

BANK OF MONTREAL /CAN/  
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Pricing Supplement to the Prospectus dated April 27, 2017,  
the Prospectus Supplement dated September 23, 2018 and the Product Supplement dated May 1, 2017

**US\$**

Autocallable Cash-Settled Notes with Contingent Interest Payments due February 28, 2020

**Linked to the Lesser Performing of the NASDAQ 100® Index and the Russell 2000® Index**

This pricing supplement relates an offering of Autocallable Cash-Settled Notes with Contingent Interest Payments linked to the Lesser Performing of the NASDAQ 100® Index and the Russell 2000® Index (the “Underlying Assets”). The notes are designed for investors who are seeking conditional interest payments equal to 1.10% (or 13.20% per annum, to be determined on the Pricing Date) of the principal amount per month, as well as a return of principal if the Closing Level of **each** Underlying Asset on any Call Date beginning on July 24, 2019 is greater than or equal to 100% of its Initial Level (the “Call Level”). Investors should be willing to have their notes automatically redeemed prior to maturity and be willing to lose some or all of their principal at maturity.

The notes will bear interest at a rate equal to 1.10% of the principal amount per month (\$11.00 per \$1,000 in principal amount) if the price of each Underlying Asset is greater than or equal to its Coupon Barrier Level as of the applicable monthly Observation Date, to be determined on the Pricing Date. Any interest will be payable on the last business day of each month, beginning on February 28, 2019, and until the maturity date, subject to the automatic redemption feature.

If on any Call Date beginning on July 24, 2019, the Closing Level of **each** Underlying Asset is greater than or equal to its Call Level, the notes will be automatically called. On the applicable Call Settlement Date, for each \$1,000 principal amount, investors will receive the principal amount plus the applicable interest payment.

The notes do not guarantee any return of principal at maturity. Instead, if the notes are not automatically called, the payment at maturity will be based on the Final Level of each Underlying Asset and whether the Closing Level of any Underlying Asset has declined from its Initial Level below its Trigger Level during the Monitoring Period (a “Trigger Event”), as described below.

If the notes are not automatically redeemed, and a Trigger Event occurs with respect to **any** Underlying Asset **and** the Final Level of **any** Underlying Asset is less than its Initial Level, investors will be subject to one-for-one loss of the principal amount of the notes for any percentage decrease in the Lesser Performing Underlying Asset from its Initial Level to its Final Level. In such a case, you will receive a cash amount at maturity that is less than the principal amount.

The notes will not be listed on any securities exchange.

All payments on the notes are subject to the credit risk of Bank of Montreal.

The offering is expected to price on or about January 28, 2019, and the notes are expected to settle through the facilities of The Depository Trust Company on or about January 31, 2019.

The notes are scheduled to mature on or about February 28, 2020.

The notes will be issued in minimum denominations of \$1,000 and integral multiples of \$1,000.

Our subsidiary, BMO Capital Markets Corp. (“BMOCM”), is the agent for this offering. See “Supplemental Plan of Distribution (Conflicts of Interest)” below.

The notes will not be subject to conversion into our common shares or the common shares of any of our affiliates under subsection 39.2(2.3) of the Canada Deposit Insurance Corporation Act (the “CDIC Act”).

| Autocallable Note Number | Underlying Assets               | Ticker Symbols | Initial Levels | Coupon Barrier Levels and Trigger Levels (% of the Initial Levels) | CUSIP     | Principal Amount | Price to Public <sup>(1)</sup> | Agent’s Commission <sup>(1)</sup> | Proceeds to Bank of Montreal |
|--------------------------|---------------------------------|----------------|----------------|--|-----------|------------------|--------------------------------|-----------------------------------|------------------------------|
| ARC478                   | NASDAQ 100 <sup>®</sup> Index   | NDX            |                | 70.00%   | 06367WGD9 |                  | 100.00%                        | 0.65%                             | 99.35%                       |
|                          | Russell 2000 <sup>®</sup> Index | RTY            |                | 70.00%   |           |                  |                                | US\$                              | US\$                         |

(1) Certain dealers who purchase the notes for sale to certain fee-based advisory accounts may forego some or all of their selling concessions, fees or commissions. The public offering price for investors purchasing the notes in these accounts may be between \$993.50 and \$1,000 per \$1,000 in principal amount.

*Investing in the notes involves risks, including those described in the “Selected Risk Considerations” section beginning on page P-5 of this pricing supplement, the “Additional Risk Factors Relating to the Notes” section beginning on page PS-6 of the product supplement, and the “Risk Factors” sections beginning on page S-1 of the prospectus supplement and on page 8 of the prospectus.*

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

The notes will be our unsecured obligations and will not be savings accounts or deposits that are insured by the United States Federal Deposit Insurance Corporation, the Deposit Insurance Fund, the Canada Deposit Insurance Corporation or any other governmental agency or instrumentality or other entity.

On the date of this preliminary pricing supplement, based on the terms set forth above, the estimated initial value of the notes is \$980.50 per \$1,000 in principal amount. The estimated initial value of the notes on the Pricing Date may differ from this value but will not be less than \$960 per \$1,000 in principal amount. However, as discussed in more detail in this pricing supplement, the actual value of the notes at any time will reflect many factors and cannot be predicted with accuracy.

