

FTSE Russell Discussion on Fixed Income Indexes CFIF Committee Meeting

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Discussion Topics

1 FTSE Russell Fixed Income Developments

- FTSE TMX Canada Evolution - Brief History and Product Overview
- Expanding FTSE Russell Fixed Income Capabilities

2 Global Regulatory Developments

3 Approach to Indexing

- Overview of Indices tracking Canadian Fixed Income
- FTSE TMX Canada Universe Bond Index
- IOSCO
- Objectives, Considerations and Oversight
- Governance and Committee Structure

4 Bond Price Methodology

- Overview of Multi Dealer Pricing Methodology
- Price Challenge Policy

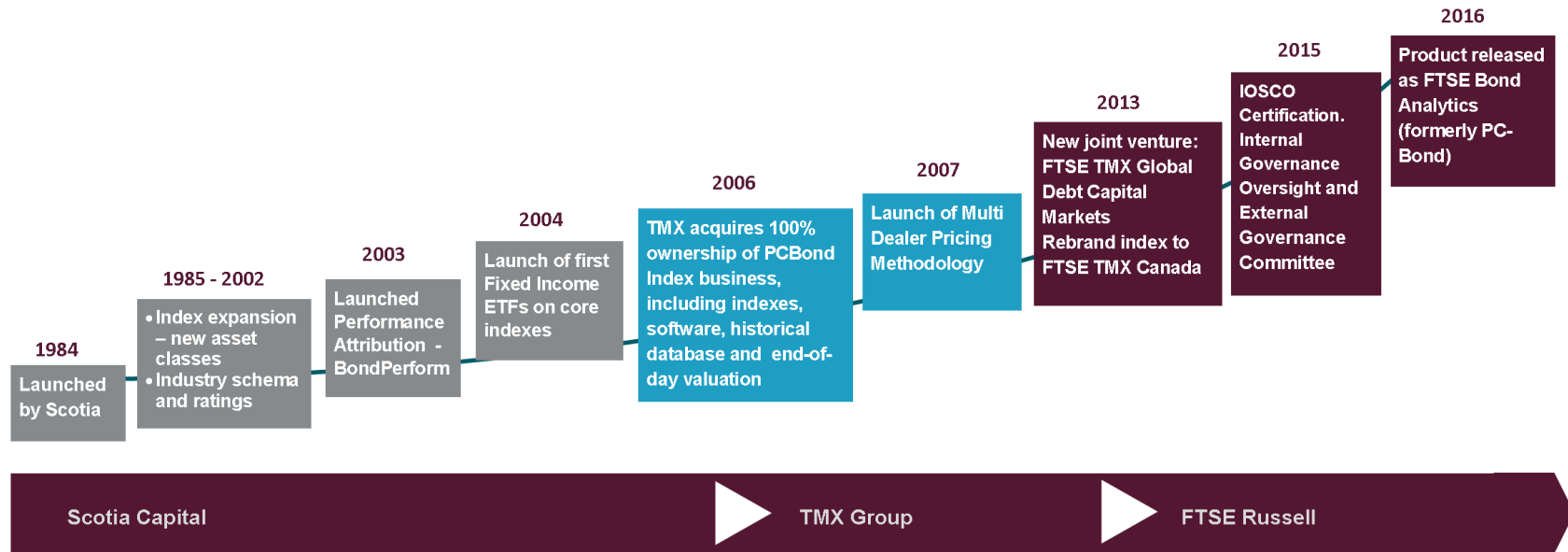
5 Appendix

- Regulatory Changes in Index Landscape

FTSE Russell

Fixed Income Developments

History of Innovation



FTSE TMX Canadian Bond Series

