optional Redemption. Your debt security is subject to a contingency if it provides for an alternative payment schedule or schedules applicable upon the occurrence of a contingency

or contingencies, other than a remote or incidental contingency, whether such contingency relates to payments of interest or of principal. In such a case, you would determine the yield and maturity of your debt security by assuming that the payments would be made according to the payment schedule most likely to occur if:

- the timing and amounts of the payments that comprise each payment schedule are known as of the issue date; and
- one of such schedules is significantly more likely than not to occur.

If there is no single payment schedule that is significantly more likely than not to occur, other than because of a mandatory sinking fund, you would include income on your debt security in accordance with the general rules that govern contingent payment obligations. These rules will be discussed in the applicable supplement.

Notwithstanding the general rules for determining yield and maturity, if your debt security is subject to contingencies, and either you or we have an unconditional option or options that, if exercised, would require payments to be made on the debt security under an alternative payment schedule or schedules, then:

- in the case of an option or options that we may exercise, we would be deemed to exercise or not exercise an option or combination of options in the manner that minimizes the yield on your debt security; and
- in the case of an option or options that you may exercise, you would be deemed to exercise or not exercise an option or combination of options in the manner that maximizes the yield on your debt security.

If both you and we hold options described in the preceding sentence, those rules would apply to each option in the order in which they may be exercised. You may determine the yield on your debt security for the purposes of those calculations by using any date on which your debt security may be redeemed or repurchased as the maturity date and the amount payable on the date that you chose in accordance with the terms of your debt security as the principal amount payable at maturity.

If a contingency, including the exercise of an option, actually occurs or does not occur contrary to an assumption made according to the above rules, then, except to the extent that a portion of your debt security is repaid as a result of this change in circumstances and solely to determine the amount and accrual of OID, you would redetermine the yield and maturity of your debt security by treating your debt security as having been retired and reissued on the date of the change in circumstances for an amount equal to your debt security's adjusted issue price on that date.

Election to Treat All Interest as Original Issue Discount. You may elect to include in gross income all interest that accrues on your debt security using the constant-yield method described above under “— General”, with the modifications described below. For purposes of this election, interest will include stated interest, OID, *de minimis* original issue discount, market discount, *de minimis* market discount and unstated interest, as adjusted by any amortizable bond premium, described below under “— Debt Securities Purchased at a Premium”, or acquisition premium.

If you make this election for your debt security, then, when you apply the constant-yield method:

- the issue price of your debt security would equal your cost;
- the issue date of your debt security would be the date you acquired it; and
- no payments on your debt security would be treated as payments of qualified stated interest.

Generally, this election will apply only to the debt security for which you make it; however, if the debt security has amortizable bond premium, you would be deemed to have made an election to apply amortizable bond premium against interest for all debt instruments with amortizable bond premium, other than debt instruments the interest on which is excludible from gross income, that you hold as of the beginning of the taxable year to which the election applies or any taxable year thereafter. Additionally, if you make this election for a market discount note, you would be treated as having made the election discussed below under “— Market Discount” to include market discount in income currently over the life of all debt instruments having market discount that you acquire on or after the first day of the first taxable year to which the election applies. You may not revoke any election to apply the constant-yield method to all interest on a debt security or the

deemed elections with respect to amortizable bond premium or market discount debt securities without the consent of the IRS.

Variable Rate Debt Securities. Your debt security would be a variable rate debt security if:

- your debt security's issue price does not exceed the total noncontingent principal payments by more than the lesser of:
 - 0.015 multiplied by the product of the total noncontingent principal payments and the number of complete years to maturity from the issue date; or
 - 15 percent of the total noncontingent principal payments; and
- your debt security provides for stated interest, compounded or paid at least annually, only at:
 - one or more qualified floating rates;
 - a single fixed rate and one or more qualified floating rates;
 - a single objective rate; or
 - a single fixed rate and a single objective rate that is a qualified inverse floating rate; and
- the value of the rate on any date during the term of your debt security is set no earlier than three months prior to the first day on which that value is in effect and no later than one year following that first day.

Your debt security would have a variable rate that is a qualified floating rate if:

- variations in the value of the rate can reasonably be expected to measure contemporaneous variations in the cost of newly borrowed funds in the currency in which your debt security is denominated; or
- the rate is equal to such a rate either:
 - multiplied by a fixed multiple that is greater than 0.65 but not more than 1.35; or
 - multiplied by a fixed multiple greater than 0.65 but not more than 1.35, increased or decreased by a fixed rate.

If your debt security provides for two or more qualified floating rates that are within 0.25 percentage points of each other on the issue date or can reasonably be expected to have approximately the same values throughout the term of the debt security, the qualified floating rates together constitute a single qualified floating rate.

Your debt security would not have a qualified floating rate, however, if the rate is subject to certain restrictions (including caps, floors, governors, or other similar restrictions) unless such restrictions are fixed throughout the term of the debt security or are not reasonably expected to significantly affect the yield on the debt security as the case may be.

Your debt security would have a variable rate that is a single objective rate if:

- the rate is not a qualified floating rate; and
- the rate is determined using a single, fixed formula that is based on objective financial or economic information that is not within the control of or unique to the circumstances of the Bank or a related party.

Your debt security would not have a variable rate that is an objective rate, however, if it is reasonably expected that the average value of the rate during the first half of your debt security's term would be either significantly less than or significantly greater than the average value of the rate during the final half of your debt security's term.

