ROYAL BANK OF CANADA
Form 424B2
April 01, 2019

March 2019
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Registration Statement No. 333-227001
PRICING SUPPLEMENT
Dated March 29, 2019
Filed Pursuant to Rule 424(b)(2)
STRUCTURED INVESTMENTS
Opportunities in U.S. and International Equities
$5,099,000 Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of the S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
Principal at Risk Securities

Contingent Income Issuer Callable Securities do not guarantee the payment of interest or the repayment of principal. Instead, the securities offer the opportunity for investors to earn a contingent quarterly payment equal to 2.125% of the stated principal amount (8.50% per annum), but only with respect to each quarterly observation period if the closing level of each underlying index on every scheduled trading day during that period is greater than or equal to 70% of the initial index level (the "coupon threshold level"). In addition, beginning with the contingent payment date occurring in June 2019, the securities may be called at our option for an amount per security equal to the principal amount plus the contingent quarterly payment (if payable). However, if the securities are not called, the payment at maturity due on the securities will be the stated principal amount only if the final index level of each underlying index is greater than or equal to 70% of the initial index level (the "downside threshold level"). Investors will be exposed to the decline in the closing level of the worst performing underlying index, as compared to its initial index level, on a 1 to 1 basis if the final index level of any underlying index is below its downside threshold level on the final valuation date. Under these circumstances, the payment at maturity will be less than 70% of the stated principal amount and could be zero. Moreover, if the closing level of any underlying index on any scheduled trading day during an observation period is less than 70% of its initial index level, you will not receive any contingent quarterly payment for that period. As a result, investors must be willing to accept the risk of not receiving any contingent quarterly payment and also the risk of receiving payment at maturity that is significantly less than the stated principal amount of the securities and could be zero. Investors could lose their entire initial investment in the securities. Investors will not participate in any appreciation of any underlying index. The securities are our senior unsecured obligations, issued as part of our Series H Senior Global Medium-Term Notes program. All payments on the securities are subject to our credit risk.

FINAL TERMS

Issuer:	Royal Bank of Canada
Underlying indices:	S&P 500® Index ("SPX"), the Russell 2000® Index ("RTY"), and the EURO STOXX 50® Index ("SX5E")
Aggregate principal amount:	$5,099,000
Stated principal amount:	$1,000 per security
Pricing date:	March 29, 2019
Issue date:	April 3, 2019
Final valuation date:	March 29, 2021
Maturity date:	April 1, 2021
Early redemption:	Beginning on the contingent payment date occurring in June 2019, we may call the securities at our option by sending notice at least three business days preceding that contingent payment date (an "early redemption notice date").

Early redemption payment:	The early redemption payment will be an amount equal to (i) the stated principal amount plus (ii) the contingent quarterly payment with respect to the related observation period, if payable.
Contingent quarterly payment:	· If the closing level of each underlying index on every scheduled trading day during the relevant observation period is greater than or equal to its coupon threshold level, we will pay a contingent quarterly payment of $21.25 (2.125%) of the stated principal amount) per security on the related contingent payment date. · If the closing level of any underlying index on any scheduled trading day during the relevant observation period is less than its coupon threshold level, no contingent quarterly payment will be made with respect to that observation period. It is possible that one or more underlying indices will remain below their respective coupon threshold levels on at least one scheduled trading day during most or all of the observation periods so that you will receive few or no contingent quarterly payments during the term of the securities.
Observation periods:	Each observation period will be a period of approximately 3 months, as set forth in the following table:

Observation Period Start	Observation Period End
March 29, 2019	June 28, 2019
July 1, 2019	September 30, 2019
October 1, 2019	December 30, 2019
December 31, 2019	March 30, 2020
March 31, 2020	June 29, 2020
June 30, 2020	September 29, 2020
September 30, 2020	December 29, 2020
December 31, 2020	March 29, 2021

Contingent payment dates:	July 3, 2019, October 3, 2019, January 3, 2020, April 2, 2020, July 2, 2020, October 2, 2020, January 4, 2021 and the maturity date, subject to postponement as described below.
Payment at maturity:	· If the final index level of each underlying index is greater than or equal to its downside threshold level: (i) the stated principal amount plus (ii) the contingent quarterly payment with respect to the final observation period, if payable · If the final index level of any underlying index is less than its downside threshold level: stated principal amount x performance factor of the worst performing underlying index
Coupon threshold level:	1,984.08 with respect to the SPX, 1,077.817 with respect to the RTY and 2,346.20 with respect to the SX5E, each of which is equal to 70% of its initial index level (rounded to two decimal places with respect to the SX5E, and rounded to three decimal places with respect to the RTY)
Downside threshold level:	1,984.08 with respect to the SPX, 1,077.817 with respect to the RTY and 2,346.20 with respect to the SX5E, each of which is equal to 70% of its initial index level (rounded to two decimal places with respect to the SX5E, and rounded to three decimal places with respect to the RTY)
Initial index level:	2,834.40 with respect to the SPX, 1,539.739 with respect to the RTY and 3,351.71 with respect to the SX5E, each of which was its closing level on the pricing date
Final index level:	As to each underlying index, its closing level on the final valuation date
Performance factor:	As to each underlying index, a fraction, determined as follows: final index level/initial index level
Worst performing underlying index:	The underlying index with the lowest performance factor.
CUSIP/ISIN:	78013X4B1 / US78013X4B14
Listing:	The securities will not be listed on any securities exchange.
Agent:	RBC Capital Markets, LLC (“RBCCM”). See “Supplemental information regarding plan of distribution; conflicts of interest.”

Commissions and issue price	Price to public	Agent’s commissions	Proceeds to issuer

Per security	$1,000.00	$15.00[1] $5.00[2]	$980.00
Total	$5,099,000.00	$76,485.00 $25,495.00	$4,997,020.00

[1] RBCCM, acting as agent for Royal Bank of Canada, will receive a fee of $20.00 per $1,000 stated principal amount and will pay to Morgan Stanley Wealth Management ("MSWM") a fixed sales commission of $15.00 for each security that MSWM sells. See "Supplemental information regarding plan of distribution; conflicts of interest."
[2] Of the amount per $1,000 stated principal amount received by RBCCM, acting as agent for Royal Bank of Canada, RBCCM will pay MSWM a structuring fee of $5 for each security.
The initial estimated value of the securities as of the date of this document is $971.25 per $1,000 in principal amount, which is less than the price to public. The actual value of the securities at any time will reflect many factors, cannot be predicted with accuracy, and may be less than this amount.
The securities involve risks not associated with an investment in ordinary debt securities. See "Risk Factors" beginning on page 8.
The Securities and Exchange Commission and state securities regulators have not approved or disapproved these securities, or determined if this document or the accompanying prospectus supplement and prospectus is truthful or complete. Any representation to the contrary is a criminal offense.
The securities will not constitute deposits insured by the Canada Deposit Insurance Corporation, the U.S. Federal Deposit Insurance Corporation (the "FDIC") or any other Canadian or U.S. government agency or instrumentality. The securities are not subject to conversion into our common shares under subsection 39.2(2.3) of the Canada Deposit Insurance Corporation Act.
You should read this document together with the related prospectus supplement and prospectus, each of which can be accessed via the hyperlinks below. Please also see "Additional Information About the Securities" at the end of this document.
Prospectus Supplement dated September 7, 2018
Prospectus dated September 7, 2018

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
Investment Summary
The Contingent Income Issuer Callable Securities due April 1, 2021, which we refer to as the securities, provide an opportunity for investors to earn a contingent quarterly payment at an annual rate of 8.50% (2.125% per quarter) of the stated principal amount, but only if the closing level of each underlying index on every scheduled trading day during the relevant observation period is greater than or equal to 70% of its initial index level, which we refer to as the coupon threshold level. If payable, the contingent quarterly payment will be paid on the contingent payment date or the maturity date, as applicable. It is possible that one or more underlying indices could remain below their respective coupon threshold levels on at least one scheduled trading day during most or all of the observation periods, so that you may receive few or no contingent quarterly payments during the term of the securities.
Beginning with the contingent payment date occurring in June 2019, the securities may be redeemed at our option at an early redemption notice date, for the principal amount plus the contingent quarterly payment, if any, for the related observation period. An early redemption will be at our option and will not automatically occur based on the performance of any underlying index. It is more likely that we will redeem the securities when it would be advantageous for you to continue to hold the securities. As such, we will be more likely to redeem the securities when the closing level of each underlying index is at or above its coupon threshold level, which would otherwise potentially result in an amount of interest payable on the securities that is greater than instruments of a comparable maturity and credit rating trading in the market. In other words, we will be more likely to redeem the securities at a time when the securities are paying an above-market coupon. If the securities are redeemed prior to maturity, you will receive no more contingent quarterly payments, may be forced to invest in a lower interest rate environment and may not be able to reinvest at comparable terms or returns. On the other hand, we will be less likely to exercise our redemption right when the closing level of any underlying index is below its coupon threshold level and/or when the final index level for any underlying index is expected to be below its downside threshold level, such that you will receive no contingent quarterly payments and/or that you will suffer a significant loss on your investment in the securities at maturity. Therefore, if we do not exercise our redemption right, it is more likely that you will receive few or no contingent quarterly payments and suffer a significant loss at maturity.
If the securities have not been previously redeemed and the final index level of each underlying index is greater than or equal to its downside threshold level, the payment at maturity will be the stated principal amount and, if payable, the final contingent quarterly payment. However, if the securities have not been previously redeemed and the final index level of any underlying index is less than its downside threshold level, you will be exposed to the decline in the closing level of the worst performing underlying index, as compared to its initial index level, on a 1 to 1 basis and will receive a payment at maturity that is less than 70% of the stated principal amount of the securities and could be zero. Investors in the securities must be willing to accept the risk of losing their entire principal and also the risk of not receiving any contingent quarterly payments. In addition, investors will not participate in any appreciation of any of the underlying indices.

Contingent Income Issuer Callable Securities due April 1, 2021
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Scenario Analysis
If the securities are not redeemed prior to maturity, the payment at maturity will vary depending on the final index level of the worst performing underlying index, as follows:

Scenario 1	On every scheduled trading day during the observation periods, the closing level for each underlying index is greater than or equal to its coupon threshold level. We choose not to redeem the securities prior to maturity. § For each of the observation periods, investors will receive the contingent quarterly payment. § The payment due at maturity will be (i) the stated principal amount and (ii) the final contingent quarterly payment. § Investors will not participate in any appreciation of the underlying indices from their respective initial index levels.
Scenario 2	On every scheduled trading day during the first 4 observation periods, the closing level for each underlying index is greater than or equal to its coupon threshold level. On any scheduled trading day during the final 4 observation periods, the closing level for at least one underlying index is less than its coupon threshold level. On the final valuation date, the closing level of at least one underlying index is less than its downside threshold level. We choose not to redeem the securities prior to maturity. § For each of the first 4 observation periods, investors will receive the contingent quarterly payment. For the final 4 observation periods, investors do not receive the contingent quarterly payment. § The payment due at maturity will be (i) the stated principal amount multiplied by (ii) the performance factor of the worst performing underlying index. No final contingent quarterly payment will be paid at maturity in this scenario. § Investors will not participate in any appreciation of the underlying indices from their respective initial index levels. § Investors will lose a significant portion, and may lose all, of their principal in this scenario.
Scenario 3	On any scheduled trading day during the first 2 observation periods, the closing level for at least one underlying index is less than its coupon threshold level. On every scheduled trading day during the 3rd observation period, the closing level for each underlying index is greater than or equal to its coupon threshold level. We choose to redeem the securities on the 3rd early redemption notice date. § For the first 2 observation periods, investors will not receive the contingent quarterly payment. § The early redemption payment will be (i) the stated principal amount and (ii) the contingent quarterly payment for the 3rd observation period. § Investors will not participate in any appreciation of the underlying indices from their respective initial index levels.