**BMO CAPITAL MARKETS**

**Key Terms of the Notes:**

|                                    |  |
|------------------------------------|--|
| Underlying Assets:                 | The NASDAQ 100® Index (ticker symbol: NDX) and the Russell 2000® Index (ticker symbol: RTY). See the section below entitled “The Underlying Assets” for additional information about the Underlying Assets.  |
| Conditional Coupon:                | If the Closing Level of each Underlying Asset is greater than or equal to its respective Coupon Barrier Level as of the applicable monthly Observation Date, investors will receive an interest payment for that month. Holders of the notes may not receive any interest payments during the term of the notes.   |
| Interest Rate:                     | 1.10% of the principal amount per month, if payable, unless earlier redeemed. Accordingly, each interest payment, if payable, will equal \$11.00 for each \$1,000 in principal amount per month. The actual interest rate on the notes will be determined on the Pricing Date.   |
| Observation Dates:                 | The fifth scheduled trading day prior to the applicable interest payment date. Each Observation Date is subject to postponement, as set forth in the product supplement in the section “General Terms of the Notes—Market Disruption Events.”  |
| Interest Payment Dates:            | Interest, if payable, will be paid on the last business day of each month, beginning on February 28, 2019 until February 28, 2020, subject to the automatic redemption feature.  |
| Automatic Redemption:              | If, on any Call Date beginning on July 24, 2019, the Closing Level of <b>each</b> Underlying Asset is greater than or equal to its Call Level, the notes will be automatically redeemed.   |
| Payment upon Automatic Redemption: | If the notes are automatically redeemed, then, on the applicable Call Settlement Date, for each \$1,000 principal amount, investors will receive the principal amount plus the applicable interest payment.  |
| Call Dates:                        | The fifth (5 <sup>th</sup> ) business day prior to a Call Settlement Date, beginning on July 24, 2019. Each Call Date is subject to postponement, as set forth in the product supplement in the section “General Terms of the Notes—Market Disruption Events.”   |
| Call Settlement Dates:             | The last business day of each month, beginning on July 31, 2019. The Call Settlement Date for the final Call Date will be the maturity date.   |
| Payment at Maturity:               | If the notes are not automatically redeemed, the payment at maturity for the notes is based on the performance of the Underlying Assets. You will receive \$1,000 for each \$1,000 in principal amount of the note, unless (a) a Trigger Event has occurred with respect to <b>any</b> Underlying Asset <b>and</b> (b) the Final Level of <b>any</b> Underlying Asset is less than its Initial Level.<br><br>However, holders of the notes are subject to potential loss of principal at maturity. If a Trigger Event has occurred with respect to <b>any</b> Underlying Asset, and if the Final Level of <b>any</b> Underlying Asset is less than its Initial Level, you will receive at maturity, for each \$1,000 in principal amount of your |

notes, a cash amount equal to:

$$\$1,000 + [\$1,000 \times (\text{Percentage Change of the Lesser Performing Underlying Asset})]$$

**This amount will be less than the principal amount of your notes, and may be zero.**

You will also receive the final interest payment at maturity, if payable.

A Trigger Event will be deemed to occur with respect to an Underlying Asset if its Closing Level is less than its Trigger Level on any trading day during the Monitoring Period.

Trigger Event:

The period from the Pricing Date to and including the Valuation Date.

Monitoring  
Period:

The Underlying Asset that has the lowest Percentage Change.

Lesser  
Performing  
Underlying  
Asset:

Percentage  
Changes: With respect to each Underlying Asset,

$\frac{\text{Final Level} - \text{Initial Level}}{\text{Initial Level}}$ , expressed as a percentage

Initial Levels: With respect to each Underlying Asset, its Closing Level on the Pricing Date.

Call Levels: With respect to each Underlying Asset, 100% of its Initial Level.

With respect to each Underlying Asset, its Closing Level on the Valuation Date.

Final Levels:

Coupon Barrier and Trigger  
Levels: With respect to each Underlying Asset, 70.00% of its Initial Level.

On or about January 28, 2019

Pricing Date:

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On or about January 31, 2019

Settlement Date:

On or about February 21, 2020

Valuation Date:

On or about February 28, 2020

Maturity Date:

BMOCM

Calculation Agent:

BMOCM

Selling Agent:

*The Pricing Date and the settlement date are subject to change. The actual Pricing Date, settlement date, Call Dates, Interest Payment Dates, Call Dates, Valuation Date and maturity date for the notes will be set forth in the final pricing supplement.*

### **Additional Terms of the Notes**

You should read this pricing supplement together with the product supplement dated May 1, 2017, the prospectus supplement dated September 23, 2018 and the prospectus dated April 27, 2017. 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 or the agent. You should carefully consider, among other things, the matters set forth in “Additional Risk Factors Relating to the Notes” in the product supplement, as the notes involve risks not associated with conventional debt securities. We urge you to consult your investment, legal, tax, accounting and other advisers before you invest in the notes.

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

Product supplement dated May 1, 2017:

<https://www.sec.gov/Archives/edgar/data/927971/000121465917002863/p427170424b5.htm>

Prospectus supplement dated September 23, 2018:

<https://www.sec.gov/Archives/edgar/data/927971/000119312518280416/d624491d424b5.htm>

Prospectus dated April 27, 2017:

<https://www.sec.gov/Archives/edgar/data/927971/000119312517142728/d254784d424b2.htm>

Please note that references in the product supplement to the prospectus supplement will be deemed to refer to the prospectus supplement dated September 23, 2018.

Our Central Index Key, or CIK, on the SEC website is 927971. As used in this pricing supplement, “we,” “us” or “our” refers to Bank of Montreal.

We have filed a registration statement (including a prospectus) with the SEC for the offering to which this document relates. Before you invest, you should read the prospectus in that registration statement and the other documents that we have filed with the SEC for more complete information about us and this offering. You may obtain these documents free of charge by visiting the SEC’s website at <http://www.sec.gov>. Alternatively, we will arrange to send to you the prospectus (as supplemented by the prospectus supplement and product supplement) if you request it by



calling our agent toll-free at 1-877-369-5412.

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## Selected Risk Considerations

An investment in the notes involves significant risks. Investing in the notes is not equivalent to investing directly in the Underlying Assets or their components. These risks are explained in more detail in the “Additional Risk Factors Relating to the Notes” section of the product supplement.

**Your investment in the notes may result in a loss.** — The notes do not guarantee any return of principal. If the notes are not automatically redeemed, the payment at maturity will be based on whether a Trigger Event has occurred with respect to **any** Underlying Asset, and whether the Final Level of **any** Underlying Asset is less than its Initial Level. If a Trigger Event has occurred with respect to **any** Underlying Asset, and if the Final Level of **any** Underlying Asset is less than its Initial Level, you will be subject to a one-for-one loss of the principal amount of the notes for any Percentage Change of the Lesser Performing Underlying Asset from its Initial Level. In such a case, you will receive at maturity a cash payment that is less than the principal amount of the notes and may be zero. **Accordingly, you could lose up to the entire principal amount of your notes.**

**You may not receive any conditional interest payments with respect to your notes.** — If the Closing Level of any Underlying Asset is less than or equal to its respective Coupon Barrier Level as of the applicable monthly Observation Date, you will not receive a monthly interest payment on the applicable interest payment date. You may not receive any interest payments during the term of the notes.