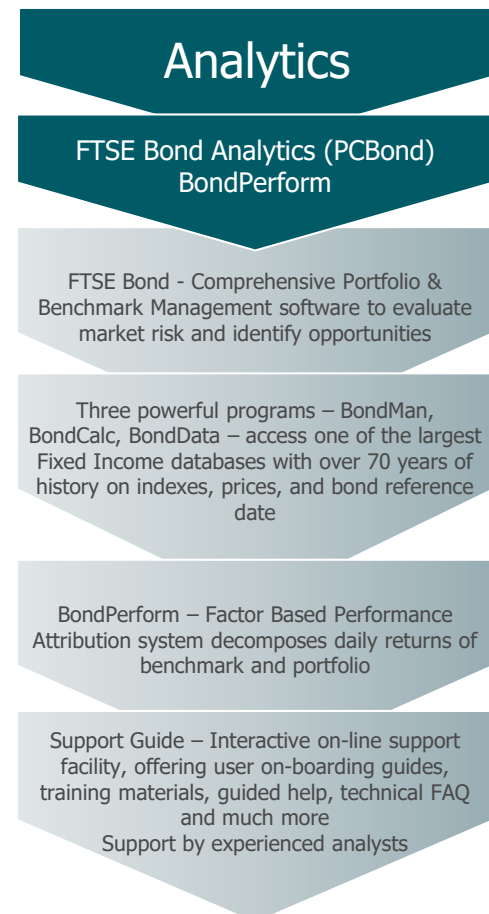
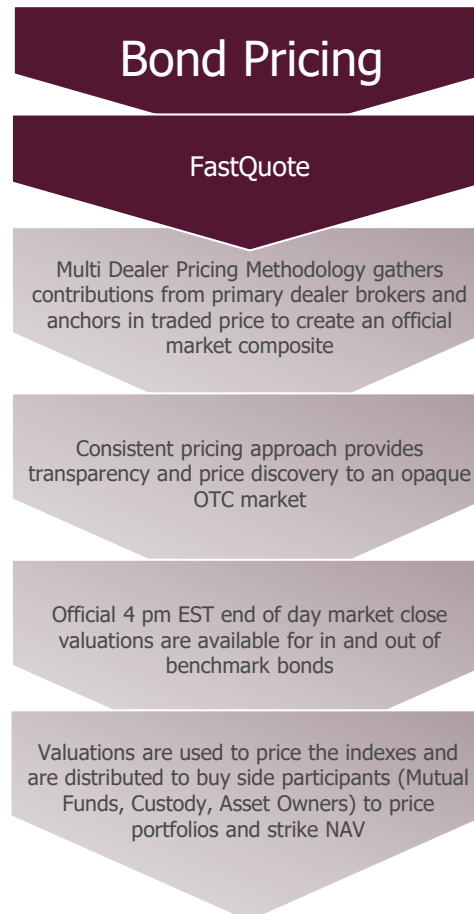
To measure performance in the Canadian domestic bond market, FTSE TMX offers a multitude of indexes and sub-indexes across various fixed income assets categories valued on a daily basis. The FTSE TMX Canada Universe Bond Index Series is the most widely used performance indicator of marketable government and corporate bonds for Canada.

Highlights

- 20+ Index Families
- 600+ Individual Indexes
- Multi Dealer Pricing
- Daily Analytics

FTSE TMX Canada Products

FTSE offers comprehensive, transparent broad market and alternative strategy Benchmark Indices in Canada, overseen by a rigorous Governance Framework, provides Bond Pricing utilizing a Multi Dealer Methodology, and supports both through market risk and performance Analytics



