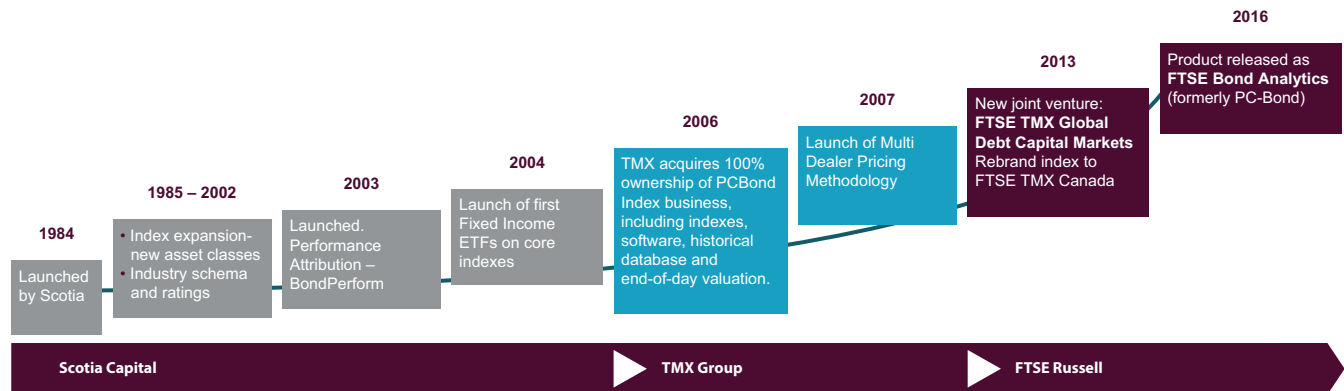


FTSE Bond Analytics

Index and Portfolio Solutions



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.

Highlights

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

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

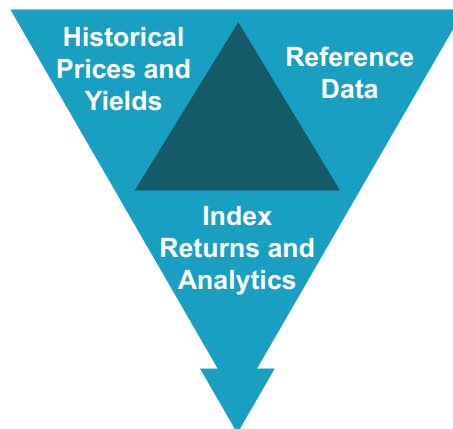
Combines CAD investment-grade bonds and FRNs (term to maturity < 2 years) with the longer end of the curve (term to maturity 10-20 years).

FTSE Bond Analytics

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

Depth of Coverage		Reference Data	
• Bullet Bonds	• Amortizing Issues	• Terms and Conditions	• Amount Outstanding
• Callable Issues	• Coupons and Residuals	• Rating Agencies	• Cashflow Models
• FRN Issues	• MBS and CMBS Issues	• Corporate Actions	
• Money Market Securities	• RRB Issues (inflation-linked)	• Multi-tier Sector Classification	
• Sinking Issues	• Fixed Income Indexes	• Trade/Liquidity Information	
• High Yield	• Blended Index Capabilities		



