ROYAL BANK OF CANADA
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PRICING SUPPLEMENT
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Dated December 24, 2018
Royal Bank of Canada Trigger Callable Contingent Yield Notes (Daily Coupon Observation)
$7,850,000 Notes Linked to the Least Performing Underlying of the S&P 500® Index, the EURO STOXX 50® Index and the Russell 2000® Index due on June 24, 2021
Investment Description
Trigger Callable Contingent Yield Notes (the "Notes") are unsecured and unsubordinated debt securities issued by Royal Bank of Canada linked to the performance of the least performing underlying of the S&P 500® Index, the EURO STOXX 50® Index, and the Russell 2000® Index (each an "underlying index" and together the "underlying indices"). If the closing level of each underlying index is equal to or greater than its coupon barrier on each trading day during a Quarterly Observation Period, we will make a contingent coupon payment with respect to that period. If the closing level of any underlying index is less than its coupon barrier on any trading day during a Quarterly Observation Period, no contingent coupon payment will be made. We may, at our election, call the Notes early on any Quarterly Observation End Date (other than the final valuation date) regardless of the closing level of any of the underlying indices on that day. If we elect to call the Notes prior to maturity, we will pay the principal amount plus any contingent coupon for the Quarterly Observation Period ending on the applicable Quarterly Observation End Date, and no further amounts will be owed to you. If we do not elect to call the Notes prior to maturity and the ending levels of each of the underlying indices are equal to or greater than their respective trigger level (which is the same level as their coupon barrier), we will make a cash payment at maturity equal to the principal amount of your Notes, in addition to any contingent coupon for the final Quarterly Observation Period. If we do not elect to call the Notes prior to maturity and the closing level of any of the underlying indices is less than its trigger level, we will pay you less than the full principal amount, if anything, at maturity, resulting in a loss of your principal amount that is proportionate to the decline in the closing level of the underlying index with the largest percentage decrease between its initial level and final level (the "least performing underlying index"). The Notes are not subject to conversion into our common shares under subsection 39.2(2.3) of the Canada Deposit Insurance Corporation Act.
Investing in the Notes involves significant risks. You may lose some or all of your principal amount at maturity. You may receive few or no quarterly contingent coupons during the term of the Notes. You will be exposed to the market risk of each underlying index on each trading day of the Quarterly Observation Periods and on the final valuation date and any decline in the level of one underlying index may negatively affect your return and will not be offset or mitigated by a lesser decline or any potential increase in the level of the other underlying indices. Generally, a higher contingent coupon rate is associated with a greater risk of loss. The contingent repayment of principal applies only if you hold the Notes to maturity. Any payment on the Notes, including any repayment of principal, is subject to our creditworthiness. If we were to default on our payment obligations, you may not receive any amounts owed to you under the Notes and you could lose your entire investment. The Notes will not be listed on any securities exchange.
Features Key Dates

q Contingent Coupon — If the closing level of each underlying index is equal to or greater than its coupon barrier on each trading day during a Quarterly Observation Period, we will make a contingent coupon payment with respect to that period. We will not pay you the contingent coupon for any Quarterly Observation Period in which the closing level of any underlying index on any day during that period is less than its coupon barrier.

q Issuer Callable — We may, at our election, call the Notes on any Quarterly Observation End Date (other than the final valuation date), regardless of the closing level of any underlying index on that Quarterly Observation End Date, and pay you the principal amount plus any contingent coupon otherwise due for the Quarterly Observation Period ending on that Quarterly Observation End Date. If the Notes are called, no further payments will be made after the Call Settlement Date.

q Contingent Repayment of Principal at Maturity— If by maturity the Notes have not been called and each underlying index closes at or above its trigger level on the final valuation date, we will pay you the principal amount per Note at maturity, in addition to any contingent coupon with respect to the final Quarterly Observation Period. If any underlying index closes below its trigger level on the final valuation date, we will repay less than the principal amount, if anything, at maturity, resulting in a loss on your principal amount that is proportionate to the decline in the closing level of the least performing underlying index from its initial level to its final level. The contingent repayment of principal applies only if you hold the Notes until maturity. Any payment on the Notes, including any repayment of principal, is subject to our creditworthiness.

Trade Date	December 24, 2018
Settlement Date	December 28, 2018
Observation Periods	Quarterly (see page 5)
Final Valuation Date[1]	June 21, 2021
Maturity Date	June 24, 2021

[1] Subject to postponement if a market disruption event occurs as described under “General Terms of the Notes — Payment at Maturity” below.

NOTICE TO INVESTORS: THE NOTES ARE SIGNIFICANTLY RISKIER THAN CONVENTIONAL DEBT INSTRUMENTS. WE ARE NOT NECESSARILY OBLIGATED TO REPAY THE FULL PRINCIPAL AMOUNT OF THE NOTES AT MATURITY, AND THE NOTES CAN HAVE DOWNSIDE MARKET RISK SIMILAR TO THE LEAST PERFORMING UNDERLYING INDEX. YOU MAY BE EXPOSED TO THE MARKET RISK OF EACH UNDERLYING INDEX ON THE FINAL VALUATION DATE, AND ANY DECLINE IN THE LEVEL OF ANY UNDERLYING INDEX MAY NEGATIVELY AFFECT YOUR RETURN AND WILL NOT BE OFFSET OR MITIGATED BY A LESSER DECLINE OR ANY POTENTIAL INCREASE IN THE LEVEL OF THE OTHER UNDERLYING INDICES.THIS MARKET RISK IS IN ADDITION TO THE CREDIT RISK INHERENT IN PURCHASING A DEBT OBLIGATION OF ROYAL BANK OF CANADA. YOU SHOULD NOT PURCHASE THE NOTES IF YOU DO NOT UNDERSTAND OR ARE NOT COMFORTABLE WITH THE SIGNIFICANT RISKS INVOLVED IN INVESTING IN THE NOTES.

YOU SHOULD CAREFULLY CONSIDER THE RISKS DESCRIBED UNDER ‘‘KEY RISKS’’ BEGINNING ON PAGE 6 OF THIS PRICING SUPPLEMENT AND UNDER ‘‘RISK FACTORS’’ BEGINNING ON PAGE S-1 OF THE PROSPECTUS SUPPLEMENT BEFORE PURCHASING ANY NOTES. EVENTS RELATING TO ANY OF THOSE RISKS, OR OTHER RISKS AND UNCERTAINTIES, COULD ADVERSELY AFFECT THE MARKET VALUE OF, AND THE RETURN ON, YOUR NOTES. YOU MAY LOSE SOME OR ALL OF THE PRINCIPAL AMOUNT OF THE NOTES.

Note Offering

This pricing supplement relates to Trigger Callable Contingent Yield Notes we are offering. The Notes are linked to the least performing underlying between the S&P 500® Index, the EURO STOXX 50® Index and the Russell 2000® Index. The Initial Levels, Trigger Levels and Coupon Barriers were determined on December 21, 2018. The Notes are offered at a minimum investment of 100 Notes at $10.00 per Note (representing a $1,000 investment), and integral multiples of $10.00 in excess thereof.

Underlying Indices	Tickers	Contingent Coupon Rate	Initial Levels	Trigger Levels*	Coupon Barriers*	CUSIP	ISIN
S&P 500® Index (SPX)	SPX		2,416.62	1,812.47, which is 75% of the initial level	1,812.47, which is 75% of the initial level		
EURO STOXX 50® Index (SX5E)	SX5E	19.10% per annum	3,000.61	2,250.46, which is 75% of the initial level	2,250.46, which is 75% of the initial level	78014H144	US78014H1445
Russell 2000® Index (RTY)	RTY		1,292.086	969.065, which is 75% of the initial level	969.065, which is 75% of the initial level		

*Rounded to two decimal places with respect to the SPX and the SX5E, and three decimal places with respect to RTY.

See "Additional Information About Royal Bank of Canada and the Notes" in this pricing supplement. The Notes will have the terms specified in the prospectus dated September 7, 2018, the prospectus supplement dated September 7, 2018 and this pricing supplement.

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

	Price to Public		Fees and Commissions[1]		Proceeds to Us	
Offering of the Notes	Total	Per Note	Total	Per Note	Total	Per Note
Notes linked to the Least Performing Underlying of the S&P 500® Index, the EURO STOXX 50® Index and the Russell 2000® Index	$7,850,000	$10.00	$78,500	$0.10	$7,771,500	$9.90

[1] UBS Financial Services Inc., which we refer to as UBS, will receive a commission of $0.10 per $10 principal amount of the Notes. See "Supplemental Plan of Distribution (Conflicts of Interest)" below.

The initial estimated value of the Notes as of the date of this document is $9.6361 per $10 in principal amount, which is less than the price to public. The actual value of the Notes at any time will reflect many factors, cannot be predicted with accuracy, and may be less than this amount. We describe our determination of the initial estimated value under "Key Risks," "Supplemental Plan of Distribution (Conflicts of Interest)" and "Structuring the Notes" below.

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

UBS Financial Services Inc. RBC Capital Markets, LLC

Additional Information About Royal Bank of Canada and the Notes

You should read this pricing supplement together with the prospectus dated September 7, 2018, as supplemented by the prospectus supplement dated September 7, 2018, relating to our Series H medium-term notes of which these Notes are a part. This pricing supplement, together with the documents listed below, contains the terms of the Notes and supersedes all other 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, fact sheets, brochures or other educational materials of ours. You should carefully consider, among other things, the matters set forth in “Key Risks” below, as the Notes involve risks not associated with conventional debt securities.

If the terms of the prospectus and prospectus supplement are inconsistent with the terms discussed herein, the terms discussed in this pricing supplement will control.

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

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

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

As used in this pricing supplement, “we,” “us” or “our” refers to Royal Bank of Canada.