Development of the FTSE TMX Canada Suite

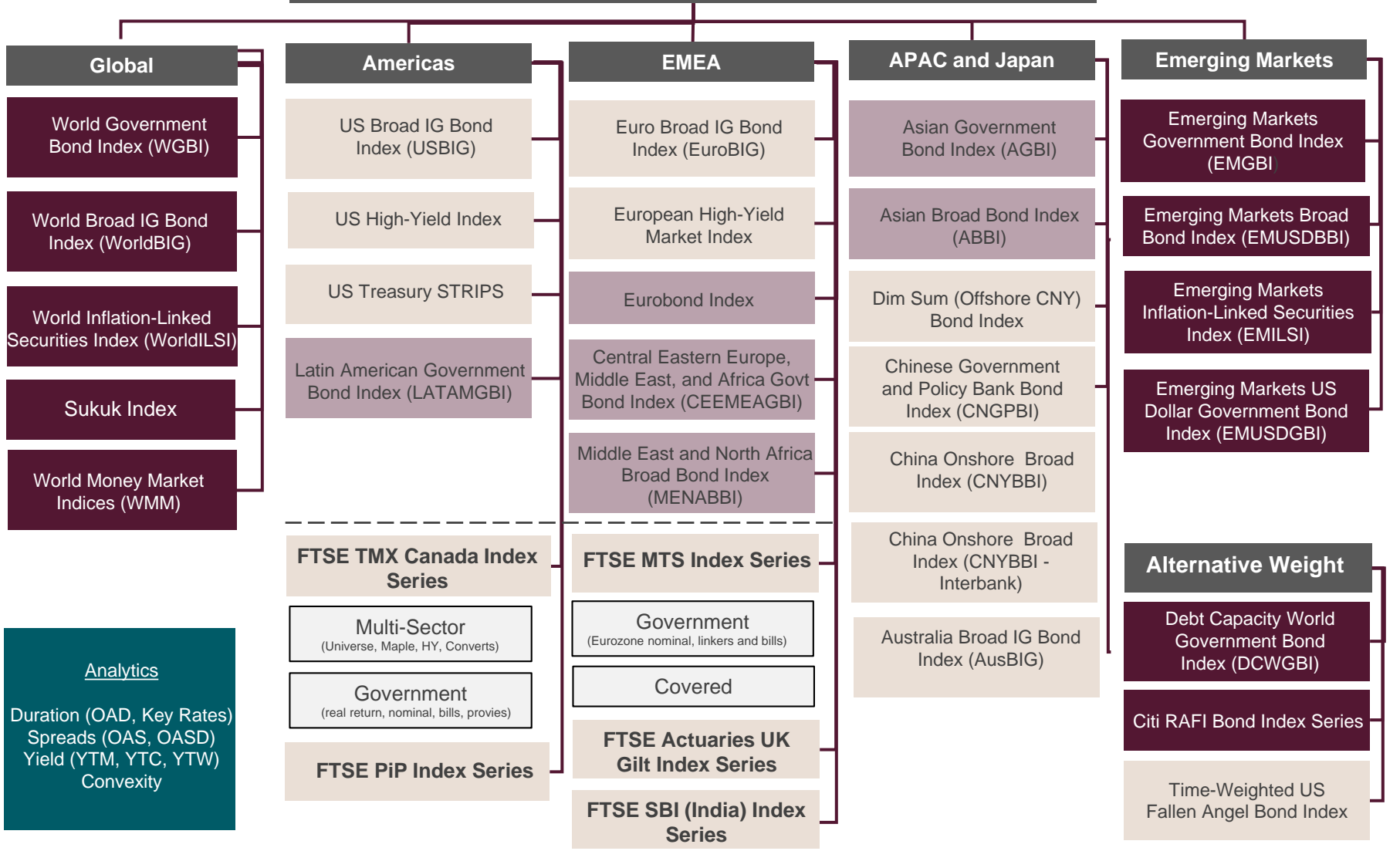
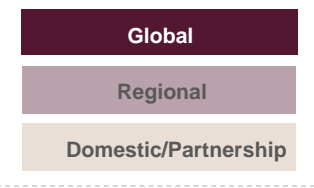
- FTSE Russell are committed to ensuring the integrity and quality of the benchmarks
- Overall strategy in Fixed Income values the deep domestic benchmarks in complement to growing the Global footprint and coverage
- FTSE Russell bring global context along side local market expertise to deliver best in class products
- FTSE Russell is investing and adding resources to the FTSE TMX Canada suite of products to support and drive a number of development initiatives

Citi Yield Book and Fixed Income Index Acquisition

- LSEG announced its acquisition of The Yield Book analytics platform and Citi Fixed Income Indices from Citi in May and completed the acquisition on 31 August 2017
- Citi Fixed Income Indices provide comprehensive coverage of global debt markets
- The Yield Book's products offer analytical insights into a broad array of fixed income instruments with specific focus on mortgage, government, corporate and derivative securities
- The FTSE TMX Canada product suite complements the Citi offering and remains a core component of FTSE Russell's benchmark development strategy for fixed income

FTSE Combined Fixed Income Family

FTSE Fixed Income Global, Regional, and Local Indices



Analytics

- Duration (OAD, Key Rates)
- Spreads (OAS, OASD)
- Yield (YTM, YTC, YTW)
- Convexity

FTSE Fixed Income Benchmark Index Overview

The Four Pillars

1.

