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 asset 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.

Core Indexes

**FTSE TMX Canada Universe Bond Index Series**
The index is divided into 72 published sub-indexes based on term, credit rating, and industry groups.

**FTSE TMX Canada Maple Bond Index Series**
Consists of Canadian-dollar denominated bond, issued in Canada (or globally inclusive of Canada), by foreign governments and corporations.

**FTSE TMX Canada Real Return Bond Index Series**
A benchmark of the performance of inflation-indexed bonds issued in Canadian dollars.

**FTSE TMX Canada Strip Bond Index Series**
Designed to reflect the performance of the Canadian strip market.

**FTSE TMX Canada 20+ Bond Index Series**
Broad measure of long-term investment-grade bond market where the effective term for all issues is equal to or exceeds 20 years.

**FTSE TMX Canada High Yield Bond Index Series**
Measures the Canadian non-investment grade fixed income market.

**FTSE TMX Canada Floating Rate Note (FRN) Index Series**
Reflects the performance of domestic Canadian Government and Corporate Floating Rate Note (FRN) securities, denominated in CAD.

**NVCC Bond Index Series**
Designed to reflect the performance of Non Viable contingent Capital securities.

**Money Market Index Series**
Consists of treasury bill rate indexes.

Bespoke Indexes

**Laddered Bond Index Series**
Measures investment-grade government, corporate and strip bonds, covering 1-3 year, 1-5 year or 1-10 year bond ladders.

**Target Maturity Bond Index Series**
Held-to-maturity portfolio of Canadian-dollar denominated investment-grade corporate bonds.

**HYBrid Bond Index Series**
Designed to track the performance of corporate bonds in the Canadian market rated BBB and lower.

**Liquid Bond Index Series**
Measures the Canadian investment-grade fixed income market with additional requirements for liquidity, issue size and credit rating.

**Barbell Index Series**
Combines CAD investment-grade bonds and FRNs (term to maturity < 2 years) with the longer end of the curve (term to maturity 10-20 years).
Explore the Canadian fixed income market using a rich historical database, including proprietary multi-dealer pricing model and comprehensive measures.

A suite of programs with access to a comprehensive historical database with over 60 years of data history or price, yield, total return, duration, index weights, ratings, historical terms and conditions and more.

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<th>Reference Data</th>
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<td>• Bullet Bonds</td>
<td>• Terms and Conditions</td>
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<td>• Callable Issues</td>
<td>• Rating Agencies</td>
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<td>• FRN Issues</td>
<td>• Corporate Actions</td>
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<td>• Money Market Securities</td>
<td>• Multi-tier Sector</td>
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<td>Classification</td>
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<td>• Sinking Issues</td>
<td>• Fixed Income Indexes</td>
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<td>• High Yield</td>
<td>• Blended Index</td>
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<td>Capabilities</td>
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**FTSE BOND ANALYTICS DATABASE**

Enhanced Security Screening dialog box
Advanced Portfolio Analysis
Index Composition
Security and Industry Analytics
Portfolio to Index Comparison
Historical Time Series
Custom Yield Curves
Simulations, Forecasting
Market Exposure
Trade Calculator

Sophisticated Analytics
Depth of Market Coverage
Quick Access Investor Tools

Historical Price, Yield, Total Return, Weights, Ratings, Terms and Conditions
A comprehensive fixed income database
**BondManager**

Analyze and stress test bond portfolios, index constituents, quantify risk and liquidity, index modeling, forecasting, simulations

**Security Analysis**
- Comprehensive historical database
- Holdings-based system with multiple identifiers
- 450+ Key Columns
- Terms and Conditions including amount outstanding, multi-level industry classifications and more
- Risk Metrics – duration, convexity, key rate duration, dollar duration, among others
- Trade Information – historical traded volume, frequency, pricing, spread averages over multiple periods

**Scenario analysis**
- Forecast portfolio returns from a selection of yield curves
- Apply spread shifts and shocks to industry sectors and rating subs

**Portfolio Strategies**
- View risk characteristics of portfolios
- Perform simulations: identify impact of proposed trades, analyze risk and calculate projected returns
- Assess market exposure and risk sensitivity across multiple sectors
- Aggregate portfolios for consolidated reporting
- Automate import from accounting systems
- Custom views and reports
- Create and manage custom index blends

**Automation**
- Templates provide customized environment
- Keep portfolios and indexes up-to-date with automated macros

**450+ analytics key columns available including**

**Reference/Data**
- Terms and Conditions
- Industry Classification
- Rating (multiple sources)
- Identifiers
- Pay Dates
- Amount Outstanding

**Risk and Reporting**
- Duration: Modified, Macaulay, OAS, Effective
- Key Rate Duration
- Contribution to Duration
- Dollar Duration
- Convexity
- Yield to Worst