Investor Suitability

The Notes may be suitable for you if, among other considerations:

- You fully understand the risks inherent in an investment in the Notes, including the risk of loss of your entire initial investment.
- You can tolerate a loss of all or a substantial portion of your investment and are willing to make an investment that may have the same downside market risk as the least performing underlying index.
- You accept that you may not receive a contingent coupon payment on some or all of the coupon payment dates.
- You are willing to make an investment whose return is limited to the applicable contingent coupon payments, regardless of any potential appreciation of the underlying indices, which could be significant.
- You do not seek guaranteed current income from this investment and are willing to forgo the dividends paid on the equity securities composing the underlying indices.
- You can tolerate fluctuations in the price of the Notes prior to maturity that may be similar to or exceed the downside fluctuations of the underlying indices.
- You are willing to invest in Notes for which there may be little or no secondary market and you accept that the secondary market will depend in large part on the price, if any, at which RBC Capital Markets, LLC, which we refer to as "RBCCM," is willing to purchase the Notes.
- You are willing to invest in the Notes based on the Contingent Coupon Rate, Coupon Barriers and Trigger Levels specified on the cover page of this pricing supplement.
- You are willing to accept individual exposure to each underlying index on each trading day of the Quarterly Observation Periods and on the final valuation date and understand that the performance of the least performing underlying index will not be offset or mitigated by the performance of the other underlying indices.
- You understand and accept the risks associated with the underlying indices.
- You are willing to invest in notes that may be called early at our election and you are otherwise willing to hold such securities to maturity.
- You are willing to assume our credit risk for all payments under the Notes, and understand that if we default on our obligations, you may not receive any amounts due to you, including any repayment of principal.

The Notes may not be suitable for you if, among other considerations:

- You do not fully understand the risks inherent in an investment in the Notes, including the risk of loss of your entire initial investment.
- You cannot tolerate a loss on your investment and require an investment designed to provide a full return of principal at maturity.
- You do not accept that you may not receive a contingent coupon payment on some or all of the coupon payment dates.
- You are not willing to make an investment that may have the same downside market risk as the least performing underlying index.
- You believe that the levels of any underlying index will decline during the term of the Notes and is likely to close below its coupon barrier during the Quarterly Coupon Observation Periods and below its trigger level on the final valuation date.
- You seek an investment that participates in the full appreciation in the levels of the underlying indices or that has unlimited return potential.
- You cannot tolerate fluctuations in the price of the Notes prior to maturity that may be similar to or exceed the downside fluctuations of the least performing underlying index.
- You are unwilling to invest in the Notes based on the Contingent Coupon Rate, Coupon Barriers and Trigger Levels specified on the cover page of this pricing supplement.
- You are unwilling to accept individual exposure to each underlying index on each trading day of the Quarterly Observation Periods and on the final valuation date or do not understand that the performance of the least performing underlying index will not be offset or mitigated by the performance of the other underlying indices.
- You seek guaranteed current income from this investment or prefer to receive the dividends paid on the securities composing the underlying indices.
- You do not understand or accept the risks associated with the underlying indices.

You are unable or unwilling to hold notes that may be called early at our election, or you are otherwise unable or unwilling to hold such securities to maturity, or you seek an investment for which there will be an active secondary market for the Notes.

¨ You are not willing to assume our credit risk for all payments under the Notes, including any repayment of principal.

The suitability considerations identified above are not exhaustive. Whether or not the Notes are a suitable investment for you will depend on your individual circumstances, and you should reach an investment decision only after you and your investment, legal, tax, accounting, and other advisers have carefully considered the suitability of an investment in the Notes in light of your particular circumstances. You should also review carefully the "Key Risks" beginning on page 6 of this pricing supplement for risks related to an investment in the Notes. In addition, you should review carefully the section below, "Information About the Underlying Indices," for more information about these indices.

Final Terms of the Notes[1]

Issuer:	Royal Bank of Canada
Principal Amount per Note:	$10.00 per Note (subject to a minimum purchase of 100 Notes of $1,000)
Term:	Approximately 2.5 years, unless earlier called at our election.
Underlying Indices:	The S&P 500® Index ("SPX"), the EURO STOXX 50® Index ("SX5E") and the Russell 2000® Index
Issuer Call Feature:	We may elect to call the Notes on any Quarterly Observation End Date (other than the final valuation date), regardless of the closing level of any underlying index on that date. If the Notes are called, we will pay you on the applicable Call Settlement Date a cash payment per Note equal to the principal amount plus any contingent coupon otherwise due on that date, and no further payments will be made on the Notes. Before we elect to call the Notes on a Quarterly Observation End Date, we will deliver written notice to The Depository Trust Company ("DTC") on or before that date.
Contingent Coupon:	If the closing levels of each of the underlying indices are equal to or greater than their respective coupon barriers on each trading day during a Quarterly Observation Period, we will pay you the contingent coupon for that period on the relevant coupon payment date. If the closing level of any of the underlying indices is less than its coupon barrier on any trading day during a Quarterly Observation Period, the contingent coupon for that period will not accrue or be payable, and we will not make any payment to you on the relevant coupon payment date. Each contingent coupon will be a fixed amount based on equal quarterly installments at the contingent coupon rate.

Contingent coupon payments on the Notes are not guaranteed. We will not pay you the contingent coupon for any Quarterly Observation Period in which the closing level of any underlying index on any trading day during that period is less than its coupon barrier.

Quarterly Observation Period:	With respect to each coupon payment date, the period from but excluding the second immediately preceding Quarterly Observation End Date (or, in the case of the first coupon payment date, from but excluding the trade date) to and including the immediately preceding Quarterly Observation End Date.
Contingent Coupon Rate:	19.10% per annum
Coupon Payment Dates:	Two business days following each Quarterly Observation End Date (as set forth on page 5), except that the coupon payment date for the final Quarterly Observation Period is the maturity date.
Call Settlement Dates:	The first coupon payment date following the applicable Quarterly Observation End Date (other than the maturity date).
Payment at Maturity:	If we do not elect to call the Notes and the closing levels of each of the underlying indices are equal to or greater than their respective trigger levels on the final valuation date, we will pay you a cash payment per Note on the maturity date equal to $10.00 plus any contingent coupon otherwise due on the maturity date. If we do not elect to call the Notes and the final level of the least performing underlying index is less than its trigger level, we will pay you a cash payment on the maturity date of less than the principal amount, if anything, resulting in a loss on your initial investment that is proportionate to the negative underlying return of the least performing underlying index, equal to: $10.00 × (1 + underlying return of the least performing underlying index) per Note

Least Performing Underlying Index:	The underlying index with the largest percentage decrease between its initial level and its final level.
Underlying Return:	$\frac{\text{Final Level} - \text{Initial Level}}{\text{Initial Level}}$
Trigger Levels:	With respect to each underlying index, 75% of its initial level, as set forth on the cover page. The trigger level equals the coupon barrier.
Coupon Barriers:	With respect to each underlying index, 75% of its initial level, as set forth on the cover page. The coupon barrier equals the trigger level.
Initial Levels:	With respect to each underlying index, its closing level on December 21, 2018, as set forth on the cover page.

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[1] Terms used in this pricing supplement, but not defined herein, shall have the meanings ascribed to them in the prospectus or the prospectus supplement.

Final Levels:	The closing level of each underlying index on the final valuation date, as determined by the calculation agent.

Investment Timeline

December 21, 2018	The initial level, trigger level and coupon barrier of each underlying index were determined.
Quarterly (callable at our election):	If the closing levels of each of the underlying indices are equal to or greater than their respective coupon barriers on each trading day during a Quarterly Observation Period, we will pay you a contingent coupon payment on the applicable coupon payment date. We may, at our election and upon written notice to DTC, call the Notes on any Quarterly Observation End Date (other than the final valuation date), regardless of the closing level of any underlying index on that Quarterly Observation End Date. If we elect to call the Notes, we will pay you a cash payment per Note equal to the principal amount plus any contingent coupon otherwise due for the applicable Quarterly Observation Period, and no further payments will be made on the Notes.
Maturity Date:	The final level of each underlying index is observed on the final valuation date. If we do not elect to call the Notes, and the final levels of each of the underlying indices are equal to or greater than their respective trigger levels (and their respective coupon barriers), we will repay the principal amount equal to $10.00 per Note plus any contingent coupon otherwise due on the maturity date. If we do not elect to call the Notes and the ending level of the least performing underlying index is less than its trigger level, we will repay less than the principal amount, if anything, resulting in a loss on your initial investment proportionate to the decline of the least performing underlying index, for an amount equal to: $10.00 × (1 + underlying return of the least performing underlying index) per Note

INVESTING IN THE NOTES INVOLVES SIGNIFICANT RISKS. YOU MAY LOSE SOME OR ALL OF YOUR PRINCIPAL AMOUNT. YOU WILL BE EXPOSED TO THE MARKET RISK OF EACH UNDERLYING INDEX

ON EACH TRADING DAY OF THE QUARTERLY OBSERVATION PERIODS AND ON THE FINAL VALUATION DATE AND ANY DECLINE IN THE LEVEL OF ONE UNDERLYING INDEX MAY NEGATIVELY AFFECT YOUR RETURN AND WILL NOT BE OFFSET OR MITIGATED BY A LESSER DECLINE OR ANY POTENTIAL INCREASE IN THE LEVEL OF THE OTHER UNDERLYING INDICES. ANY PAYMENT ON THE NOTES, INCLUDING ANY REPAYMENT OF PRINCIPAL, IS SUBJECT TO OUR CREDITWORTHINESS. IF WE WERE TO DEFAULT ON OUR PAYMENT OBLIGATIONS, YOU MAY NOT RECEIVE ANY AMOUNTS OWED TO YOU UNDER THE NOTES AND YOU COULD LOSE YOUR ENTIRE INVESTMENT.

Quarterly Observation Periods, Quarterly Observation End Dates and Coupon Payment Dates

Quarterly Observation Periods Ending on the Following Quarterly Observation End Dates	Coupon Payment Dates / Call Settlement Dates (if called)
March 21, 2019	March 25, 2019
June 21, 2019	June 25, 2019
September 23, 2019	September 25, 2019
December 23, 2019	December 27, 2019
March 23, 2020	March 25, 2020
June 22, 2020	June 24, 2020
September 21, 2020	September 23, 2020
December 21, 2020	December 23, 2020
March 22, 2021	March 24, 2021
June 21, 2021 (the Final Valuation Date)	June 24, 2021* (the Maturity Date)

* The Notes are not callable on the final valuation date. Thus, the Maturity Date is not a Call Settlement Date. Each of the Quarterly Observation End Dates, and therefore the coupon payment dates, is subject to the market disruption event provisions set forth below under "General Terms of the Notes – Market Disruption Events."

