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CIRCULAR
May 23, 2013

REQUEST FOR COMMENTS

MODIFICATION TO THE 30-DAY OVERNIGHT REPO RATE FUTURES CONTRACT (ONX) SPECIFICATIONS

METHODOLOGY USED TO CALCULATE THE FINAL SETTLEMENT PRICE

The Rules and Policies Committee of Bourse de Montréal Inc. (the **Bourse**) has approved amendments to the 30-Day Overnight Repo Rate Futures contract (ONX) in regard to the methodology used to calculate the final settlement price of the ONX futures contract. The Bourse proposes to change the calculation methodology of the ONX from a simple arithmetic average to a geometric average so as to be more in line with the OTC market and to facilitate a cleaner hedge for participants taking on OIS positions.

Comments on the proposed amendments must be submitted within 30 days following the date of publication of this notice, at the latest on **June 25, 2013**. Please submit your comments to:

M[e] Pauline Ascoli
Vice-President, Legal Affairs, Derivatives
Bourse de Montréal Inc.
Tour de la Bourse
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Montréal, Québec H4Z 1A9
E-mail: **legal@m-x.ca**

A copy of these comments shall also be forwarded to the *Autorité des marchés financiers* (the **Autorité**) to:

M[e] Anne-Marie Beaudoin
Corporate Secretary
Autorité des marchés financiers
800 Victoria Square, 22nd Floor
P.O. Box 246, Tour de la Bourse
Montréal (Québec) H4Z 1G3
E-mail: consultation-en-cours@lautorite.qc.ca

Circular no.: 098-2013

Appendices

For your information, you will find in the appendices an analysis of the proposed amendments as well as the amended ONX contract specifications. The implementation date of the proposed amendments will be determined by the Bourse, in accordance with the self-certification process as determined by the *Derivatives Act* (R.S.Q., chapter I-14.01).

Process for Changes to the Rules

The Bourse is authorized to carry on business as an exchange and is recognized as a self-regulatory organization (SRO) by the Autorité. The Board of Directors of the Bourse has delegated to the Rules and Policies Committee of the Bourse its powers to approve and amend the Rules and Procedures. The Rules of the Bourse are submitted to the Autorité in accordance to the self-certification process as determined by the *Derivatives Act* (R.S.Q., chapter I-14.01).

MODIFICATION TO THE 30-DAY OVERNIGHT REPO RATE FUTURES CONTRACT (ONX) SPECIFICATIONS

I. OVERVIEW

Bourse de Montréal Inc. (the Bourse) hereby proposes to modify the contract specifications in regard to the 30-Day Overnight Repo Rate Futures contract (ONX) with respect to the methodology used to calculate the final settlement price of the ONX futures contract.

II. ANALYSIS

Description and Analysis of Impacts

At the present time, the ONX contract specifications stipulate that it is cash settled by the use of a simple arithmetic average of the daily overnight repo rate for the contract month. For a simple arithmetic average, the sum of the daily overnight repo rates for the contract month is divided by the number of days in the month. In mathematical terms, the calculation of a simple arithmetic average is expressed as follows:

$$A := \frac{1}{n}\sum_{i=1}^{n} a_i$$

Where:

A = average (or arithmetic mean)
n = the number of terms (e.g. number of rates)
$\mathbf{a_i}$ **=** the value of each individual item (e.g. each daily rate)

This methodology is quite useful in calculating averages on data sets where the individual observations are independent of one another. In the case of student test scores, for example, wherein the score of a given student has no bearing on the score of the next student, an arithmetic average can be calculated that will yield an average that is representative of the data set observations.

Unfortunately, this methodology is not very effective in calculating a truly representative average of data sets where the individual observations are not independent of one another, as is generally the case with financial data sets.

With financial data sets, geometric averages are a more appropriate measure than simple arithmetic averages. With geometric averages the compounding effect is taken into account. In other words, while simple arithmetic averages yield the average value of a data set, geometric averages allow for the incorporation of the impact of the average growth rate on those numbers, where there exists a variable in the rate of growth over a period of time. This means that percentage changes from one day to another are accounted for in the calculation, as opposed to just the observations in the data set themselves (as is the case with simple arithmetic averages).

In mathematical terms, the calculation of a geometric average is expressed as follows:

$$G = \sqrt[n]{x_1 x_2 \cdots x_n},$$

Where:

G = Geometric Mean
n = the number of terms
$\mathbf{x_n}$= the value of each individual item (e.g. each daily rate)

The Underlying Reference Rate of the ONX

The reference rate for the ONX futures contract is the daily Canadian Overnight Repo Rate Average (CORRA). More specifically, it is the weighted average rate of overnight collateralised repo trades that occur on the screens of inter-dealer brokers on a specific day, as reported by the Bank of Canada. With CORRA, the rate of return on capital on any given day has a direct bearing on the amount of capital that is invested on the following day, and thus it affects the quotes inter-dealer brokers will post the following day. Thus, arithmetic averages do not take into account the increase and decrease in the rates of return, or the compounding of rates from one day to another, as described above.