Global Footprint, Domestic Partnerships

Capturing global fixed income in broad indices, coupled with local market partnerships to provide depth in domestic fixed income

2.

Index & Analytics

Differentiated Core Offering
Thematic Innovation
Rich Analytical Framework

3.

Custom Index Solutions

Scalable and extensive custom solutions, for both global and local markets

4.

Robust Control & Governance Framework

Ongoing continuous product improvement through governance and independent oversight

Global Regulatory Developments

European Benchmark Regulation

- Changes in regulatory landscape require index providers to meet higher standards in control, governance, and oversight as Benchmark Administrators
- European Regulation on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds (the EU BMR) will apply from 1 January 2018
- EU BMR introduces a common framework to ensure the accuracy and integrity of indices used as benchmarks in the European Union
- FTSE Russell fully supports the focus of the EU BMR, has been involved in contributing to its formation, and is committed to ensuring compliance of its relevant benchmarks with the EU BMR

Please refer to Appendix for additional details on EU BMR

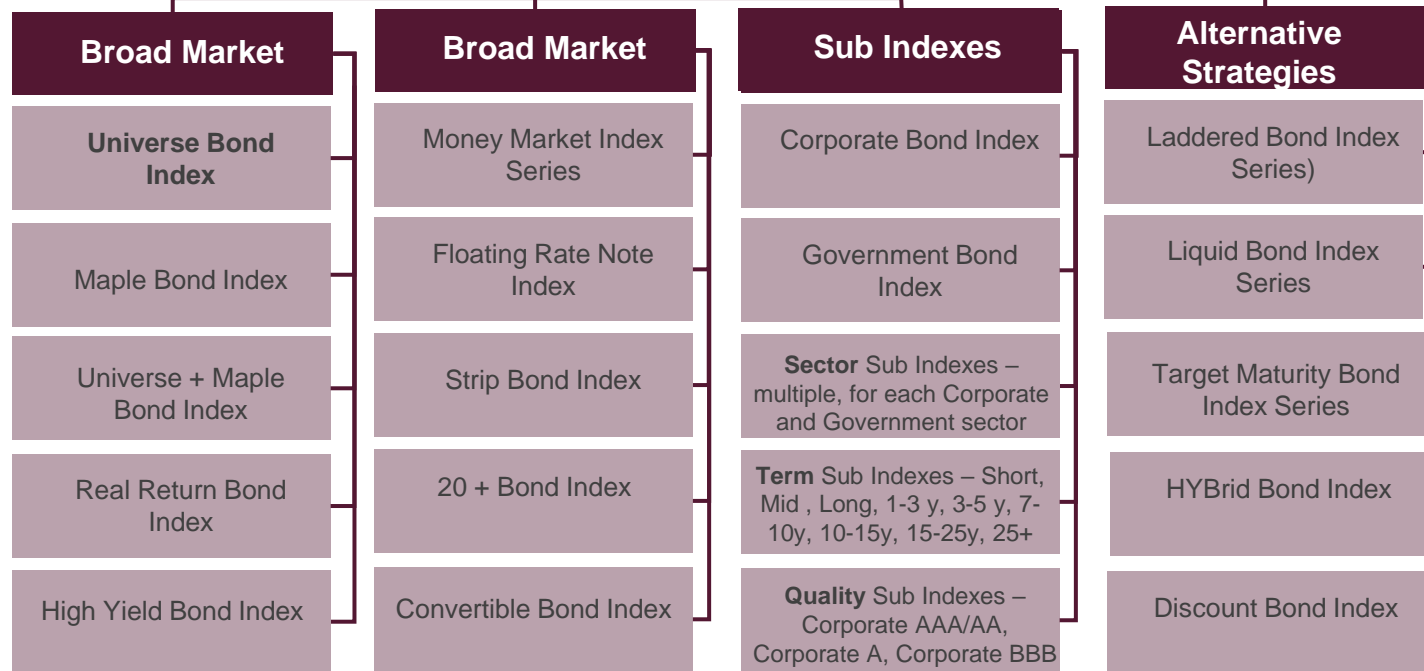
Approach to Indexing

IOSCO Statement of Compliance

- **FTSE Russell publishes a Statement of Compliance** with respect to the recommendations made by the International Organization of Securities Commissions (IOSCO) in Principles for Financial Benchmarks Final Report (the IOSCO Principles)
- **Independent assurance** of the assertions by FTSE Russell in its Statement of Compliance has been received from KPMG LLP
- FTSE Russell embraces and endorse the IOSCO Principles and adhere to the standards for benchmark administrators, set out by IOSCO in the areas
 - Governance
 - Quality of the Benchmark and Methodology
 - Accountability
- For FTSE TMX Canada, report covers the Universe Bond Index **benchmark and the pricing** used to strike the index
