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Section 1

Introduction

1.0 Introduction

1.1 The FTSE Canada Treasury Bill Index Series

1.1.1 The FTSE Canada Treasury Bill index series consists of benchmarks to track the performance of Government of Canada Treasury Bills, with separate indexes for 1-month, 2-month, 3-month, 6-month, and 1-year T-Bills. Each index is designed to reflect the performance of a portfolio that only owns a single security, the current on the run T-Bill for the relevant term, switching into the new T-Bill at each auction.

1.1.2 The index series consist of the following indexes:
- FTSE Canada 30 Day T-Bill Index
- FTSE Canada 60 Day T-Bill Index
- FTSE Canada 91 Day T-Bill Index
- FTSE Canada 182 Day T-Bill Index
- FTSE Canada 365 Day T-Bill Index

1.2 IOSCO

1.2.1 FTSE International Limited (FTSE) considers that the FTSE Canada Treasury Bill Index Series meets the IOSCO Principles for Financial Benchmarks as published in July 2013.

Full details can be accessed at www.iosco.org.

Details of FTSE Russell’s Statement of Compliance with respect to the IOSCO Principles can be accessed using the following link: IOSCO Statement of Compliance.

1.3 FTSE hereby notifies users of the index series that it is possible that circumstances, including external events beyond the control of FTSE, may necessitate changes to, or the cessation of, the index series and therefore, any financial contracts or other financial instruments that reference the index series or investment funds which use the index series to measure their performance should be able to withstand, or otherwise address the possibility of changes to, or cessation of, the index series.

1.4 Index users who choose to follow this index or to buy products that claim to follow this index should assess the merits of the index’s rules-based methodology and take independent investment advice before investing their own or client funds. No liability whether as a result of negligence or otherwise is accepted by FTSE nor its subsidiary undertakings (or any person concerned with the preparation or
publication of these Ground Rules) for any losses, damages, claims and expenses suffered by any person as a result of:

- any reliance on these Ground Rules, and/or
- any errors or inaccuracies in these Ground Rules, and/or
- any non-application or misapplication of the policies or procedures described in these Ground Rules, and/or
- any errors or inaccuracies in the compilation of the Index or any constituent data.

1.5 These Ground Rules

1.5.1 This document sets out the Ground Rules for the construction and management of the FTSE Canada Treasury Bill Index Series.

1.6 FTSE Russell


1.7 Capital Index (also known as the Price Index)

1.7.1 The capital index is calculated every business day. The index returns are adjusted during the auction period to reflect the performance of a T-Bill fund manager under the methodology that will be discussed in the Appendix A.

1.8 The base currency of the benchmark is Canadian Dollars (CAD).
Section 2

Management Responsibilities

2.0 Management Responsibilities

2.1 FTSE International Limited (FTSE)

2.1.1 FTSE is the benchmark administrator of the index series.¹

2.1.2 FTSE is responsible for the daily calculation, production and operation of the FTSE Canada Universe Bond Index Series and will:

- maintain records of all the constituents;
- be responsible for the addition and deletion of bonds and changes of nominal amounts, in accordance with the Ground Rules.

2.1.3 These Ground Rules set out the methodology and provide information about the publication of the FTSE Canada Treasury Bill Index Series.

2.2 FTSE Canada Fixed Income Advisory Committee

2.2.1 The FTSE Canada Fixed Income Advisory Committee is established by FTSE Russell.

2.2.2 The purpose of the Committee is to provide a forum for FTSE Russell to interact with index users and other stakeholders with a view to enhancing the underlying methodologies of FTSE Russell indexes.

2.2.3 The Terms of Reference of the FTSE Canada Fixed Income Advisory Committee are set out on the FTSE Russell website and can be accessed using the following link: FTSE_Canada_Fixed_Income_Advisory_Committee.pdf

2.3 Amendments to these Ground Rules

2.3.1 These Ground Rules shall be subject to regular review (at least once a year) by FTSE Russell to ensure that they continue to best reflect the aims of the index series. Any proposals for significant amendments to these Ground Rules will be subject to consultation with FTSE Russell advisory committees and other stakeholders if appropriate. The feedback from these consultations will be considered by the FTSE Russell Product Governance Board before approval is granted.

¹ The term administrator is used in this document in the same sense as it is defined in Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds (the European Benchmark Regulation).
2.3.2 As provided for in the Statement of Principles for FTSE Fixed Income Indexes, where FTSE Russell determines that the Ground Rules are silent or do not specifically and unambiguously apply to the subject matter of any decision, any decision shall be based as far as practical on the Statement of Principles. After making any such determination, FTSE Russell shall advise the market of its decision at the earliest opportunity. Any such treatment will not be considered as an exception or change to the Ground Rules, or to set a precedent for future action, but FTSE Russell will consider whether the Rules should subsequently be updated to provide greater clarity.
Section 3

FTSE Russell Index Policies

3.0 FTSE Russell Index Policies

These Ground Rules should be read in conjunction with the following policy documents which can be accessed using the links below:

