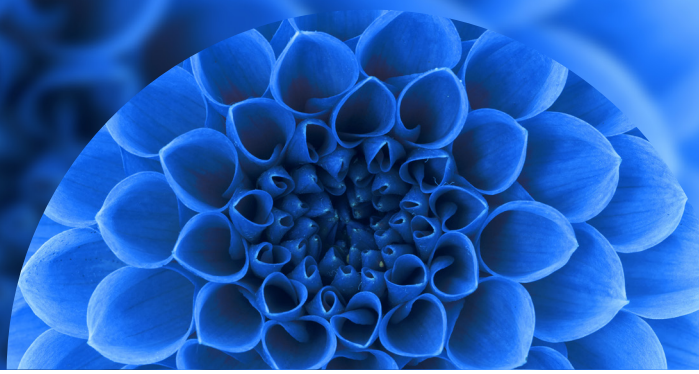
SOLUTION OVERVIEW

FTSE Global Factor Index Series



Overview

The FTSE Global Factor Index Series is a family of benchmarks designed to represent the performance of specific factor characteristics. This series applies a consistent and transparent methodology to achieve controlled exposure to target factors, while considering levels of diversification and capacity.

Features

- Eligible securities of each factor index are the constituents of the relevant underlying FTSE–All World Index or Russell 1000®/Russell 2000® Indexes respectively.
- The indexes derived from a FTSE underlying index are reviewed annually in September.
- The indexes derived from a Russell index are reviewed annually in June.
- Single factor Momentum, or multi-factor indexes that contain Momentum, are reviewed semi-annually; March and September for FTSE indexes and June and December for Russell indexes.

Results

- Tilt-Tilt methodology provides greater index factor exposure in a more controlled manner, while balancing concerns about liquidity, capacity, diversification, and turnover.
- The indexes are designed to target specific factor return premia in a rules-based and investable format.
- Potential improvement in risk-adjusted index outcomes.
- Multi-factor combinations can help mitigate investment cyclicality by diversifying across several factors.
- The indexes are also customizable – any underlying universe can be used, and a range of different factor tilt combinations and other screens can be applied.

Single Factor Building Blocks

- FTSE All-World
- FTSE Developed
- FTSE Developed ex US
- FTSE Developed Europe
- FTSE Developed Asia Pac
- FTSE Emerging
- FTSE USA
- FTSE USA Small Cap
- FTSE Japan
- FTSE 350 ex Invt Trust
- FTSE Developed ex Korea
- FTSE Brazil
- Russell 1000®
- Russell 2000®

Multi-Factor Indexes*

- Comprehensive Factor
- Focused Factor
- Qual/Vol/Yield Factor
- Balanced Factor

*See individual Methodology Overviews for more information.

Factors at a glance

Value	Quality	Size
Yield	Low Volatility	Momentum

FTSE RUSSELL
An LSEG Business

The factors

A factor is a stock characteristic that is important in explaining a security's risk and return. The FTSE Global Factor Index Series reference six equity factors, each of which is supported by academic research, with strong theoretical explanations as to why the factor has historically provided a premium.

- Factor-based investing is premised on the ability to identify factors that are expected to earn a positive premium in the future (i.e. factor exposures which are compensated).
- Not all factors are equal – some factors are uncorrelated, which means they may perform differently in different parts in the cycle.
- FTSE Russell's factors represent common factor characteristics supported by a body of empirical evidence across different geographies and time periods.

Factor premia and definitions

Factor	Description	Definition
Value	**The Value Premium:** Stocks that appear cheap tend to perform better than stocks that appear expensive. **Value tilts:** Can help capture exposures at a reasonable price relative to their fundamentals.	Composite of cash flow yield, earnings yield and country relative Sales: Price Ratio.
Quality	**The Quality Premium:** Higher quality companies tend to demonstrate higher performance than lower quality companies. **Quality tilts:** Can help capture companies with the ability to consistently generate strong future cash flows, while limiting exposures to stocks that are unprofitable or highly leveraged.	Composite of profitability, efficiency, earnings quality and leverage.
Size	**The Size Premium:** Smaller companies tend to demonstrate higher performance than larger companies. **Size tilts:** Can help capture excess returns of smaller companies relative to their larger counterparts.	Log of full market cap.
Yield	**The Yield Premium:** Higher yielding stocks (dividends) tend to demonstrate higher performance than stocks with lower yields. **Yield tilts:** Can help identify companies that have recently delivered strong dividends to shareholders.	Log of each company's 12 month trailing dividend.
Low Volatility	**The Low Volatility Premium:** Stocks that exhibit low volatility tend to perform better than stocks with higher volatility. **Low volatility tilts:** Can help capture companies with a historically lower risk (and higher return) profile relative to higher risk counterparts.	Standard deviation of 5 years of weekly local total returns.
Momentum	**The Momentum Premium:** Stock performance tends to persist, either continuing to rise or fall. **Momentum tilts:** Can lead to the selection of companies with strong recent performance, with the expectation that this will continue to produce short term excess returns in the future.	Cumulative 11 month return.