- The highlights and the full FTSE Russell report are publicly available at the following <http://www.ftse.com/products/indices/iosco>

FTSE TMX Canada Benchmarks Track Multiple Market Segments in Domestic Fixed Income

Broad range of security types



Pricing

Bonds are priced using the Multi Dealer Pricing Methodology

Analytics

Risk and Performance
Yield, Duration (Mod, Mac)
Convexity, DVal01
Sector, Rating, Term
Breakdowns

Governance

IOSCO Compliant
Overseen by internal
Governance Board and
External Advisory
Committees

Rules Based Transparent Methodologies

- In line with governance standards, FTSE TMX maintains transparent, robust, rules-driven index construction methodologies
- Methodologies are publicly available and contain eligibility, exclusion, handling and calculation attributes <http://www.ftse.com/products/FTSETMX/Home/Methodologies>

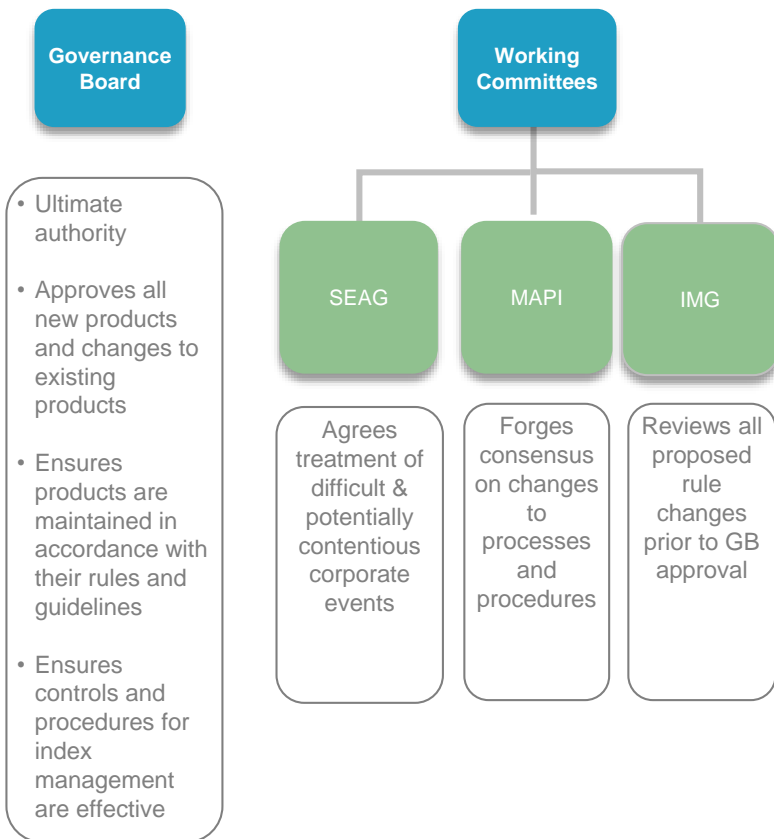
Category	Summary of Current Rules – FTSE TMX Canada Universe Bond Index
Market Coverage	Domestic (Canadian) Government and Corporate issuers, in Canada in C\$
Min Issue Size	Government Bonds: \$50mn / Corporate Bonds: \$100 MM Adjusted to reflect buybacks, BoC holdings, stripping / reconstitution
Quality	Investment Grade; Index Rating of BBB or higher
Term	Securities must have at least one year to maturity
Coupon	Fixed-rate, semi-annual pay securities
Additional Screen	At least 10 institutional buyers at issue (independent compliance certificate)
Other Inclusion Clarification	Clarification to include NVCC, callable, extendible/ retractable, sinking funds, exchangeables, junior subordinated bonds/hybrid capital, fixed-to-floaters, semi-annual amortizing securities, semi-annual bullet ABS
Exclusion Clarification	Does not include floating-rate notes, convertible bonds, CMBS, MBS, other monthly-pay, pre-payable, or inflation-indexed securities, securities specifically targeted to the retail market or securities that are not priced