An objective rate as described above is a qualified inverse floating rate if:

- the rate is equal to a fixed rate minus a qualified floating rate; and
- the variations in the rate can reasonably be expected to inversely reflect contemporaneous variations in the cost of newly borrowed funds.

Your debt security would also have a single qualified floating rate or an objective rate if interest on your debt security is stated at a fixed rate for an initial period of one year or less followed by either a qualified floating rate or an objective rate for a subsequent period, and either:

- the fixed rate and the qualified floating rate or objective rate have values on the issue date of the debt security that do not differ by more than 0.25 percentage points; or
- the value of the qualified floating rate or objective rate is intended to approximate the fixed rate.

In general, if your variable rate debt security provides for stated interest at a single qualified floating rate or objective rate, or one of those rates after a single fixed rate for an initial period provided certain requirements are satisfied, all stated interest on your debt security is qualified stated interest. In this case, the amount of OID, if any, is determined by using, in the case of a qualified floating rate or qualified inverse floating rate, the value as of the issue date of the qualified floating rate or qualified inverse floating rate, or, for any other objective rate, a fixed rate that reflects the yield reasonably expected for your debt security.

If your variable rate debt security does not provide for stated interest at a single qualified floating rate or a single objective rate, and also does not provide for interest payable at a fixed rate other than a single fixed rate for an initial period, you generally would determine the interest and OID accruals on your debt security by:

- determining a fixed rate substitute for each variable rate provided under your variable rate debt security;
- constructing the equivalent fixed rate debt instrument, using the fixed rate substitute described above;
- determining the amount of qualified stated interest and OID with respect to the equivalent fixed rate debt instrument; and
- adjusting for actual variable rates during the applicable accrual period.

When you determine the fixed rate substitute for each variable rate provided under the variable rate debt security, you generally will use the value of each variable rate as of the issue date or, for an objective rate that is not a qualified inverse floating rate, a rate that reflects the reasonably expected yield on your debt security.

If your variable rate debt security provides for stated interest either at one or more qualified floating rates or at a qualified inverse floating rate and also provides for stated interest at a single fixed rate other than at a single fixed rate for an initial period, you generally would determine interest and OID accruals by using the method described in the previous paragraph. However, your variable rate debt security would be treated, for purposes of the first three steps of the determination, as if your debt security had provided for a qualified floating rate, or a qualified inverse floating rate, rather than the fixed rate. The qualified floating rate, or qualified inverse floating rate, that replaces the fixed rate must be such that the fair market value of your variable rate debt security as of the issue date approximates the fair market value of an otherwise identical debt instrument that provides for the qualified floating rate, or qualified inverse floating rate, rather than the fixed rate.

Short-Term Debt Securities. In general, if you are an individual or other cash basis U.S. holder of a short-term debt security, you are not required to accrue OID for United States federal income tax purposes unless you elect to do so (although it is possible that you may be required to include any stated interest in income as you receive it). If you are an accrual basis taxpayer, a taxpayer in a special class, including, but not limited to, a regulated investment company, common trust fund, or a certain type of pass-through entity, or a cash basis taxpayer who so elects, you would be required to accrue OID on short-term debt securities on either a straight-line basis or under the constant-yield method, based on daily compounding. If you are not required and do not elect to include OID in income currently, any gain you realize on the sale or retirement of your short-term debt security would be ordinary income to the extent of the accrued OID, which will be determined on a straight-line

basis unless you make an election to accrue the OID under the constant-yield method, through the date of sale or retirement. However, if you are not required and do not elect to accrue OID on your short-term debt securities, you would be required to defer deductions for interest on borrowings allocable to your short-term debt securities in an amount not exceeding the deferred income until the deferred income is realized.

When you determine the amount of OID subject to these rules, you must include all interest payments on your short-term debt security, including stated interest, in your short-term debt security's stated redemption price at maturity.

Foreign Currency Discount Notes. If your discount note is denominated in, or determined by reference to, a foreign currency, you would determine OID for any accrual period on your discount note in the foreign currency and then translate the amount of OID into U.S. dollars in the same manner as stated interest accrued by an accrual basis U.S. holder, as described under “— U.S. Holders — Payments of Interest”. You may recognize ordinary income or loss when you receive an amount attributable to OID in connection with a payment of interest or the sale or retirement of your note.

Market Discount

You would be treated as if you purchased your debt security, other than a short-term debt security, at a market discount, and your debt security will be a market discount debt security if:

- you purchase your debt security for less than its issue price as determined above under “— Original Issue Discount — General”; and
- the difference between the debt security's stated redemption price at maturity or, in the case of a discount debt security, the debt security's revised issue price (i.e., the issue price increased by the amount of accrued OID), and the price you paid for your debt security is equal to or greater than 1/4 of 1 percent of your debt security's stated redemption price at maturity or revised issue price, respectively, multiplied by the number of complete years to the debt security's maturity. To determine the revised issue price of your debt security for these purposes, you generally add any OID that has accrued on your debt security to its issue price.

If your debt security's stated redemption price at maturity or, in the case of a discount debt security, its revised issue price, exceeds the price you paid for the debt security by less than 1/4 of 1 percent multiplied by the number of complete years to the debt security's maturity, the excess constitutes *de minimis* market discount, and the rules discussed below are not applicable to you.

You must treat any gain you recognize on the maturity or disposition of your market discount debt security as ordinary income to the extent of the accrued market discount on your debt security. Alternatively, you may elect to include market discount in income currently over the life of your debt security. If you make this election, it would apply to all debt instruments with market discount that you acquire on or after the first day of the first taxable year to which the election applies. You may not revoke this election without the consent of the IRS. If you own a market discount debt security and do not make this election, you would generally be required to defer deductions for interest on borrowings allocable to your debt security in an amount not exceeding the accrued market discount on your debt security until the maturity or disposition of your debt security.