**Statistical Analysis**
- Yield Spreads to curve and benchmark
- Trade Data: volume, spread, price, yield, count for last and historical averages
- Standard Deviation
- Custom formula
- Matrix Pricing

**BondManager: A complete portfolio analysis solution**
Create custom composite indexes using defined weights or target market-value weights
BondManager Reporting

Compare portfolios with index constituents – risk, projected returns, simulations and more

Comprehensive index breakdown
- Drill down to constituent level
- Perform specific sector/industry analysis
- Custom index modelling using sub-index constituents
- Historical data – explore index changes over time
- Create and manage custom indexes

Comparison tab
- Report templates make it easy to automate portfolio with index analysis reporting
- Compare multiple portfolios with the index or sub-indexes
- Pre-defined reports for ease-of-use or customizable report options
- Flexible
- Delta reporting

Reporting
- Cash flow reports
- Export or copy to XLS, CSV
- Save reports for daily/weekly/monthly review

Automation
- Generate latest comparative analysis reports overnight using automated processes
- Easily export reports to XLS, CSV

Custom Report: Industry Sector, Industry Group

| Price Date | Aug 31, 2015 |
| Portfolio | Universe Bond Index |
| Market Value | 1,544,152,439 |

<table>
<thead>
<tr>
<th>Index</th>
<th>% Hold Current</th>
<th>Yield 20160831</th>
<th>Modified Duration</th>
<th>% Total Duration</th>
<th>Term (ER)</th>
<th>Convexity</th>
<th>Coupon</th>
</tr>
</thead>
</table>

Government
- Federal: 557,691,369 38.12 0.97 6.50 30.47 8.15 0.94 2.59
- Provincial: 536,391,941 34.67 1.98 9.99 44.99 14.11 1.77 4.21
- Municipal: 29,866,975 1.92 2.09 8.58 2.14 11.98 1.37 4.10

Total: 1,122,770,225 72.71 1.48 8.22 77.51 11.10 1.34 3.40

Corporate
- Communication: 42,202,751 2.73 2.70 8.78 2.40 9.74 0.88 4.00
- Energy: 74,406,592 4.82 3.08 9.10 5.69 13.54 1.43 4.74
- Financial: 173,709,343 11.25 1.82 3.53 5.16 4.09 0.22 3.24
- Industrial: 20,714,565 1.86 2.06 6.23 1.50 8.64 0.74 4.51
- Infrastructure: 68,331,433 4.43 2.88 11.23 6.45 17.47 2.11 4.08
- Real Estate: 24,441,444 1.58 2.50 4.69 0.94 5.26 0.31 3.86
- Securitization: 9,405,067 0.61 1.45 3.00 0.24 3.13 0.12 2.18

Total: 421,382,214 27.29 2.40 6.32 22.39 8.85 0.85 4.01

Total: 1,544,152,439 100.00 1.73 7.70 100.00 10.48 1.21 3.57

Source: FTSE Russell. This chart is for illustrative purposes only.

BondManager: A complete portfolio analysis solution
Create custom composite indexes using defined weights or target market-value weights
**BondData**

Desktop charting software for historical time series, yield curve and technical analysis, including full coverage of index risk metrics

**Time Series**
- Extensive historical time series
- Plot individual securities or benchmarks
- Spread analysis, including credit and industry
- Historical risk metrics: FTSE TMX Canada Bond Index families
- Draw user-defined trend lines
- View trade data – last traded price/yield, volume
- Plot historical traded volume
- Library of technical indicators

**Yield Curves**
- Create custom yield curves
- Benchmark yield curves

**Automation**
- Automation: build custom views with up-to-date data
- Save charts for future use
- Save linear trend lines for enhanced analysis
- Create a chart slideshow

Sample Value Line

<table>
<thead>
<tr>
<th>Issue</th>
<th>Chart</th>
<th>A (10) 1092530-CN</th>
<th>3.5/Dec 1, 2045</th>
<th>Yield</th>
<th>1.6279</th>
<th>CurSpd</th>
<th>1.4311</th>
<th>TrdYld</th>
<th>1.6405</th>
<th>TrdSpread</th>
<th>0.00</th>
</tr>
</thead>
</table>

Source: FTSE Russell. Charts are for illustrative purposes only.