Key Risks

An investment in the Notes is subject to the risks described below, as well as the risks described under "Risk Factors" in the prospectus and the prospectus supplement. The return on the Notes is linked to the performance of the underlying indices. The Notes do not guarantee any return of principal at, or prior to, maturity. Investing in the Notes is not equivalent to investing directly in the securities composing the underlying indices. In addition, your investment in the Notes entails other risks not associated with an investment in conventional debt securities. You should consider carefully the following discussion of risks before you decide that an investment in the Notes is suitable for you.

Risks Relating to the Notes Generally

- Your investment in the Notes may result in a loss. The Notes do not guarantee any return of principal. The amount payable to you at maturity, if any, will be determined as described in this pricing supplement. If we do not elect to call the Notes and the closing level of any underlying index has declined below its trigger level on the final valuation date, you will be fully exposed to any depreciation of the least performing underlying index from its initial level to its final level. In this case, we will repay less than the full principal amount at maturity, resulting in a loss of principal that is proportionate to the negative return of the least performing underlying index. Under these circumstances, you will lose 1% (or a fraction thereof) of the principal amount for every 1% (or a fraction thereof) decrease in the level of the least performing underlying index below its initial level. Accordingly, you may lose the entire principal amount of your Notes.
- The Notes are subject to our credit risk. The Notes are subject to our credit risk, and our credit ratings and credit spreads may adversely affect the market value of the Notes. Investors are dependent on our ability to pay all amounts due on the Notes, and therefore investors are subject to our credit risk and to changes in the market's view of our creditworthiness. Any decline in our credit ratings or increase in the credit spreads charged by the market for taking our credit risk is likely to adversely affect the value of the Notes. If we were to default on our payment obligations, you may not receive any amounts owed to you under the Notes and you could lose your entire investment.
- The Notes Will Be Subject to Risks, Including Non-Payment in Full, Under Canadian Bank Resolution Powers: Under Canadian bank resolution powers, the Canada Deposit Insurance Corporation ("CDIC") may, in circumstances where we have ceased, or are about to cease, to be viable, assume temporary control or ownership over us and may be granted broad powers by one or more orders of the Governor in Council (Canada), including the power to sell or dispose of all or a part of our assets, and the power to carry out or cause us to carry out a transaction or a series of transactions the purpose of which is to restructure our business of the Bank. As See "Description of Debt Securities - Canadian Bank Resolution Powers" in the accompanying prospectus for a description of the Canadian bank resolution powers, including the bail-in regime. If the CDIC were to take action under the Canadian bank resolution powers with respect to us, this could result in holders of the Notes being exposed to losses.
- You may not receive any contingent coupons with respect to your Notes. Royal Bank of Canada will not necessarily make periodic coupon payments on the Notes. If the closing level of any underlying index on any trading day during a Quarterly Observation Period is less than its coupon barrier, we will not pay you the contingent coupon applicable to that period. This will be the case even if the closing level of each other underlying index is greater than or equal to its respective coupon barrier on each trading day during that Quarterly Observation Period, and even if the closing level of that underlying index was higher than its coupon barrier on every other trading day during the Quarterly Observation Period. If the closing level of any underlying index is less than its coupon barrier on any trading day during each Quarterly Observation Period, we will not pay you the applicable contingent coupon during the term of, and you will not receive a positive return on, your Notes. Generally, this non-payment of the contingent coupon will coincide with a greater risk of principal loss on your Notes.
- The return on the Notes is limited to the sum of any contingent coupons and you will not participate in any appreciation of any underlying index. The return potential of the Notes is limited to the pre-specified contingent coupon rate, regardless of the appreciation of any underlying index, which may be significant. In addition, the total return on the Notes will vary based on the number of Quarterly Observation Periods for which the contingent coupon is payable prior to maturity, or if we elect to call the Notes. Further, if we elect to call the Notes, you will not receive any contingent coupons or any other payments in respect of any Quarterly Observation Periods after the Call Settlement Date. If we do not elect to call the Notes, you may be subject to the risk of decline in the level of each underlying index, even though you are not able to participate in any potential appreciation of any underlying index. As a result, the return on an investment in the Notes could be less than the return on a hypothetical direct investment

in the securities represented by any underlying index. In addition, if we do not elect to call the Notes and the final level of any underlying index is below its trigger level, you will lose some or all of your principal amount and the overall return on the Notes would be less than the amounts that would be paid on a conventional debt security of ours of comparable maturity.

- If you sell the Notes prior to maturity, you may receive less than the principal amount. If we do not elect to call the Notes, you should be willing to hold the Notes until maturity. If you are able to sell the Notes in the secondary market prior to maturity, you may have to sell them for a loss relative to the principal amount, even if the levels of the underlying indices are above their respective trigger levels. In addition, you will not receive the benefit of any contingent repayment of principal associated with the trigger levels if you sell the Notes before the maturity date. The potential returns described in this document assume that the Notes, which are not designed to be short-term trading instruments, are held to maturity.

- The Notes may be called early and are subject to reinvestment risk. We may, in our sole discretion, elect to call the Notes on any Quarterly Observation End Date (other than the final valuation date), regardless of the closing level of any underlying index on that Quarterly Observation End Date. If we elect to call your Notes early, you will no longer have the opportunity to receive any contingent coupons after the applicable Call Settlement Date. The first Quarterly Observation End Date, which is the first potential date on which we may elect to call the Notes, occurs approximately three months after the trade date, and therefore you may not have the opportunity to receive any contingent coupons after approximately three months. In the event we elect to call the Notes, there is no guarantee that you would be able to reinvest the proceeds at a comparable rate of return for a similar level of risk. To the extent you are able to reinvest such proceeds at an investment comparable to the Notes; you may incur transaction costs such as dealer discounts and hedging costs built into the price of the new securities.

It is more likely that we will elect to call the Notes prior to maturity when the expected interest payable on the Notes is greater than the interest that would be payable on other instruments issued by us of comparable maturity, terms and credit rating trading in the market. We are less likely to call the Notes prior to maturity when the expected interest payable on the Notes is less than the interest that would be payable on other comparable instruments issued by us, which includes when the level of any of the underlying indices is less than its respective coupon barrier. Therefore, the Notes are more likely to remain outstanding when the expected interest payable on the Notes is less than what would be payable on other comparable instruments and when your risk of not receiving a contingent coupon is relatively higher.

¨ The contingent coupon rate will reflect in part the volatility of the underlying indices and may not be sufficient to compensate you for the risk of loss at maturity. "Volatility" refers to the frequency and magnitude of changes in the levels of the underlying indices. The greater the volatility of the underlying indices, the more likely it is that the level of any underlying index could close below its coupon barrier on any trading day during a Quarterly Observation Period or below its trigger level on the final valuation date. This risk will generally be reflected in a higher contingent coupon rate for the Notes than the interest rate payable on our conventional debt securities with a comparable term. In addition, lower correlation between the underlying indices can also indicate a greater likelihood of one underlying index closing below its coupon barrier or trigger level on any trading day during a Quarterly Observation Period or the final valuation date, respectively. This greater risk will also be reflected in a higher contingent coupon rate than on a security linked to underlying indices with a greater degree of correlation. However, while the contingent coupon will be a fixed amount, the underlying indices' volatility and correlation can change significantly over the term of the Notes. The levels of one or any of the underlying indices could fall sharply as of any trading day during a Quarterly Observation Period or the final valuation date, which could result in missed contingent coupon payments and a significant loss of your principal amount.

¨ Your return on the Notes may be lower than the return on a conventional debt security of comparable maturity. The return that you will receive on the Notes, which could be negative, may be less than the return you could earn on other investments. 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.

¨ The initial estimated value of the Notes is less than the price to the public. The initial estimated value that is set forth on the cover page of this document, which is less than the public offering price you pay for the Notes, does not represent a minimum price at which we, RBCCM or any of our other affiliates would be willing to purchase the Notes in any secondary market (if any exists) at any time. If you attempt to sell the Notes prior to maturity, their market value may be lower than the price you paid for them and the initial estimated value. This is due to, among other things, changes in the 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 underwriting discount, and our estimated profit and the costs relating to our hedging of the Notes. These factors, together with various credit, market and economic factors over the term of the Notes, are expected to reduce the price at which you may be able to sell the Notes in any secondary market and will affect the value of the Notes in complex and unpredictable ways. Assuming no change in market conditions or any other relevant factors, the price, if any, at which you may be able to sell your Notes prior to maturity may be less than the price to public, as any such sale price would not be expected to include the underwriting discount and our estimated profit and the costs relating to our hedging of the Notes. In addition, any price at which you may sell the Notes is likely to reflect customary bid-ask spreads for similar trades. In addition to bid-ask spreads, the value of the Notes determined for any secondary market price is expected to be based on a secondary market rate rather than the internal borrowing rate used to price the Notes and determine the initial estimated value. As a result, the secondary price will be less than if the internal borrowing rate was used. The Notes are not designed to be short-term trading instruments. Accordingly, you should be able and willing to hold your Notes to maturity.

¨ Our initial estimated value of the Notes is an estimate only, calculated as of the time the terms of the Notes are set. The initial estimated value of the Notes is based on the value of our obligation to make the payments on the Notes, together with the mid-market value of the derivative embedded in the terms of the Notes. See "Structuring the Notes" below. Our estimate is based on a variety of assumptions, including our credit spreads, expectations as to dividends, interest rates and volatility, and the expected term of the Notes. These assumptions are based on certain forecasts about future events, which may prove to be incorrect. Other entities may value the Notes or similar securities at a price that is significantly different than we do.

The value of the Notes at any time after the trade date will vary based on many factors, including changes in market conditions, and cannot be predicted with accuracy. As a result, the actual value you would receive if you sold the

Notes in any secondary market, if any, should be expected to differ materially from the initial estimated value of your Notes and the amounts that may be paid on the Notes.

¨ Your return on the Notes will not reflect dividends on the equity securities composing the underlying indices. The return on the Notes will not reflect the return you would realize if you actually owned the equity securities composing the underlying indices and received the dividends paid on those equity securities. The final levels of each of the underlying indices and the determination of the amount to be paid at maturity or whether the contingent coupon is payable will not take into consideration the value of those dividends.

¨ If the levels of the underlying indices change, the market value of the Notes may not change in the same manner. Owning the Notes is not the same as owning the securities composing the underlying indices. Accordingly, changes in the levels of the underlying indices may not result in a comparable change of the market value of the Notes. If the levels of the underlying indices on any trading day increase above their respective initial levels or coupon barriers, the value of the Notes may not increase in a comparable manner, if at all. It is possible for the levels of the underlying indices to increase while the value of the Notes declines.