If you own a market discount debt security, the market discount would accrue on a straight-line basis unless an election is made to accrue market discount using a constant-yield method. If you make this election, it would apply only to the debt security with respect to which it is made and you may not revoke it. You would, however, not include accrued market discount in income unless you elect to do so as described above.

Debt Securities Purchased at a Premium

If you purchase your debt security for an amount that is in excess of its principal amount (or, in the case of a discount debt security, in excess of its stated redemption price at maturity), you may elect to treat the excess as amortizable bond premium. If you make this election, you would reduce the amount required to be included in your income each year with respect to interest on your debt security by the amount of amortizable bond premium allocable to that year, based on a constant yield method. If your debt security is denominated in, or determined by reference to, a foreign currency, you would compute your amortizable bond premium in units of the foreign currency and your amortizable bond premium would reduce your interest income in units of the foreign currency. Gain or loss recognized that is attributable to changes in exchange rates between the time your amortized bond premium offsets interest income and the time of the acquisition of your debt security is generally taxable as ordinary income or loss. If you make an election to amortize bond premium, it would apply to all debt

instruments, other than debt instruments the interest on which is excludible from gross income, that you hold at the beginning of the first taxable year to which the election applies or that you thereafter acquire, and you may not revoke it without the consent of the IRS. See also “— Original Issue Discount — Election to Treat All Interest as Original Issue Discount”.

Purchase, Sale and Retirement of the Debt Securities

Your tax basis in your debt security will generally be the U.S. dollar cost, as defined below, of your debt security adjusted by:

- adding any OID or market discount previously included in income with respect to your debt security; and then
- subtracting any payments on your debt security that are not qualified stated interest payments and any amortizable bond premium applied to reduce interest on your debt security.

If you purchase your debt security with foreign currency, the U.S. dollar cost of your debt security will generally be the U.S. dollar value of the purchase price on the date of purchase. However, if you are a cash basis taxpayer or an accrual basis taxpayer if you so elect and your debt security is traded on an established securities market, as defined in the applicable Treasury regulations, the U.S. dollar cost of your debt security would be the U.S. dollar value of the purchase price on the settlement date of your purchase.

You will generally recognize gain or loss on the sale or retirement of your debt security equal to the difference between the amount you realize on the sale or retirement, excluding any amounts attributable to accrued but unpaid interest (which will be treated as interest payments), and your adjusted tax basis in your debt security. If your debt security is sold or retired for an amount in foreign currency, the amount you realize would be the U.S. dollar value of such amount on the date the debt security is disposed of or retired, except that in the case of a debt security that is traded on an established securities market, as defined in the applicable Treasury regulations, a cash basis taxpayer, or an accrual basis taxpayer that so elects, would determine the amount realized based on the U.S. dollar value of the foreign currency on the settlement date of the sale or retirement.

You will recognize capital gain or loss when you sell or retire your debt security, except to the extent:

- described above under “— Original Issue Discount — Short-Term Debt Securities” or “— Market Discount”; or
- attributable to changes in exchange rates as described below.

Capital gain of a noncorporate U.S. holder is generally taxed at preferential rates where the property is held for more than one year.

You must treat any portion of the gain or loss that you recognize on the sale or retirement of a debt security as ordinary income or loss to the extent attributable to changes in exchange rates. However, you take exchange gain or loss into account only to the extent of the total gain or loss you realize on the transaction.

Exchange of Amounts in other than U.S. Dollars

If you receive foreign currency as interest on your debt security or on the sale or retirement of your debt security, your tax basis in such foreign currency would equal its U.S. dollar value when the interest is received or at the time of the sale or retirement. If you purchase foreign currency, you generally would have a tax basis equal to the U.S. dollar value of such foreign currency on the date of your purchase. If you sell or dispose of foreign currency, including if you use it to purchase debt securities or exchange them for U.S. dollars, any gain or loss recognized generally would be ordinary income or loss.

Medicare Tax

A U.S. holder that is an individual or estate, or a trust that does not fall into a special class of trusts that is exempt from such tax, is subject to a 3.8% tax on the lesser of (1) the U.S. holder’s “net investment income” (or “undistributed net investment income” in the case of an estate or trust) for the relevant taxable year and (2) the excess of the U.S. holder’s modified adjusted gross income for the taxable year over a certain threshold (which in the case of individuals is between

\$125,000 and \$250,000, depending on the individual's circumstances). A holder's net investment income generally includes its interest income and its net gains from the disposition of debt securities, unless such interest income or net gains are derived in the ordinary course of the conduct of a trade or business (other than a trade or business that consists of certain passive or trading activities). If you are a U.S. holder that is an individual, estate or trust, you are urged to consult your tax advisors regarding the applicability of the Medicare tax to your income and gains in respect of your investment in the debt securities.

Indexed Debt Securities and Exchangeable Debt Securities

The applicable supplement will discuss any special United States federal income tax rules with respect to indexed notes, other debt securities that are subject to the rules governing contingent payment obligations and debt securities exchangeable for stock or securities of the Bank or another entity or entities, into the cash value therefore or into any combination of the above.