In Canada, the over-the-counter (OTC) market already uses the CORRA rate compounded daily (geometric average) to price overnight index swaps. Hence, changing the calculation methodology of the ONX contract from simple arithmetic average to geometric average will reflect the practice of the OTC market to use the CORRA rate compounded daily.

The proposed change in the calculation methodology of the ONX from a simple arithmetic average to a geometric average will provide participants with a more precise hedge of the interest rate risk faced when a participant enters into an overnight index swap transaction on the OTC market. Furthermore, as thirty days is a very common life span for an overnight index swap transaction on the OTC market, the ONX contract would serve as an excellent hedge for the risk assumed through such transactions. As such, if the prices quoted on ONX were to offer an accurate representation of CORRA, which can be achieved by using a geometric average, participants in the OTC market would be encouraged to execute transactions on exchange by

means of this listed contract. This would be consistent with G-20 commitments to mitigate counterparty risk through mandatory clearing and also to encourage trading on listed products in an effort to improve price discovery and transparency as per recent regulatory and risk management reforms set forth in the US *Dodd-Frank Wall Street Reform and Consumer Protection Act*, the *Markets in Financial Instruments Directive* (*MiFID*) and the *Markets in Financial Instruments Directive Regulation* (*MiFIR*) as well as in the *European Market Infrastructure Regulation* (*EMIR*).

Therefore, the Bourse proposes to change the methodology used to calculate the final settlement price for the ONX contract from an arithmetic average to a geometric average. *(Refer to Appendix B for the calculation methodology of the final settlement price of the ONX contract)*

Drafting Process

While the drafting process was driven by the need to harmonise the final settlement methodology for ONX with that of the Overnight Index Swap (OIS) market, the original request for this change in methodology came from a client request.

Impacts on Technological Systems

The proposed changes should have no impact on the technological systems of the Bourse, the Bourse's approved participants or of any other market participants.

Benchmarking

30-Day OIS Futures Contracts		
Exchange	**Contract**	**Final Settlement Method**
CME	30-Day Fed Funds Futures	Cash settlement: 100 minus the (arithmetic) average daily Fed Funds overnight rate for the delivery month.
Euronext	EONIA Futures	Cash settlement: 100 minus the geometric average of the EONIA rate for the delivery month.
SFE	30-Day Interbank Cash Rate Futures	Cash Settlement: 100 minus the monthly (arithmetic) average of the Interbank Overnight Cash Rate for that contract month.

III. SUMMARY OF THE PROPOSED AMENDMENTS TO THE RULES OF THE BOURSE

The Bourse proposes to amend the contract specifications for the 30-Day Overnight Repo Rate Futures contract (ONX) to specify that settlement values will be based on a geometric average of the daily overnight repo rate for the contract month.

IV. OBJECTIVE OF THE PROPOSED AMENDMENTS TO THE RULES OF THE BOURSE

The objective of the proposed amendment is to change the methodology for calculating settlement prices on ONX so as to be more in line with the OTC market in order to facilitate a cleaner hedge for participants taking on OIS positions. The end goal is to further liquidity and stimulate trading activity on the ONX contract.

V. PUBLIC INTEREST

The proposed amendments will benefit participants in the OIS market by facilitating a cleaner hedge than is currently available to them through a listed contract. In fact the impetus for this change in methodology was a request from a market participant. By encouraging participants in the OTC market to execute their transactions on exchange, the entire Canadian derivatives market will benefit through enhanced transparency and greater liquidity.

VI. PROCESS

The proposed amendment will be presented for approval to the Rules and Policies Committee of the Bourse at the next meeting of the Committee on May 9, 2013, and will be transmitted to *the Autorité des marchés financiers* (AMF) as well in accordance with the self-certification process. These modifications will also be transmitted to the Ontario Securities Commission (OSC) for information.

VII. REFERENCES

The Bank of Canada
http://www.bankofcanada.ca/rates/interest-rates/money-market-yields/

CME Group
http://www.cmegroup.com/trading/interest-rates/stir/30-day-federal-fund_contract_specifications.html

NYSE Euronext
https://globalderivatives.nyx.com/stirs/nyse-liffe/eonia

ASX
http://www.sfe.com.au/content/aboutsfe/brochures/013_cashrate.pdf

VIII. ATTACHED DOCUMENTS

- Revised contract specifications for the 30-Day Overnight Repo Rate Futures contract (ONX)

- The Bank of Canada
  Christopher Reid, *The Canadian Overnight Market: Recent Evolution and Structural Changes*
  http://www.bankofcanada.ca/wp-content/uploads/2010/06/reid.pdf

APPENDIX A

In finance, returns are not considered to be independent of each other. An accurate average of return over a specific period needs to be calculated with a geometric average so as to take the effect of compounding into account.