Contingent Income Issuer Callable Securities due April 1, 2021
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How the Securities Work
The following diagrams illustrate the potential outcomes for the securities depending on (1) the closing level for each underlying index on every scheduled trading day during the relevant observation period and (2) if the securities are redeemed early, at our option on any early redemption notice date.
Diagram #1: Contingent Quarterly Payments

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
Diagram #2: Payment at Maturity if No Early Redemption Occurs

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
The examples below are based on the following terms:

Hypothetical Initial Index Level:	With respect to each underlying index, 100.00
Hypothetical Downside Threshold Level:	With respect to each underlying index, 70.00, which is 70% of its hypothetical initial index level
Hypothetical Coupon Threshold Level:	With respect to each underlying index, 70.00, which is 70% of its hypothetical initial index level
Contingent Quarterly Payment:	8.50% per annum (corresponding to $21.25 (or 2.125%) per quarter per security)
Stated Principal Amount:	$1,000 per security

How to determine whether a contingent quarterly payment is payable with respect to an observation period:

Early Redemption Example

	Lowest Index Closing Value on any Scheduled Trading Day During the Applicable Observation Period			
Hypothetical Observation Periods	SPX	RTY	SX5E	Contingent Quarterly Payment
#1	90.00 (at or above its coupon threshold level)	85.00 (at or above its coupon threshold level)	105.00 (at or above its coupon threshold level)	$21.25
#2	55.00 (below its coupon threshold level)	100.00 (at or above its coupon threshold level)	90.00 (at or above its coupon threshold level)	N/A
#3	90.00 (at or above its coupon threshold level)	85.00 (at or above its coupon threshold level)	105.00 (at or above its coupon threshold level)	$21.25

§ In Early Redemption Example, on each scheduled trading day during the hypothetical observation period #1, each of the underlying indices closes at or above its coupon threshold level. Therefore, a contingent quarterly payment is made on the relevant contingent payment date for the hypothetical observation period #1. On at least one scheduled trading day during each of the hypothetical observation period #2 at least one underlying index closes at or above its coupon threshold level, but one or more other underlying indices closes below its coupon threshold level. Therefore, no contingent quarterly payment is made on the relevant contingent payment date. The securities are redeemed at our option on the 3rd early redemption notice date. Since the closing level of each underlying index is greater than or equal to its coupon threshold level on every scheduled trading day during the hypothetical observation period #3, in addition to the previous contingent coupon received, you would receive the early redemption payment, calculated as follows:

stated principal amount + contingent quarterly payment = $1,000 + $21.25
= $1,021.25

In this example, the early redemption feature limits the term of your investment to approximately 9 months, and you may not be able to reinvest at comparable terms or returns. If the securities are redeemed early, you will not receive any additional contingent quarterly payments.

Contingent Income Issuer Callable Securities due April 1, 2021
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How to calculate the payment at maturity (if the securities have not been redeemed):

	Index Closing Value on the Valuation Date (Final Index Level)			
Example	SPX	RTY	SX5E	Payment at Maturity
#1	115.00 (at or above its downside threshold level)	105.00 (at or above its downside threshold level)	105.00 (at or above its downside threshold level)	$1,000*
#2	105.00 (at or above its downside threshold level)	50.00 (below its downside threshold level)	90.00 (at or above its downside threshold level)	$1,000 × the worst performing index performance factor = $10 × (50.00 / 100.00) = $500.00
#3	90.00 (at or above its downside threshold level)	60.00 (below its downside threshold level)	105.00 (at or above its downside threshold level)	$1,000 × (60.00 / 100.00) = $600.00

*In addition, the final contingent quarterly payment will be payable if the closing level of each underlying index is at or above its coupon threshold level on every scheduled trading day during the final observation period.

- In Example #1, the final index level of each of the underlying indices is at or above its downside threshold level. Therefore, investors receive at maturity the stated principal amount of the securities and, if the closing level of each underlying index on every scheduled trading day is at or above its coupon threshold level during the final observation period, the contingent quarterly payment with respect to such period. Investors will not participate in any appreciation of any underlying index.
- In Examples #2 and #3, the final index level of one or more underlying indices is at or above its downside threshold level, but the final index level of one or more of the other underlying indices is below its downside threshold level. Therefore, investors are exposed to the downside performance of the worst performing underlying index at maturity and receive at maturity an amount equal to the stated principal amount multiplied by the worst performing index performance factor.

If the final index level of any underlying index is below its downside threshold level, you will be exposed to the downside performance of the worst performing underlying index at maturity, and your payment at maturity will be less than 70% of the stated principal amount and could be zero.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
Risk Factors

The following is a non-exhaustive list of certain key risk factors for investors in the securities. For further discussion of these and other risks, you should read the section entitled "Risk Factors" in the accompanying prospectus supplement and prospectus. You should also consult your investment, legal, tax, accounting and other advisers in connection with your investment in the securities.

- The securities do not guarantee the return of any principal. The terms of the securities differ from those of ordinary debt securities in that the securities do not guarantee the payment of regular interest or the return of any of the principal amount at maturity. Instead, if the securities have not been redeemed prior to maturity and if the final index level of any underlying index is less than its downside threshold level, you will be exposed to the decline in the closing level of the worst performing underlying index, as compared to its initial index level, on a 1 to 1 basis. In this case, the payment at maturity will be less than 70% of the stated principal amount and could be zero.
- The potential contingent repayment of principal represented by the downside threshold level applies only at maturity. If the securities are not redeemed, you should be willing to hold the securities until maturity. Additionally, if the securities are not redeemed, at maturity, you will receive the stated principal amount only if the final index level of each underlying index is greater than or equal to its downside threshold level. If you are able to sell the securities prior to maturity, you may have to sell them for a loss relative to the principal amount, even if the level of each underlying index is at or above its downside threshold level.
- You will not receive any contingent quarterly payment for any observation period where the closing level of any underlying index on any scheduled trading day during that period is less than its coupon threshold level. A contingent quarterly payment will be made with respect to an observation period only if the closing level of each underlying index on every scheduled trading day during the relevant observation period is greater than or equal to its coupon threshold level. It is possible that the closing level of one or more underlying indices could be below its respective coupon threshold level on at least one scheduled trading day during most or all of the observation periods, so that you will receive few or no contingent quarterly payments. If the closing level of any underlying index on any scheduled trading day during an observation period is below its coupon threshold level, you will not receive any contingent quarterly payments for the related observation period, even if the closing level of that underlying index was at or above its coupon threshold level on most or all of the other trading days during that observation period and even if the closing levels of the other underlying indices were at or above their respective coupon threshold levels on each scheduled trading day during that observation period.
- Your return on the securities may be lower than the return on a conventional debt security of comparable maturity. The return that you will receive on the securities, 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.
- Investors will not participate in any appreciation in the level of any underlying index. Investors will not participate in any appreciation in the level of any underlying index from its initial index level, and the return on the securities will be limited to the contingent quarterly payments, if any, that are payable. The payment at maturity will not exceed the principal amount plus the final contingent quarterly payment, if it is payable. It is possible that the closing level of one or more of the underlying indices could be below the applicable coupon threshold level on at least one scheduled trading day during most or all of the observation periods so that you will receive few or no contingent quarterly payments. If you do not earn sufficient contingent quarterly payments over the term of the securities, the overall return on the securities may be less than the amount that would be paid on one of our conventional debt securities of comparable maturity.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

- The early redemption feature may limit the term of your investment to approximately three months. If the securities are redeemed early, you may not be able to reinvest at comparable terms or returns. The term of your investment in the securities may be limited to as short as approximately three months by the early redemption feature. If the securities are redeemed prior to maturity, you will receive no more contingent quarterly payments and may be forced to invest in a lower interest rate environment and may not be able to reinvest at comparable terms or returns. It is more likely that we will redeem the securities when it would be advantageous for you to continue to hold the securities. As such, we will be more likely to redeem the securities when the closing level of each underlying index is at or above its coupon threshold level, which would otherwise potentially result in an amount of interest payable on the securities that is greater than instruments of a comparable maturity and credit rating trading in the market. In other words, we will be more likely to redeem the securities at a time when the securities are paying an above-market coupon. If the securities are redeemed prior to maturity, you will receive no more contingent quarterly payments, may be forced to invest in a lower interest rate environment and may not be able to reinvest at comparable terms or returns. On the other hand, we will be less likely to exercise our redemption right when the closing level of any underlying index is below its coupon threshold level and/or when the final index level for any underlying index is expected to be below its downside threshold level, such that you will receive no contingent quarterly payments and/or that you will suffer a significant loss on your investment in the securities at maturity. Therefore, if we do not exercise our redemption right, it is more likely that you will receive few or no contingent quarterly payments and suffer a significant loss at maturity.
- You are exposed to the market risk of all underlying indices, with respect to both the contingent quarterly payments, if any, and the payment at maturity, if any. Your return on the securities is not linked to a basket consisting of the underlying indices. Rather, it will be contingent upon the independent performance of each underlying index. Unlike an instrument with a return linked to a basket of underlying assets, in which risk is potentially mitigated and diversified among all the components of the basket, you will be exposed to the risks related to each of the underlying indices. Poor performance by any underlying index over the term of the securities may negatively affect your return and will not be offset or mitigated by any positive performance by the other underlying indices. To receive any contingent quarterly payments, all underlying indices must close at or above their respective coupon threshold levels on each trading day during the applicable observation period. In addition, if any underlying index has decreased to below its respective downside threshold level as of the final valuation date, you will be fully exposed to the decrease in the worst performing underlying index on a 1 to 1 basis, even if the other underlying indices have appreciated. Under this scenario, the payment at maturity will be less than 70% of the stated principal amount and could be zero. Accordingly, your investment is subject to the market risk of each of the underlying indices.
- Because the securities are linked to the performance of the worst performing underlying index, you are exposed to greater risks of receiving no contingent quarterly payments and sustaining a significant loss on your investment than if the securities were linked to just one underlying index. The risk that you will not receive any contingent quarterly payments, or that you will suffer a significant loss on your investment, is greater if you invest in the securities as opposed to substantially similar securities that are linked to the performance of just one underlying index. With three underlying indices, it is more likely that one or more of the underlying indices will close below their respective coupon threshold levels on any scheduled trading day during any observation period or the final valuation date than if the securities were linked to only one underlying index. Therefore, it is more likely that you will not receive any contingent quarterly payments, and that you will suffer a significant loss on your investment.
- The market price will be influenced by many unpredictable factors. Several factors will influence the value of the securities in the secondary market and the price at which RBCCM may be willing to purchase or sell the securities in the secondary market. Although we expect that generally the closing levels of the underlying indices on any day may affect the value of the securities more than any other single factor, other factors that may influence the value of the securities include:
  - the volatility (frequency and magnitude of changes in the level) of the underlying indices;
  - whether the closing level of any underlying index has been below its coupon threshold level on any scheduled trading day during any observation period;
  - dividend rates on the securities included in the underlying indices;

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

- interest and yield rates in the market;
- the time remaining until the securities mature;
- geopolitical conditions and economic, financial, political, regulatory or judicial events that affect the underlying indices and their levels;
- the composition of the underlying indices and changes in their constituent stocks; and
- any actual or anticipated changes in our credit ratings or credit spreads.