The factor index construction process

Steps 1-3 explain the high level process for a single factor index construction process. There are a number of ways that multiple factors can be targeted in an index. FTSE Russell employs a 'Tilt-Tilt' approach, which is briefly described in Step 4, and over the page.

Step 1

Calculate factor scores

Assign a 'raw' value for a given factor to each stock in the underlying index. Remove outliers and normalize results (Z Score)[1]. Assign each of the Z-Scores to a score in the range 0 to 1 by mapping to the cumulative normal distribution. Stocks which exhibit the highest factor characteristics will have a score closer to 1.

Step 1 Step 2

Translate scores into index weights

Combine scores with weights in the underlying index to form a broad factor index (unadjusted weights are normalized to ensure they total 100%).

- Underlying weights may be of any type (Market cap, Risk weight, etc) or geographical region. The resulting factor index can be understood as a 'Factor Tilt' on the underlying index, by tilting the underlying weights according to factor score. The index weights are then rescaled to ensure final weights sum to 100%.

Underlying Weight X Factor Score = Unadjusted Weight → Final Weight

Step 1 Step 2 Step 3

Combining factors

The application of consecutive 'factor tilts' (or, a tilt of one factor on another) towards multiple factors, through the repeated application of the above steps, results in a set of broad multi factor index weights. This can be understood as a modified Step 2, in which several factor scores are combined with the underlying index weight, as below.

Underlying Weight X Factor Score 1 X Factor Score 2 X Factor Score 3... = Unadjusted Weight → Final Weight

Step 1 Step 2 Step 3 Step 4

Narrow index and constrain final weights

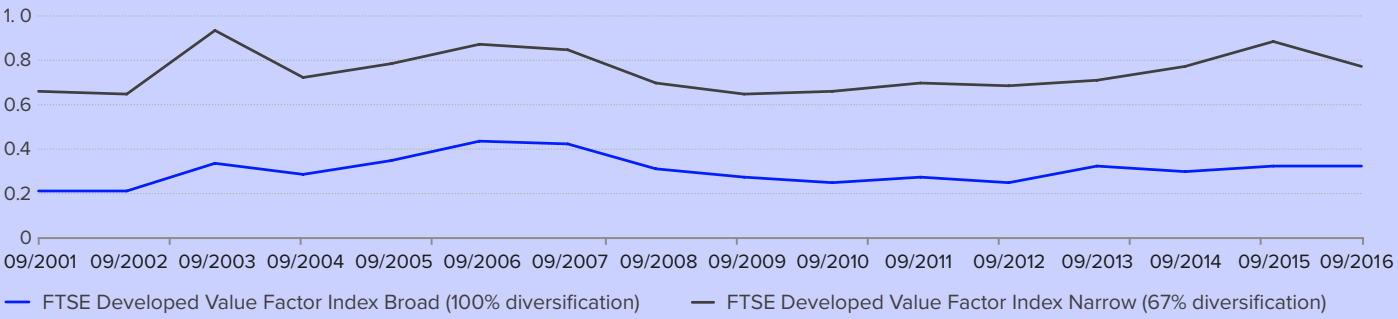
Remove stocks which do not contribute to the overall factor objective, whilst ensuring that diversification constraints are not breached.

The following constraints are applied during this process:

- Country and Industry weight constraints
- Maximum stock level capacity ratio
- Minimum stock weight

Why do we narrow?

Narrowing ensures greater Factor exposure in the final index



Source: FTSE Russell. Data as of September 30, 2016. Past performance is no guarantee of future results. Returns shown may reflect hypothetical historical performance. See disclaimer page for legal disclosures.