**The protection provided by the Trigger Level of an Underlying Asset may terminate on any day during the Monitoring Period.** — If the Closing Level of **any** Underlying Asset on any trading day during the Monitoring Period is less than its Trigger Level and the Final Level of **any** Underlying Asset is less than its Initial Level, you will be fully exposed at maturity to any decrease in the value of the Lesser Performing Underlying Asset. Under these circumstances, if the Percentage Change of the Lesser Performing Underlying Asset on the Valuation Date is less than zero, you will lose 1% (or a fraction thereof) of the principal amount of your investment for every 1% (or a fraction thereof) that the Final Level of the Lesser Performing Underlying Asset is less than its Initial Level. You will be subject to this potential loss of principal even if, after the Trigger Event occurs with respect to **any** Underlying Asset, the value of each Underlying Asset increases above its Trigger Level.

**Your notes are subject to automatic early redemption.** — We will redeem the notes if the Closing Level of **each** Underlying Asset on any Call Date specified above is greater than its Call Level. Following an automatic redemption, you will not receive any additional conditional interest payments on the notes, and you may not be able to reinvest your proceeds in an investment with returns that are comparable to the notes.

**Your return on the notes is limited to the conditional interest payments, regardless of any appreciation in the value of any Underlying Asset.** — You will not receive a payment at maturity with a value greater than your principal amount plus the final interest payment, if payable. In addition, if the notes are automatically called, you will not receive a payment greater than the principal amount plus the applicable conditional interest payment, even if the Final Level of an Underlying Asset exceeds its Call Level by a substantial amount. Accordingly, your maximum

return for each \$1,000 in principal amount of the notes is equal to the 13 monthly payments of \$11.00, or \$143, a return of approximately 14.30% over the term of the notes. The actual interest rate on the notes will be determined on the Pricing Date.

**Your investment is subject to the credit risk of Bank of Montreal.** — 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.

**Whether interest is payable on the notes, and your payment at maturity may be determined solely by reference to the Lesser Performing Underlying Asset, even if the other Underlying Asset performs better.** — We will only make each interest payment on the notes if the Closing Level of each of the Underlying Assets on the applicable Observation Date exceeds the applicable Coupon Barrier, even if the levels of the other Underlying Asset has increased significantly. Similarly, if a Trigger Event occurs with respect to any Underlying Asset and the Final Level of any Underlying Asset is less than its Initial Level, your payment at maturity will be determined by reference to the performance of the Lesser Performing Underlying Asset. Even if the other Underlying Asset has appreciated in value compared to its Initial Level, or has experienced a decline that is less than that of the Lesser Performing Underlying Asset, your return at maturity will only be determined by reference to the performance of the Lesser Performing Underlying Asset if a Trigger Event occurs.

**The payments on the notes will be determined by reference to each Underlying Asset individually, not to a basket, and the payments on the notes will be based on the performance of the Lesser Performing Underlying Asset.** — Whether each interest payment is payable, and the payment at maturity if a Trigger Event occurs, will be determined only by reference to the performance of the Lesser Performing Underlying Asset, regardless of the performance of the other Underlying Asset. The notes are not linked to a weighted basket, in which the risk may be mitigated and diversified among each of the basket components. For example, in the case of notes linked to a weighted basket, the return would depend on the weighted aggregate performance of the basket components reflected as the basket return. As a result, the depreciation of one basket component could be mitigated by the appreciation of the other basket components, as scaled by the weighting of that basket component. However, in the case of the notes, the individual performance of each Underlying Asset would not be combined, and the depreciation of an Underlying Asset would not be mitigated by any appreciation of the other Underlying Asset. Instead, your receipt of interest payments on the notes will depend on the level of each Underlying Asset on each Observation Date, and your return at maturity will depend solely on the Final Level of the Lesser Performing Underlying Asset if a Trigger Event occurs.

**Potential conflicts.** — We and our affiliates play a variety of roles in connection with the issuance of the notes, including acting as calculation agent. In performing these duties, the economic interests of the calculation agent and other affiliates of ours are potentially adverse to your interests as an investor in the notes. We or one or more of our affiliates may also engage in trading securities included in the Underlying Assets on a regular basis as part of our general broker-dealer and other businesses, for proprietary accounts, for other accounts under management or to facilitate transactions for our customers. Any of these activities could adversely affect the level of an Underlying Asset and, therefore, the market value of the notes. We or one or more of our affiliates may also issue or underwrite other securities or financial or derivative instruments with returns linked or related to changes in the performance of the Underlying Assets. By introducing competing products into the marketplace in this manner, we or one or more of our affiliates could adversely affect the market value of the notes.

**Our initial estimated value of the notes will be lower than the price to public.** — Our initial estimated value of the notes is only an estimate, and is based on a number of factors. The price to public of the notes will exceed our initial estimated value, because costs associated with offering, structuring and hedging the notes are included in the price to public, but are not included in the estimated value. These costs include the underwriting discount and selling concessions, the profits that we and our affiliates expect to realize for assuming the risks in hedging our obligations under the notes and the estimated cost of hedging these obligations. The initial estimated value of the notes may be as low as the amount indicated on the cover page of this pricing supplement.

**Our initial estimated value does not represent any future value of the notes, and may also differ from the estimated value of any other party.** — Our initial estimated value of the notes as of the date of this preliminary pricing supplement is, and our estimated value as determined on the Pricing Date will be, derived using our internal pricing models. This value is based on market conditions and other relevant factors, which include volatility of the Underlying Assets, dividend rates and interest rates. Different pricing models and assumptions could provide values for the notes that are greater than or less than our initial estimated value. In addition, market conditions and other relevant factors after the Pricing Date are expected to change, possibly rapidly, and our assumptions may prove to be incorrect. After the Pricing Date, the value of the notes could change dramatically due to changes in market conditions, our creditworthiness, and the other factors set forth in this pricing supplement and the product supplement. These changes are likely to impact the price, if any, at which we or BMOCM would be willing to purchase the notes from you in any secondary market transactions. Our initial estimated value does not represent a

minimum price at which we or our affiliates would be willing to buy your notes in any secondary market at any time.

**The terms of the notes are not determined by reference to the credit spreads for our conventional fixed-rate debt.** — To determine the terms of the notes, we will use an internal funding rate that represents a discount from the credit spreads for our conventional fixed-rate debt. As a result, the terms of the notes are less favorable to you than if we had used a higher funding rate.