Index Control and Governance Framework

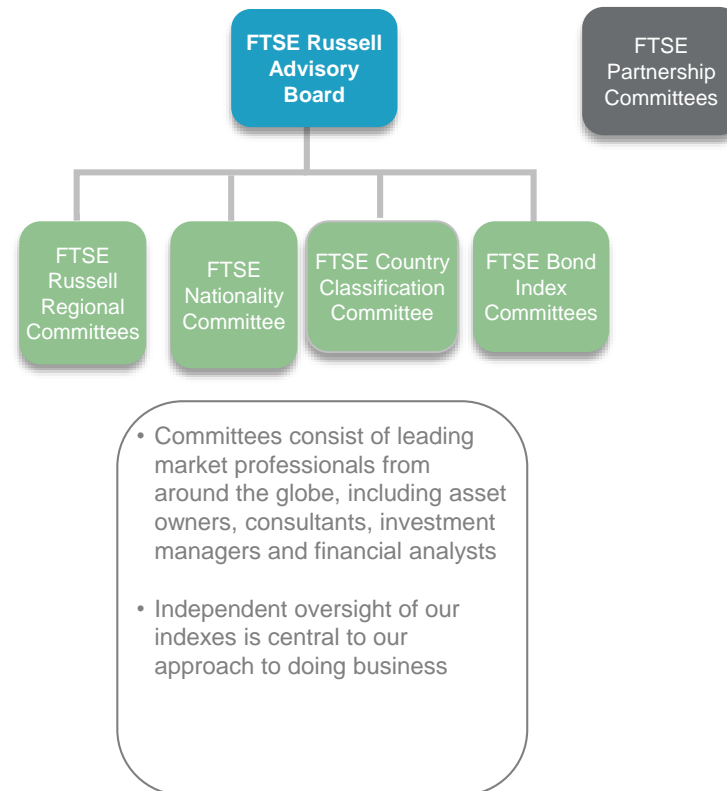
- FTSE Russell leads global best practice standards in governance, including those applied to FTSE TMX Canada, with a focus on transparent, robust and rules-driven index construction
- Index construction, management, and methodology evolution are overseen by an overarching governance structure which includes
 - Internal Governance Board
 - External Advisory Committees
 - Market Consultations
- Index developments are communicated to the market to inform participants

Effective Governance

FTSE Russell Internal Committees



FTSE Russell External Committees



Index Control and Governance Framework

FTSE Russell Internal Governance Board (GB)

- Operated through working groups of senior, knowledgeable and experienced professionals across governance, research, and operations areas
- Governance Board is responsible for maintaining the integrity of the indexes through regular review and approvals of any index methodology changes, quality of inputs and analytics, product development, as well as technical and operational robustness
- For FTSE TMX Canada Indexes this process also includes **Review of Submissions**
 - Undertaken regularly throughout the year
 - Comparison with corroborating data
 - Review of satisfactory operation of the index in light of market conditions

Index Control and Governance Framework

FTSE Russell External Advisory Committees

- Formed of senior experienced market practitioners serving in a personal capacity, including but not limited to: asset owners, asset managers and consultants
- The independent committee structure supports the Governance Board by
 - Helping to ensure that indexes reflect their underlying market (representative)
 - Methodology (a strict set of rules by which all FTSE Russell indexes are governed) evolve in line with the highest standards of the industry to take account of changing market dynamics
 - Ensure that the indexes are managed and calculated according to the Index Methodology, and remain transparent and accurate
- Committee discussions are minuted, and a high level summary of the Public Minutes is available for access at <http://www.ftse.com/products/indices/public-minutes>