3.1 Queries and Complaints

FTSE Russell's complaints procedure can be accessed using the following link:

Benchmark_Determination_Complaints_Handling_Policy.pdf

3.2 Statement of Principles for FTSE Fixed Income Indexes (the Statement of Principles)

Indexes need to keep abreast of changing markets and the Ground Rules cannot anticipate every eventuality. Where the Ground Rules do not fully cover a specific event or development, FTSE Russell will determine the appropriate treatment by reference to the Statement of Principles for FTSE Fixed Income Indexes which summarises the ethos underlying FTSE Russell's approach to index construction. The Statement of Principles is reviewed annually and any changes proposed by FTSE Russell are presented to the FTSE Russell Policy Advisory Board for discussion before approval by the FTSE Russell Product Governance Board.

The Statement of Principles for Fixed Income Indexes can be accessed using the following link:

3.3 Price Sources

3.3.1 For further information, please see the FTSE Canada Multi Dealer Pricing Methodology Guide which can be accessed using the following link:

FTSE_Canada_Multi_Dealer_Pricing_Methodology_Guide.pdf

3.4 Recalculation Policy and Guidelines

The Recalculation Policy and Guidelines for Fixed Income Indexes document is available from the FTSE Russell website using the link below or by contacting info@ftserussell.com.

Fixed_Income_Recalculation_Policy_and_Guidelines.pdf

3.5 Policy for Benchmark Methodology Changes

3.5.1 Details of FTSE Russell's policy for making benchmark methodology changes can be accessed using the following link:

Policy_for_Benchmark_Methodology_Changes.pdf
Section 4

Index Methodology

4.0 Index Methodology

Each T-Bill index is assumed to always own the current on the run T-Bill for the relevant term to maturity. Based on current auction schedules, the three-month index rolls over the current T-Bill every two weeks, when a new 3-month T-Bill is auctioned. The six and one-year indexes roll over the current T-Bill every four weeks (every second 6-month and 1-year auction is a re-opening of the current T-Bill, and hence has no impact on the T-Bill index). The 1 and 2-month T-Bills are treated differently because there are no auctions, though they also roll over every two weeks.

4.1 Rolling of the 3-month, 6-month and 1-year T-Bill Indexes

The index sells the old T-Bill just prior to the auction bid deadline of 12:30 on Tuesday, for settlement on Thursday at the trading desk’s bid side. The index buys the new T-Bill at the average auction yield, which is known at 12:45 pm on the day of the auction, for settlement on Thursday.

The index uses the full proceeds from the sale of the old Bill for Thursday settlement to purchase the new T-Bill for Thursday settlement. There are thus no cash flows in or out of the index due to the switch to the new security. The index recognizes capital gains or losses on the new T-Bill between the time of the auction and the close of business on the day of the auction. It continues to recognize capital gains and losses on the new T-Bill up to and including the auction settlement date, which in most cases will be Thursday given a Tuesday auction. The index does not recognize any income on the new T-Bill prior to settlement.

The index recognizes income accrual on the old T-Bill between the time it is sold on the day of the auction, and the auction settlement date (typically from Tuesday to Thursday). However, the index no longer recognizes capital gains or losses on the old T-Bill once it is sold on the day of the auction.

4.2 Rolling of the 1-month and 2-month T-Bill Indexes

There are no auctions for one and two-month T-Bills. Market convention is to switch to new one and two month benchmarks at the same time as the 3-month T-Bill auction settles. The index is therefore assumed to sell the old one (or two) month T-Bill on the auction settlement date (i.e. Thursday) for same day settlement, and to buy the new one (or two) month T-Bill for same day settlement.

4.3 In order to be eligible for the indexes bonds must have a price assigned from a price source as specified in Section 5 of these Ground Rules.
Section 5

Price Sources

5.0 Price Sources

The securities are priced using inputs from leading fixed income broker / dealers in Canada at 4:00pm Eastern Time. The single quote per issue (Multi Dealer quote) is devised using proprietary filters that first remove any severe outliers, followed by a Standard Deviation Mean calculation. This Multi Dealer data best represents the marketplace by removing the ability of any one dealer to have undue influence upon the final calculated price / yield.

For more information, please see the FTSE Canada Multi-Dealer Pricing Methodology Guide which can be accessed using the following link:

FTSE_Canada_Multi_Dealer_Pricing_Methodology_Guide.pdf
Section 6

Periodic Changes to the Index

6.0 Periodic Changes to the Index

6.1 Rebalancing the Indexes

6.1.1 Each of the FTSE Canada Treasury Bill Index Series is assumed to always own the current on the run T-Bill for the relevant term to maturity. The index is rolled over based on the auction schedules, which is shown in the following table.