The levels of the underlying indices may be, and has recently been, volatile, and we can give you no assurance that the volatility will lessen. See "The Underlying Indices" below. You may receive less, and possibly significantly less, than the stated principal amount per security if you try to sell your securities prior to maturity.

- The securities are subject to our credit risk, and any actual or anticipated changes to its credit ratings or credit spreads may adversely affect the market value of the securities. You are dependent on our ability to pay all amounts due on the securities on each contingent payment date or at maturity, and therefore you are subject to our credit risk. If we default on our obligations under the securities, your investment would be at risk and you could lose some or all of your investment. As a result, the market value of the securities prior to maturity will be affected by changes in the market's view of our creditworthiness. Any actual or anticipated 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 market value of the securities.
- Owning the securities is not the same as owning the common stocks included in the underlying indices. The return on your securities will not reflect the return you would realize if you actually owned and held the common stocks included in the underlying indices for a similar period. If the securities are redeemed, the early redemption payment that you receive will be the stated principal amount plus the contingent quarterly payment (if payable), regardless of the amount by which the closing level of any underlying index on any scheduled trading day exceeds its initial index level. Investors will not participate in any appreciation of any underlying index. The return on the securities will be limited to any contingent quarterly payments made during the term of the securities. In addition, you will not have voting rights, the right to receive dividends, or any other rights that holders of those common stocks may have. Even if the level of any underlying index increases above its initial index level during the term of the securities, the market value of the securities may not increase by the same amount. It is also possible for the levels of one or more of the underlying indices to increase while the market value of the securities decreases.
- Changes that affect the underlying indices will affect the market value of the securities and the payments on the securities. The policies of the applicable index sponsors concerning the calculation of the underlying indices, additions, deletions or substitutions of the common stocks included in those indices and the manner in which changes affecting the issuers of those stocks, such as stock dividends, reorganizations or mergers, are reflected in the applicable index could affect the levels of these indices, whether the securities are called at our option, the contingent quarterly payment, the payment at maturity, and the market value of the securities prior to maturity. The amount payable on the securities and their market value could also be affected if an index sponsor changes these policies, for example, by changing the manner in which it calculates the underlying index, or if an index sponsor discontinues or suspends calculation or publication of an underlying index, in which case it may become difficult to determine the market value of the securities. If events such as these occur, or if the level of an underlying index is not available on the final valuation date because of a market disruption event or for any other reason and no successor index is selected, the calculation agent may determine the level of the applicable underlying index — and thus the payment at maturity — in its sole discretion.
- No affiliation with any index sponsor. None of the applicable index sponsors is an affiliate of ours and is not involved with this offering in any way. Consequently, we have no control over the actions of those index sponsors, including any actions of the type that would affect the composition of the underlying indices, and therefore, the levels of the underlying indices. The index sponsors have no obligation of any sort with respect to the securities. Thus, these index sponsors have no obligation to take your interests into consideration for any reason, including in taking any actions that might affect the value of the securities.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

- An investment in the securities is subject to risks associated in investing in stocks with a small market capitalization. The RTY consists of stocks issued by companies with relatively small market capitalizations. These companies often have greater stock price volatility, lower trading volume and less liquidity than large-capitalization companies. As a result, the level of this underlying index may be more volatile than that of a market measure that does not track solely small-capitalization stocks. Stock prices of small-capitalization companies are also often more vulnerable than those of large-capitalization companies to adverse business and economic developments, and the stocks of small-capitalization companies may be thinly traded, and be less attractive to many investors if they do not pay dividends. In addition, small capitalization companies are often less well-established and less stable financially than large-capitalization companies and may depend on a small number of key personnel, making them more vulnerable to loss of those individuals. Small capitalization companies tend to have lower revenues, less diverse product lines, smaller shares of their target markets, fewer financial resources and fewer competitive strengths than large-capitalization companies. These companies may also be more susceptible to adverse developments related to their products or services.
- There are risks associated with investments in securities linked to the value of foreign equity securities. The SX5E includes equity securities issued by non-U.S. companies. An investment in securities 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 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.

Securities prices 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.

- The securities are subject to exchange rate risk. Because securities included in the SX5E are traded in currencies other than U.S. dollars, and the securities are denominated in U.S. dollars, the amount payable on the securities at maturity may be exposed to fluctuations in the exchange rate between the U.S. dollar and each of the currencies in which those securities are denominated. These changes in exchange rates may reflect changes in various non-U.S. economies that in turn may affect the payment on the securities at maturity. An investor's net exposure will depend on the extent to which the currencies in which the relevant securities are denominated either strengthen or weaken against the U.S. dollar and the relative weight of each security.
- We or our affiliates may have adverse economic interests to the holders of the securities. RBCCM and other affiliates of ours may trade the common stocks included in the underlying indices and other financial instruments related to the underlying indices 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 underlying indices. To the extent that we or one of our affiliates serves as issuer, agent or underwriter for those securities or financial instruments, our or their interests with respect to those products may be adverse to those of the holders of the securities. Any of these trading activities could potentially affect the performance of the underlying indices and, accordingly, could affect the value of the securities and the amounts, if any, payable on the securities.

We may hedge our obligations under the securities through certain affiliates, who would expect to make a profit on that hedge. We or our affiliates may adjust these hedges by, among other things, purchasing or selling those assets

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

at any time, which could have an impact on the return of your securities. Because hedging our obligations entails risk and may be influenced by market forces beyond our or our affiliates' control, such hedging may result in a profit that is more or less than expected, or it may result in a loss.

- The historical performance of the underlying indices should not be taken as an indication of their future performance. The levels of the underlying indices will determine the amounts to be paid on the securities. The historical performance of the underlying indices does not give an indication of their future performance. As a result, it is impossible to predict whether the level of any underlying index will rise or fall during the term of the securities.
- The levels of the underlying indices will be influenced by complex and interrelated political, economic, financial and other factors. The level of an underlying index may decrease such that you may not receive any return of your investment or any contingent quarterly payment. There can be no assurance that the level of any underlying index will not decrease so that at maturity you will not lose a significant portion or all of your investment.
- The securities will not be listed on any securities exchange and secondary trading may be limited. The securities will not be listed on any securities exchange. Therefore, there may be little or no secondary market for the securities. RBCCM may, but is not obligated to, make a market in the securities, and, if it chooses to do so at any time, it may cease doing so. When it does make a market, it will generally do so for transactions of routine secondary market size at prices based on its estimate of the current value of the securities, taking into account its bid/offer spread, our credit spreads, market volatility, the notional size of the proposed sale, the cost of unwinding any related hedging positions, the time remaining to maturity and the likelihood that it will be able to resell the securities. Even if there is a secondary market, it may not provide enough liquidity to allow you to trade or sell the securities easily. Because we do not expect that other broker-dealers will participate significantly in the secondary market for the securities, the price at which you may be able to trade your securities is likely to depend on the price, if any, at which RBCCM is willing to transact. If, at any time, RBCCM were to cease making a market in the securities, it is likely that there would be no secondary market for the securities. Accordingly, you should be willing to hold your securities to maturity.
- The initial estimated value of the securities is less than the price to the public. The initial estimated value that is set forth on the cover page of this document does not represent a minimum price at which we, RBCCM or any of our affiliates would be willing to purchase the securities in any secondary market (if any exists) at any time. If you attempt to sell the securities prior to maturity, their market value may be lower than the price you paid for them and the initial estimated value. This is due to, among other things, changes in the levels of the underlying indices, the borrowing rate we pay to issue securities of this kind, and the inclusion in the price to the public of the agent's commissions and the estimated costs relating to our hedging of the securities. These factors, together with various credit, market and economic factors over the term of the securities, are expected to reduce the price at which you may be able to sell the securities in any secondary market and will affect the value of the securities in complex and unpredictable ways. Assuming no change in market conditions or any other relevant factors, the price, if any, at which you may be able to sell your securities prior to maturity may be less than your original purchase price, as any such sale price would not be expected to include the agent's commissions and the hedging costs relating to the securities. In addition to bid-ask spreads, the value of the securities determined for any secondary market price is expected to be based on the secondary rate rather than the internal funding rate used to price the securities and determine the initial estimated value. As a result, the secondary price will be less than if the internal funding rate was used. The securities are not designed to be short-term trading instruments. Accordingly, you should be able and willing to hold your securities to maturity.
- Our initial estimated value of the securities is an estimate only, calculated as of the pricing date. The initial estimated value of the securities is based on the value of our obligation to make the payments on the securities, together with the mid-market value of the derivative embedded in the terms of the securities. See "Additional Information About the Securities—Structuring the securities" below. Our estimate is based on a variety of assumptions, including our credit spreads, expectations as to dividends, interest rates and volatility, and the expected term of the securities. These assumptions are based on certain forecasts about future events, which may prove to be incorrect. Other entities may value the securities or similar securities at a price that is significantly different than we do.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