¨ The determination of the payment at maturity on the Notes does not take into account all developments in the levels of the underlying indices. Changes in the levels of the underlying indices prior to the final valuation date will not be reflected in the calculation of the amount payable, if any, at maturity. The calculation agent will calculate the payment at maturity by comparing only the closing level of the least performing underlying index on the final valuation date relative to its initial level. No other levels will be taken into account. As a result, you may lose some or all of your principal amount even if the level of the least performing underlying index has risen at certain times during the term of the Notes before falling to a level below its trigger level on the final valuation date.

¨ The Notes are not designed to be short-term trading instruments. The price at which you will be able to sell the Notes to us or our affiliates prior to maturity, if at all, may be at a substantial discount from the principal amount of the Notes, even in cases where the closing levels of the underlying indices have appreciated since the date on which the Initial Levels were determined. In addition, you will not receive the benefit of any contingent repayment of principal associated with the trigger levels if you sell the Notes before the maturity date. The potential returns described in this document assume that the Notes, which are not designed to be short-term trading instruments, are held to maturity.

- You must rely on your own evaluation of the merits of an investment linked to the underlying indices. In the ordinary course of their business, our affiliates, or UBS or its affiliates, may have expressed views on expected movements in each of the underlying indices or the securities included in the underlying indices, and may do so in the future. These views or reports may be communicated to our respective clients and clients of our respective affiliates. However, these views are subject to change from time to time. Moreover, other professionals who transact business in markets relating to any underlying index, may at any time have significantly different views from those of ours, and those of UBS and its 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 us, UBS, or our respective affiliates.
- Your return on the Notes is not linked to a basket consisting of the underlying indices. Rather, it will be contingent upon the performance of each individual underlying index. Unlike an instrument with a return linked to a basket of indices or other underlying assets, in which risk is mitigated and diversified among all of the components of the basket, you will be exposed equally to the risks related to each of the underlying indices. Poor performance by any one of the underlying indices over the term of the Notes may negatively affect your return and will not be offset or mitigated by a positive performance by the other underlying indices. To receive any contingent coupon payment or contingent repayment of principal at maturity from us, all underlying indices must close above their initial levels, coupon barriers and trigger levels, respectively, on each trading day during a Quarterly Observation Period and on the final valuation date. In addition, if not called at our election prior to maturity, you may incur a loss proportionate to the negative return of the least performing underlying index. Accordingly, your investment is subject to the market risk of each underlying index, which results in a higher risk of your not receiving contingent coupon payments and incurring a loss at maturity.
- Because the Notes are linked to the individual performance of more than one underlying index, it is more likely that one of the underlying indices will decrease in value below its coupon barrier and its trigger level, increasing the probability that you will not receive the contingent coupons and that you will lose some or all of your initial investment. The risk that you will not receive the contingent coupons and that you will lose some or all of your initial investment in the Notes is greater if you invest in the Notes as opposed to securities that are linked to the performance of fewer underlying indices if their terms are otherwise substantially similar. With a greater total number of underlying indices, it is more likely that one of the underlying indices will be below its coupon barrier or trigger level, and therefore it is more likely that you will not receive the contingent coupons and that at maturity you will receive an amount in cash which is worth less than your principal amount. In addition, the performances of a pair of underlying indices may be positively or negatively correlated, or may not be correlated at all. If a pair of underlying indices is not correlated to each other or is negatively correlated, there is a greater potential for one of those underlying indices to close below its coupon barrier or trigger level on any day during a Quarterly Observation Period or on the final valuation date, respectively, and therefore the risk of missing a contingent coupon payment and that a loss of principal will occur is even greater. Further, with three underlying indices, it is more likely that the performance of one pair of underlying indices will not be correlated or will be negatively correlated.

It is impossible to predict what the correlations between the underlying indices will be over the term of the Notes. The underlying indices represent different equity markets and these different equity markets may not perform similarly over the term of the Notes. Although the correlation of the underlying indices' performance may change over the term of the Notes, the contingent coupon rate is determined, in part, based on the underlying indices' performance calculated using our internal models at the time when the terms of the Notes are determined. As stated earlier, a higher contingent coupon rate is generally associated with lower correlation of the underlying indices, which reflects a greater potential for missed contingent coupons and for a loss on your investment at maturity. See “Correlation of the Underlying Indices” below.

Risks Relating to Liquidity and Secondary Market Issues

- Secondary trading in the Notes may be limited. The Notes will not be listed on a securities exchange. There may be little or no secondary market for the Notes. Even if there is a secondary market, it may not provide enough liquidity to allow you to trade or sell the Notes easily.

RBCCM intends to act as a market maker for the Notes, but is not required to do so. Because we do not expect that other market makers will participate significantly in the secondary market for the Notes, the price at which you may be able to trade the Notes is likely to depend on the price, if any, at which RBCCM is willing to buy the Notes. If at any time RBCCM does not act as a market maker, it is likely that there would be little or no secondary market for the

Notes. We expect that transaction costs in any secondary market would be high. As a result, the difference between the bid and asked prices for the Notes in any secondary market could be substantial. If you sell the Notes before maturity, you may have to do so at a substantial discount from the issue price, and as a result, you may suffer substantial losses.

- The terms of the Notes at issuance were influenced and their market value prior to maturity will be influenced by many unpredictable factors. Many economic and market factors influenced the terms of the Notes at issuance and will affect their value prior to maturity. These factors are similar in some ways to those that could affect the value of a combination of instruments that might be used to replicate the payments on the Notes, including a combination of a bond with one or more options or other derivative instruments. For the market value of the notes, we expect that, generally, the levels of the underlying indices on any day will affect the value of the Notes more than any other single factor. However, you should not expect the value of the Notes in the secondary market to vary in proportion to changes in the levels of the underlying indices. The value of the Notes will be affected by a number of other factors that may either offset or magnify each other, including:
- the level of the underlying indices;
- whether the levels of the underlying indices are below their respective coupon barriers or the trigger levels;
- the expected volatility of the underlying indices;
- the expected correlation of the underlying indices;
- the time to maturity of the Notes;
- the dividend rate on the securities composing the underlying indices;
- interest and yield rates in the market generally, as well as in the markets of the equity securities composing the underlying indices;
- economic, financial, political, regulatory or judicial events that affect the underlying indices or the equity securities composing the underlying indices or stock markets generally, and which may affect the levels of the underlying indices;

- the exchange rate and the volatility of the exchange rate between the U.S. dollar and euro, which is the currency in which the equity securities included in the SX5E are traded; and
- our creditworthiness, including actual or anticipated downgrades in our credit ratings.

Some or all of these factors influenced the terms of the Notes at issuance and will influence the price you will receive if you choose to sell the Notes prior to maturity. The impact of any of the factors set forth above may enhance or offset some or all of any change resulting from another factor or factors. You may have to sell the Notes at a substantial discount from the principal amount if the levels of the underlying indices are at, below or not sufficiently above, their respective initial levels, coupon barriers or trigger levels.

Risks Relating to the Underlying Indices

- Changes that affect an underlying index will affect the market value of the Notes and the payments on the Notes. The policies of the applicable index sponsor concerning the calculation of each underlying index, additions, deletions or substitutions of the components of that underlying index and the manner in which changes affecting those components, such as stock dividends, reorganizations or mergers, may be reflected in the underlying index and, therefore, could affect the amounts payable on the Notes, and the market value of the Notes prior to maturity. The amounts payable on the Notes and their market value could also be affected if the index sponsor changes these policies, for example, by changing the manner in which it calculates the applicable underlying index, or if the index sponsor discontinues or suspends calculation or publication of that underlying index, in which case it may become difficult to determine the market value of the Notes.
- We have no affiliation with any index sponsor and will not be responsible for any actions taken by an index sponsor. No index sponsor is an affiliate of ours or will be involved in the offering of the Notes in any way. Consequently, we have no control of the actions of any index sponsor, including any actions of the type that might impact the value of the Notes. No index sponsor has any obligation of any sort with respect to the Notes. Thus, no index sponsor has any obligation to take your interests into consideration for any reason, including in taking any actions that might affect the value of the Notes. None of our proceeds from the issuance of the Notes will be delivered to any index sponsor.
- 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 amount to be paid on the Notes. The historical performance of each underlying index does not give an indication of its future performance. As a result, it is impossible to predict whether the level of the underlying indices will rise or fall during the term of the Notes. The level of each underlying index will be influenced by complex and interrelated political, economic, financial and other factors. The level of each underlying index may decrease such that you may not receive any return on your investment or any contingent coupon payments. There can be no assurance that the level of each underlying index will not decrease so that at maturity you will not lose some or all of your investment.
- An investment in the Notes is subject to risks associated with non-U.S. securities markets. The securities included in the SX5E have been 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 U.S. companies that are subject to the reporting requirements of the SEC, and non-U.S. companies are subject to accounting, disclosure, auditing and financial reporting standards and requirements that differ from those applicable to U.S. reporting companies.

Prices of securities in non-U.S. countries are subject to political, economic, financial and social factors that may be unique to the particular countries. 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 relevant 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.

¨ As a holder of the Notes, you will not have direct exposure to fluctuations in the U.S. dollar/euro exchange rate related to the SX5E. The value of the Notes will not be adjusted for exchange rate fluctuations between the U.S. dollar and the euro, even though any currency fluctuations could affect the performance of the SX5E. Therefore, if the euro appreciates or depreciates relative to the U.S. dollar over the term of the Notes, you will not receive any additional payment or incur any reduction in any payment on the Notes.

¨ An investment in the Notes linked to the RTY 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.

Risks Relating to Hedging Activities and Conflicts of Interest

¨ We, UBS or our respective affiliates may have adverse economic interests to the holders of the Notes. RBCCM, UBS and our respective affiliates trade the securities represented by the underlying indices, and other financial instruments related to the underlying indices, on a regular basis, for their accounts and for other accounts under our or their management. UBS, RBCCM and these affiliates may also issue or underwrite or assist unaffiliated entities in the issuance or underwriting of other securities or financial instruments that relate to the underlying indices. To the extent that we, UBS or any of our respective affiliates serves as issuer, agent or underwriter for such securities or financial instruments, our or their interests with respect to such products may be adverse to those of the holders of the Notes. Any of these trading activities could potentially affect the performance of the underlying indices and, accordingly, could affect the value of the Notes, and the amounts, if any, payable on the Notes.