Index Control and Governance Framework

Market Consultations

- FTSE Russell regularly consults the market to provide guidance on various topics:
 - Representativeness of indices to continue to meet index users requirements
 - Coverage of new issuance types
 - Interpretation of index rules in light of market events/developments
 - Evolution of index methodology to ensure benchmarks meet objectives
- Feedback is gathered through a number of channels including formal consultations and surveys, ongoing dialogue with market participants and the Advisory Committee
- Engagement with market participants include buy side and sell side firms; asset owners and consultants; issuers and syndicates; and regulatory agencies
- Consultation feedback and survey results are non-binding and ultimate decision making authority belongs to FTSE Russell

FTSE TMX Canada

Bond Pricing Methodology

Multi Dealer Pricing Methodology

Overview

- FTSE TMX Canada Multi Dealer Pricing Methodology Guide publicly available to all users at <http://www.ftse.com/products/FTSETMX/Home/MultiDealerPricing>
- The Guide specifies the following logic
 - Contributors provide quotes according to market conditions
 - FTSE TMX price verification process compares the contributions against several verifications such as pricing from the lead dealer (if such exists), contributions from other dealers, and traded prices (if such are reported)
 - Contributions that pass these tests but lie more than one standard deviation from the mean are excluded
 - Those remaining are averaged to form the blended price
- The blended price is further checked against the nearest maturing Canada benchmark bond for consistency in price and yield movements from the previous day
- Price challenge policy and process allows for users to challenge and validate levels

Multi Dealer Pricing Contributors

- The FTSE TMX receives bond pricing contributions from the following Canadian dealers (listed alphabetically)

BMO Nesbitt Burns	Merrill Lynch Canada
Casgrain & Company	National Bank Financial
CIBC World Markets	Scotia Capital
Desjardins Securities	RBC Dominion Securities
Laurentian Bank Securities	TD Securities

Multi Dealer Pricing Methodology

Price Verification

- Scrub mechanisms aim to remove stale or off-market prices which could possibly distort the final price.
- The scrub mechanisms:
 - utilize the database, by reviewing historical volatilities of daily yields;
 - review the lead dealer pricing;
 - review trade data (CDS, for trades with min size of \$500k) to identify contributions most in line with recent trades;
 - compare Dealer to Dealer valuations for each instrument

Anchoring

Multi Dealer Pricing Methodology

Final Blend – Standard Deviation Mean

- Once passed through the validation and price verification screens, the remaining contributions are included in the **Standard Deviation Mean calculation**
- Quotes are used to calculate the mean and standard deviation of the remaining data set
- Prices falling above or below one standard deviation of the mean are eliminated
- The final price is derived as the mean (average) of the remaining quotes

Multi Dealer Pricing Methodology

Price Challenge Policy

- FTSE TMX has an established policy for clients to challenge the price of any fixed income security which has been derived through the multi dealer pricing methodology
- Price challenge email can be sent to ftsebond@ftserussell.com
- FTSE TMX will notify all submitters for the issue(s) in question to review their pricing contributions
- FTSE TMX does not require feedback from the dealers in response to any challenge
- Any updated pricing levels (if applicable) will be reflected in the future quote contributions
- Clients challenging a price will receive a confirmation that FTSE TMX has challenged the respective contributors
- All challenges are anonymized

Appendix

Regulatory Changes in Index Landscape

Regulatory Response

- **FCA legislation via MAR (8) in 2013**
 - Initially targeted at LIBOR, informed by Wheatley review
 - Subsequently extended to WM/Reuters 4pm fix, ISDAfix (ICE Swap Rate), ICE Brent, LBMA gold price, LBMA Silver price, SONIA, RONIA
- **IOSCO Principles for Financial Benchmarks in 2014**
 - Sets out recommended practices for administrators
 - Administrators required to produce an annual statement of compliance
- **European regulation on indices used as benchmarks in financial instruments and financial contracts in 2018**

IOSCO Principles (2014)

Governance

1. Overall responsibility of the administrator
2. Oversight of third parties
3. Conflicts of interest for administrators
4. Control framework for administrators
5. Internal oversight

Quality of the benchmark

6. Benchmark design
7. Data sufficiency
8. Hierarchy of data inputs
9. Transparency of benchmark determination
10. Periodic review

IOSCO Principles

(cont.)