Treasury Regulations Requiring Disclosure of Reportable Transactions

Treasury regulations require United States taxpayers to report certain transactions that give rise to a loss in excess of certain thresholds (a "Reportable Transaction"). Under these regulations, if the debt securities are denominated in a foreign currency, a U.S. holder (or a U.S. alien holder that holds the debt securities in connection with a U.S. trade or business) that recognizes a loss with respect to the debt securities that is characterized as an ordinary loss due to changes in currency exchange rates (under any of the rules discussed above) would be required to report the loss on IRS Form 8886 (Reportable Transaction Statement) if the loss exceeds the thresholds set forth in the regulations. For individuals and trusts, this loss threshold is \$50,000 in any single taxable year. For other types of taxpayers and other types of losses, the thresholds are higher. You should consult with your tax advisor regarding any tax filing and reporting obligations that may apply in connection with acquiring, owning and disposing of debt securities.

Information With Respect to Foreign Financial Assets

A U.S. holder who, during any taxable year, holds any interest in "specified foreign financial assets" with an aggregate value in excess of \$50,000 (and in some circumstances, a higher threshold) may be required to file an information report with respect to such assets with his or her tax returns. "Specified foreign financial assets" may include financial accounts maintained by foreign financial institutions, as well as any of the following, but only if they are held for investment and not held in accounts maintained by financial institutions: (i) stocks and securities issued by non-United States persons, (ii) financial instruments and contracts that have non-United States issuers or counterparties, and (iii) interests in foreign entities. Holders are urged to consult their tax advisors regarding the application of this reporting requirement to their ownership of the debt securities.

Information Reporting and Backup Withholding

In general, if you are a noncorporate U.S. holder, the Bank and other payors are required to report to the IRS all payments of principal, any premium and interest on your debt security, and the accrual of OID on a discount debt security. In addition, the Bank and other payors are required to report to the IRS any payment of proceeds of the sale of your debt security before maturity within the United States. Additionally, backup withholding would apply to any payments, including payments of OID, if you fail to provide an accurate taxpayer identification number, or (in the case of interest payments) you are notified by the IRS that you have failed to report all interest and dividends required to be shown on your federal income tax returns.

In general, payment of the proceeds from the sale of debt securities effected at a foreign office of a broker will not be subject to information reporting or backup withholding. However, a sale effected at a foreign office of a broker could be subject to information reporting in the same manner as a sale within the United States (and in certain cases may be subject to backup withholding as well) if (i) the broker has certain connections to the United States, (ii) the proceeds or confirmation are sent to the United States or (iii) the sale has certain other specified connections with the United States. In addition, certain foreign brokers may be required to report the amount of gross proceeds from the sale or other disposition of debt securities under FATCA (as defined below) if you are, or are presumed to be, a United States person.

Backup withholding is not an additional tax. You generally may obtain a refund of any amounts withheld under the backup withholding rules that exceed your income tax liability by filing a refund claim with the IRS.

Information With Respect to FATCA

Sections 1471 through 1474 of the Internal Revenue Code of 1986, as amended (commonly referred to as “FATCA”), impose a new reporting regime and potentially a 30% withholding tax with respect to certain payments to (i) any non-U.S. financial institution (a “foreign financial institution”, or “FFI” (as defined by FATCA)) that is receiving a payment on an investor’s behalf that does not become a “Participating FFI” by entering into an agreement with the IRS to provide the IRS with certain information in respect of its account holders and investors or is not otherwise exempt from or in deemed compliance with FATCA and (ii) in certain instances, an investor who does not provide information sufficient to determine whether the investor is a U.S. person or in the case of certain non-financial non-exempt entities does not provide information sufficient to determine whether the investor has substantial U.S. owners. The Bank is classified as an FFI. The Bank anticipates that any debt securities issued in global form will be held by FFIs that are not non-Participating FFIs but there is no guarantee that a custodian or broker through which an investor holds a debt security will not be a non-Participating FFI.

The new withholding regime is now in effect for payments from sources within the United States and will apply to “foreign passthru payments” (a term not yet defined) no earlier than January 1, 2019. This withholding would only apply to payments in respect of any debt securities that are issued on or after the date that is six months after the date on which final U.S. Treasury regulations defining the term “foreign passthru payment” are published in the U.S. Federal Register. If a debt security is issued on or after such date, the application of FATCA to such debt security will be disclosed in the applicable pricing supplement.

The United States and a number of other jurisdictions, including Canada, have entered into intergovernmental agreements to facilitate the implementation of FATCA (each, an “IGA”). These rules generally limit instances when FATCA withholding is required. Nevertheless, these IGAs currently contain no rules regarding the withholding, if any, that may be required on foreign passthru payments.

FATCA is particularly complex and its application is uncertain at this time. The above description is based in part on regulations, official guidance and IGAs, all of which are subject to amendment or further interpretation by one or more governments or governmental agencies. Prospective investors should consult their tax advisers on how these rules may apply to the Bank and to payments they may receive in connection with the Securities.

CANADIAN TAXATION

In the opinion of Norton Rose Fulbright Canada LLP, Canadian tax counsel to the Bank, the following summary describes the principal Canadian federal income tax considerations generally applicable to a holder of senior debt securities or subordinated debt securities (collectively, “debt securities”) who acquires, as beneficial owner, debt securities in the original offering or common shares of the Bank or any affiliate of the Bank on a conversion of debt securities, including on a bail-in conversion or Non-Viability Trigger Event, and who, at all relevant times, for the purposes of the application of the *Income Tax Act* (Canada) (the “Tax Act”): (i) is not resident and is not deemed to be resident in Canada; (ii) deals at arm’s length with the Bank, any issuer of common shares, and any transferee resident (or deemed to be resident) in Canada to whom the holder disposes of debt securities; (iii) does not use or hold debt securities or common shares in or in the course of carrying on a business in Canada; (iv) is entitled to receive all payments (including any interest and principal) on the debt securities as beneficial owner; (v) is not a “specified non-resident shareholder” of the Bank for purposes of the Tax Act or a non-resident person not dealing at arm’s length with a “specified shareholder” (within the meaning of subsection 18(5) of the Tax Act) of the Bank; and (vi) is not an insurer that carries on an insurance business in Canada and elsewhere (a “Non-resident Holder”).