We, UBS or our respective affiliates may currently or from time to time engage in business with the issuers of the securities represented by the underlying indices, including extending loans to, or making equity investments in, or providing advisory services to them, including merger and acquisition advisory services. In the course of this business, we, UBS or our respective affiliates may acquire non-public information about these companies, and we will not disclose any such information to you. None of us, UBS or our respective affiliates makes any representation or warranty to any purchaser of a Note with respect to any matters whatsoever relating to our business with the issuer of any security included in the underlying indices or future price movements of any such security.

Additionally, we, UBS or our respective affiliates may serve as issuer, agent or underwriter for additional issuances of securities with returns linked or related to changes in the level of one or more of the underlying indices. By introducing competing products into the marketplace in this manner, we could adversely affect the value of the Notes.

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

We, UBS or our respective affiliates may currently or from time to time engage in trading activities related to the euro, which is the currency in which the securities represented by the SX5E are denominated. These trading activities could potentially affect the exchange rates with respect to the euro and could affect the level of the SX5E.

In the course of our currency trading activities, we, UBS or our respective affiliates may acquire material nonpublic information with respect to currency exchange rates, and we will not disclose any such information to you. In addition, we, UBS or our respective affiliates may produce and/or publish research reports, or otherwise express views, with respect to expected movements in currency exchange rates. We, UBS and our respective do not make any representation or warranty to any purchaser of the Notes with respect to any matters whatsoever relating to future currency exchange rate movements, and any prospective purchaser of the Notes should undertake an independent investigation of the applicable currencies as, in its judgment, is appropriate to make an informed decision with respect to an investment in the Notes.

- The calculation agent will have significant discretion with respect to the Notes, which may be exercised in a manner that is adverse to your interests. Our wholly-owned subsidiary, RBCCM, will act as the calculation agent. The calculation agent will determine, among other things, the closing levels of the underlying indices on each trading day; the final level for each underlying index; the underlying return for each underlying index; and the amounts, if any, that we will pay to you on the Notes. The calculation agent will also be responsible for determining whether a market disruption event has occurred. The calculation agent may exercise its discretion in a manner which reduces your return on the Notes. Since these determinations by the calculation agent may affect the payments on the Notes, the calculation agent may have a conflict of interest if it needs to make a determination of this kind.
- Market disruptions may adversely affect your return. The calculation agent may, in its sole discretion, determine that the markets have been affected in a manner that prevents it from properly determining the closing level of one or any of the underlying indices on the final valuation date or calculating the underlying return for each underlying index and the amount, if any, that we are required to pay you. These events may include disruptions or suspensions of trading in the markets as a whole. If the calculation agent, in its sole discretion, determines that any of these events prevents us or any of our affiliates from properly hedging our obligations under the Notes, it is possible that the maturity date will be postponed, and your return will be adversely affected. See "General Terms of the Notes — Market Disruption Events."
- Non-U.S. investors may be subject to certain additional risks. This document contains a general description of certain U.S. tax considerations relating to the Notes. In the event you are a non-U.S. investor, you should consult your tax

advisors as to the consequences, under the tax laws of the country where you are resident for tax purposes, of acquiring, holding and disposing of the Notes and receiving the payments that might be due under the Notes.

For a discussion of the Canadian federal income tax consequences of investing in the Notes, please see the section entitled "Tax Consequences — Canadian Taxation" in the accompanying prospectus. If you are not a Non-resident Holder (as defined in the section titled "Tax Consequences—Canadian Taxation" in the accompanying prospectus) or if you acquire the Notes in the secondary market, you should consult your tax advisors as to the consequences of acquiring, holding and disposing of the Notes and receiving the payments that may be due under the Notes.

- Significant aspects of the income tax treatment of an investment in the Notes may be uncertain. The tax treatment of an investment in the Notes is uncertain. We do not plan to request a ruling from the Internal Revenue Service or the Canada Revenue Agency regarding the tax treatment of an investment in the Notes, and the Internal Revenue Service, the Canada Revenue Agency or a court may not agree with the tax treatment described in this document.

The Internal Revenue Service has issued a notice indicating that it and the Treasury Department are actively considering whether, among other issues, a holder should be required to accrue ordinary income on a current basis irrespective of any contingent coupons. The outcome of this process is uncertain and could apply on a retroactive basis.

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

Use of Proceeds and Hedging

The net proceeds we receive from the sale of the Notes will be used for general corporate purposes and, in part, by us or by one or more of our affiliates in connection with hedging our obligations under the Notes. The original issue price of the Notes includes the underwriting commission (as shown on the cover page of this document) paid with respect to the Notes and the estimated cost of hedging our obligations under the Notes.

In anticipation of the sale of the Notes, we expect to enter into hedging transactions with one or more of our affiliates, involving the underlying indices or the securities composing the underlying indices, and/or related listed and/or over-the-counter derivative instruments prior to or on the trade date. From time to time, including around the time of the maturity date, we and our respective affiliates may enter into additional hedging transactions or unwind those that we or they have entered into. In this regard, we and our respective affiliates may:

- acquire or dispose of investments relating to the underlying indices;
- acquire or dispose of long or short positions in listed or over-the-counter derivative instruments related to the underlying indices; or
- any combination of the above two.

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

We and our affiliates may close out our or their hedges at any time during the term of the Notes. That step may, for example, involve sales or purchases of over-the-counter derivative instruments linked to the underlying indices.

Hypothetical Examples

Hypothetical terms only. Actual terms may vary. See the cover page for actual offering terms.

The examples below illustrate the hypothetical payments on a coupon payment date, upon an issuer call or at maturity under different hypothetical scenarios for a $10.00 Note on an offering of the Notes, with the assumptions set forth below.* We cannot predict the closing level of any underlying index on any trading day during the term of the Notes, including on any trading day during any Quarterly Observation Period or on the Final Valuation Date. You should not take these examples as an indication or assurance of the expected performance of the Notes. Numbers in the examples below have been rounded for ease of analysis.

Principal Amount:	$10.00
Term:	Approximately 2.5 years (unless earlier called)
Hypothetical Initial Level:	1,000 for each underlying index
Contingent Coupon Rate:	19.10% per annum (or 4.775% per quarter)
Quarterly Observation Periods/Quarterly Observation End Dates:	Quarterly
Hypothetical Trigger Level:	750 for each underlying index, which is 75% of its hypothetical initial level
Hypothetical Coupon Barrier:	750 for each underlying index, which is 75% of its hypothetical initial level

* Terms used for purposes of these hypothetical examples do not represent the actual initial levels, coupon barriers or trigger levels. The hypothetical initial levels above have been chosen for illustrative purposes only and do not represent the actual initial level for any underlying index. The actual initial level and resulting trigger level and coupon barrier of each underlying index are based on its closing level on December 21, 2018.

The examples below are hypothetical. These examples are intended to illustrate (a) the effect of an issuer call, (b) how the payment of a Contingent Coupon with respect to any Quarterly Observation Period will depend on whether the closing level of any underlying index is less than its Coupon Barrier on any trading day during that Quarterly Observation Period, (c) how the value of the payment at maturity on the Notes will depend on whether the Final Index Level of any underlying index is less than its Trigger Level and (d) how the total return on the Notes may be less than the total return on a direct investment in any or all Indices in certain scenarios. The "total return" as used in this pricing supplement is the number, expressed as a percentage, that results from comparing the total payments per $10.00 in principal amount of the Notes over their term to the $10.00 initial issue price.

Example 1 — We Elect to Call the Notes on the First Quarterly Observation End Date

Quarterly Observation Period	Lowest Closing Level During Applicable Quarterly Observation Period	Payment (per Note)	
First Quarterly Observation Period	SPX Index: 1,100.00 SX5E Index: 1,200.00 RTY Index: 1,300.000	We elect to call the Notes. Closing level of each underlying index above its coupon barrier on each trading day during Quarterly Observation Period; we pay contingent coupon of $0.4775 on Call Settlement Date.	
Total Payments (per $10.00 Note):		Payment on Call Settlement Date:	$10.4775 ($10.00 + $0.4775)
		Total:	$10.4775
		Total Return:	4.775%

On the first Quarterly Observation End Date, we elect to call the Notes. Because the closing level of each underlying index is above its applicable coupon barrier on each trading day during the first Quarterly Observation Period, we will pay you on the Call Settlement Date $10.4775 per $10.00 principal amount of the Notes, which is equal to your principal amount plus the contingent coupon due on the coupon payment date that is also the Call Settlement Date. No further amounts will be owed to you under the Notes.

Example 2 — Notes Are NOT Called and the Final Level of Each Underlying Index Is Above Its Trigger Level

Quarterly Observation Period	Lowest Closing Level During Applicable Quarterly Observation	Final Level	Payment (per Note)

	Period		
First Quarterly Observation Period	SPX Index: 1,150.00 SX5E Index: 1,100.00 RTY Index: 850.000	N/A	Notes NOT called at our election. Closing level of each underlying index above its coupon barrier on each trading day during Quarterly Observation Period; we pay contingent coupon of $0.4775 on the first coupon payment date.
Second Quarterly Observation Period	SPX Index: 1,200.00 SX5E Index: 1,150.00 RTY Index: 800.000	N/A	Notes NOT called at our election. Closing level of each underlying index above its coupon barrier on each trading day during Quarterly Observation Period; we pay contingent coupon of $0.4775 on the second coupon payment date.
Third Quarterly Observation Period	SPX Index: 1,150.00 SX5E Index: 1,100.00 RTY Index: 600.000	N/A	Notes NOT called at our election. Closing level of the RTY Index below its coupon barrier on at least one day during Quarterly Observation Period; we DO NOT pay contingent coupon on third coupon payment date.
Fourth to Ninth Quarterly Observation Periods	Various (at least one underlying index below coupon barrier)	N/A	Notes NOT called at our election. Closing level of at least one underlying index below its coupon barrier on at least one day during Quarterly Observation Period; we DO NOT pay contingent coupon on any of the fourth to ninth coupon payment dates.
Tenth Quarterly Observation Period (the final Quarterly	SPX Index: 1,000.00 SX5E Index: 1,050.00 RTY Index: 800.000	SPX Index: 1,150.00 SX5E Index:	Notes NOT callable. Final level of each underlying index above its trigger level and closing level of each underlying index above its coupon barrier on each trading day during Quarterly Observation Period; we repay principal plus we pay contingent

Observation Period)	1,100.00 RTY Index: 850.000	coupon of $0.4775 on the maturity date.	
Total Payments (per $10.00 Note):		Payment at Maturity:	$10.4775 ($10.00 + $0.4775)
		Prior Contingent Coupons:	$0.955 ($0.4775 × 2)
		Total:	$11.4325
		Total Return:	14.325%

In this example, we do not elect to call the Notes and the Notes remain outstanding until maturity. Because the final level of each underlying index is greater than or equal to its trigger level and the closing level of each underlying index is greater than or equal to its coupon barrier on each trading day during the final Quarterly Observation Period, we will pay you on the maturity date $10.4775 per $10.00 in principal amount of the Notes, which is equal to your principal amount plus the contingent coupon due on the coupon payment date that is also the maturity date.