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

- The securities are not designed to be short-term trading instruments. The price at which you will be able to sell the securities to us or our affiliates prior to maturity, if at all, may be at a substantial discount from the principal amount of the securities, even in cases where the closing level of one or more of the underlying indices have appreciated since the pricing date. In addition, you may receive less, and possibly significantly less, than the stated principal amount of your securities if you try to sell your securities prior to the maturity date, and you will not receive the benefit of any contingent repayment of principal represented by the downside threshold level.
- Hedging and trading activity by our subsidiaries could potentially adversely affect the value of the securities. One or more of our subsidiaries and/or third party dealers expect to carry out hedging activities related to the securities (and to other instruments linked to the underlying indices), including trading in the common stocks included in the underlying indices and in other instruments related to the underlying indices. Some of our subsidiaries also trade the common stocks included in the underlying indices and other financial instruments related to the underlying indices on a regular basis as part of their general broker-dealer and other businesses. Any of these hedging or trading activities on or prior to the pricing date could have increased the initial index level of one or more of the underlying indices and, as a result, could have increased the coupon threshold level which is the level at or above which an underlying index must close on any scheduled trading day for each observation period in order for you to earn a contingent quarterly payment. These activities could also make it more likely that you will be exposed to the negative performance of that underlying index at maturity. Additionally, those hedging or trading activities during the term of the securities could potentially affect the levels of one or more of the underlying indices on any scheduled trading day for each observation period and the final valuation date, and, accordingly, the payments to you on the securities.
- You must rely on your own evaluation of the merits of an investment linked to the underlying indices. In the ordinary course of their business, our affiliates may have expressed views on expected movement in the underlying indices, 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 the underlying indices may at any time have significantly different views from those of our affiliates. For these reasons, you are encouraged to derive information concerning the underlying indices from multiple sources, and you should not rely solely on views expressed by our affiliates.
- The calculation agent, which is a subsidiary of the issuer, will make determinations with respect to the securities, which may create a conflict of interest. Our wholly owned subsidiary, RBCCM, will serve as the calculation agent. As calculation agent, RBCCM determined the initial index levels, the downside threshold levels and coupon threshold levels, and will determine the final index levels, whether the contingent quarterly payment will be paid on each contingent payment date, whether a market disruption event has occurred, and the payment that you will receive upon an early redemption or at maturity, if any. Any of these determinations made by RBCCM, in its capacity as calculation agent, may require it to exercise discretion and make subjective judgments, such as with respect to the occurrence or nonoccurrence of market disruption events, may affect the payments to you upon an early redemption or at maturity.
- Significant aspects of the income tax treatment of an investment in the securities are uncertain. The tax treatment of an investment in the securities 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 securities, and the Internal Revenue Service, the Canada Revenue Agency or a court may not agree with the tax treatment described in this document. Although the U.S. federal income tax treatment of the contingent quarterly payments is uncertain, we intend to take the position that the contingent quarterly payments constitute taxable ordinary income to a U.S. holder at the time received or accrued in accordance with the holder's regular method of tax accounting.

The Internal Revenue Service has issued a notice indicating that it and the U.S. Treasury Department are actively considering whether, among other issues, the holder of an instrument such as the securities should be required to

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

accrue ordinary income on a current basis. The outcome of this process is uncertain and could apply on a retroactive basis.

Please read carefully the section entitled "Additional Information About the Securities—U.S. tax considerations" in this document, the section "Tax Consequences – United States Taxation" 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 discussion of the material Canadian federal income tax consequences of investing in the securities, please see the section entitled "Tax Consequences — Canadian Taxation" in the accompanying prospectus. If you are a not a Non-resident Holder (as that term is defined in "Tax Consequences — Canadian Taxation" in the accompanying prospectus) or if you acquire the securities in the secondary market, you should consult your tax advisors as to the consequences of acquiring, holding and disposing of the securities and receiving the payments that may be due under the securities.

- A 30% U.S. federal withholding tax will be withheld on contingent quarterly payments paid to non-U.S. holders. While the U.S. federal income tax treatment of the securities (including proper characterization of the contingent quarterly payments 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 quarterly payments 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.

Please read carefully the section entitled "Additional Information About the Securities—U.S. tax considerations" in this document, the section "Tax Consequences – United States Taxation" 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.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

The Underlying Indices

All disclosures contained in this document regarding the underlying indices, including, without limitation, their make-up, method of calculation, and changes in their components, have been derived from publicly available sources. The information reflects the policies of, and is subject to change by, the applicable index sponsor. Each of these entities has no obligation to continue to publish, and may discontinue publication of, the applicable underlying index. The consequences of an index sponsor discontinuing publication or making other changes to an underlying index are discussed below in the section entitled "Additional Provisions—Unavailability of the level of an underlying index on a determination date." Neither we nor RBCCM accepts any responsibility for the calculation, maintenance or publication of any underlying index or any successor index.

The selection of the underlying indices is not a recommendation to invest in any underlying index. Neither we nor any of our affiliates make any representation to you as to the future performance of any underlying index.

The S&P 500® Index

The S&P 500® Index (the "SPX") is intended to provide an indication of the pattern of common stock price movement in the large capitalization segment of the U.S. equity market. The calculation of the level of the SPX is based on the relative value of the aggregate market value of the common stocks of 500 companies as of a particular time compared to the aggregate average market value of the common stocks of 500 similar companies during the base period of the years 1941 through 1943.

The index sponsor calculates the SPX by reference to the prices of the constituent stocks of the SPX without taking account of the value of dividends paid on those stocks. As a result, the return on the securities will not reflect the return you would realize if you actually owned the SPX constituent stocks and received the dividends paid on those stocks.

Effective with the September 2015 rebalance, consolidated share class lines will no longer be included in the SPX. Each share class line will be subject to public float and liquidity criteria individually, but the company's total market capitalization will be used to evaluate each share class line. This may result in one listed share class line of a company being included in the SPX while a second listed share class line of the same company is excluded.

Computation of the SPX

While the index sponsor currently employs the following methodology to calculate the SPX, no assurance can be given that the index sponsor will not modify or change this methodology in a manner that may affect the payments on the securities.

Historically, the market value of any component stock of the SPX was calculated as the product of the market price per share and the number of then outstanding shares of such component stock. In March 2005, the index sponsor began shifting the SPX halfway from a market capitalization weighted formula to a float-adjusted formula, before moving the SPX to full float adjustment on September 16, 2005. The index sponsor's criteria for selecting stocks for the SPX did not change with the shift to float adjustment. However, the adjustment affects each company's weight in the SPX.

Under float adjustment, the share counts used in calculating the SPX reflect only those shares that are available to investors, not all of a company's outstanding shares. Float adjustment excludes shares that are closely held by control groups, other publicly traded companies or government agencies.

In September 2012, all shareholdings representing more than 5% of a stock's outstanding shares, other than holdings by "block owners," were removed from the float for purposes of calculating the SPX. Generally, these "control holders" will include officers and directors, private equity, venture capital and special equity firms, other publicly traded companies that hold shares for control, strategic partners, holders of restricted shares, ESOPs, employee and family trusts, foundations associated with the company, holders of unlisted share classes of stock, government entities at all levels (other than government retirement/pension funds) and any individual person who controls a 5% or greater stake in a company as reported in regulatory filings. However, holdings by block owners, such as depositary banks, pension funds, mutual funds and ETF providers, 401(k) plans of the company, government retirement/pension funds, investment funds of insurance companies, asset managers and investment funds, independent foundations and savings and investment plans, will ordinarily be considered part of the float.

Treasury stock, stock options, restricted shares, equity participation units, warrants, preferred stock, convertible stock, and rights are not part of the float. Shares held in a trust to allow investors in countries outside the country of domicile, such as depositary shares and Canadian exchangeable shares are normally part of the float unless those shares form a control block.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

For each stock, an investable weight factor ("IWF") is calculated by dividing the available float shares by the total shares outstanding. Available float shares are defined as the total shares outstanding less shares held by control holders. This calculation is subject to a 5% minimum threshold for control blocks. For example, if a company's officers and directors hold 3% of the company's shares, and no other control group holds 5% of the company's shares, the index sponsor would assign that company an IWF of 1.00, as no control group meets the 5% threshold. However, if a company's officers and directors hold 3% of the company's shares and another control group holds 20% of the company's shares, the index sponsor would assign an IWF of 0.77, reflecting the fact that 23% of the company's outstanding shares are considered to be held for control. As of July 31, 2017, companies with multiple share class lines are no longer eligible for inclusion in the SPX. Constituents of the SPX prior to July 31, 2017 with multiple share class lines will be grandfathered in and continue to be included in the SPX. If a constituent company of the SPX reorganizes into a multiple share class line structure, that company will remain in the SPX at the discretion of the S&P Index Committee in order to minimize turnover.

The SPX is calculated using a base-weighted aggregate methodology. The level of the SPX reflects the total market value of all 500 component stocks relative to the base period of the years 1941 through 1943. An indexed number is used to represent the results of this calculation in order to make the level easier to work with and track over time. The actual total market value of the component stocks during the base period of the years 1941 through 1943 has been set to an indexed level of 10. This is often indicated by the notation 1941- 43 = 10. In practice, the daily calculation of the SPX is computed by dividing the total market value of the component stocks by the "index divisor." By itself, the index divisor is an arbitrary number. However, in the context of the calculation of the SPX, it serves as a link to the original base period level of the SPX. The index divisor keeps the SPX comparable over time and is the manipulation point for all adjustments to the SPX, which is index maintenance.

Index Maintenance

Index maintenance includes monitoring and completing the adjustments for company additions and deletions, share changes, stock splits, stock dividends, and stock price adjustments due to company restructuring or spinoffs. Some corporate actions, such as stock splits and stock dividends, require changes in the common shares outstanding and the stock prices of the companies in the SPX, and do not require index divisor adjustments.

To prevent the level of the SPX from changing due to corporate actions, corporate actions which affect the total market value of the SPX require an index divisor adjustment. By adjusting the index divisor for the change in market value, the level of the SPX remains constant and does not reflect the corporate actions of individual companies in the SPX. Index divisor adjustments are made after the close of trading and after the calculation of the index closing level. Changes in a company's shares outstanding and IWF due to its acquisition of another public company are made as soon as reasonably possible. At S&P's discretion, de minimis merger and acquisition share changes are accumulated and implemented with the quarterly share rebalancing.

All other changes of less than 5% are accumulated and made quarterly on the third Friday of March, June, September, and December.

Changes in a company's total shares outstanding of 5% or more due to public offerings are made as soon as reasonably possible. Other changes of 5% or more (for example, due to tender offers, Dutch auctions, voluntary exchange offers, company stock repurchases, private placements, acquisitions of private companies or non-index companies that do not trade on a major exchange, redemptions, exercise of options, warrants, conversion of preferred stock, notes, debt, equity participations, at-the-market stock offerings or other recapitalizations) are made weekly, and are generally announced on Fridays for implementation after the close of trading the following Friday (one week later). If a 5% or more share change causes a company's IWF to change by five percentage points or more, the IWF is updated at the same time as the share change. IWF changes resulting from partial tender offers are considered on a case-by-case basis.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
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The securities are not sponsored, endorsed, sold or promoted by S&P Dow Jones Indices LLC, Dow Jones, S&P or any of their respective affiliates (collectively, "S&P Dow Jones Indices"). S&P Dow Jones Indices make no representation or warranty, express or implied, to the holders of the securities or any member of the public regarding the advisability of investing in securities generally or in the securities particularly or the ability of the SPX to track general market performance. S&P Dow Jones Indices' only relationship to us with respect to the SPX is the licensing of the SPX and certain trademarks, service marks and/or trade names of S&P Dow Jones Indices and/or its third party licensors. The SPX is determined, composed and calculated by S&P Dow Jones Indices without regard to us or the securities. S&P Dow Jones Indices have no obligation to take our needs or the needs of holders of the securities into consideration in determining, composing or calculating the SPX. S&P Dow Jones Indices are not responsible for and have not participated in the determination of the prices, and amount of the securities or the timing of the issuance or sale of the securities or in the determination or calculation of the equation by which the securities are to be converted into cash. S&P Dow Jones Indices have no obligation or liability in connection with the administration, marketing or trading of the securities. There is no assurance that investment products based on the SPX will accurately track index performance or provide positive investment returns. S&P Dow Jones Indices LLC and its subsidiaries are not investment advisors. Inclusion of a security or futures contract within an index is not a recommendation by S&P Dow Jones Indices to buy, sell, or hold such security or futures contract, nor is it considered to be investment advice.