This summary is based upon the provisions of the Tax Act and the regulations thereunder (the “Regulations”) in force on the date hereof and an understanding of the current published administrative practices and assessing policies of the Canada Revenue Agency. This summary takes into account all specific proposals to amend the Tax Act and Regulations publicly announced by or on behalf of the Minister of Finance (Canada) prior to the date hereof (the “Proposed Amendments”) and assumes that all Proposed Amendments will be enacted in the form proposed. However, no assurances can be given that the Proposed Amendments will be enacted as proposed, or at all. This summary does not otherwise take into account or anticipate any changes in law or administrative or assessing practice, whether by legislative, regulatory, administrative or judicial action, nor does it take into account provincial, territorial or foreign income tax legislation. Subsequent developments could have a material effect on the following description.

This summary is of a general nature only and is not intended to be legal or tax advice to any particular holder and no representation is made with respect to the Canadian federal income tax consequences to any particular holder.

This summary is not exhaustive of all Canadian federal income tax considerations. Accordingly, prospective investors should consult their own tax advisors with respect to their particular circumstances.

It is the intention of the Bank that the terms and conditions of any debt security, and in particular, any underlying security of such debt security, will not cause the debt security to be “taxable Canadian property” (within the meaning of the Act).

Canadian federal income tax considerations applicable to debt securities may be described particularly, when such debt securities are offered, in the applicable supplement related thereto. In the event the Canadian federal income tax considerations are described in such supplement, the following description will be superseded by the description in the supplement to the extent indicated therein.

In general, for the purpose of the Act, all amounts not otherwise expressed in Canadian dollars must be converted into Canadian dollars based on the rate as quoted by the Bank of Canada for the applicable day or such other rate of exchange that is acceptable to the Minister of National Revenue (Canada).

Interest paid or credited or deemed to be paid or credited by the Bank on a debt security (including amounts on account of, or in lieu of, or in satisfaction of interest) to a Non-resident Holder will not be subject to Canadian non-resident withholding tax unless all or any portion of such interest (other than on a “prescribed obligation” described below) is contingent or dependent on the use of or production from property in Canada or is computed by reference to revenue, profit, cash flow, commodity price or any other similar criterion or by reference to dividends paid or payable to shareholders of any class or series of shares of the capital stock of a corporation. A “prescribed obligation” is an “indexed debt obligation” (defined below) no amount payable in respect of which, other than an amount determined by reference to a change in the purchasing power of money, is contingent or dependent upon any of the criteria described in the preceding sentence. An “indexed debt obligation” is a debt obligation the terms or conditions of which provide for an adjustment to an amount payable in respect of the obligation for a period during which the obligation was outstanding that is determined by reference to a change in the purchasing power of money.

In the event that a debt security the interest (or deemed interest) payable on which is not exempt from Canadian withholding tax is redeemed, cancelled or purchased by the Bank or any other person resident or deemed to be resident in Canada from a Non-resident Holder or is otherwise assigned or transferred by a Non-resident Holder to a person resident or deemed to be resident in Canada for an amount which exceeds, generally, the issue price thereof, the excess may be deemed to be interest and may, together with any interest that has accrued on the debt security to that time, be subject to non-resident withholding tax. Such excess will not be subject to withholding tax if the debt security is considered to be an “excluded obligation” for purposes of the Tax Act. A debt security that: (i) is not an indexed debt obligation; (ii) was issued for an amount not less than 97 per cent. of the principal amount (as defined in the Tax Act) of the debt security, and (iii) the yield from which, expressed in terms of an annual rate (determined in accordance with the Tax Act) on the amount for which the debt security was issued does not exceed $\frac{4}{3}$ of the interest stipulated to be payable on the debt security, expressed in terms of an annual rate on the outstanding principal amount from time to time, will be an excluded obligation for this purpose.

In the event a debt security held by a Non-resident Holder is converted to common shares on a conversion, the amount, if any, by which the fair market value of the common shares received on the conversion exceeds the sum of: (i) price for which the debt security was issued, and (ii) any amount that is paid in respect of accrued and unpaid interest owing on the debt security at the time of conversion (the “Conversion Interest”) (the difference referred to as the “Excess Amount”), may be deemed to be interest paid to the Non-resident Holder. There is a risk that the Excess Amount (if any) and the Conversion Interest could be characterized as Participating Debt Interest and therefore subject to Canadian non-resident withholding tax unless certain exceptions apply. No advance tax ruling has been sought or obtained from CRA and Non-resident Holders of debt securities should consult their own tax advisors in this regard.

If applicable, the normal rate of Canadian non-resident withholding tax is 25% but such rate may be reduced under the terms of an applicable income tax treaty.

Generally, there are no other taxes on income (including taxable capital gains) payable by a Non-resident Holder on interest, discount, or premium on a debt security or on the proceeds received by a Non-resident Holder on the disposition of a debt security including a redemption, payment on maturity, conversion (including a bail-in conversion), cancellation or purchase.