In addition, because the closing level of each underlying index was greater than or equal to its coupon barrier on each trading day during the first and second Quarterly Observation Periods, we will pay the contingent coupon of $0.4775 on the first and second coupon payment dates. However, because the closing level of at least one underlying index was less than its coupon barrier on at least one day during each of the third through ninth Quarterly Observation Periods, we will not pay any contingent coupon on the coupon payment dates following the applicable Quarterly Observation Periods. Accordingly, we will have paid a total of $11.4325 per $10.00 in principal amount of the Notes for a 14.325% total return over the approximately 2.5 year term of the Notes.

Example 3 — Notes Are NOT Called and the Final Level of Each Underlying Index Is Above Its Trigger Level

Quarterly Observation Period	Lowest Closing Level During Applicable Quarterly Observation Period	Final Level	Payment (per Note)
First Quarterly Observation Period	SPX Index: 950.00 SX5E Index: 800.00 RTY Index: 1,200.000	N/A	Notes NOT called at our election. Closing level of each underlying index above its coupon barrier on each trading day during Quarterly Observation Period; we pay contingent coupon of $0.4775 on the first coupon payment date.
Second Quarterly Observation Period	SPX Index: 900.00 SX5E Index: 750.00 RTY Index: 1,150.000	N/A	Notes NOT called at our election. Closing level of each underlying index above its coupon barrier on each trading day during Quarterly Observation Period; we pay contingent coupon of $0.4775 on the second coupon payment date.
Third Quarterly Observation Period	SPX Index: 1,150.00 SX5E Index: 900.00 RTY Index: 600.000	N/A	Notes NOT called at our election. Closing level of the RTY Index below its coupon barrier on at least one day during Quarterly Observation Period; we DO NOT pay contingent coupon on the third coupon payment date.
Fourth to Ninth Quarterly Observation Periods	Various (at least one underlying index below coupon barrier)	N/A	Notes NOT called at our election. Closing level of at least one underlying index below its coupon barrier on at least one day during Quarterly Observation Period; we DO NOT pay contingent coupon on any of the fourth to ninth coupon payment dates.
Tenth Quarterly Observation Period (the final Quarterly Observation Period)	SPX Index: 1,050.00 SX5E Index: 800.00 RTY Index: 500.000	SPX Index: 1,100.00 SX5E Index: 900.00	Notes NOT callable. Final level of each underlying index above its trigger level but closing level of the RTY Index below its coupon barrier on at least one day during Quarterly Observation Period; we repay principal but do not pay contingent coupon.

	RTY Index: 800.000	
Total Payments (per $10.00 Note):	Payment at Maturity:	$10.00
	Prior Contingent Coupons:	$0.955 ($0.4775 × 2)
	Total:	$10.955
	Total Return:	9.55%

In this example, we do not elect to call the Notes and the Notes remain outstanding until maturity. Because the final level of each underlying index is greater than or equal to its trigger level but the closing level of at least one underlying index is less than its coupon barrier on at least one day during the final Quarterly Observation Period, we will pay you on the maturity date $10.00 per $10.00 in principal amount of the Notes, which is equal to your principal amount, but we will not pay any Contingent Coupon on the maturity date.

In addition, because the closing level of each underlying index was greater than or equal to its coupon barrier on each trading day during the first and second Quarterly Observation Periods, we will pay the Contingent Coupon of $0.4775 on the first and second coupon payment dates. However, because the closing level of at least one underlying index was less than its coupon barrier on at least one day during each of the third through ninth Quarterly Observation Periods, we will not pay any Contingent Coupon on the coupon payment dates following the applicable Quarterly Observation Periods. Accordingly, we will have paid a total of $10.955 per $10.00 in principal amount of the Notes for a 9.55% total return over the approximately 2.5 year term of the Notes.

Example 4 — Notes Are NOT Called and the Final Level of Any Underlying Index Is Below Its Trigger Level

Quarterly Observation Period	Lowest Closing Level During Applicable Quarterly Observation Period	Final Level	Payment (per Note)
First Quarterly Observation Period	SPX Index: 550.00 SX5E Index: 600.00 RTY Index: 500.000	N/A	Notes NOT called at our election. Closing level of each underlying index below its coupon barrier on at least one day during Quarterly Observation Period; we DO NOT pay Contingent Coupon on the first coupon payment date.
Second Quarterly Observation Period	SPX Index: 750.00 SX5E Index: 600.00 RTY Index: 800.000	N/A	Notes NOT called at our election. Closing level of the SX5E Index below its coupon barrier on at least one day during Quarterly Observation Period; we DO NOT pay Contingent Coupon on the second coupon payment date.
Third Quarterly Observation Period	SPX Index: 950.00 SX5E Index: 600.00 RTY Index: 850.000	N/A	Notes NOT called at our election. Closing level of the SX5E Index below its coupon barrier on at least one day during Quarterly Observation Period; we DO NOT pay Contingent Coupon on the third coupon payment date.
Fourth to Ninth Quarterly Observation Periods	Various (at least one underlying index below coupon barrier)	N/A	Notes NOT called at our election. Closing level of at least one underlying index below its coupon barrier on at least one day during Quarterly Observation Period; we DO NOT pay Contingent Coupon on any of the fourth to ninth coupon payment dates.
Tenth Quarterly Observation Period (the final Quarterly Observation Period)	SPX Index: 450.00 SX5E Index: 750.00 RTY Index: 800.000	SPX Index: 450.00 SX5E Index: 800.00 RTY Index: 850.000	Notes NOT callable. Closing level of the SPX Index below its trigger level; we DO NOT pay Contingent Coupon on the maturity date, and we will repay less than the principal amount resulting in a loss proportionate to the decline of the Least Performing Index.

Total Payments (per $10.00 Note):	Payment at Maturity:	$4.50
	Prior Contingent Coupons:	$0.00
	Total:	$4.50
	Total Return:	-55.00%

In this example, we do not elect to call the Notes and the Notes remain outstanding until maturity. Because the final level of at least one underlying index is less than its trigger level on the Final Valuation Date, at maturity, we will pay you a total of $4.50 per $10.00 in principal amount of the Notes, for a -55.00% total return on the Notes, calculated as follows:

$10.00 × (1 + underlying return of the least performing underlying index)

In this example, the SPX is the least performing underlying index, with an underlying return of -55%.

$10.00 × (1 + -55.00%) = $4.50

In addition, because the closing level of at least one underlying index is less than its coupon barrier on at least one day during each Quarterly Observation Period, we will not pay any Contingent Coupons over the term of the Notes. Accordingly, we will have paid a total of $4.50 per $10.00 in principal amount of the notes, for a -55.00% total return over the approximately 2.5 year term of the Notes.

The Notes differ from ordinary debt securities in that, among other features, we are not necessarily obligated to repay the full amount of your initial investment. If we do not elect to call the Notes, you may lose some or all of your initial investment. Specifically, if the Notes are not called and the final level of the least performing underlying index is less than its trigger level on the final valuation date, you will lose 1% (or a fraction thereof) of your principal amount for each 1% (or a fraction thereof) that its underlying return is less than zero. You will be exposed to the market risk of each underlying index on each trading day of the Quarterly Observation Periods and on the final valuation date and any decline in the level of one underlying index may negatively affect your return and will not be offset or mitigated by a lesser decline or any potential increase in the level of the other underlying indices.

Any payment on the Notes, including payments in respect of an automatic call, contingent coupon or any repayment of principal provided at maturity, is dependent on our ability to satisfy our obligations when they come due. If we are unable to meet our obligations, you may not receive any amounts due to you under the Notes.

What Are the Tax Consequences of the Notes?

U.S. Federal Income Tax Consequences

The following is a general description of the material U.S. tax considerations relating to the Notes. It does not purport to be a complete analysis of all tax considerations relating to the Notes. Prospective purchasers of the Notes should consult their tax advisors as to the consequences under the tax laws of the country of which they are a resident for tax purposes and the tax laws of Canada and the U.S. of acquiring, holding and disposing of the Notes and receiving payments under the Notes. This summary is based upon the law as in effect on the date of this 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. It does not address the tax consequences applicable to any holders subject to special rules including accrual method taxpayers subject to special tax accounting rules under Section 451(b) of the Internal Revenue Code. This discussion applies only to U.S. holders and non-U.S. holders that will purchase the Notes upon original issuance and will hold the Notes as capital assets for U.S. federal income tax purposes. In addition, the discussion below assumes that an investor in the Notes will be subject to a significant risk that it will lose a significant amount of its investment in the Notes.

You should consult your tax advisor concerning the U.S. federal income tax and other tax consequences of your investment in the Notes 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 NOTES SHOULD BE TREATED FOR U.S. FEDERAL INCOME TAX PURPOSES. AS A RESULT, THE U.S. FEDERAL INCOME TAX CONSEQUENCES OF AN INVESTMENT IN THE NOTES ARE UNCERTAIN. BECAUSE OF THE UNCERTAINTY, YOU SHOULD CONSULT YOUR TAX ADVISOR IN DETERMINING THE U.S. FEDERAL INCOME TAX AND OTHER TAX CONSEQUENCES OF YOUR INVESTMENT IN THE NOTES, INCLUDING THE APPLICATION OF STATE, LOCAL OR OTHER TAX LAWS AND THE POSSIBLE EFFECTS OF CHANGES IN FEDERAL OR OTHER TAX LAWS.