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**Certain costs are likely to adversely affect the value of the notes.** — Absent any changes in market conditions, any secondary market prices of the notes will likely be lower than the price to public. This is because any secondary market prices will likely take into account our then-current market credit spreads, and because any secondary market prices are likely to exclude all or a portion of the agent's commission and the hedging profits and estimated hedging costs that are included in the price to public of the notes and that may be reflected on your account statements. In addition, any such price is also likely to reflect a discount to account for costs associated with establishing or unwinding any related hedge transaction, such as dealer discounts, mark-ups and other transaction costs. As a result, the price, if any, at which BMOCM or any other party may be willing to purchase the notes from you in secondary market transactions, if at all, will likely be lower than the price to public. Any sale that you make prior to the maturity date could result in a substantial loss to you.

**You will not have any shareholder rights and will have no right to receive any shares of any company included in any Underlying Asset at maturity.** — Investing in your notes will not make you a holder of any shares of any company included in any Underlying Asset. Neither you nor any other holder or owner of the notes will have any voting rights, any right to receive dividends or other distributions or any other rights with respect to those securities.

**Changes that affect an Underlying Asset may adversely affect the market value of the notes and the amount you will receive at maturity.** — The policies of NASDAQ OMX Group, Inc. (“NASDAQ”), the sponsor of the NDX, and FTSE Russell, the sponsor of the RTY (each, an “Index Sponsor”), concerning the calculation of the applicable Underlying Asset, additions, deletions or substitutions of the components of the applicable Underlying Asset and the manner in which changes affecting those components, such as stock dividends, reorganizations or mergers, may be reflected in the applicable Underlying Asset and, therefore, could affect the level of the applicable Underlying Asset, the amount payable on the notes at maturity and the market value of the notes prior to maturity. The amount payable on the notes and their market value could also be affected if any Index Sponsor changes these policies, for example, by changing the manner in which it calculates the applicable Underlying Asset, or if any Index Sponsor discontinues or suspends the calculation or publication of the applicable Underlying Asset.

**We have no affiliation with any Index Sponsor and will not be responsible for any actions taken by any 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 over the actions of any Index Sponsor, including any actions of the type that would require the calculation agent to adjust the payment to you at maturity. 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.

**Lack of liquidity.** — The notes will not be listed on any securities exchange. BMOCM may offer to purchase the notes in the secondary market, but is not required to do so. Even if there is a secondary market, it may not provide enough liquidity to allow you to trade or sell the notes easily. Because other dealers are not likely to make a 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 BMOCM is willing to buy the notes.

**Hedging and trading activities.** — We or any of our affiliates may carry out hedging activities related to the notes, including purchasing or selling securities included in an Underlying Asset, or futures or options relating to an

Underlying Asset, or other derivative instruments with returns linked or related to changes in the performance of an Underlying Asset. We or our affiliates may also engage in trading relating to an Underlying Asset from time to time. Any of these hedging or trading activities on or prior to the Pricing Date and during the term of the notes could adversely affect our payment to you at maturity.

**Many economic and market factors will influence the value of the notes.** — In addition to the level of each Underlying Asset and interest rates on any trading day, the value of the notes will be affected by a number of economic and market factors that may either offset or magnify each other, and which are described in more detail in the product supplement.

**You must rely on your own evaluation of the merits of an investment linked to the Underlying Assets.** — In the ordinary course of their businesses, our affiliates from time to time may express views on expected movements in the levels of the Underlying Assets or the prices of the securities included in the Underlying Assets. One or more of our affiliates have published, and in the future may publish, research reports that express views on the Underlying Assets or these securities. However, these views are subject to change from time to time. Moreover, other professionals who deal in the markets relating to the Underlying Assets at any time may have significantly different views from those of our affiliates. You are encouraged to derive information concerning the Underlying Assets from multiple sources, and you should not rely on the views expressed by our affiliates.

Neither the offering of the notes nor any views which our affiliates from time to time may express in the ordinary course of their businesses constitutes a recommendation as to the merits of an investment in the notes.

**An investment in the notes 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 the RTY 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 generally 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 typically 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.

**An investment in the notes linked to the NASDAQ 100® Index is subject to risks associated with foreign securities markets.** — The NDX tracks the value of certain foreign equity securities. You should be aware that investments in securities linked to the value of foreign equity securities involve particular risks. The foreign securities markets comprising the NDX may have less liquidity and may be more volatile than U.S. or other securities markets and market developments may affect foreign markets differently from U.S. or other securities markets. Direct or indirect government intervention to stabilize these foreign securities markets, as well as cross-shareholdings in foreign companies, may affect trading prices and volumes in these markets. Also, there is generally less publicly available information about foreign companies than about those U.S. companies that are subject to the reporting requirements of the U.S. Securities and Exchange Commission, and foreign companies are subject to accounting, auditing and financial reporting standards and requirements that differ from those applicable to U.S. reporting companies.

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

**Significant aspects of the tax treatment of the notes are uncertain.** — The tax treatment of the notes is uncertain. We do not plan to request a ruling from the Internal Revenue Service or from any Canadian authorities regarding the tax treatment of the notes, and the Internal Revenue Service or a court may not agree with the tax treatment described



in this pricing supplement.

The Internal Revenue Service has released a notice that may affect the taxation of holders of “prepaid forward contracts” and similar instruments. According to the notice, the Internal Revenue Service and the U.S. Treasury are actively considering whether the holder of such instruments should be required to accrue ordinary income on a current basis. While it is not clear whether the notes would be viewed as similar to such instruments, it is possible that any future guidance could materially and adversely affect the tax consequences of an investment in the notes, possibly with retroactive effect.

Please read carefully the section entitled “Supplemental U.S. Federal Income Tax Considerations” in this pricing supplement, the section entitled “United States Federal Income Taxation” in the accompanying prospectus and the section entitled “Certain Income Tax Consequences” in the accompanying prospectus supplement. You should consult your tax advisor about your own tax situation.

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**Examples of the Hypothetical Payment at Maturity for a \$1,000 Investment in the Notes**

The following table illustrates the hypothetical payments on a note at maturity, assuming that the notes are not automatically called. The hypothetical payments are based on a \$1,000 investment in the note, a hypothetical Initial Level of 100.00 for each Underlying Asset, a hypothetical Trigger Level of 70.00 for each Underlying Asset (70.00% of its hypothetical Initial Level), a hypothetical Call Level of 100 for each Underlying Asset (100% of its hypothetical Initial Level), a range of hypothetical Final Levels of the Lesser Performing Underlying Asset and the effect on the payment at maturity if (i) a Trigger Event occurs with respect to **any** Underlying Asset or (ii) if a Trigger Event does not occur with respect to **each** Underlying Asset.