<table>
<thead>
<tr>
<th></th>
<th>1-month and 2-month T-Bill Indexes</th>
<th>3-month T-Bill Index</th>
<th>6-month and 1-year T-Bill Indexes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rolling frequency</td>
<td>every two weeks</td>
<td>every two weeks</td>
<td>every four weeks</td>
</tr>
</tbody>
</table>
Appendix A: Index Calculations

The following formulas are used to calculate total return indexes for 3-month, 6-month, and 1-year T-Bills during standard auction periods, when the auction occurs on a Tuesday and settles on Thursday.\footnote{There are times when the auction may not be held on Tuesday, and settlement may not be on Thursday, such as a holiday-shortened week like the first week of January. The subscripts Tues and Thurs have been used to make the notation easier to read, but should be understood in more general terms as the auction date and the auction settlement date, respectively.} Because the index consists of a single security, we do not need to follow the usual practice of including the par holdings in the index formulas, since they would just cancel out of the equations. We can therefore assume par holdings to $1 without affecting the resulting index return calculation. During auction periods the amount of the new T-Bill that is bought can be expressed in terms of the old security and the relative prices of the two securities, so again we can simply assume $1 par holding of the old T-Bill.

1. **Index calculations for days except auction period:**

   \[ I_t = I_{t-1} \times \frac{P_{t,t}}{P_{t-1,t-1}} \] \[ \text{[1]} \]

   where \( I_t \) is the total return index level at the close on day \( t \), and \( P_{i,j} \) is the mark-to-market price given the yield known at time \( i \), for settlement on day \( j \). In most cases, \( i = j \) and the yield is as of the close of business. Thus, \( P_{t,t} \) is the mark-to-market price on day \( t \) for same day settlement.

2. **Auction (Tuesday):**

   At the close on the day of the auction (Tuesday), the index recognizes the capital gain or loss from selling the old T-Bill, but only recognizes income earned up to Tuesday. We therefore recalculate the price of the old T-Bill for same day settlement rather than Thursday settlement, holding the yield fixed. We recognize gains or losses on the new T-Bill due to changes in yield between the 12:45 auction result and the close at the end of the day. In order to reinvest the full proceeds from the sale in the new Bill, we buy a par amount \( Q \) of the new T-Bill for each dollar par amount of the old T-Bill. The capital gains or losses on the new T-Bill are therefore calculated with respect to this par amount \( Q \).

   \[ I_{\text{Tues}} = I_{\text{Mon}} \times \left( \frac{P_{\text{Old,Auction,Tues}} + Q \times (P_{\text{New,Auction,Thurs}} - P_{\text{Old,Auction,Thurs}})}{P_{\text{Old,Mon}} + Q} \right) \] \[ \text{[2]} \]

   where:

   \[ Q = \frac{P_{\text{Old,Auction,Thurs}}}{P_{\text{New,Auction,Thurs}}} \] \[ \text{[3]} \]

   \( P_{\text{Old,Auction,Thurs}} \) = Price of old T-Bill established before auction for settlement Thursday

   \( P_{\text{New,Auction,Thurs}} \) = Price of new T-Bill at Tuesday's auction for settlement Thursday
Other prices are defined similarly. For example, $P_{Old,Tues}^{Auction}$ is the price of the old T-Bill at the yield established prior to Tuesday’s auction, calculated for same day settlement.

3. **Auction + 1 (Wednesday):**

The index return calculation on Wednesday, one day after the auction, follows a similar method. We recognize capital gains or losses but no income on the new T-Bill, and we recognize one more day of income on the old T-Bill.

$$I_{Wed}=I_{Mon} \times \left( \frac{P_{Old,Tues}^{Auction}+Q \times (P_{New,Wed}^{New}-P_{Auction,Wed}^{New})}{P_{Mon,Mon}^{Old}} \right)$$  \[4\]

Note that Wednesday’s index return is measured relative to Monday’s index level and prices established at the auction on Tuesday. In particular, the dollars invested in the index do not yet include the dollar gains or losses on the new T-Bill, since the forward purchase is in effect a levered position prior to the settlement date (by contrast, the return calculation outside of the auction period would be measured with respect to the previous day’s index level, and would include the previous day’s closing valuations in the denominator).

4. **Auction Settlement (Thursday):**

The index calculation for Thursday is similar. Now, we recognize the full proceeds from the sale of the old T-Bill. We continue to recognize only capital gains or losses on the new T-Bill, with respect to its original purchase price. As well, the index return is again measured with respect to Monday’s index level and the transaction prices from Tuesday’s auction.

$$I_{Thurs}=I_{Mon} \times \left( \frac{P_{Old,Tues}^{Auction}+Q \times (P_{New,Wed}^{New}-P_{Auction,Wed}^{New})}{P_{Mon,Mon}^{Old}} \right)$$

The index calculations for auction settlement + 1 onward use the regular formula [1]
Appendix B: Further Information

A Glossary of Terms used in FTSE Russell’s Ground Rule documents can be found using the following link: Glossary.pdf

For further information on the FTSE Canada Treasury Bill Index Series Ground Rules please visit www.ftserussell.com or e-mail info@ftserussell.com. Contact details can also be found on this website.