Quality of the methodology

11. Content of the methodology
12. Changes to the methodology
13. Transition
14. Submitter code of conduct
15. Internal controls over data collection

Accountability

16. Complaints procedure
17. Audits
18. Audit trail
19. Cooperation with regulatory authorities

European Regulation of Indices used as Benchmarks

Applies from 1 January 2018

- **Index means any figure:**
 - Published *or made available to the public*
 - Regularly determined by application of a formula or assessment
 - Determination made on the basis of the value of one or more underlying assets (or prices, quotes, surveys)
- **Benchmark means any index by reference to which:**
 - Amount payable under a financial instrument or contract is determined
 - Value of a financial instrument is determined
 - *An index used to measure the performance of an investment fund*

EU-based Administrators

Authorisation and registration

- **Authorisation**

- Required if administrator provides indices used as benchmarks

- **Registration**

- If a supervised entity other than an administrator that does not provide critical benchmarks
- If only provide non-significant benchmarks

- **Register maintained by ESMA**

- Authorised and registered administrators

Third Country Administrators

Equivalence, recognition and endorsement

- **Equivalence**

- Administrator authorised/registered in 3rd country with equivalent requirements; IOSCO compliance
- Provision for specific administrators/benchmarks

- **Recognition**

- Administrator recognised by competent authority of a member state; assessed IOSCO compliance statement

- **Endorsement**

- An administrator in the EU can endorse a benchmark or family of benchmarks

- **ESMA register**

- Lists individual benchmarks or combinations thereof

Timetable

- **Entered into force in mid 2016**
 - Publication in official journal
- **Date of application 18 months later**
 - 1 January 2018
 - Critical benchmarks applied immediately
- **Administrators to seek authorisation or registration within 24 months of application**
 - Competent authority can register certain administrators
- **Transitional provisions for EU administrators**
 - Allow continued introduction of new benchmarks and uses

Appendix

Implications for Administrators

Organisational Requirements

- **Governance**
 - Robust, clear structure
- **Conflicts of interest**
 - Conflicts to be published or disclosed
 - Mitigate (independent oversight), manage or cease production
- **Oversight function (e.g. separate committee)**
 - Methodology definition, change process
 - Control framework
 - Third parties
 - Audits ...

Organisational Requirements

(cont.)

- **Control framework**
 - Compliance with regulation
 - Management of operational risk, BCP and DR
 - Adherence to contributor code of conduct
- **Accountability framework**
 - Compliance function, audits
- **Record keeping**
 - Inputs, judgements, complaints
- **Complaints handling procedure**
 - Published, timely, independence

Organisational Requirements

(cont.)

- **Outsourcing**
 - Administrator remains responsible
- **Input data (values or prices of underlying assets)**
 - Sufficient to accurately and reliably represent the market
- **Methodology**
 - Robust and reliable; transparency
- **Code of conduct for submitters**
 - What, who; suspicions, conflicts
- **Governance and controls for supervised contributors**
 - Conflicts, controls, training
- **Cessation policy**

Benchmark Requirements

- **Identify critical and significant benchmarks**
 - Decide whether to avail of certain exemptions for significant and non-significant benchmarks
 - Publish reasons if so
- **Meet benchmark requirements**
 - Publish methodology and review procedures
 - Publish benchmark statement
 - Monitor input data
 - Contingency arrangements
 - Implement code of conduct for contributors
 - Contributions defined as input data which is not readily available to the administrator
 - Prices, values, quotations

Benchmark Requirements

Published Benchmark Statement

- **Define the market or economic reality**
- **Clearly and unambiguously identify elements of discretion**
- **Provide notice that external factors may necessitate changes or cessation**
- **Contains at a minimum:**
 - Definitions of key terms
 - Criteria and procedures used in determination
 - Controls and rules governing discretion or judgement
 - Procedures in times of market stress
 - Procedures for dealing with errors
 - Identification of potential limitations
 - Operation in illiquid or fragmented markets

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