Notwithstanding the foregoing, CME Group Inc. and its affiliates may independently issue and/or sponsor financial products unrelated to the securities currently being issued by us, but which may be similar to and competitive with the securities. In addition, CME Group Inc. and its affiliates may trade financial products which are linked to the performance of the SPX. It is possible that this trading activity will affect the value of the securities.

S&P DOW JONES INDICES DO NOT GUARANTEE THE ADEQUACY, ACCURACY, TIMELINESS AND/OR THE COMPLETENESS OF THE SPX OR ANY DATA RELATED THERETO OR ANY COMMUNICATION, INCLUDING BUT NOT LIMITED TO, ORAL OR WRITTEN COMMUNICATION (INCLUDING ELECTRONIC COMMUNICATIONS) WITH RESPECT THERETO. S&P DOW JONES INDICES SHALL NOT BE SUBJECT TO ANY DAMAGES OR LIABILITY FOR ANY ERRORS, OMISSIONS, OR DELAYS THEREIN. S&P DOW JONES INDICES MAKE NO EXPRESS OR IMPLIED WARRANTIES, AND EXPRESSLY DISCLAIMS ALL WARRANTIES, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE OR AS TO RESULTS TO BE OBTAINED BY US, HOLDERS OF THE SECURITIES, OR ANY OTHER PERSON OR ENTITY FROM THE USE OF THE SPX OR WITH RESPECT TO ANY DATA RELATED THERETO. WITHOUT LIMITING ANY OF THE FOREGOING, IN NO EVENT WHATSOEVER SHALL S&P DOW JONES INDICES BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL, PUNITIVE, OR CONSEQUENTIAL DAMAGES INCLUDING BUT NOT LIMITED TO, LOSS OF PROFITS, TRADING LOSSES, LOST TIME OR GOODWILL, EVEN IF THEY HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, WHETHER IN CONTRACT, TORT, STRICT LIABILITY, OR OTHERWISE. THERE ARE NO THIRD PARTY BENEFICIARIES OF ANY AGREEMENTS OR ARRANGEMENTS BETWEEN S&P DOW JONES INDICES AND US, OTHER THAN THE LICENSORS OF S&P DOW JONES INDICES.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
Information as of market close on March 29, 2019:

Bloomberg Index Symbol:	SPX	52 Week High (on 9/20/2018):	2,930.75
Current Index Level:	2,834.40	52 Week Low (on 12/24/2018):	2,351.10
52 Weeks Ago:	2,640.87		

The table below sets forth the published high and low closing levels of this underlying index for each quarter from January 1, 2014 through March 29, 2019. The graph below the table sets forth the daily closing levels of this underlying index for that period. We obtained the information in the table and graph below from Bloomberg Financial Markets, without independent verification. The historical performance of the underlying index should not be taken as an indication of its future performance, and no assurance can be given as to the level of the underlying index at any time.

The S&P 500® High Low

2014		
First Quarter	1,878.04	1,741.89
Second Quarter	1,962.87	1,815.69
Third Quarter	2,011.36	1,909.57
Fourth Quarter	2,090.57	1,862.49
2015		
First Quarter	2,117.39	1,992.67
Second Quarter	2,130.82	2,057.64
Third Quarter	2,128.28	1,867.61
Fourth Quarter	2,109.79	1,923.82
2016		
First Quarter	2,063.95	1,829.08
Second Quarter	2,119.12	2,000.54
Third Quarter	2,190.15	2,088.55
Fourth Quarter	2,271.72	2,085.18
2017		
First Quarter	2,395.96	2,257.83
Second Quarter	2,453.46	2,328.95
Third Quarter	2,519.36	2,409.75
Fourth Quarter	2,690.16	2,529.12
2018		
First Quarter	2,872.87	2,581.00
Second Quarter	2,786.85	2,581.88
Third Quarter	2,930.75	2,713.22
Fourth Quarter	2,925.51	2,351.10
2019		
First Quarter (through March 29, 2019)	2,854.88	2,447.89

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
Underlying Index Daily Closing Levels
January 1, 2014 to March 29, 2019

Neither the issuer nor any of its affiliates makes any representation to you as to the performance of this underlying index.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

The Russell 2000® Index

The RTY was developed by Russell Investments ("Russell") before FTSE International Limited ("FTSE") and Russell combined in 2015 to create FTSE Russell, which is wholly owned by London Stock Exchange Group. Russell began dissemination of the RTY (Bloomberg L.P. index symbol "RTY") on January 1, 1984. The RTY was set to 135 as of the close of business on December 31, 1986. FSTE Russell (the "index sponsor") calculates and publishes the RTY. The RTY is designed to track the performance of the small capitalization segment of the U.S. equity market. As a subset of the Russell 3000® Index, the RTY consists of the smallest 2,000 companies included in the Russell 3000® Index. The Russell 3000® Index measures the performance of the largest 3,000 U.S. companies, representing approximately 98% of the investable U.S. equity market. The RTY is determined, comprised, and calculated by the index sponsor without regard to the securities.

Selection of Stocks Underlying the RTY

All companies eligible for inclusion in the RTY must be classified as a U.S. company under the index sponsor's country-assignment methodology. If a company is incorporated, has a stated headquarters location, and trades in the same country (American Depositary Receipts and American Depositary Shares are not eligible), then the company is assigned to its country of incorporation. If any of the three factors are not the same, the index sponsor defines three Home Country Indicators ("HCIs"): country of incorporation, country of headquarters, and country of the most liquid exchange (as defined by a two-year average daily dollar trading volume) ("ADDTV") from all exchanges within a country. Using the HCIs, the index sponsor compares the primary location of the company's assets with the three HCIs. If the primary location of its assets matches any of the HCIs, then the company is assigned to the primary location of its assets. If there is insufficient information to determine the country in which the company's assets are primarily located, the index sponsor will use the primary country from which the company's revenues are primarily derived for the comparison with the three HCIs in a similar manner. The index sponsor uses the average of two years of assets or revenues data to reduce potential turnover. If conclusive country details cannot be derived from assets or revenues data, the index sponsor will assign the company to the country of its headquarters, which is defined as the address of the company's principal executive offices, unless that country is a Benefit Driven Incorporation "BDI" country, in which case the company will be assigned to the country of its most liquid stock exchange. BDI countries include: Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, Bonaire, British Virgin Islands, Cayman Islands, Channel Islands, Cook Islands, Curacao, Faroe Islands, Gibraltar, Guernsey, Isle of Man, Jersey, Liberia, Marshall Islands, Panama, Saba, Sint Eustatius, Sint Maarten, and Turks and Caicos Islands. For any companies incorporated or headquartered in a U.S. territory, including countries such as Puerto Rico, Guam, and U.S. Virgin Islands, a U.S. HCI is assigned.

All securities eligible for inclusion in the RTY must trade on a major U.S. exchange. Stocks must have a closing price at or above $1.00 on their primary exchange on the last trading day in May to be eligible for inclusion during annual reconstitution. However, in order to reduce unnecessary turnover, if an existing member's closing price is less than $1.00 on the last day of May, it will be considered eligible if the average of the daily closing prices (from its primary exchange) during the month of May is equal to or greater than $1.00. Initial public offerings are added each quarter and must have a closing price at or above $1.00 on the last day of their eligibility period in order to qualify for index inclusion. If an existing stock does not trade on the "rank day" (typically the last trading day in May, but a confirmed timetable is announced each Spring) but does have a closing price at or above $1.00 on another eligible U.S. exchange, that stock will be eligible for inclusion.

An important criterion used to determine the list of securities eligible for the RTY is total market capitalization, which is defined as the market price as of the rank day in May for those securities being considered at annual reconstitution times the total number of shares outstanding. Where applicable, common stock, non-restricted exchangeable shares and partnership units/membership interests are used to determine market capitalization. Any other form of shares such as preferred stock, convertible preferred stock, redeemable shares, participating preferred stock, warrants, rights, installment receipts or trust receipts, are excluded from the calculation. If multiple share classes of common stock exist, they are combined to determine total shares outstanding. In cases where the common stock share classes act independently of each other (e.g., tracking stocks), each class is considered for inclusion separately. If multiple share classes exist, the pricing vehicle will be designated as the share class with the highest two-year trading volume as of

the rank day in May.

Companies with a total market capitalization of less than $30 million are not eligible for the RTY. Similarly, companies with only 5% or less of their shares available in the marketplace are not eligible for the RTY. Royalty trusts, limited liability companies, closed-end investment companies (companies that are required to report Acquired Fund Fees and Expenses, as defined by the SEC, including business development companies), blank check companies, special-purpose acquisition companies, and limited partnerships are also not eligible for inclusion in the Russell U.S. Indices. Exchange traded funds

Contingent Income Issuer Callable Securities due April 1, 2021

Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

and mutual funds are also excluded. Bulletin board, pink-sheets, and over-the-counter ("OTC") traded securities are not eligible for inclusion.

Annual reconstitution is a process by which the RTY is completely rebuilt. On the rank day of May, all eligible securities are ranked by their total market capitalization. The largest securities become the Russell 3000E Index, and the other of the index sponsor's indexes are determined from that set of securities. Reconstitution of the RTY occurs on the last Friday in June or, when the last Friday in June is the 29th or 30th, reconstitution occurs on the prior Friday. In addition, the index sponsor adds initial public offerings to the RTY on a quarterly basis based on total market capitalization guidelines ranking within the market-adjusted capitalization breaks established during the most recent reconstitution.

After membership is determined, a security's shares are adjusted to include only those shares available to the public. This is often referred to as "free float." The purpose of the adjustment is to exclude from market calculations the capitalization that is not available for purchase and is not part of the investable opportunity set.

License Agreement

FTSE Russell and Royal Bank of Canada have entered into a non-exclusive license agreement providing for the license to Royal Bank of Canada, and certain of its affiliates, in exchange for a fee, of the right to use indices owned and published by FTSE Russell in connection with some securities, including the securities.

FTSE Russell does not guarantee the accuracy and/or the completeness of the RTY or any data included in the RTY and has no liability for any errors, omissions, or interruptions in the RTY. FTSE Russell makes no warranty, express or implied, as to results to be obtained by the calculation agent, holders of the securities, or any other person or entity from the use of the RTY or any data included in the RTY in connection with the rights licensed under the license agreement described in this document or for any other use. FTSE Russell makes no express or implied warranties, and hereby expressly disclaims all warranties of merchantability or fitness for a particular purpose with respect to the RTY or any data included in the RTY. Without limiting any of the above information, in no event will FTSE Russell have any liability for any special, punitive, indirect or consequential damages, including lost profits, even if notified of the possibility of these damages.