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

In the opinion of our counsel, Morrison & Foerster LLP, it would generally be reasonable to treat a Note with terms described in this 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 Notes require a holder and us (in the absence of a change in law or an administrative or judicial ruling to the contrary) to treat the Notes for all tax purposes in accordance with such characterization. If the Notes are so treated, a U.S. holder should generally recognize capital gain or loss upon the sale or maturity of the Notes in an amount equal to the difference between the amount a holder receives at such time and the holder’s tax basis in the Notes. Capital gain recognized by an individual U.S. holder is generally taxed at preferential rates where the property is held for more than one year and is generally taxed at ordinary income rates where the property is held for one year or less. The deductibility of capital losses is subject to limitations. In addition, we intend to treat the contingent coupons as U.S. source income for U.S. federal income tax purposes. The following discussion assumes that the treatment described in this paragraph is proper and will be respected.

Although the U.S. federal income tax treatment of the contingent coupons is uncertain, we intend to take the position, and the following discussion assumes, that such contingent coupons (including any coupon paid on or with respect to the call or maturity date) constitute taxable ordinary income to a U.S. holder at the time received or accrued in accordance with the holder’s regular method of accounting. If the Notes are treated as described above, a U.S. holder should generally recognize capital gain or loss upon the call, sale or maturity of the Notes in an amount equal to the difference between the amount a holder receives at such time (other than amounts properly attributable to any contingent coupon, which would be taxed, as described above, as ordinary income) and the holder's tax basis in the Notes. In general, a U.S. holder's tax basis in the Notes will be equal to the price the holder paid for the Notes. Capital gain recognized by an individual U.S. holder is generally taxed at preferential rates where the property is held for more than one year and is generally taxed at ordinary income rates where the property is held for one year or less. The ordinary income treatment of the contingent quarterly coupons, in conjunction with the capital loss treatment of any loss recognized upon the sale, exchange or maturity of the Notes, 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 Notes are also possible and the Internal Revenue Service might assert that a treatment other than that described above is more appropriate. For example, it would also be possible to treat the Notes, and the Internal Revenue Service might assert that the Notes should be treated, as a single debt instrument.

Because the Notes have a term that exceeds one year, such a debt instrument would be subject to the special tax rules governing contingent payment debt instruments. If the Notes are so treated, a holder would generally be required to accrue interest income over the term of the Notes based upon the yield at which we would issue a non-contingent fixed-rate debt instrument with other terms and conditions similar to the Notes. In addition, any gain a holder might recognize upon the call, sale or maturity of the Notes would be ordinary income and any loss recognized by a holder at such time would generally be ordinary loss to the extent of interest that same holder included in income in the current or previous taxable years in respect of the Notes, and thereafter, would be capital loss.

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

The Internal Revenue Service has released a notice that may affect the taxation of holders of the Notes. According to the notice, the Internal Revenue Service and the U.S. Treasury Department are actively considering whether the holder of an instrument similar to the Notes should be required to accrue ordinary income on a current basis irrespective of any contingent quarterly coupons. It is not possible to determine what guidance they will ultimately issue, if any. It is possible, however, that under such guidance, holders of the Notes will ultimately be required to accrue income currently irrespective of any contingent coupons 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 Internal Revenue 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 Notes 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 Notes and proceeds from the sale of the Notes may be subject to a backup withholding tax unless, in general, the holder complies with certain procedures or is an exempt recipient. Any amounts so withheld generally will be refunded by the Internal Revenue Service or allowed as a credit against the holder's U.S. federal income tax liability, provided the holder makes a timely filing of an appropriate tax return or refund claim to the Internal Revenue Service.

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

Individual holders that own “specified foreign financial assets” may be required to include certain information with respect to such assets with their U.S. federal income tax return. You are urged to consult your own tax advisor regarding such requirements with respect to the Notes.

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

While the U.S. federal income tax treatment of the Notes (including proper characterization of the contingent quarterly coupons for U.S. federal income tax purposes) is uncertain, U.S. federal income tax at a 30% rate (or at a lower rate under an applicable income tax treaty) will be withheld in respect of the contingent quarterly coupons paid to a non-U.S. holder unless such payments are effectively connected with the conduct by the non-U.S. holder of a trade or business in the U.S. (in which case, to avoid withholding, the non-U.S. holder will be required to provide a Form W-8ECI). We will not pay any additional amounts in respect of such withholding. To claim benefits under an income tax treaty, a non-U.S. holder must obtain a taxpayer identification number and certify as to its eligibility under the appropriate treaty’s limitations on benefits article, if applicable (which certification may generally be made on a Form W-8BEN or Form 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 coupons under U.S. federal income tax laws and whether such treaty rate or exemption applies to such contingent coupon payments. No assurance can be provided on the proper characterization of the contingent quarterly coupons for U.S. federal income tax purposes and, accordingly, no assurance can be provided on the availability of benefits under any income tax treaty. Non-U.S. holders must 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 coupon which would be subject to the rules discussed in the previous paragraph) upon the call, sale or maturity of the Notes, provided that (i) the holder complies with any applicable certification requirements (which certification may generally be made on a Form W-8BEN or Form W-8BEN-E, or a substitute or successor form), (ii) the payment is not effectively connected with the conduct by the holder of a U.S. trade or business, and (iii) if the holder is a non-resident alien individual, such holder is not present in the U.S. for 183 days or more during the taxable year of the call, sale or maturity of the Notes. In the case of (ii) above, the holder generally would be subject to U.S. federal income tax with respect to any income or gain in the same manner as if the holder were a U.S. holder and, in the case of a holder that is a corporation, the holder may also be subject to a branch profits tax equal to 30% (or such lower rate provided by an applicable U.S. income tax treaty) of a portion of its earnings and profits for the taxable year that are effectively connected with its conduct of a trade or business in the U.S., subject to certain adjustments. Payments made to a non-U.S. holder may be subject to information reporting and to backup withholding unless the holder complies with applicable certification and identification requirements as to its foreign status.

As discussed above, alternative characterizations of the Notes for U.S. federal income tax purposes are possible. Should an alternative characterization, by reason of change or clarification of the law, by regulation or otherwise, cause payments as to the Notes to become subject to withholding tax in addition to the withholding tax described above, we will withhold tax at the applicable statutory rate. The Internal Revenue Service has also indicated that it is considering whether income in respect of instruments such as the Notes should be subject to withholding tax. Prospective investors should consult their own tax advisors in this regard.

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 Notes are not delta-one instruments, non-U.S. holders should not be subject to withholding on dividend equivalent payments, if any, under the Notes. However, it is possible that the Notes could be treated as deemed reissued for U.S. federal income tax purposes upon the occurrence of certain events affecting the underlying indices or the Notes (for example, upon an underlying index rebalancing), and following such occurrence the Notes could be treated as subject to withholding on dividend equivalent payments. Non-U.S. holders that enter, or have entered, into other transactions in respect of the underlying indices or the Notes should consult their tax advisors as to the application of the dividend equivalent withholding tax in the context of the Notes and their other transactions. If any payments are treated as dividend equivalents subject to withholding, we (or the applicable withholding agent) would be entitled to withhold taxes without being required to pay any additional amounts with respect to amounts so withheld.

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

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

Canadian Federal Income Tax Consequences

For a discussion of the material Canadian federal income tax consequences relating to an investment in the Notes, please see the section entitled "Tax Consequences – Canadian Taxation" in the accompanying prospectus, which you should carefully review prior to investing in the Notes.

Information About the Underlying Indices

We have derived all information contained in this document regarding each of the underlying indices, including, without limitation, its make up, method of calculation, and changes in its components, from publicly available sources. The information reflects the policies of, and is subject to change by, the applicable index sponsor. Each index sponsor, which owns the copyright and all other rights to the applicable underlying index, has no obligation to continue to publish, and may discontinue publication of, that underlying index. The consequences of an index sponsor discontinuing publication of the applicable underlying index are discussed below under the heading "General Terms of the Notes — Discontinuation of an Underlying Index; Alteration of Method of Calculation." None of us, UBS or RBCCM accepts any responsibility for the calculation, maintenance or publication of any underlying index or any successor 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 Notes will not reflect the return you would realize if you actually owned the SPX constituent stocks and received the dividends paid on those stocks.

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 Payment at Maturity.

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.

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.

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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 NOTES, 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.

Historical Information

The graph below illustrates the performance of the SPX from December 21, 2008 to December 21, 2018, based on its initial level of 2,416.62, which was its closing level on December 21, 2018. The red line represents its coupon barrier and trigger level of 1,812.47, which is equal to 75.00% of its initial level (rounded to two decimal places).

HISTORIC PERFORMANCE IS NOT AN INDICATION OF FUTURE PERFORMANCE

Source: Bloomberg L.P. We have not independently verified the accuracy or completeness of the information obtained from Bloomberg Financial Markets.

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 SX5E 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 monthly 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:

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

The "free float market capitalization of the SX5E" is equal to the sum of the products of the price, the number of shares, the free float factor and the weighting 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 SX5E) in connection with certain securities, including the Notes offered hereby.

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 SX5E and the related trademarks for use in connection with the Notes. STOXX does not:

- sponsor, endorse, sell, or promote the Notes;
- recommend that any person invest in the Notes offered hereby or any other securities;
- have any responsibility or liability for or make any decisions about the timing, amount, or pricing of the Notes;
- have any responsibility or liability for the administration, management, or marketing of the Notes; or
- consider the needs of the Notes or the holders of the Notes in determining, composing, or calculating the SX5E, or have any obligation to do so.

STOXX will not have any liability in connection with the Notes. Specifically:

- STOXX does not make any warranty, express or implied, and disclaims any and all warranty concerning:
- the results to be obtained by the Notes, the holders of the Notes or any other person in connection with the use of the SX5E and the data included in the SX5E;
- the accuracy or completeness of the SX5E and its data;
- the merchantability and the fitness for a particular purpose or use of the SX5E and its data;
- STOXX will have no liability for any errors, omissions, or interruptions in the SX5E 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 Notes or any other third parties.

Historical Information

The graph below illustrates the performance of the SX5E from December 21, 2008 to December 21, 2018, based on its initial level of 3,000.61, which was its closing level on December 21, 2018. The red line represents its coupon barrier and trigger level of 2,250.46, which is equal to 75.00% of its initial level (rounded to two decimal places).

HISTORIC PERFORMANCE IS NOT AN INDICATION OF FUTURE PERFORMANCE

Source: Bloomberg L.P. We have not independently verified the accuracy or completeness of the information obtained from Bloomberg Financial Markets.