The hypothetical examples shown below are intended to help you understand the terms of the notes. If the notes are not automatically called, the actual cash amount that you will receive at maturity will depend upon whether the Closing Level of **any** Underlying Asset is below its Trigger Level on any trading day during the Monitoring Period and whether the Final Level of **any** Underlying Asset is below its Initial Level on the Valuation Date. If the notes are automatically called prior to maturity, the hypothetical examples below will not be relevant, and you will receive on the applicable Call Settlement Date, for each \$1,000 principal amount, the principal amount plus the applicable interest payment, if payable.

Your total return on the notes will also depend on the number of monthly periods in which interest is payable, as set forth above.

| <b>Hypothetical Final Level of the Lesser Performing Underlying Asset</b> | <b>Hypothetical Final Level of the Lesser Performing Underlying Asset Expressed as a Percentage of the Initial Level</b> | <b>Payment at Maturity (Excluding Any Conditional Interest Payment)</b>  |  |
|---|--|--|--|
|   |  | <b>(i) if the Closing Level of each Underlying Asset does not fall below its Trigger Level on any day during the Monitoring Period</b> | <b>(ii) if the Closing Level of any Underlying Asset falls below its Trigger Level on any day during the Monitoring Period</b> |
| 150.00  | 150.00%  | \$1,000.00   | \$1,000.00   |
| 125.00  | 125.00%  | \$1,000.00   | \$1,000.00   |
| 110.00  | 110.00%  | \$1,000.00   | \$1,000.00   |
| 100.00  | 100.00%  | \$1,000.00   | \$1,000.00   |
| 90.00   | 90.00%   | \$1,000.00   | \$900.00   |

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|       |        |            |          |
|-------|--------|------------|----------|
| 80.00 | 80.00% | \$1,000.00 | \$800.00 |
| 70.00 | 70.00% | \$1,000.00 | \$700.00 |
| 65.00 | 65.00% | N/A        | \$650.00 |
| 60.00 | 60.00% | N/A        | \$600.00 |
| 50.00 | 50.00% | N/A        | \$500.00 |
| 25.00 | 25.00% | N/A        | \$250.00 |
| 0.00  | 0.00%  | N/A        | \$0.00   |

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## Supplemental U.S. Federal Income Tax Considerations

*The following, together with the discussion of U.S. federal income taxation in the accompanying prospectus and prospectus supplement, is a general description of the material U.S. tax considerations relating to the notes. It does not purport to be a complete analysis of all tax considerations relating to the notes. Prospective purchasers of the notes should consult their tax advisors as to the consequences under the tax laws of the country of which they are resident for tax purposes and the tax laws of Canada and the U.S. of acquiring, holding and disposing of the notes and receiving payments under the notes. This summary is based upon the law as in effect on the date of this pricing supplement 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 with respect to United States holders (as defined in the accompanying prospectus). 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 apply to holders subject to special rules including holders subject to Section 451(b) of the Code. In addition, the discussion below assumes that an investor in the notes will be subject to a significant risk that it will lose a significant amount of its investment in the notes. Bank of Montreal intends to treat conditional interest payments with respect to the notes as U.S. source income for U.S. federal income tax purposes.

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 an Underlying Asset would be treated as a “passive foreign investment company” within the meaning of Section 1297 of the Code or a “U.S. real property holding corporation” within the meaning of Section 897 of the Code. If the issuer of any of the component stocks included in an Underlying Asset 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 by the component stocks included in the Underlying Assets and consult your tax advisor regarding the possible consequences to you in this regard.

In the opinion of our counsel, Morrison & Foerster LLP, it would generally be reasonable to treat a note with terms described in this pricing supplement as a pre-paid cash-settled contingent income-bearing derivative contract in respect of the Underlying Assets 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. Although the U.S. federal income tax treatment of the conditional interest payments is uncertain, we intend to take the position, and the following discussion assumes, that such conditional interest payments (including any interest payment on or with respect to the maturity date) constitute taxable ordinary income to a United States 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, it would be reasonable for a United States holder to take the position that it will recognize capital gain or loss upon the sale or maturity of the notes in an amount equal to the difference between the amount a United States holder receives at such time (other than amounts properly attributable to any interest payments, which would be treated, as described above, as ordinary income) and the United States holder's tax basis in the notes. In general, a United States 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 United States holder 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.

## **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 be possible to treat the notes, and the Internal Revenue Service might assert that the notes should be treated, as a single debt instrument. If the notes are so treated, a United States holder would generally be required to accrue interest currently over the term of the notes irrespective of the conditional interest payments, if any, paid on the notes. In addition, any gain a United States holder might recognize upon the sale or maturity of the notes would be ordinary income and any loss recognized by a holder at such time would be ordinary loss to the extent of interest that same holder included in income in the current or previous taxable years in respect of the notes, and thereafter, would be capital loss.

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.

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 Treasury Department are actively considering whether the holder of an instrument such as the notes should be required to accrue ordinary income on a current basis irrespective of any interest payments, and they sought taxpayer comments on the subject. It is not possible to determine what guidance they will ultimately issue, if any. It is possible, however, that under such guidance, holders of the notes will ultimately be required to accrue income currently and this could be applied on a retroactive basis. The Internal Revenue Service and the Treasury Department are also considering other relevant issues, including whether additional gain or loss from such instruments should be treated as ordinary or capital and whether the special “constructive ownership rules” of Section 1260 of the Code 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 pricing supplement unless and until such time as the Treasury Department and Internal Revenue Service determine that some other treatment is more appropriate.

## **Backup Withholding and Information Reporting**

Please see the discussion under “United States Federal Income Taxation—Other Considerations—Backup Withholding and Information Reporting” in the accompanying prospectus for a description of the applicability of the backup withholding and information reporting rules to payments made on your notes.