The securities are not sponsored, endorsed, sold or promoted by FTSE Russell. FTSE Russell makes no representation or warranty, express or implied, to the owners of the securities or any member of the public regarding the advisability of investing in securities generally or in the securities particularly or the ability of the RTY to track general stock market performance or a segment of the same. FTSE Russell's publication of the RTY in no way suggests or implies an opinion by FTSE Russell as to the advisability of investment in any or all of the stocks upon which the RTY is based. FTSE Russell's only relationship to Royal Bank of Canada is the licensing of certain trademarks and trade names of FTSE Russell and of the RTY, which is determined, composed and calculated by FTSE Russell without regard to Royal Bank of Canada or the securities. FTSE Russell is not responsible for and has not reviewed the securities nor any associated literature or publications and FTSE Russell makes no representation or warranty express or implied as to their accuracy or completeness, or otherwise. FTSE Russell reserves the right, at any time and without notice, to alter, amend, terminate or in any way change the RTY. FTSE Russell has no obligation or liability in connection with the administration, marketing or trading of the securities.

"Russell 2000®" and "Russell 3000®" are registered trademarks of FTSE Russell in the U.S. and other countries.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
Information as of market close on March 29, 2019:

Bloomberg Index Symbol:	RTY	52 Week High (on 8/31/2018):	1,740.753
Current Index Level:	1,539.739	52 Week Low (on 12/24/2018):	1,266.925
52 Weeks Ago:	1,529.427		

The table below sets forth the published high and low closing levels of this underlying index for each quarter from January 1, 2014 through March 29, 2019. The graph below the table sets forth the daily closing levels of this underlying index for that period. We obtained the information in the table and graph below from Bloomberg Financial Markets, without independent verification. The historical performance of the underlying index should not be taken as an indication of its future performance, and no assurance can be given as to the level of the underlying index at any time.

The Russell 2000®	High	Low
2014		
First Quarter	1,208.651	1,093.594
Second Quarter	1,192.964	1,095.986
Third Quarter	1,208.150	1,101.676
Fourth Quarter	1,219.109	1,049.303
2015		
First Quarter	1,266.373	1,154.709
Second Quarter	1,295.799	1,215.417
Third Quarter	1,273.328	1,083.907
Fourth Quarter	1,204.159	1,097.552
2016		
First Quarter	1,114.028	953.715
Second Quarter	1,188.954	1,089.646
Third Quarter	1,263.438	1,139.453
Fourth Quarter	1,388.073	1,156.885
2017		
First Quarter	1,413.635	1,345.598
Second Quarter	1,425.985	1,345.244
Third Quarter	1,490.861	1,356.905
Fourth Quarter	1,548.926	1,464.095
2018		
First Quarter	1,610.706	1,463.793
Second Quarter	1,706.985	1,492.531
Third Quarter	1,740.753	1,653.132
Fourth Quarter	1,672.992	1,266.925
2019		
First Quarter (through March 29, 2019)	1,590.062	1,330.831

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
Underlying Index Daily Closing Levels
January 1, 2014 to March 29, 2019
Neither the issuer nor any of its affiliates makes any representation to you as to the performance of this underlying index.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

The EURO STOXX 50® Index

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

Composition and Maintenance

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

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

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

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

Calculation of the SX5E

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

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

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

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

License Agreement

We have entered into a non-exclusive license agreement with STOXX providing for the license to us and certain of our affiliated or subsidiary companies, in exchange for a fee, of the right to use indices owned and published by STOXX (including the EURO STOXX 50® Index) in connection with certain securities, including the securities.

The license agreement between us and STOXX requires that the following language be stated in this document: STOXX has no relationship to us, other than the licensing of the EURO STOXX 50® Index and the related trademarks for use in connection with the securities.

STOXX does not:

§ sponsor, endorse, sell, or promote the securities;
§ recommend that any person invest in the securities or any other securities;
§ have any responsibility or liability for or make any decisions about the timing, amount or pricing of the securities.
§ have any responsibility or liability for the administration, management, or marketing of the securities; or
§ consider the needs of the securities or the holders of the securities in determining, composing, or calculating the EURO STOXX 50® Index, or have any obligation to do so.

STOXX will not have any liability in connection with the securities. Specifically, STOXX does not make any warranty, express or implied, and disclaims any and all warranty concerning:

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

- the results to be obtained by the securities, the holders of the securities or any other person in connection with the use of the EURO STOXX 50® Index and the data included in the EURO STOXX 50® Index;
- the accuracy or completeness of the EURO STOXX 50® Index and its data;
- the merchantability and the fitness for a particular purpose or use of the EURO STOXX 50® Index and its data;
- STOXX will have no liability for any errors, omissions, or interruptions in the EURO STOXX 50® Index or its data; and
- under no circumstances will STOXX be liable for any lost profits or indirect, punitive, special, or consequential damages or losses, even if STOXX knows that they might occur.

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

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
Information as of market close on March 29, 2019:

Bloomberg Index Symbol:	SX5E	52 Week High (on 5/17/2018):	3,592.18
Current Index Level:	3,351.71	52 Week Low (on 12/27/2018):	2,937.36
52 Weeks Ago:	3,361.50		

The table below sets forth the published high and low closing levels of this underlying index for each quarter from January 1, 2014 through March 29, 2019. The graph below the table sets forth the daily closing levels of this underlying index for that period. We obtained the information in the table and graph below from Bloomberg Financial Markets, without independent verification. The historical performance of the underlying index should not be taken as an indication of its future performance, and no assurance can be given as to the level of the underlying index at any time.

The EURO STOXX 50® Index	High	Low
2014		
First Quarter	3,172.43	2,962.49
Second Quarter	3,314.80	3,091.52
Third Quarter	3,289.75	3,006.83
Fourth Quarter	3,277.38	2,874.65
2015		
First Quarter	3,731.35	3,007.91
Second Quarter	3,828.78	3,424.30
Third Quarter	3,686.58	3,019.34
Fourth Quarter	3,506.45	3,069.05
2016		
First Quarter	3,178.01	2,680.35
Second Quarter	3,151.69	2,697.44
Third Quarter	3,091.66	2,761.37
Fourth Quarter	3,290.52	2,954.53
2017		
First Quarter	3,500.93	3,230.68
Second Quarter	3,658.79	3,409.78
Third Quarter	3,594.85	3,388.22
Fourth Quarter	3,697.40	3,503.96
2018		
First Quarter	3,672.29	3,278.72
Second Quarter	3,592.18	3,340.35
Third Quarter	3,527.18	3,293.36
Fourth Quarter	3,414.16	2,936.36
2019		
First Quarter (through March 29, 2019)	3,409.00	2,954.66

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
Underlying Index Daily Closing Levels
January 1, 2014 to March 29, 2019
Neither the issuer nor any of its affiliates makes any representation to you as to the performance of this underlying index.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index
Additional Information About the Securities
Please read this information in conjunction with the summary terms on the front cover of this document.

Additional Provisions:

Market disruption events:

"Market disruption event" means, as to any underlying index:

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

· a suspension, absence or limitation of trading in futures or options contracts relating to the underlying index on their respective markets;

· any event that disrupts or impairs, as determined by the calculation agent, the ability of market participants to (i) effect transactions in, or obtain market values for, index components constituting 20% or more, by weight, of the underlying index, or (ii) effect transactions in, or obtain market values for, futures or options contracts relating to the underlying index on their respective markets;

· the closure on any day of the primary market for futures or options contracts relating to the underlying index or index components constituting 20% or more, by weight, of the underlying index on a scheduled trading day prior to the scheduled weekday closing time of that market (without regard to after hours or any other trading outside of the regular trading session hours) unless such earlier closing time is announced by the primary market at least one hour prior to the earlier of (i) the actual closing time for the regular trading session on such primary market on such scheduled trading day for such primary market and (ii) the submission deadline for orders to be entered into the relevant exchange system for execution at the close of trading on such scheduled trading day for such primary market;

· any scheduled trading day on which (i) the primary markets for index components constituting 20% or more, by weight, of the underlying index or (ii) the exchanges or quotation systems, if any, on which futures or options contracts on the underlying index are traded, fails to open for trading during its regular trading session; or

· any other event, if the calculation agent determines 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 securities that we or our affiliates have effected or may effect as described below under "Use of proceeds and hedging" in this document;

· in each case as determined by the calculation agent in its sole discretion; and the calculation determines in its sole discretion that the relevant event materially interferes with our ability or the ability of any of our affiliates to adjust or unwind all or a material portion of any hedge with respect to the securities,

If any scheduled trading day during an observation period is not a trading day or a market disruption event occurs with respect to any underlying index on that day, the closing level of that underlying index as of that day may be disregarded by the calculation agent in determining whether the contingent quarterly payment is payable for that period.

Postponement of final valuation date:

In the calculation of the final index level of each underlying index, the calculation agent will take into account market disruption events and non-trading days as follows:

If the scheduled final valuation date is not a trading day or if there is a market disruption event on that date, the final valuation date shall be the next succeeding trading day on which there is no market disruption event; provided that if a market disruption event has occurred on each of the five consecutive trading days immediately succeeding the scheduled final valuation date, then (i) that fifth succeeding trading day will be deemed to be the final valuation date notwithstanding the occurrence of a market disruption event on that date and (ii) with respect to any that fifth trading day on which a market disruption event occurs, the calculation agent will determine (or, if not determinable, estimate) the closing level of the applicable underlying index on that fifth trading day, regardless of the

	occurrence or continuation of a market disruption event on that day. In such an event, the calculation agent will make a good faith estimate in its sole discretion of the closing level that would have prevailed in the absence of the market disruption event. For the avoidance of doubt, if the final valuation date is postponed as to any underlying index due to a market disruption event or non-trading day, the final valuation date will not be postponed as to any underlying index that is not so effected.
Unavailability of the level of an underlying index:	If the applicable index sponsor discontinues publication of an underlying index and that sponsor or another entity publishes a successor or substitute index that the calculation agent determines, in its sole discretion, to be comparable to the discontinued underlying index (such successor or substitute index being referred to in this section as a "successor index"), then any subsequent index closing level

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

will be determined by reference to the published level of that successor index at the regular weekday close of trading on the applicable date.

Upon any selection by the calculation agent of a successor index, the calculation agent will provide written notice to the trustee of the selection, and the trustee will furnish written notice thereof, to the extent the trustee is required to under the indenture, to each holder of the securities.

If a successor index is selected by the calculation agent, that successor index will be used as a substitute for the underlying index for all purposes, including for purposes of determining whether a market disruption event exists with respect to that underlying index.

If the applicable sponsor discontinues publication of the underlying index prior to, and that discontinuance is continuing on, any date prior to maturity and the calculation agent determines, in its sole discretion, that no successor index is available at that time, then the calculation agent will determine the level of the applicable underlying index for the relevant date in accordance with the formula for and method of calculating the underlying index last in effect prior to the discontinuance, without rebalancing or substitution, using the closing level (or, if trading in the relevant underlying securities or components of the underlying index have been materially suspended or materially limited, its good faith estimate of the closing level that would have prevailed but for that suspension or limitation) at the close of the principal trading session of the relevant exchange on that date of each security or component most recently comprising the underlying index. Notwithstanding these alternative arrangements, discontinuance of the publication of any underlying index may adversely affect the value of the securities.