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

BondData

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

Time Series

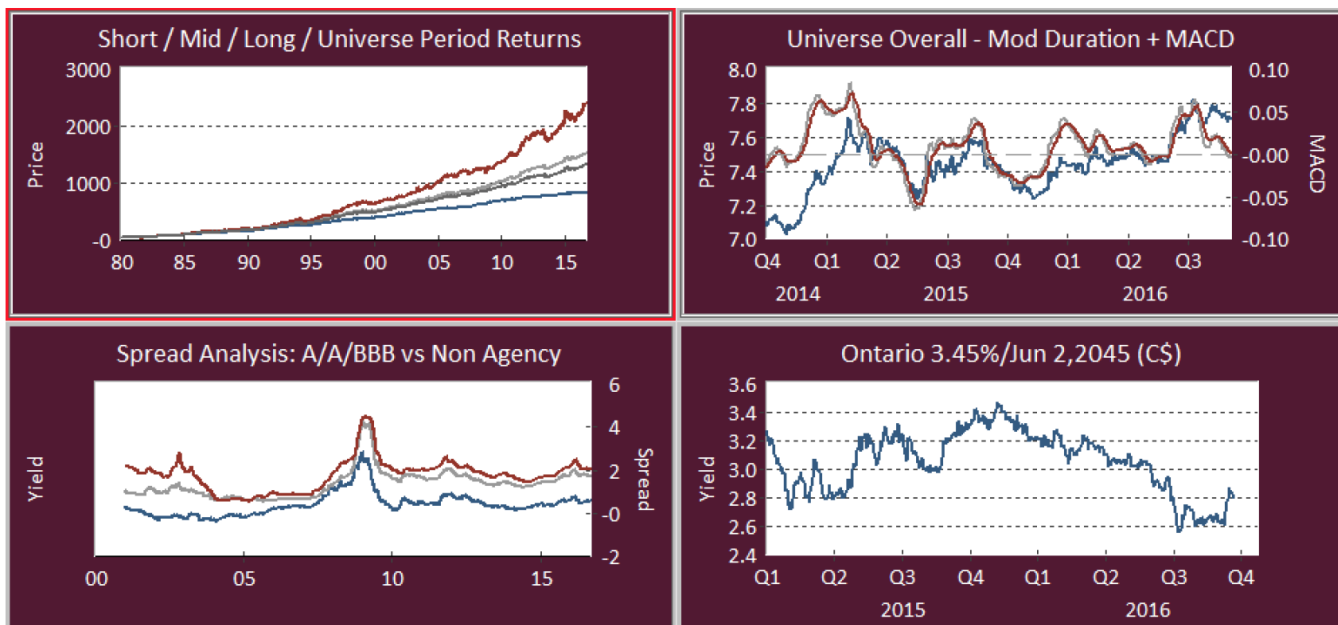
- Extensive historical time series
- Plot individual securities or benchmarks
- Spread analysis, including credit and industry
- Historical risk metrics: FTSE TMX Canada Bond Index families
- Draw user-defined trend lines
- View trade data – last traded price/yield, volume
- Plot historical traded volume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

Issue Chart A (10) 109253CAN3.5/Dec1,2045	Yield 1.6279	CurrSprd	BenSec	TrdPrice 143.11	TrdYield 1.6405	TrdSpread 0.00	TrdVol(000s)/Cnt 519,083(342)	TrdDate Aug 31, 2016
----------------------------------------------	-----------------	----------	--------	--------------------	--------------------	-------------------	----------------------------------	-------------------------

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

BondCalc

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

Standard Layout	Security 1	Security 2	Security 3	Security 4	Security 5	Security 6
Security ID	126580 CAN	117618 CAN	137439 CAN			
Security Desc.	CAN 1.25/Sep 1,2018 (C CAN 1.5/Jun 1,2023 (C\$ CAN 1.5/Jun 1,2026 (C\$					
CUSIP	135087B37	135087A61				
ISIN	CA135087B378	CA135087A610				
Issue Type	1=CANF	1=CANF				
Buy or Sell	SELL	BUY				
Settlement Date	Sep 15,2016	Sep 16,2016				
Coupon or Rate		1.250	1.500			
Maturity Date	Sep 1,2018	Jun 1,2023				
Eff Mat Date	Sep 1,2018	Jun 1,2023				
Data Source	Mid Price	Mid Price				
Market Price	101.3452	104.1272				
Market Yield	0.559	0.865				
I.R.R.	0.558	0.865				
Semi-Annual Yield	0.559	0.865				
Accrued Interest	0.0479	0.4397				
Dirty Price	101.3932	104.5669				
Term (Eff) in Years	1.96	6.71				
Term To Mat: Years	1.96	6.71				
Macaulay Duration	1.943	6.387				
Modified Duration	1.937	6.360				
Value of .01%	1.964	6.650				
Convexity	0.0474	0.4495				
Units	5,000,000	10,000,000				
Total Investment	5,069,658.41	10,456,691.35				
Principal	5,067,261.15	10,412,718.75				
Total Accrued	2,397.26	43,972.60				
Current Face Value	5,000,000.00	10,000,000.00				

Analytics Result

Risk-Weighted Butterfly Result Settlement: Sep 15,2016

Cost of Funds: 0.000 Reinvestment: 0.050

Sell

	Units	Coupon	Eff Mat Date	\$ ModDur
Security 1	3,848,604	1.25%	Sep 1,2018	7,560.5
Security 3	6,325,809	1.5%	Jun 1,2026	58,943.1

Buy

	Units	Coupon	Eff Mat Date	\$ ModDur
Security 2	10,000,000	1.5%	Jun 1,2023	66,503.7

	Sell	Buy	Diff	
Cost	10,456,691.35	10,456,691.35	5.34 *	Takeout
Avg Yield	0.932	0.865	6.6bp	Giveup
IRR	1.086	0.865	22.1bp	Giveup
Mac. Duration	6.394	6.387	0.007	Shorten
Mod. Duration	6.360	6.360	0.000	
Convexity	0.577	0.449	-0.127	Decrease
Horizon IRR	1.164	0.900	26.4bp	Giveup
Profit or Loss	13,903.02 PROFIT			