## **Non-United States Holders**

The following discussion applies to non-United States holders of the notes. A non-United States 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 conditional interest payments for U.S. federal income tax purposes) is uncertain, U.S. federal income tax at a 30% rate (or at a lower rate under an applicable income tax treaty) will be withheld in respect of the conditional interest payments paid to a non-United States holder unless such payments are effectively connected with the conduct by the non-United States holder of a trade or business in the U.S. (in which case, to avoid withholding, the non-United States 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-United States holder must obtain a taxpayer identification number and certify as to its eligibility under the appropriate treaty's limitations on benefits article, if applicable (which certification may generally be made on a Form W-8BEN or W-8BEN-E, or a substitute or successor form). In addition, special rules may apply to claims for treaty benefits made by corporate non-United States holders. A non-United States 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 conditional interest payments under U.S. federal income tax laws and whether such treaty rate or exemption applies to such payments. No assurance can be provided on the proper characterization of the conditional interest payments for U.S. federal income tax purposes and, accordingly, no assurance can be provided on the availability of benefits under any income tax treaty. Non-United States holders must consult their tax advisors in this regard.

Except as discussed below, a non-United States 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 interest which would be subject to the rules discussed in the previous paragraph) upon the sale or maturity of the notes, provided that (i) the holder complies with any applicable certification requirements (which certification may generally be made on a Form W-8BEN or W-8BEN-E, or a substitute or successor form), (ii) the payment is not effectively connected with the conduct by the holder of a U.S. trade or business, and (iii) if the holder is a non-resident alien individual, such holder is not present in the U.S. for 183 days or more during the taxable year of the 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 United States 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-United States holder may be subject to information reporting and to backup withholding unless the holder complies with applicable certification and identification requirements as to its foreign status.

A “dividend equivalent” payment is treated as a dividend from sources within the U.S. and such payments generally would be subject to a 30% U.S. withholding tax if paid to a non-United States 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, Internal Revenue Service guidance provides 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 Assets or the notes, and following such occurrence the notes could be treated as delta-one specified ELIs that are subject to withholding on dividend equivalent payments. Non-United States holders that enter, or have entered, into other transactions in respect of the Underlying Assets 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 paying agent) would be entitled to withhold taxes without being required to pay any additional amounts with respect to amounts so withheld.

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

## **Foreign Account Tax Compliance Act**



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

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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. Account holders subject to information reporting requirements pursuant to the Foreign Account Tax Compliance Act may include holders of the notes. Foreign financial institutions and non-financial foreign entities located in jurisdictions that have an intergovernmental agreement with the United States governing the Foreign Account Tax Compliance Act may be subject to different rules. Holders are urged to consult with their own tax advisors regarding the possible implications of this legislation on their investment in the notes.

### **Supplemental Plan of Distribution (Conflicts of Interest)**

BMOCM will purchase the notes from us at a purchase price reflecting the commission set forth on the cover page of this pricing supplement. BMOCM has informed us that, as part of its distribution of the notes, it will reoffer the notes to other dealers who will sell them. Each such dealer, or each additional dealer engaged by a dealer to whom BMOCM reoffers the notes, will receive a commission from BMOCM, which will not exceed the commission set forth on the cover page. This commission will include a selling concession paid by BMOCM or one of its affiliates to certain dealers of up to 1.60% of the principal amount in connection with the distribution of the notes.

Certain dealers who purchase the notes for sale to certain fee-based advisory accounts may forego some or all of their selling concessions, fees or commissions. The public offering price for investors purchasing the notes in these accounts may be less than 100% of the principal amount, as set forth on the cover page of this document. Investors that hold their notes in these accounts may be charged fees by the investment advisor or manager of that account based on the amount of assets held in those accounts, including the notes.

We will deliver the notes on a date that is greater than two business days following the pricing date. Under Rule 15c6-1 of the Securities Exchange Act of 1934, trades in the secondary market generally are required to settle in two business days, unless the parties to any such trade expressly agree otherwise. Accordingly, purchasers who wish to trade the notes more than two business days prior to the issue date will be required to specify alternative settlement arrangements to prevent a failed settlement.

We own, directly or indirectly, all of the outstanding equity securities of BMOCM, the agent for this offering. In accordance with FINRA Rule 5121, BMOCM may not make sales in this offering to any of its discretionary accounts without the prior written approval of the customer.

We reserve the right to withdraw, cancel or modify the offering of the notes and to reject orders in whole or in part. You may cancel any order for the notes prior to its acceptance.

You should not construe the offering of the notes as a recommendation of the merits of acquiring an investment linked to any Underlying Asset or as to the suitability of an investment in the notes.

BMOCM may, but is not obligated to, make a market in the notes. BMOCM will determine any secondary market prices that it is prepared to offer in its sole discretion.

We may use the final pricing supplement relating to the notes in the initial sale of the notes. In addition, BMOCM or another of our affiliates may use the final pricing supplement relating to the notes in market-making transactions in any notes after their initial sale. Unless BMOCM or we inform you otherwise in the confirmation of sale, the final pricing supplement is being used by BMOCM in a market-making transaction.

For a period of approximately three months following issuance of the notes, the price, if any, at which we or our affiliates would be willing to buy the notes from investors, and the value that BMOCM may also publish for the notes through one or more financial information vendors and which could be indicated for the notes on any brokerage account statements, will reflect a temporary upward adjustment from our estimated value of the notes that would otherwise be determined and applicable at that time. This temporary upward adjustment represents a portion of (a) the hedging profit that we or our affiliates expect to realize over the term of the notes and (b) the underwriting discount and the selling concessions paid in connection with this offering. The amount of this temporary upward adjustment will decline to zero on a straight-line basis over the three-month period.

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

The notes are not intended to be offered, sold or otherwise made available to, and should not be offered, sold or otherwise made available to, any retail investor in the EEA. For these purposes, the expression “offer” includes the communication in any form and by any means of sufficient information on the terms of the offer and the notes to be offered so as to enable an investor to decide to purchase or subscribe the notes, and a “retail investor” means a person who is one (or more) of: (a) a retail client, as defined in point (11) of Article 4(1) of Directive 2014/65/EU, as amended (“MiFID II”); or (b) a customer, within the meaning of Insurance Distribution Directive 2016/97/EU, as amended, where that customer would not qualify as a professional client as defined in point (10) of Article 4(1) of MiFID II; or (c) not a qualified investor as defined in the Prospectus Directive. Consequently, no key information document required by Regulation (EU) No 1286/2014, as amended (the “PRIIPs Regulation”), for offering or selling the notes or otherwise making them available to retail investors in the EEA has been prepared, and therefore, offering or selling the notes or otherwise making them available to any retail investor in the EEA may be unlawful under the PRIIPs Regulation.

### **Additional Information Relating to the Estimated Initial Value of the Notes**

Our estimated initial value of the notes on the date of this preliminary pricing supplement, and that will be set forth on the cover page of the final pricing supplement relating to the notes, equals the sum of the values of the following hypothetical components:

- a fixed-income debt component with the same tenor as the notes, valued using our internal funding rate for structured notes; and

- one or more derivative transactions relating to the economic terms of the notes.