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. FTSE 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 Notes.

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 last trading 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 and rights, installment receipts or trust receipts, are excluded from the calculation. If multiple share classes of common stock exist, they are combined. 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 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 last trading day of May, all eligible securities are ranked by their total market capitalization. The largest 4,000 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 Notes.

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 Notes, 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 Notes 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 Notes or any member of the public regarding the advisability of investing in securities generally or in the Notes 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 Notes. FTSE Russell is not responsible for and has not reviewed the Notes 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 Notes.

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

Historical Information

The graph below illustrates the performance of the RTY from December 21, 2008 to December 21, 2018, based on its initial level of 1,292.086, which was its closing level on December 21, 2018. The red line represents its coupon barrier and trigger level of 969.065, which is equal to 75.00% of its initial level (rounded to three decimal places).

HISTORIC PERFORMANCE IS NOT AN INDICATION OF FUTURE PERFORMANCE

Source: Bloomberg L.P. We have not independently verified the accuracy or completeness of the information obtained from Bloomberg Financial Markets.

Correlation of the Underlying Indices

The graph below illustrates the daily performance of the underlying indices from December 21, 2008 through December 21, 2018. For comparison purposes, each underlying index has been normalized to have a closing level of 100.00 on December 21, 2008 by dividing the closing level of that index on each day by the closing level of that Index on December 21, 2008 and multiplying by 100.00. We obtained the closing levels used to determine the normalized closing levels set forth below from Bloomberg, without independent verification.

Past performance of the underlying indices is not indicative of their future performance.

The correlation of a pair of indices represents a statistical measurement of the degree to which the returns of those indices were similar to each other over a given period in terms of timing and direction (i.e., positive or negative). The closer the relationship of the daily returns of a pair of underlying indices over a given period, the more positively correlated those indices are. The graph above illustrates the historical performance of each of the underlying indices relative to one another over the time period shown and provides an indication of how close the relative performance of one underlying index has historically been to another. The lower (or more negative) the correlation between two underlying indices, the less likely it is that those indices will move in the same direction and, therefore, the greater the potential for one of those indices to close below its coupon barrier or trigger level on any day during a Quarterly Observation Period or the final valuation date, respectively. This is because the less positively correlated a pair of indices are, the greater the likelihood that at least one of those indices will decrease in value. This results in a greater potential for a contingent coupon not to be paid during the term of the Notes and for a loss of principal at maturity. However, even if two underlying indices have a higher positive correlation, one or both of those indices might close below its coupon barrier or trigger level on any day during a Quarterly Observation Period or the final valuation date, as both of those indices may decrease in value together.

The lower the correlation between two underlying indices, the greater the potential for one of those indices to close below its coupon barrier or its trigger level on any trading day during a Quarterly Observation Period or the final valuation date, respectively. Further, with three underlying indices, it is more likely that the performance of one pair of underlying indices will not be correlated or will be negatively correlated, and therefore this risk is even greater than with securities linked to the individual performance of fewer underlying indices. Therefore, the greater the number of underlying indices, the greater the potential for missed contingent coupons and for a loss of principal at maturity. We determine the contingent coupons for the Notes based, in part, on the correlation among the underlying indices, calculated using internal models at the time the terms of the Notes are set. As discussed above, increased risk resulting from lower correlation or from a greater number of underlying indices will be reflected in a higher contingent coupon than would be payable on securities linked to fewer underlying indices or that have a higher degree of correlation.

General Terms of the Notes

The following description of the terms of the Notes supplements the description of the general terms of the debt securities set forth under the headings "Description of the Notes We May Offer" in the accompanying prospectus supplement and "Description of Debt Securities" in the accompanying prospectus. Capitalized terms used but not defined in this pricing supplement have the meanings assigned in the accompanying prospectus supplement, prospectus. The term "Note" refers to $10 in principal amount of the Notes.

General

The Notes are senior unsecured debt obligations of Royal Bank of Canada that are linked to the underlying indices. The Notes will be issued under an indenture dated October 23, 2003, as it may be amended or supplemented from time to time, between us and The Bank of New York Mellon (as successor to JPMorgan Chase Bank, N.A.), as trustee.

The Notes are unsecured debt obligations and are not savings accounts or deposits of a bank. The Notes are not insured or guaranteed by the Canada Deposit Insurance Corporation, the U.S. Federal Deposit Insurance Corporation, or any other governmental agency of Canada or the United States.

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

The Notes will be issued in denominations of $10 and integral multiples thereof. The principal amount of each Note is $10. The Notes will be represented by one or more permanent global securities registered in the name of The Depository Trust Company, or DTC, or its nominee, as described under "Description of Debt Securities — Ownership and Book-Entry Issuance" and "—Considerations Relating to DTC" in the prospectus.

All references to the "debt securities" in the accompanying prospectus and all references to the "notes" in the accompanying prospectus supplement shall be read as and shall apply to the "Notes" for the purpose of this pricing supplement. Unless the context otherwise requires, references to the "debt securities," "notes" and the "Notes" in the prospectus, prospectus supplement and this document can be read interchangeably and are synonymous.

If any required payment on the Notes is due on a day that is not a business day, the payment will be paid on the next business day, and no interest will accrue in respect of that postponement.

A "closing level" will be the official closing level of the applicable underlying index on the applicable trading day, as determined by the calculation agent.

A "trading day" is a day, as determined by the calculation agent, on which trading is generally conducted on (i) the relevant exchanges (as defined below) for the applicable underlying index or the successor index and (ii) the exchanges on which futures or options contracts related to that 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.

If the final valuation date is not a trading day or if there is a market disruption event on that day, the final valuation date will be postponed to the immediately succeeding trading day during which no market disruption event shall have occurred or be continuing. In no event, however, will the final valuation date be postponed more than ten business days following the date originally scheduled. If the tenth business day following the date originally scheduled to be the final valuation date is not a trading day, or if there is a market disruption event on that date, the calculation agent will determine the closing level for the applicable underlying index in accordance with the formula for and method of calculating that underlying index last in effect prior to commencement of the market disruption event (or prior to the non-trading day), using the closing price (or, if trading in the relevant securities has been materially suspended or materially limited, the calculation agent's good faith estimate of the closing price that would have prevailed but for such suspension or limitation or non-trading day) on that tenth scheduled business day of each security most recently constituting that underlying index.

For the avoidance of doubt, if an underlying index is subject to a non-trading day or market disruption event only the closing level of that underlying index shall be postponed; the closing level of any underlying index that is not so affected shall be determined on the scheduled final valuation date.

If, due to a market disruption event or otherwise, the final valuation date is postponed, the maturity date will be postponed by the same number of business days. However, if the final valuation date is postponed so that it falls less than three business days prior to the scheduled maturity date, the maturity date will be the third business day following the final valuation date, as so postponed.

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

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

Calculation Agent

RBC Capital Markets, LLC will act as the calculation agent. The calculation agent will determine, among other things, the level of each underlying index on each trading day, including the final valuation date, and the payments to be made, if any, on the Notes. In addition, the calculation agent will determine whether there has been a market disruption event or a discontinuation of any underlying index and whether there has been a material change in the method of calculating an underlying index. All determinations made by the calculation agent will be at the sole discretion of the calculation agent and will, in the absence of manifest error, be conclusive for all purposes and binding on you and on us. We may appoint a different calculation agent from time to time after the date of this document without your consent and without notifying you.

All calculations with respect to the level of each underlying index will be rounded to the nearest one hundred-thousandth, with five one-millionths rounded upward (e.g., .876545 would be rounded to .87655); all dollar amounts related to determination of the payment per $10 in principal amount of the Notes, if any, will be rounded to the nearest one ten-thousandth, with five one hundred-thousandths rounded upward (e.g., .87645 would be rounded up to .8765); and all dollar amounts paid, if any, on the aggregate principal amount of Notes per holder will be rounded to the nearest cent, with one-half cent rounded upward.

Market Disruption Events

Certain events may prevent the calculation agent from determining the closing level of each underlying index, and consequently, the amount, if any, that we will pay to you on the Notes. These events may include disruptions or suspensions of trading on the markets as a whole. We refer to each of these events individually as a "market disruption event."

With respect to any underlying index and any relevant successor index, a "market disruption event," means:

- a suspension, absence or material limitation of trading of equity securities then constituting 20% or more of the level of the underlying index (or the relevant successor index) on the relevant exchanges (as defined below) for such securities for more than two hours of trading during, or during the one hour period preceding the close of, the principal trading session on such relevant exchange; or
- a breakdown or failure in the price and trade reporting systems of any relevant exchange as a result of which the reported trading prices for equity securities then constituting 20% or more of the level of the underlying index (or the relevant successor index) during the one hour preceding the close of the principal trading session on such relevant exchange are materially inaccurate; or
- a suspension, absence or material limitation of trading on the primary exchange or market for trading in futures or options contracts related to the underlying index (or the relevant successor index) for more than two hours of trading during, or during the one hour period preceding the close of, the principal trading session on such exchange or market; or
- a decision to permanently discontinue trading in the relevant futures or options contracts;

in each case as determined by the calculation agent in its sole discretion; and

- a determination by the calculation agent in its sole discretion that the event described above materially interfered 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 Notes.

For purposes of determining whether a market disruption event with respect to any underlying index (or the relevant successor index) exists at any time, if trading in a security included in the underlying index (or the relevant successor index) is materially suspended or materially limited at that time, then the relevant percentage contribution of that security to the level of the underlying index (or the relevant successor index) will be based on a comparison of:

- the portion of the level of the underlying index (or the relevant successor index) attributable to that security relative to
- the overall level of the underlying index (or the relevant successor index),

in each case immediately before that suspension or limitation.

For purposes of determining whether a market disruption event with respect to any underlying index (or the relevant successor index) has occurred:

§ a limitation on the hours or number of days of trading will not constitute a market disruption event if it results from an announced change in the regular business hours of the relevant exchange, or the primary exchange or market for trading in futures or options contracts related to the underlying index (or the relevant successor index);

§ limitations pursuant to the rules of any relevant exchange similar to NYSE Rule 80B (or any applicable rule or regulation enacted or promulgated by any other self-regulatory organization or any government agency of scope similar to NYSE Rule 80B as determined by the calculation agent) on trading during significant market fluctuations will constitute a suspension, abse