**BondData: Historical time series and yield curves**
Stay on top of market and index trends and technical analysis
Excel-based security analytics for multiple issue types including mortgage-backed and asset-backed securities, butterfly and switch trade calculator

### Historical Database
- Single security analysis
- Bond characteristics
- Measures of risk
- Historical views
- Enhanced MBS and ABS analysis
- Multiple templates for ease of use
- Security modeling

### Trade Metrics
- Projected returns
- Scenario analysis
- Switch trades – cost, yield, duration, profit/loss
- Butterfly trades – both risk and arbitrage-weighted
- Save trades for later review

### Reports
- Cashflow reports
- Copy/paste trade analytics to Excel

Source: FTSE Russell. This chart is included for illustrative purposes only.
Technical Specifications

Server-side installation offers concurrent access to multiple workstations: portfolio and index analytics are just one click away

- Automated database management – communicate securely with the FTSE TMX server via FTP
- Customize your own environment with flexible server and client-side configuration options
- Convenient Excel Add-ins and easy application automation for overnight processing
- Insert corporate logo for branded portfolio and index comparison reporting

FTSE BOND ANALYTICS STANDARD CONFIGURATION OPTIONS

FTP to FTSE TMX
Market Data
-200 files per day
-3MB per day

File Server

- 2GB RAM
- FTSE Bond Database < 10GB
- Proprietary Applications
- Java RunTime
- Authorization (USB or Softkey)
- SCNet broadcast

Workstation
Microsoft Excel
FTSE Bond Add-In
c:edbro

Workstation
Microsoft Excel
FTSE Bond Add-In
c:edbro

Workstation
Microsoft Excel
FTSE Bond Add-In
c:edbro

STANDALONE
Local Drive
Install Database, Programs
Authorization (USB or Softkey)

Firewall

Read/Execute

Read/Execute

Streamlined installation and support
Support Guide

An interactive online resource provides streamlined help for users: quickly access key features and functionality through helpful tutorials and screencasts

Key Features
• Frequently Asked Questions
• Streamlined Support
• Screencasts
• Troubleshooting Tips
• Starter Guide
• Screenshots
• Search the Guide
• Automation Steps
• Latest/Popular Articles

Content Includes
• Portfolio vs Index Comparison
• Custom Blended Indexes
• Understanding Portfolio/Pricing Defaults
• Use the File Import Wizard
• Guide to BondManager Macros
• Screen the FTSE TMX Bond Indexes
• Technical Indicators Defined
• Access Trade Information
• Switch/Butterfly Trades

FTSE Bond Analytics Support Guide

Get Started with BondManager

This article provides a quick overview of BondManager, and presents a recommended list of articles to assist with specific tasks - how to create/maintain your fixed income portfolios, in-depth index analytics, introduction to the Comparisons Module, and more.

New users of BondManager will find answers to the most frequently asked questions about the program here, and experienced users may find features and shortcuts to assist with their daily usage.

Additional recommended reading for new users: BondManager Starter Guide

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<th>WHAT YOU WANT TO DO</th>
<th>ARTICLE</th>
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<tr>
<td>Import my portfolio in BondManager?</td>
<td>Copy/Paste CUSIPs and holdings into a worksheet, then price the portfolio.</td>
</tr>
<tr>
<td>Automate BondManager portfolios from my Accounting System?</td>
<td>Export one (or more) files from your accounting system for import into BondManager, create and save the import specification, then record a macro to build portfolios overnight.</td>
</tr>
<tr>
<td>Create a macro to price my portfolio as of yesterday’s close?</td>
<td>Use BondManager’s macro recorder to capture the required keystrokes.</td>
</tr>
<tr>
<td>Create a macro to price my portfolio as of a specific date?</td>
<td>Record a macro using the same steps above, but edit the “inptu” file to add an [Input] or [InputFormFile] command.</td>
</tr>
<tr>
<td>How to price securities not in the Database?</td>
<td>Use the benchmark pricing Key Column: Bench Sec. ID, Bench Y Curve and Bench Spread.</td>
</tr>
<tr>
<td>Autemate pricing of securities not in the Database?</td>
<td>Create a standalone portfolio file that contains all the securities not in the FTSE Bond Analytics database, with assigned benchmarks (see above).</td>
</tr>
</tbody>
</table>

Support Guide: Subscribers easily access product help and functionality tutorials
About FTSE Russell

FTSE Russell is a leading global provider of benchmarking, analytics and data solutions for investors, giving them a precise view of the market relevant to their investment process. A comprehensive range of reliable and accurate indexes provides investors worldwide with the tools they require to measure and benchmark markets across asset classes, styles or strategies.

FTSE Russell index expertise and products are used extensively by institutional and retail investors globally. For over 30 years, leading asset owners, asset managers, ETF providers and investment banks have chosen FTSE Russell indexes to benchmark their investment performance and create ETFs, structured products and index-based derivatives.

FTSE Russell is focused on applying the highest industry standards in index design and governance, employing transparent rules-based methodology informed by independent committees of leading market participants. FTSE Russell fully embraces the IOSCO Principles and its Statement of Compliance has received independent assurance. Index innovation is driven by client needs and customer partnerships, allowing FTSE Russell to continually enhance the breadth, depth and reach of its offering.

FTSE Russell is wholly owned by London Stock Exchange Group.

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