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

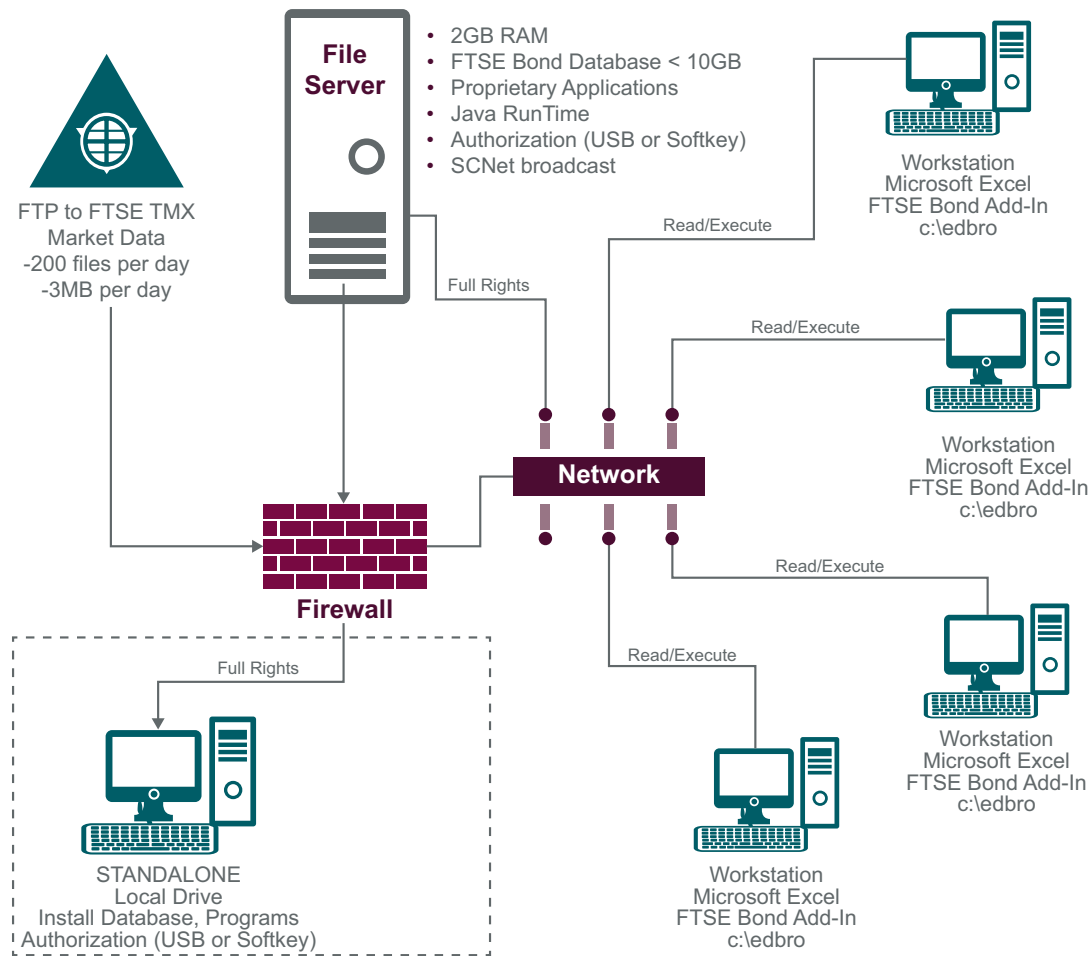
BondCalc: Lightweight trade calculator and historical security analysis tool
Use multiple templates and generate projected horizon returns

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
- Convenient Excel Add-ins and easy application automation for overnight processing
- Customize your own environment with flexible server and client-side configuration options
- Insert corporate logo for branded portfolio and index comparison reporting

FTSE BOND ANALYTICS STANDARD CONFIGURATION OPTIONS



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

Technical/Installation ▾ Introduction BondData ▾ BondManager ▾ UserData BondCalc FTSE TMX Canada Indexes

View All | Close All

Technical/Installation (12)

Introduction (3)

BondData (12)

BondManager (70)

BondManager Interactive Overview

BondManager Start Up Screen

Guide to Bondmanager Macros

Key Columns - List

Formula in BondManager

BondManager File Types

Multiple Portfolios in BondManager

Home > Categories > BondManager

Get Started with BondManager

Article ID 115 | 02/10/2016 00:00:00

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 Comparison 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

