

ROYAL BANK OF CANADA  
Form 424B5  
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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.

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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.

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

**Contingent Coupon:** 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”).

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.

**Coupon Payment Dates:**

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.

**Call Feature:**

Following an automatic call, no further amounts will be owed to you under the notes.

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.

**Call Settlement Dates:**

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).

Payment at  
Maturity:

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.

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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.”

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## 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.

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## 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.

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## 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 Thomson 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;
  - who is subject to such taxes by reason of the holder being connected presently or formerly with Canada or any
- (ii) 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;
  - 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
- (iii) "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);
  - who presents such note for payment (where presentation is required, such as if a note is issued in definitive form)
- (iv) 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
    - if the full amount of the monies payable on such date has not been received by the Trustee on or prior to such due
  - (b) 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;
    - who could lawfully avoid (but has not so avoided) such withholding or deduction by complying, or procuring that
  - (v) 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
    - 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
  - (vi) 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.

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**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.

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**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.

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## 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

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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.

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#### 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.

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#### 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.