Dividends paid or credited, or deemed under the Tax Act to be paid or credited, on common shares of the Bank or of any affiliate of the Bank that is a Canadian resident corporation to a Non-resident Holder will generally be subject to Canadian non-resident withholding tax at the rate of 25% on the gross amount of such dividends unless the rate is reduced under the

provisions of an applicable income tax treaty or convention between Canada and the country of residence of the Non-resident Holder.

A Non-resident Holder will not be subject to tax under the Tax Act in respect of any capital gain realized on a disposition or deemed disposition of a common share unless the common share is or is deemed to be “taxable Canadian property” of the Non-resident Holder for the purposes of the Tax Act and the Non-resident Holder is not entitled to an exemption under an applicable income tax convention between Canada and the country in which the Non-resident Holder is resident.

PLAN OF DISTRIBUTION

We may sell all or part of the debt securities at any time after effectiveness of the Registration Statement of which this prospectus forms a part in one or more of the following ways from time to time:

- through underwriters or dealers;
- through agents; or
- directly to one or more purchasers.

The offered securities may be distributed periodically in one or more transactions at:

- a fixed price or prices, which may be changed;
- market prices prevailing at the time of sale;
- prices related to the prevailing market prices; or
- negotiated prices.

The prospectus supplement will include:

- the initial public offering price;
- the names of any underwriters, dealers or agents;
- the purchase price of the securities;
- our proceeds from the sale of the securities;
- any underwriting discounts or agency fees and other underwriters' or agents' compensation;
- any discounts or concessions allowed or reallocated or paid to dealers;
- the place and time of delivery of the securities; and
- any securities exchange on which the securities may be listed.

If underwriters are used in the sale, they will buy the securities for their own account. The underwriters may then resell the securities in one or more transactions, at any time or times at a fixed public offering price or at varying prices. The underwriters may change from time to time any fixed public offering price and any discounts or commissions allowed or re-allowed or paid to dealers. If dealers are utilized in the sale of the securities, we will sell the securities to the dealers as principals. The dealers may then resell the securities to the public at varying prices to be determined by such dealers.

In connection with the offering of securities, we may grant to the underwriters an option to purchase additional securities to cover over-allotments, if any, at the initial public offering price (with an additional underwriting commission), as may be set forth in the prospectus supplement for such securities. If we grant any over-allotment option, the terms of the option will be set forth in the prospectus supplement for the securities.

This prospectus may be delivered by underwriters and dealers in connection with short sales undertaken to hedge exposures under commitments to acquire our securities to be issued on a delayed or contingent basis.

Underwriters, dealers and agents that participate in the distribution of the securities may be underwriters as defined in the Securities Act. Any discounts or commissions that we pay them and any profit they receive when they resell the securities may be treated as underwriting discounts and commissions under that Act. We may have agreements with underwriters, dealers and agents to indemnify them against certain civil liabilities, including liabilities under the Securities

Act, to contribute with respect to payments which they may be required to make in respect of such liabilities and to reimburse them for certain expenses.

Each series of offered securities will be a new issue of securities and will have no established trading market. Securities may or may not be listed on a national or foreign securities exchange or automated quotation system. Any underwriters or agents to whom securities are sold for public offering or sale may make, but are not required to make, a market in the securities, and the underwriters or agents may discontinue making a market in the securities at any time without notice. No assurance can be given as to the liquidity or the existence of trading markets for any securities.

Any underwriters utilized may engage in stabilizing transactions and syndicate covering transactions in accordance with Rule 104 of Regulation M under the Exchange Act. Stabilizing transactions permit bids to purchase the offered securities or any underlying security so long as the stabilizing bids do not exceed a specified maximum. Syndicate covering transactions involve purchases of securities in the open market after the distribution has been completed in order to cover syndicate short positions. Such stabilizing transactions and syndicate covering transactions may cause the price of the offered securities to be higher than would be the case in the absence of such transactions.

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. The prospectus supplement or pricing supplement may provide that the original issue date for a series of securities may be more than two scheduled business days after the trade date for the securities. Accordingly, in such a case, if you wish to trade the securities on any date prior to the second business day before the original issue date for the securities, you will be required, by virtue of the fact that the securities initially are expected to settle in more than two scheduled business days after the trade date for the securities, to make alternative settlement arrangements to prevent a failed settlement.

While the senior debt securities are exempted from the prospectus requirement under the securities laws of each province or territory of Canada, the subordinated debt securities and warrants are not exempt and have not been and will not be qualified for any non-exempt distribution under such laws. Any sales of subordinated debt securities and warrants in Canada will be made only with our prior consent and only in compliance with the securities laws of Canada or any province or territory thereof.

Market-Making Resales By the Bank and its Affiliates

This prospectus may be used by the Bank, RBC Capital Markets, LLC or certain other of the Bank's affiliates (the "Market-Makers") in connection with offers and sales of the notes in market-making transactions. A Market-Maker may engage in market-making transactions only in those jurisdictions in which it has all necessary governmental and regulatory authorizations for such activity. In a market-making transaction, a Market-Maker may resell a security it acquires from other holders, after the original offering and sale of the security. Resales of this kind may occur in the open market or may be privately negotiated, at prevailing market prices at the time of resale or at related or negotiated prices. In these transactions, a Market-Maker may act as principal or agent, including as agent for the counterparty in a transaction in which the Market-Maker acts as principal, or as agent for both counterparties in a transaction in which the Market-Maker does not act as principal. The Market-Makers may receive compensation in the form of discounts or commissions, including from both counterparties in some cases.