WHAT YOU WANT TO DO		ARTICLE
Import my portfolio in BondManager?	BondManager offers full portfolio automation, but to quickly get started, copy/paste CUSIPs and holdings into a worksheet, then price the portfolio.	Copy/Paste CUSIPs
Automate BondManager portfolios from my Accounting System?	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.	File Import Wizard
Create a macro to price my portfolio as of yesterday's close?	Use BondManager's macro recorder to capture the required keystrokes.	BondManager Macro Guide
Create a macro to price my portfolio as of a specific date?	Record a macro using the same steps above, but edit the *.mb6 file to add an {Input} or {InputFromFile} command.	BondManager Macro Guide
How to price securities not in the Database?	Use the benchmark pricing Key Columns: Bench Sec. ID, Bench Y.Curve and Bench Spread.	Matrix/Bench Pricing
Automate pricing of securities not in the Database?	Create a standalone portfolio file that contains all the securities not in the FTSE Bond Analytics database, with assigned benchmarks (see above).	Bench Pricing and File Merge

Support Guide: Subscribers easily access product help and functionality tutorials

Toronto

70 York Street, Suite 1520

Toronto, ON M5J 1S9

ftsebond@ftserussell.com

+1 416 572-7979

For more information about our product offering, please visit ftserussell.com or email us at ftsebond@ftserussell.com

© 2016 London Stock Exchange Group plc and its applicable group undertakings (the "LSE Group"). The LSE Group includes (1) FTSE International Limited ("FTSE"), (2) Frank Russell Company ("Russell"), (3) FTSE TMX Global Debt Capital Markets Inc. and FTSE TMX Global Debt Capital Markets Limited (together, "FTSE TMX") and (4) MTSNext Limited ("MTSNext"). All rights reserved.

FTSE Russell® is a trading name of FTSE, Russell, FTSE TMX and MTS Next Limited. "FTSE®", "Russell®", "FTSE Russell®" "MTS®", "FTSE TMX®", "FTSE4Good®" and "ICB®" and all other trademarks and service marks used herein (whether registered or unregistered) are trade marks and/or service marks owned or licensed by the applicable member of the LSE Group or their respective licensors and are owned, or used under licence, by FTSE, Russell, MTSNext, or FTSE TMX.

All information is provided for information purposes only. Every effort is made to ensure that all information given in this publication is accurate, but no responsibility or liability can be accepted by any member of the LSE Group nor their respective directors, officers, employees, partners or licensors for any errors or for any loss from use of this publication or any of the information or data contained herein.

No member of the LSE Group nor their respective directors, officers, employees, partners or licensors make any claim, prediction, warranty or representation whatsoever, expressly or impliedly, either as to the results to be obtained from the use of the FTSE Russell Indexes or the fitness or suitability of the Indexes for any particular purpose to which they might be put.

No member of the LSE Group nor their respective directors, officers, employees, partners or licensors provide investment advice and nothing in this document should be taken as constituting financial or investment advice. No member of the LSE Group nor their respective directors, officers, employees, partners or licensors make any representation regarding the advisability of investing in any asset. A decision to invest in any such asset should not be made in reliance on any information herein. Indexes cannot be invested in directly. Inclusion of an asset in an index is not a recommendation to buy, sell or hold that asset. The general information contained in this publication should not be acted upon without obtaining specific legal, tax, and investment advice from a licensed professional.

No part of this information may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the applicable member of the LSE Group. Use and distribution of the LSE Group index data and the use of their data to create financial products require a licence from FTSE, Russell, FTSE TMX, MTSNext and/or their respective licensors.

Past performance is no guarantee of future results. Charts and graphs are provided for illustrative purposes only. Index returns shown may not represent the results of the actual trading of investable assets. Certain returns shown may reflect back-tested performance. All performance presented prior to the index inception date is back-tested performance. Back-tested performance is not actual performance, but is hypothetical. The back-test calculations are based on the same methodology that was in effect when the index was officially launched. However, back-tested data may reflect the application of the index methodology with the benefit of hindsight, and the historic calculations of an index may change from month to month based on revisions to the underlying economic data used in the calculation of the index.

This publication may contain forward-looking statements. These are based upon a number of assumptions concerning future conditions that ultimately may prove to be inaccurate. Such forward-looking statements are subject to risks and uncertainties and may be affected by various factors that may cause actual results to differ materially from those in the forward-looking statements. Any forward-looking statements speak only as of the date they are made and no member of the LSE Group nor their licensors assume any duty to and do not undertake to update forward-looking statements.

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.

For more information, visit ftserussell.com.

To learn more, visit ftserussell.com; email info@ftserussell.com;
or call your regional Client Service Team office:

EMEA

+44 (0) 20 7866 1810

North America

+1 877 503 6437

Toronto

70 York Street, Suite 1520
Toronto, ON M5J 1S9
+1 416 572-7979

Asia-Pacific

Hong Kong +852 2164 3333
Tokyo +81 3 3581 2764
Sydney +61 (0) 2 8823 3521