The internal funding rate used in the determination of the initial estimated value generally represents a discount from the credit spreads for our conventional fixed-rate debt. The value of these derivative transactions are derived from our internal pricing models. These models are based on factors such as the traded market prices of comparable derivative instruments and on other inputs, which include volatility, dividend rates, interest rates and other factors. As a result, the estimated initial value of the notes on the Pricing Date will be determined based on market conditions at that time.

## **The Underlying Assets**

All disclosures contained in this pricing supplement regarding the Underlying Assets, including, without limitation, their make-up, method of calculation, and changes in their components and their historical closing values, have been derived from publicly available information prepared by the applicable sponsors. The information reflects the policies of, and is subject to change by, the sponsors. The sponsors own the copyrights and all rights to the Underlying Assets. The sponsors are under no obligation to continue to publish, and may discontinue publication of, the Underlying Assets. Neither we nor BMO Capital Markets Corp. accepts any responsibility for the calculation, maintenance or publication of any Underlying Asset or any successor.

We encourage you to review recent levels of the Underlying Assets prior to making an investment decision with respect to the notes.

### **NASDAQ 100® Index (“NDX”)**

The NASDAQ 100® Index (“NDX”) is a modified market capitalization-weighted index of 100 of the largest stocks of both U.S. and non-U.S. non-financial companies listed on The NASDAQ Stock Market based on market capitalization. It does not contain securities of financial companies, including investment companies. The NASDAQ 100® Index, which includes companies across a variety of major industry groups, was launched on January 31, 1985, with a base index value of 250.00. On January 1, 1994, the base index value was reset to 125.00. The NASDAQ OMX Group, Inc. publishes the NDX. Current information regarding the market value of the NDX is available from NASDAQ OMX Group, Inc. (“NASDAQ OMX”) as well as numerous market information services.

The share weights of the component securities of the NDX at any time are based upon the total shares outstanding in each of those securities and are additionally subject, in certain cases, to rebalancing. Accordingly, each underlying stock’s influence on the level of the NDX is directly proportional to the value of its share weight.

### **Index Calculation**

At any moment in time, the level of the NDX equals the aggregate value of the then-current share weights of each of the component securities, which are based on the total shares outstanding of each such component security, multiplied by each such security’s respective last sale price on The NASDAQ Stock Market (which may be the official closing price published by The NASDAQ Stock Market), and divided by a scaling factor (the “divisor”), which becomes the basis for the reported level of the NDX. The divisor serves the purpose of scaling such aggregate value to a lower

order of magnitude, which is more desirable for reporting purposes.

## **Underlying Stock Eligibility Criteria and Annual Ranking Review**

### Initial Eligibility Criteria

To be eligible for initial inclusion in the NDX, a security must be listed on The NASDAQ Stock Market and meet the following criteria:

the security's U.S. listing must be exclusively on the NASDAQ Global Select Market or the NASDAQ Global Market;

the security must be issued by a non-financial company;

the security may not be issued by an issuer currently in bankruptcy proceedings;

the security must generally be a common stock, ordinary share, American Depositary Receipt, or tracking stock (closed-end funds, convertible debentures, exchange traded funds, limited liability companies, limited partnership interests, preferred stocks, rights, shares or units of beneficial interests, warrants, units and other derivative securities are not included in the NDX, nor are the securities of investment companies);

the security must have a three-month average daily trading volume of at least 200,000 shares;

if the security is issued by an issuer organized under the laws of a jurisdiction outside the United States, it must have listed options on a recognized market in the United States or be eligible for listed-options trading on a recognized options market in the United States;

the issuer of the security may not have entered into a definitive agreement or other arrangement which would likely result in the security no longer being eligible;

the issuer of the security may not have annual financial statements with an audit opinion that is currently withdrawn;  
and

the issuer of the security must have “seasoned” on the NASDAQ Stock Market or another recognized market (generally, a company is considered to be seasoned if it has been listed on a market for at least three full months, excluding the first month of initial listing).

#### Continued Eligibility Criteria

In addition, to be eligible for continued inclusion in the NDX the following criteria apply:

the security’s U.S. listing must be exclusively on the NASDAQ Global Select Market or the NASDAQ Global Market;

the security must be issued by a non-financial company;

the security may not be issued by an issuer currently in bankruptcy proceedings;

the security must have an average daily trading volume of at least 200,000 shares in the previous three-month trading period as measured annually during the ranking review process described below;

if the issuer of the security is organized under the laws of a jurisdiction outside the United States, then such security must have listed options on a recognized market in the United States or be eligible for listed-options trading on a recognized options market in the United States, as measured annually during the ranking review process;

the issuer of the security may not have entered into a definitive agreement or other arrangement that would likely result in the security no longer being eligible;

the security must have an adjusted market capitalization equal to or exceeding 0.10% of the aggregate adjusted market capitalization of the NDX at each month-end. In the event that a company does not meet this criterion for two consecutive month-ends, it will be removed from the NDX effective after the close of trading on the third Friday of the following month; and

the issuer of the security may not have annual financial statements with an audit opinion that is currently withdrawn.

These eligibility criteria may be revised from time to time by NASDAQ OMX without regard to the notes.

### **Annual Ranking Review**

The component securities are evaluated on an annual basis (the “Ranking Review”), except under extraordinary circumstances, which may result in an interim evaluation, as follows. Securities that meet the applicable eligibility criteria are ranked by market value. eligible securities that are already in the NDX and that are ranked in the top 100 eligible securities (based on market capitalization) are retained in the NDX. A security that is ranked 101 to 125 is also retained, provided that such security was ranked in the top 100 eligible securities as of the previous Ranking Review or was added to the NDX subsequent to the previous Ranking Review. Securities not meeting such criteria are replaced. The replacement securities chosen are those eligible securities not currently in the NDX that have the largest market capitalization. The data used in the ranking includes end of October market data and is updated for total shares outstanding submitted in a publicly filed SEC document via EDGAR through the end of November.

Replacements are made effective after the close of trading on the third Friday in December. Moreover, if at any time during the year other than the Ranking Review, a component security is determined by NASDAQ OMX to become ineligible for continued inclusion in the NDX, the security will be replaced with the largest market capitalization security meeting the eligibility criteria listed above and not currently included in the NDX.