Here is an example of the effect of compounding on a $10,000 investment.

	Return	Portfolio
		$10,000
Year 1	50%	$15,000
Year 2	-50%	$7,500

Arithmetic average return	0.00%
Geometric average return	-13.40%

In the above scenario, the arithmetic average return comes out to 0%, but the overall return comes out to -25%. The geometric average gives the most accurate measure, with an average return of -13,40% per year.

Here is an example of the discrepancy between an arithmetic average and a geometric average, using historical CORRA rates for the month of December 2012; this is for information purposes only:

Dates	***CORRA rates***
Dec 3, 2012	1.1084%
Dec 4, 2012	1.0293%
Dec 5, 2012	1.0046%
Dec 6, 2012	1.0010%
Dec 7, 2012	1.0176%
Dec 10, 2012	1.0205%
Dec 11, 2012	1.0127%
Dec 12, 2012	0.9893%
Dec 13, 2012	1.0013%
Dec 14, 2012	1.0051%
Dec 17, 2012	0.9974%
Dec 18, 2012	0.9985%
Dec 19, 2012	1.0049%
Dec 20, 2012	1.0037%
Dec 21, 2012	1.0059%
Dec 24, 2012	0.9791%
Dec 27, 2012	0.9890%
Dec 28, 2012	0.9767%
Dec 31, 2012	0.9861%
Arithmetic average	1.0069%
Geometric average	1.0065%

APPENDIX B

Final Settlement Price Calculation

ONX contracts are quoted on an index basis and the final settlement price is calculated as:

100 – R

With a geometric average methodology, R will be determined by means of the following formula:

$$R = \left[\prod_{i=1}^{d_o}\left(1+\frac{ORR_i \times n_i}{365}\right)-1\right]\times\frac{365}{d}\times 100$$

Where R = the compounded daily overnight repo rate (CORRA) for the contract month.

d_o = the number of Business Days in the calculation period.

i = is a series of whole numbers from one to d_o, each representing the relevant Business Day in chronological order from, and including, the first Business Day in the relevant Calculation Period.

ORR_i = the overnight repo rate (CORRA) on the i^{th} day of the calculation period (if the i^{th} day is not a business day, the previous available CORRA is used).

n_i = the number of calendar days in the relevant Calculation Period on which the rate is.

d = the number of calendar days in the relevant Calculation Period.

Specifications

ONX – 30-Day Overnight Repo Rate Futures

Trading Unit	Each contract shall be for a nominal value of C$5,000,000.
Contract Months	March, June, September and December plus three nearest non-quarterly months (serials).
Price Quotation	Index: 100 minus the compounded dailymonthly average overnight repo rate for the contract month.
Last Day of Trading	Last business day of the contract month.
Contract Type	Cash settlement.
Minimum Price Fluctuation	0.005 = C$20.55 (one half of 1/100 of one percent of C$5,000,000 on a 30-day basis).
Reporting Limit	300 contracts.
Position Limits	Information on position limits can be obtained from the Exchange as they are subject to periodical changes.
Final Settlement Price	The contract is cash settled against the monthly average of the daily overnight repo rate for the contract month. The final settlement price shall be determined by the Bourse and shall be equal to 100 minus the compounded daily overnight repo rate (CORRA), expressed in terms of an overnight repo rate index and calculated over the period of the contract month that begins on the first calendar day of the contract month and ends on the last calendar day of the contract month. The daily overnight repo rate (CORRA) is calculated and reported by the Bank of Canada. The monthly average is a simple arithmetic average corresponding to the sum of the daily overnight repo rates divided by the number of calendar days in the month. Weekend and holiday rates are considered to be the rate applicable on the previous business day for which a rate was reported. For example, Friday's rate is used for Saturday and Sunday rates. The final settlement price is determined on the first business day following the last day of trading.
Minimum Margin Requirements	Information on minimum margin requirements can be obtained from the Exchange as they are subject to periodical changes.
Daily Price Limits	None
Trading Hours (Montréal time)	Early session: 6:00 a.m. to 7:45 a.m. Regular session: 8:00 a.m. to 3:00 p.m. Extended session*: 3:09 p.m. to 4:00 p.m. * There is no extended session on the last trading day of the expiring contract month. Note: During early closing days, the regular session closes at 1:00 p.m., time at which the daily settlement price is established. In those circumstances, the extended session is from 1:09 p.m. to 1:30 p.m.

Clearing Corporation	Canadian Derivatives Clearing Corporation (CDCC).
Ticker Symbol	ONX.