The notes to be sold in market-making transactions include notes to be issued after the date of this prospectus, as well as notes previously issued.

The Bank does not expect to receive any proceeds from market-making transactions except to the extent the Bank is entitled to the proceeds of sales of notes made by it in such transactions. The Bank does not expect that the Market-Makers will pay any proceeds from their market-making resales to it.

Information about the trade and settlement dates, as well as the purchase price, for a market-making transaction will be provided to the purchaser in a separate confirmation of sale.

Unless we or an agent informs you in your confirmation of sale that your notes are being purchased in their original offering and sale, you should assume that you are purchasing your notes in a market-making transaction.

Conflicts of Interest

Some of the underwriters, dealers and agents and their affiliates have engaged in, and may in the future engage in, investment banking and other commercial dealings in the ordinary course of business with us or our affiliates. They have received, or may in the future receive, customary fees and commissions for these transactions.

In addition, in the ordinary course of their business activities, the underwriters, dealers and agents and their affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (including bank loans) for their own account and for the accounts of their customers. Such investments and securities activities may involve securities and/or instruments of ours or our affiliates. If any of the underwriters, dealers and agents or their affiliates have a lending relationship with us, certain of those underwriters, dealers and agents or their affiliates routinely hedge, and certain other of those underwriters, dealers and agents or their affiliates may hedge, their credit exposure to us consistent with their customary risk management policies. Typically, such underwriters, dealers and agents and their affiliates would hedge such exposure by entering into transactions which consist of either the purchase of credit default swaps or the creation of short positions in our securities, including potentially the notes offered hereby. Any such credit default swaps or short positions could adversely affect future trading prices of the notes offered hereby. The underwriters, dealers and agents and their affiliates may also make investment recommendations and/or publish or express independent research views in respect of such securities or financial instruments and may hold, or recommend to clients that they acquire, long and/or short positions in such securities and instruments.

Our affiliate, RBC Capital Markets, LLC, may participate in the distribution of the securities as an underwriter, dealer or agent. Any offering of securities in which RBC Capital Markets, LLC participates will be conducted in compliance with the applicable requirements of FINRA Rule 5121, a rule of the Financial Industry Regulatory Authority, Inc. ("FINRA"). RBC Capital Markets, LLC will not participate in the distribution of an offering of securities that do not have a bona fide public market within the meaning of Rule 5121 and are not investment grade rated within the meaning of Rule 5121 or securities in the same series that have equal rights and obligations as investment grade rated securities unless either (1) each member firm responsible for managing the public offering does not have a conflict of interest within the meaning of Rule 5121, is not an affiliate of any member that does have a conflict of interest, and meets the requirements of Rule 5121 with respect to disciplinary history or (2) a qualified independent underwriter has participated in the preparation of the prospectus supplement or other offering document for the offering of securities and has exercised the usual standards of due diligence with respect thereto. Neither RBC Capital Markets, LLC nor any other FINRA member participating in an offering of these securities that has a conflict of interest will confirm initial sales to any discretionary accounts over which it has authority without the prior specific written approval of the customer.

In compliance with guidelines of FINRA, the maximum commission or discount to be received by the participating FINRA members may not exceed 8% of the aggregate principal amount of securities offered pursuant to this prospectus. We anticipate, however, that the maximum commission or discount to be received in any particular offering of securities will be significantly less than this amount.

BENEFIT PLAN INVESTOR CONSIDERATIONS

A fiduciary of a pension, profit-sharing or other employee benefit plan (a “plan”) subject to the Employee Retirement Income Security Act of 1974, as amended (“ERISA”), should consider the fiduciary standards of ERISA in the context of the plan’s particular circumstances before authorizing an investment in the debt securities. Accordingly, among other factors, the fiduciary should consider whether the investment would satisfy the prudence and diversification requirements of ERISA and would be consistent with the documents and instruments governing the plan, and whether the investment would involve a prohibited transaction under Section 406 of ERISA or Section 4975 of the Internal Revenue Code.

Section 406 of ERISA and Section 4975 of the Internal Revenue Code prohibit plans, as well as individual retirement accounts and Keogh plans subject to Section 4975 of the Internal Revenue Code (also “plans”), from engaging in certain transactions involving “plan assets” with persons who are “parties in interest” under ERISA or “disqualified persons” under the Internal Revenue Code (“parties in interest”) with respect to the plan. A violation of these prohibited transaction rules may result in civil penalties or other liabilities under ERISA and/or an excise tax under Section 4975 of the Internal Revenue Code for those persons, unless relief is available under an applicable statutory, regulatory or administrative exemption. Certain employee benefit plans and arrangements including those that are governmental plans (as defined in section 3(32) of ERISA), certain church plans (as defined in Section 3(33) of ERISA) and foreign plans (as described in Section 4(b)(4) of ERISA (collectively “non-ERISA arrangements”) are not subject to the requirements of ERISA or Section 4975 of the Internal Revenue Code but may be subject to similar provisions under applicable federal, state, local, foreign or other regulations, rules or laws (“similar laws”).