If at any time the method of calculating a closing level for an underlying index or a successor index is changed in a material respect, or if an underlying index is in any other way modified so that the underlying index does not, in the opinion of the calculation agent, fairly represent the level of the underlying index had those changes or modifications not been made, then, from and after that time, the calculation agent will, at the close of business in New York City on the applicable date, make such calculations and adjustments as, in the good faith judgment of the calculation agent, may be necessary in order to arrive at a level of the applicable underlying index comparable to the underlying index as if those changes or modifications had not been made. Accordingly, if the method of calculating an underlying index is modified so that the level of the underlying index is a fraction of what it would have been if it had not been modified (e.g., due to a split in the underlying index), then the calculation agent will adjust the underlying index in order to arrive at a value of the underlying index as if it had not been modified (e.g., as if such split had not occurred).

Record date: The record date for each contingent payment date shall be the date one business day prior to the scheduled contingent payment date; provided, however, that any contingent quarterly payment payable at maturity or upon redemption will be payable to the person to whom the payment at maturity or early redemption payment, as the case may be, is payable.

Postponement of maturity date: If the scheduled final valuation date is not a trading day or if a market disruption event occurs on that day so that the final valuation date is postponed and falls less than two business days prior to the scheduled maturity date, the maturity date will be postponed to the second business day following that final valuation date as postponed.

Trading day: "Trading day" means a day, as determined by the calculation agent, means a day, as determined by the calculation agent, on which trading is generally conducted on (i) the relevant exchanges for securities comprising the applicable underlying index or the successor index and (ii) the exchanges on which futures or options contracts related to the applicable underlying index or the successor index are traded, other than a day on which trading on such relevant exchange or exchange on which such futures or options contracts are traded is scheduled to close prior to its regular weekday closing time.

Alternate exchange In case an event of default with respect to the securities shall have occurred and be continuing, the amount of cash declared due and payable per security upon any acceleration of the securities (the "Acceleration Amount") shall be determined by the calculation agent and will be an amount of cash equal

calculation in the case of an event of default:	to the payment at maturity calculated as if the date of acceleration were the final valuation date; provided that the unpaid portion of the contingent quarterly payment, if any, will be calculated on a 30/360 basis. If the maturity of the securities 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 Acceleration Amount due with respect to the securities as promptly as possible and in no event later than two business days after the date of acceleration.
Listing:	The securities will not be listed on any securities exchange.
Minimum ticketing size:	$1,000 / 1 security

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

Trustee:	The Bank of New York Mellon
Calculation agent:	RBCCM. The calculation agent will make all determinations regarding the securities. Absent manifest error, all determinations of the calculation agent will be final and binding on you and us, without any liability on the part of the calculation agent. You will not be entitled to any compensation from us for any loss suffered as a result of any of the above determinations or confirmations by the calculation agent.
Additional amounts:	We will pay any amounts to be paid by us on the securities 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 securities, 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 security or of a right to receive payments in respect thereto (a "Payment Recipient"), which we refer to as an "Excluded Holder," in respect of a beneficial owner or Payment Recipient: (i) with whom we do not deal at arm's length (within the meaning of the Income Tax Act (Canada)) at the time of making such payment; (ii) who is subject to such taxes by reason of the holder being connected presently or formerly with Canada or any province or territory thereof otherwise than by reason of the holder's activity in connection with purchasing the securities, the holding of securities or the receipt of payments thereunder; (iii) who is, or who does not deal at arm's length with a person who is, a "specified shareholder" (within the meaning of subsection 18(5) of the Income Tax Act (Canada)) of Royal Bank of Canada (generally a person will be a "specified shareholder" for this purpose if that person, either alone or together with persons with whom the person does not deal at arm's length, owns 25% or more of (a) our voting shares, or (b) the fair market value of all of our issued and outstanding shares); (iv) who presents such security for payment (where presentation is required, such as if a security is issued in definitive form) more than 30 days after the relevant date; for this purpose, the "relevant date" in relation to any payments on any security means: a. the due date for payment thereof (whether at maturity or upon an earlier acceleration), or b. if the full amount of the monies payable on such date has not been received by the Trustee on or prior to such due date, the date on which the full amount of such monies has been received and notice to that effect is given to holders of the securities in accordance with the Indenture; (v) who could lawfully avoid (but has not so avoided) such withholding or deduction by complying, or requiring that any agent comply with, any statutory requirements necessary to establish qualification for an exemption from withholding or by making, or requiring that any agent make, a declaration of non-residence or other similar claim for exemption to any relevant tax authority; or (vi) who is subject to deduction or withholding on account of any tax, assessment, or other governmental charge that is imposed or withheld by reason of the application of Section 1471 through 1474 of the United States Internal Revenue Code of 1986, as amended (the "Code") (or

any successor provisions), any regulation, pronouncement, or agreement thereunder, official interpretations thereof, or any law implementing an intergovernmental approach thereto, whether currently in effect or as published and amended from time to time.

For the purposes of clause (iv) above, if a security 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 securities.

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

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

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 securities (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 securities, 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.

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.

U.S. tax considerations: The following is a general description of the material U.S. tax considerations relating to the securities. It does not purport to be a complete analysis of all tax considerations relating to the securities. Prospective purchasers of the securities 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 the U.S. of acquiring, holding and disposing of the securities and receiving payments under the securities. This summary is based upon the law as in effect on the date of this document and is subject to any change in law that may take effect after such date.

The following section supplements the discussion of U.S. federal income taxation in the accompanying prospectus and prospectus supplement. It applies only to those holders who are not excluded from the discussion of U.S. federal income taxation in the accompanying prospectus. This discussion applies only to U.S. holders and non-U.S. holders that will purchase the securities upon original issuance and will hold the securities as capital assets for U.S. federal income tax purposes. It does not apply to holders subject to special rules including holders subject to Section 451(b) of the Code. In addition, the discussion below assumes that an investor in the securities will be subject to a significant risk that it will lose a significant amount of its investment in the securities.

You should consult your tax advisor concerning the U.S. federal income tax and other tax consequences of your investment in the securities in your particular circumstances, including the application of state, local or other tax laws and the possible effects of changes in federal or other tax laws.

NO STATUTORY, JUDICIAL OR ADMINISTRATIVE AUTHORITY DIRECTLY DISCUSSES HOW THE SECURITIES 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 SECURITIES 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 SECURITIES, 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 any of the entities whose stock is included in the underlying indices would be treated as a "passive foreign investment company" within the meaning of Section 1297 of the Code, or a "U.S. real property holding corporation" within the meaning of Section 897 of the Code. If any of the entities whose stock is included in the underlying indices were so treated, certain adverse U.S. federal income tax consequences could possibly apply to U.S. and non-U.S. holders, respectively. You should refer to any available information filed with the SEC and other authorities by the entities whose stock is included in the underlying indices and consult your tax advisor regarding the possible consequences to you in this regard.

In the opinion of our counsel, Morrison & Foerster LLP, it would generally be reasonable to treat a security with terms described in this document as a callable pre-paid cash-settled contingent income-bearing derivative contract linked to the underlying indices for U.S. federal income tax purposes, and the terms of the securities 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 securities for all tax purposes in

accordance with such characterization. Although the U.S. federal income tax treatment of the contingent quarterly payment is uncertain, we intend to take the position, and the following discussion assumes, that such contingent quarterly payment (including any contingent quarterly payment paid on or with respect to the call or maturity date) constitutes taxable ordinary income to a U.S. holder at the time received or accrued in accordance with the holder's regular method of tax accounting. If the securities are so treated, a U.S. holder should generally recognize capital gain or loss upon the call, sale or maturity of the securities 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 quarterly payment, which would be taxed, as described above, as ordinary income) and the holder's tax basis in the securities. In general, a U.S. holder's tax basis in the securities will be equal to the price the holder paid for the securities. Capital gain recognized by an individual U.S. holder is generally taxed at ordinary income rates where

the property is held for one year or less. The ordinary income treatment of the contingent quarterly coupons, in conjunction with the capital loss treatment of any loss recognized upon the sale, exchange or maturity of the securities, could result in adverse tax consequences to a holder because the deductibility of capital losses is subject to limitations.

Alternative Treatments. Alternative tax treatments of the securities 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 securities, and the Internal Revenue Service might assert that the securities should be treated, as a single debt instrument. Pursuant to such characterization, the securities would generally be subject to the rules concerning short-term debt instruments as described under the heading "Tax Consequences --- United States Taxation --- Original Issue Discount --- Short-Term Debt Securities" in the accompanying prospectus.

Because of the absence of authority regarding the appropriate tax characterization of the securities, it is also possible that the Internal Revenue Service could seek to characterize the securities 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 securities 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 securities. According to the notice, the Internal Revenue Service and the U.S. Treasury Department are actively considering whether the holder of an instrument such as the securities should be required to accrue ordinary income on a current basis irrespective of any contingent quarterly payments. 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 securities will ultimately be required to accrue income currently irrespective of any contingent quarterly payments 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 very generally can 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. We intend to treat the securities for U.S. federal income tax purposes in accordance with the treatment described in this document 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 securities and proceeds from the sale or exchange of the securities 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 securities. A non-U.S. holder is a beneficial owner of a security 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 securities (including proper characterization of the contingent quarterly payments 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 quarterly payments 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 quarterly payments under U.S. federal income tax laws and whether such treaty rate or exemption applies to such payments. No assurance can be provided on the proper characterization of the contingent quarterly payments 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 quarterly payment which would be subject to the rules discussed in the previous paragraph) upon the call, sale or maturity of the securities, 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 securities. 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.

Under Section 871(m) of the Code, a "dividend equivalent" payment is treated as a dividend from sources within the United States. Such payments generally would be subject to a 30% U.S. withholding tax if paid to a non-U.S. holder. Under U.S. Treasury Department regulations, payments (including deemed payments) with respect to equity-linked instruments ("ELIs") that are "specified ELIs" may be treated as dividend equivalents if such specified ELIs reference an interest in an "underlying security," which is generally any interest in an entity taxable as a corporation for U.S. federal income tax purposes if a payment with respect to such interest could give rise to a U.S. source dividend. However, the Internal Revenue Service has issued guidance that states that the U.S. Treasury Department and the Internal Revenue Service intend to amend the effective dates of the U.S. Treasury Department regulations to provide that withholding on dividend equivalent payments will not apply to specified ELIs that are not delta-one instruments and that are issued before January 1, 2021. Based on our determination that the securities are not delta-one instruments, 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 stock or the securities (for example, upon an underlying index rebalancing), 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 stock or the securities should consult their tax advisors as to the application of the dividend equivalent withholding tax in the context of the securities and their other transactions. If any payments are treated as dividend equivalents subject to withholding, we (or the applicable withholding 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 securities 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 securities 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 securities should be subject to withholding tax. Prospective investors should consult their own tax advisors in this regard.