### **Index Maintenance**

In addition to the Ranking Review, the securities in the NDX are monitored every day by NASDAQ OMX with respect to changes in total shares outstanding arising from corporate events, such as stock dividends, stock splits and certain spin-offs and rights issuances. NASDAQ OMX has adopted the following quarterly scheduled weight adjustment procedures with respect to those changes. If the change in total shares outstanding arising from a corporate action is greater than or equal to 10%, that change will be made to the NDX as soon as practical, normally within ten days of such corporate action. Otherwise, if the change in total shares outstanding is less than 10%, then all such changes are accumulated and made effective at one time on a quarterly basis after the close of trading on the third Friday in each of March, June, September and December.



In either case, the share weights for those component securities are adjusted by the same percentage amount by which the total shares outstanding have changed in those securities. Ordinarily, whenever there is a change in the share weights, a change in a component security, or a change to the price of a component security due to spin-off, rights issuances or special cash dividends, NASDAQ OMX adjusts the divisor to ensure that there is no discontinuity in the level of the NDX that might otherwise be caused by any of those changes. All changes will be announced in advance.

## **Index Rebalancing**

Under the methodology employed, on a quarterly basis coinciding with NASDAQ OMX's quarterly scheduled weight adjustment procedures, the component securities are categorized as either "Large Stocks" or "Small Stocks" depending on whether their current percentage weights (after taking into account scheduled weight adjustments due to stock repurchases, secondary offerings or other corporate actions) are greater than, or less than or equal to, the average percentage weight in the NDX (i.e., as a 100-stock index, the average percentage weight in the NDX is 1%).

This quarterly examination will result in an index rebalancing if it is determined that: (1) the current weight of the single largest market capitalization component security is greater than 24% or (2) the "collective weight" of those component securities, the individual current weights of which are in excess of 4.5%, when added together, exceed 48%. In addition, NASDAQ OMX may conduct a special rebalancing at any time if it is determined to be necessary to maintain the integrity of the NDX.

If either one or both of these weight distribution requirements are met upon quarterly review, or NASDAQ OMX determines that a special rebalancing is required, a weight rebalancing will be performed. First, relating to weight distribution requirement (1) above, if the current weight of the single largest component security exceeds 24%, then the weights of all Large Stocks will be scaled down proportionately towards 1% by enough of an amount for the adjusted weight of the single largest component security to be set to 20%. Second, relating to weight distribution requirement (2) above, for those component securities whose individual current weights or adjusted weights in accordance with the preceding step are in excess of 4.5%, if their "collective weight" exceeds 48%, then the weights of all Large Stocks will be scaled down proportionately towards 1% by just enough amount for the "collective weight," so adjusted, to be set to 40%.

The aggregate weight reduction among the Large Stocks resulting from either or both of the above rescalings will then be redistributed to the Small Stocks in the following iterative manner. In the first iteration, the weight of the largest Small Stock will be scaled upwards by a factor which sets it equal to the average Index weight of 1.0%. The weights of each of the smaller remaining Small Stocks will be scaled up by the same factor, reduced in relation to each stock's relative ranking among the Small Stocks, such that the smaller the component security in the ranking, the less the scale-up of its weight. This is intended to reduce the market impact of the weight rebalancing on the smallest component securities in the NDX.

In the second iteration, the weight of the second largest Small Stock, already adjusted in the first iteration, will be scaled upwards by a factor which sets it equal to the average index weight of 1%. The weights of each of the smaller remaining Small Stocks will be scaled up by this same factor, reduced in relation to each stock's relative ranking among the Small Stocks, such that, once again, the smaller the component stock in the ranking, the less the scale-up of its weight.

Additional iterations will be performed until the accumulated increase in weight among the Small Stocks exactly equals the aggregate weight reduction among the Large Stocks from rebalancing in accordance with weight distribution requirement (1) and/or weight distribution requirement (2).

Then, to complete the rebalancing procedure, once the final percent weights of each of the component securities are set, the share weights will be determined anew based upon the last sale prices and aggregate capitalization of the NDX at the close of trading on the last day in February, May, August and November. Changes to the share weights will be made effective after the close of trading on the third Friday in March, June, September and December, and an adjustment to the divisor will be made to ensure continuity of the NDX.

Ordinarily, new rebalanced weights will be determined by applying the above procedures to the current share weights. However, NASDAQ OMX may from time to time determine rebalanced weights, if necessary, by instead applying the above procedure to the actual current market capitalization of the component securities. In those instances, NASDAQ OMX would announce the different basis for rebalancing prior to its implementation.

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## **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 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. The RTY is determined, comprised, and calculated by FTSE Russell without regard to the notes.

## **Selection of Stocks Comprising the RTY**

All companies eligible for inclusion in the RTY must be classified as a U.S. company under FTSE Russell’s country-assignment methodology. If a company is incorporated, has a stated headquarters location, and trades on a standard exchange 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, FTSE Russell 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, FTSE Russell 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, FTSE Russell will use the primary location of the company’s revenue for the same cross-comparison and assigns the company to the appropriate country in a similar fashion. FTSE Russell 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, FTSE Russell will assign the company to the country in which its headquarters are located unless the country is a Benefit Driven Incorporation “BDI” country. If the country in which its headquarters are located is a BDI, it 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 “rank day” in May of each year (timetable is announced each spring) 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. FTSE Russell adds initial public offerings (IPOs) each quarter to ensure that new additions to the institutional investing

opportunity set are reflected in representative indexes. A stock added during the quarterly IPO process is considered a new index addition, and therefore must have a closing price on its primary exchange at or above \$1.00 on the last day of the eligibility period in order to qualify for index inclusion. If an existing index member does not trade on the rank day, it must price at \$1.00 or above on another eligible U.S. exchange to remain eligible.

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, are not eligible), blank check companies, special-purpose acquisition companies, exchange traded funds, mutual funds and limited partnerships are ineligible for inclusion. Preferred and convertible preferred stock, redeemable shares, participating preferred stock, warrants, rights, installment receipts and trust receipts are not eligible for inclusion in the RTY.

Annual reconstitution is a process by which the RTY is completely rebuilt. On the rank day of July, all eligible securities are ranked by their total market capitalization. The largest 4,000 become the Russell 3000E Index, and the other FTSE Russell 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, FTSE Russell adds initial public offerings to the RTY on a quarterly basis based on total market capitalization 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.

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