The acquisition, holding or, if applicable, exchange of the debt securities by a plan or any entity whose underlying assets include “plan assets” by reason of any Plan’s investment in the entity with respect to which we or certain of our affiliates is or becomes a party in interest may constitute or result in a prohibited transaction under ERISA or Section 4975 of the Internal Revenue Code, unless those debt securities are acquired pursuant to and in accordance with an applicable exemption. The U.S. Department of Labor has issued five prohibited transaction class exemptions, or “PTCEs”, that may provide exemptive relief if required for direct or indirect prohibited transactions that may arise from the purchase or holding of the debt securities. These exemptions are:

- PTCE 84-14, an exemption for certain transactions determined or effected by independent qualified professional asset managers;
- PTCE 90-1, an exemption for certain transactions involving insurance company pooled separate accounts;
- PTCE 91-38, an exemption for certain transactions involving bank collective investment funds;
- PTCE 95-60, an exemption for transactions involving certain insurance company general accounts; and
- PTCE 96-23, an exemption for plan asset transactions managed by in-house asset managers.

In addition, ERISA Section 408(b)(17) and Section 4975(d)(20) of the Internal Revenue Code provide statutory exemptive relief for certain arm’s-length transactions with a person that is a party in interest solely by reason of providing services to Plans or being an affiliate of such a service provider. Under these provisions, the purchase and sale of the debt securities will not constitute a prohibited transaction under ERISA or Section 4975 of the Internal Revenue Code, provided that neither the issuer of the debt securities nor any of its affiliates have or exercise any discretionary authority or control or render any investment advice with respect to the assets of any Plan involved in the transaction, and provided further that the Plan pays no more and receives no less than “adequate consideration” in connection with the transaction (the “service provider exemption”). Any Plan fiduciary considering reliance on the service provider exemption is encouraged to consult with counsel regarding its availability. There can be no assurance that all of the conditions of any such exemptions will be satisfied.

Any purchaser or holder of debt securities or any interest therein will be deemed to have represented (both on behalf of itself and any plan) by its purchase and holding of the debt securities that either (1) it is not a plan and is not purchasing those debt securities on behalf of or with “plan assets” of any plan or (2) the purchase and holding of the debt securities will not constitute a non-exempt prohibited transaction under ERISA or the Internal Revenue Code. In addition, any purchaser or holder of debt securities or any interest therein which is a non-ERISA arrangement will be deemed to have represented by its purchase and holding of the debt securities that its purchase and holding will not violate the provisions of any similar law.

Due to the complexity of these rules and the penalties that may be imposed upon persons involved in non-exempt prohibited transactions, it is important that fiduciaries or other persons considering purchasing debt securities on behalf of or with “plan assets” of any plan or non-ERISA arrangement consult with their counsel regarding the availability of exemptive relief or the potential consequences of any purchase, holding or exchange under similar laws, as applicable.

Each purchaser and holder of the debt securities has exclusive responsibility for ensuring that its purchase and holding of the debt securities does not violate the fiduciary or prohibited transaction rules of ERISA, the Internal Revenue Code or any similar laws. The sale of any debt securities to any plan is in no respect a representation by us or any of our affiliates or representatives that such an investment is appropriate for, and meets all relevant legal requirements with respect to investments by plans generally or any particular plan.

LIMITATIONS ON ENFORCEMENT OF U.S. LAWS AGAINST THE BANK, OUR MANAGEMENT AND OTHERS

We are a Canadian chartered bank. Many of our directors and executive officers, including many of the persons who signed the Registration Statement on Form F-3, of which this prospectus is a part, and some of the experts named in this document, reside outside the United States, and a substantial portion of our assets and all or a substantial portion of the assets of such persons are located outside the United States. As a result, it may be difficult for you to effect service of process within the United States upon such persons to enforce against them judgments of the courts of the United States predicated upon, among other things, the civil liability provisions of the federal securities laws of the United States. In addition, it may be difficult for you to enforce, in original actions brought in courts in jurisdictions located outside the United States, among other things, civil liabilities predicated upon such securities laws.

We have been advised by our Canadian counsel, Norton Rose Fulbright Canada LLP, that a judgment of a United States court predicated solely upon civil liability under such laws would probably be enforceable in Canada if the United States court in which the judgment was obtained has a basis for jurisdiction in the matter that was recognized by a Canadian court for such purposes. We have also been advised by such counsel, however, that there is substantial doubt whether an original action could be brought successfully in Canada predicated solely upon such civil liabilities.

VALIDITY OF SECURITIES

The validity of the debt securities and the warrants will be passed upon by Sullivan & Cromwell LLP, New York, New York, as to matters of New York law, and by Norton Rose Fulbright Canada LLP, Toronto, Ontario, as to matters of Canadian law and applicable matters of Ontario and Québec law. The validity of the common shares will be passed upon by Norton Rose Fulbright Canada LLP, Toronto, Ontario. Davis Polk & Wardwell LLP, New York, New York will issue an opinion as to certain legal matters for the agents or underwriters.

EXPERTS

The consolidated financial statements and management’s assessment of the effectiveness of internal control over financial reporting (which is included in Management’s Report on Internal Control over Financial Reporting) of the Bank incorporated in this prospectus by reference to the 2017 Annual Report have been so incorporated in reliance on the report of PricewaterhouseCoopers LLP, an independent registered public accounting firm, given on the authority of said firm as experts in auditing and accounting.

OTHER EXPENSES OF ISSUANCE AND DISTRIBUTION

The estimated expenses in connection with the offerings hereunder, other than underwriting discounts and commissions, are as follows (in U.S. dollars):

Registration Statement filing fee	\$	2,520,675
Trustees' fees and expenses.....	\$	1,350,000
Legal fees and expenses.....	\$	7,200,000
Accounting fees and expenses	\$	496,000
Printing costs	\$	550,000
Miscellaneous	\$	<u>500,000</u>
Total.....	\$	<u>12,616,675</u>