Foreign Account Tax Compliance Act. The Foreign Account Tax Compliance Act ("FATCA") enacted on March 18, 2010, imposes a 30% U.S. withholding tax on certain U.S. source payments of interest (and original issue discount), dividends, or other fixed or determinable annual or periodical gain, profits, and income, and on the gross proceeds from a disposition of property (including payments at maturity, or upon a redemption or sale) 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. account holders, including certain account holders that are foreign entities with U.S.

owners, with such institution or otherwise complies with FATCA. In addition, the securities may constitute a "financial account" for these purposes and thus, be subject to information reporting requirements pursuant to FATCA. The legislation 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.

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

	The U.S. Treasury Department and the Internal Revenue Service have announced that withholding on payments of gross proceeds from a sale, exchange or redemption of the securities will only apply to payments made after December 31, 2018. However, recently proposed regulations eliminate the requirement of withholding on gross proceeds from the sale or disposition of financial instruments. The U.S. Treasury Department has indicated that taxpayers may rely on these proposed regulations pending their finalization. We will not pay additional amounts with respect to any FATCA withholding. Therefore, if such withholding applies, any payments on the securities will be significantly less than what you would have otherwise received. Depending on your circumstances, these amounts withheld may be creditable or refundable to you. 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. You are urged to consult with your own tax advisors regarding the possible implications of FATCA on your investment in the securities.
Use of proceeds and hedging:	The net proceeds from the sale of the securities will be used as described under “Use of Proceeds” in the accompanying prospectus supplement and prospectus and to hedge market risks of Royal Bank of Canada associated with its obligation to make the payments on the securities. The initial public offering price of the securities includes the underwriting discount and commission and the estimated cost of hedging our obligations under the securities.
Supplemental information regarding plan of distribution; conflicts of interest:	Under the terms of a distribution agreement, RBCCM, an affiliate of Royal Bank of Canada, will purchase the securities from Royal Bank of Canada for distribution to MSWM. RBCCM will act as agent for the securities and will receive a fee of $20.00 per $1,000 stated principal amount and will pay to MSWM a fixed sales commission of $15.00 for each of the securities they sell. Of the amount per $1,000 stated principal amount received by RBCCM, RBCCM will pay MSWM a structuring fee of $5 for each security. MSWM may reclaim selling concessions allowed to individual brokers within MSWM in connection with the offering if, within 30 days of the offering, Royal Bank of Canada repurchases the securities distributed by those brokers. Delivery of the securities will be made against payment for the securities on April 3, 2019, which is the third business day following the pricing date (this settlement cycle being referred to as “T+3”). Under Rule 15c6-1 of the Exchange Act, trades in the secondary market generally are required to settle in two business days, unless the parties to any such trade expressly agree otherwise. Accordingly, purchasers who wish to trade the securities more than two business days prior to the original issue date will be required to specify alternative settlement arrangements to prevent a failed settlement. In addition, RBCCM or another of its affiliates or agents may use this document in market-making transactions after the initial sale of the securities, but is under no obligation to do so and may discontinue any market-making activities at any time without notice. The value of the securities shown on your account statement may be based on RBCCM’s estimate of the value of the securities if RBCCM or another of our affiliates were to make a market in the securities (which it is not obligated to do). That estimate will be based on the price that RBCCM may pay for the securities in light of then prevailing market conditions, our creditworthiness and transaction costs. For an initial period of approximately 12 months, the value of the securities that may be shown on your account statement is expected to be higher than RBCCM’s estimated value of the securities at that time. This is because the estimated value of the securities will not include the agent’s commission and our hedging costs and profits; however, the value of the securities shown on your account statement during that period is initially expected to be a higher amount, reflecting the addition of the agent’s commission and our estimated costs and profits from hedging the securities. This excess is expected to decrease over time until the end of this period, and we reserve the right to shorten this period. After this period, if RBCCM repurchases your securities, it expects to do so at prices that reflect its estimated value. No Prospectus (as defined in Directive 2003/71/EC (as amended, the “Prospectus Directive”)) will be prepared in connection with the securities. Accordingly, the securities may not be offered to the public

in any member state of the European Economic Area (the "EEA"), and any purchaser of the securities who subsequently sells any of the securities 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 securities 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 securities to be offered so as to enable an investor to decide to purchase or subscribe the securities, 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,

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

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 securities or otherwise making them available to retail investors in the EEA has been prepared, and therefore, offering or selling the securities or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation.

For additional information as to the relationship between us and RBCCM, please see the section "Plan of Distribution—Conflicts of Interest" in the accompanying prospectus.

Structuring the securities:

The securities are our debt securities, the return on which is linked to the performance of the underlying indices. As is the case for all of our debt securities, including our structured notes, the economic terms of the securities reflect our actual or perceived creditworthiness at the time of pricing. In addition, because structured notes result in increased operational, funding and liability management costs to us, we typically borrow the funds under these securities at a rate that is more favorable to us than the rate that we might pay for a conventional fixed or floating rate debt security of comparable maturity. Using this relatively lower implied borrowing rate, rather than the secondary market rate, along with the fees and expenses associated with structured notes, reduced the initial estimated value of the securities at the time their terms were set. Unlike the estimated value included in this pricing supplement, any value of the securities determined for purposes of a secondary market transaction may be based on a different funding rate, which may result in a lower value for the securities than if our initial internal funding rate were used.

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

The lower implied borrowing rate, the underwriting commission and the hedging-related costs relating to the securities reduced the economic terms of the securities to you and resulted in the initial estimated value for the securities on the pricing date being less than their public offering price. See "Risk Factors—The initial estimated value of the securities is less than the price to the public" above.

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 securities.

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 securities. Accordingly, among other factors, the fiduciary should consider whether the investment would satisfy the prudence and diversification requirements of ERISA and would be consistent with the documents and instruments governing the ERISA Plan.

In addition, Section 406 of ERISA and Section 4975 of the 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 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 securities should consider

whether the purchase or holding of such instruments might constitute a “prohibited transaction.” Royal Bank of Canada 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 of Canada (or its affiliate) providing services to such plans. Prohibited transactions within the meaning of ERISA or the Code may arise, for example, if securities are acquired by or with the assets of a Plan, and with respect to which Royal Bank of Canada or any of its affiliates is a ‘‘party in interest” or a “disqualified person,” unless those securities 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

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

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 securities, or exercising any rights related thereto, to represent that (a) such purchase, holding and exercise of the securities will not result in a non-exempt prohibited transaction under ERISA or the Code (or, with respect to a governmental plan, under any similar applicable law or regulation) and (b) neither Royal Bank of Canada 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 securities, or any exercise related thereto or as a result of any exercise by Royal Bank of Canada or any of its affiliates of any rights in connection with the securities, and no advice provided by Royal Bank of Canada 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 securities and the transactions contemplated with respect to the securities.

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

Contact: MSWM clients may contact their local Morgan Stanley branch office or our principal executive offices at 1585 Broadway, New York, New York 10036 (telephone number 1-(866)-477-4776). All other clients may contact their local brokerage representative. Third-party distributors may contact Morgan Stanley Structured Investment Sales at 1-(800)-233-1087.

Where you can find more information: Royal Bank of Canada has filed a registration statement (including a prospectus) with the SEC for the offering to which this communication relates. Before you invest, you should read the prospectus in that registration statement and other documents the issuer has filed with the SEC for more complete information about the issuer and this offering. You may get these documents for free by visiting EDGAR on the SEC website at.www.sec.gov. Alternatively, the issuer, any underwriter or any dealer participating in this offering will arrange to send you the prospectus if you request it by calling toll-free 1-877-688-2301.

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

This document, together with the documents listed below, contains the terms of the securities and supersedes all prior or contemporaneous oral statements as well as any other written materials including preliminary or indicative pricing terms, correspondence, trade ideas, structures for implementation, sample structures, brochures or other educational materials of ours. You should carefully consider, among other things, the matters set forth in "Risk Factors" in the prospectus supplement dated September 7, 2018 and in this document, as the securities involve risks not associated with conventional debt securities. We urge you to consult your investment, legal, tax, accounting and other advisors before you invest in the securities.

You may access these documents on the SEC website at www.sec.gov as follows (or if such address has changed, by reviewing our filings for the relevant date on the SEC website):

Prospectus dated September 7, 2018:
https://www.sec.gov/Archives/edgar/data/1000275/000121465918005973/l96181424b3.htm

Prospectus Supplement dated September 7, 2018:
https://www.sec.gov/Archives/edgar/data/1000275/000121465918005975/f97180424b3.htm

Our Central Index Key, or CIK, on the SEC website is 1000275.

	Please see the section "Documents Incorporated by Reference" on page i of the above prospectus for a description of our filings with the SEC that are incorporated by reference therein.
Validity of the securities:	In the opinion of Norton Rose Fulbright Canada LLP, the issue and sale of the securities has been duly authorized by all necessary corporate action of the Bank in conformity with the Indenture, and when the securities have been duly executed, authenticated and issued in accordance with the Indenture and delivered against payment therefor, the securities will be validly issued and, to the extent validity of the securities is a matter governed by the laws of the Province of Ontario or Québec, or the laws of Canada applicable therein, and will be valid obligations of the Bank, subject to equitable remedies

Contingent Income Issuer Callable Securities due April 1, 2021
Based on the Worst Performing of S&P 500® Index, the Russell 2000® Index and the EURO STOXX 50® Index

which may only be granted at the discretion of a court of competent authority, subject to applicable bankruptcy, to rights to indemnity and contribution under the securities or the Indenture which may be limited by applicable law; to insolvency and other laws of general application affecting creditors' rights, to limitations under applicable limitations statutes, and limitations as to the currency in which judgments in Canada may be rendered, as prescribed by the Currency Act (Canada). This opinion is given as of the date hereof and is limited to the laws of the Provinces of Ontario and Québec and the federal laws of Canada applicable thereto. In addition, this opinion is subject to customary assumptions about the Trustee's authorization, execution and delivery of the Indenture and the genuineness of signatures and certain factual matters, all as stated in the letter of such counsel dated September 7, 2018, which has been filed as Exhibit 5.1 to Royal Bank's Form 6-K filed with the SEC dated September 7, 2018.

In the opinion of Morrison & Foerster LLP, when the securities have been duly completed in accordance with the Indenture and issued and sold as contemplated by the prospectus supplement and the prospectus, the securities will be valid, binding and enforceable obligations of Royal Bank, entitled to the benefits of the Indenture, subject to applicable bankruptcy, insolvency and similar laws affecting creditors' rights generally, concepts of reasonableness and equitable principles of general applicability (including, without limitation, concepts of good faith, fair dealing and the lack of bad faith). This opinion is given as of the date hereof and is limited to the laws of the State of New York. This opinion is subject to customary assumptions about the Trustee's authorization, execution and delivery of the Indenture and the genuineness of signatures and to such counsel's reliance on the Bank and other sources as to certain factual matters, all as stated in the legal opinion dated September 7, 2018, which has been filed as Exhibit 5.2 to the Bank's Form 6-K dated September 7, 2018.

Terms incorporated in the master note:	All of the terms in "Final Terms" (except the item captioned "Commissions and issue price") and the terms above the item captioned "Use of proceeds and hedging" in "Additional Information About the Securities" of this pricing supplement, and the definition of "business day" on page S-27 of the prospectus supplement.