1 A 'Z-Score' is a statistical measurement of a score's relationship to the mean in a group of scores. A Z-Score of 0 means the score is the same as the mean. A Z-Score can be positive or negative, indicating whether it is above or below the mean.

The factor combination process

Gaining exposure to multiple factors becomes increasingly challenging using allocations to multiple individual single factor indexes. Targeting multiple factors can be achieved in several ways:

Composite index ('Top down' portfolio construction)

- Combine the weightings of individual factor indexes (e.g. 33.3% value, 33.3% quality, 33.3% size).
- However, at times, this may result in a dilution of exposures to the target factors.

Composite factor

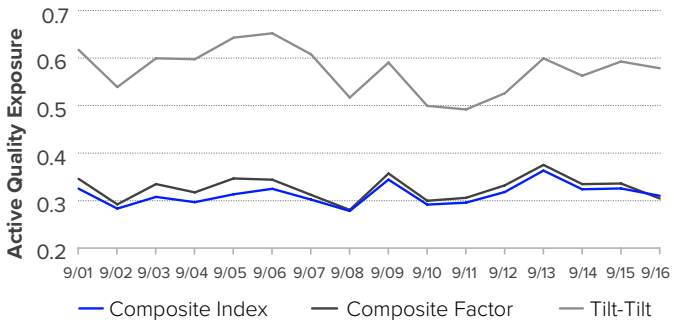
- Combine individual factor 'Z-Scores' to create a composite 'Z-Score'.
- Works for positively correlated factors (e.g. quality and low volatility) but is less effective for negatively correlated factors (e.g. quality and value).

The FTSE Russell preferred approach: Tilt-Tilt ('Bottom up' portfolio construction)

- Sequential, or 'multiplicative' tilts on each factor – outcome is independent of ordering.
- Approximately the same exposures of single factor indexes, without the dilutive effects of other methods.
- The magnitude of tilt determined by implementation concerns such as liquidity, capacity, diversification, and turnover.

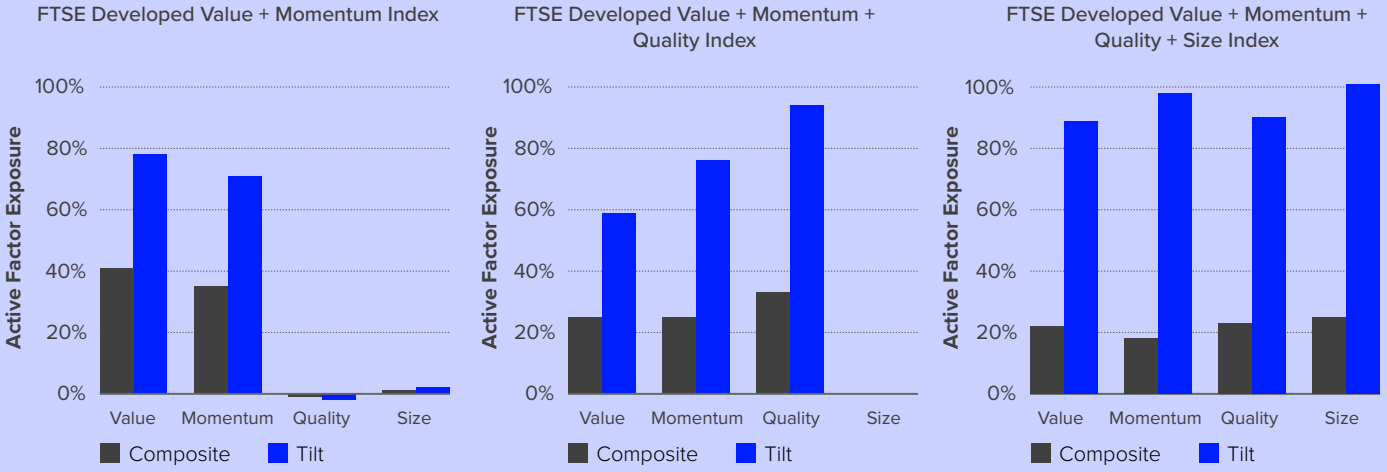
Tilt-Tilt improves factor exposure for positively corrected factors

FTSE Developed, Quality + Low Volatility Factor Index



Source: FTSE Russell. Data as of September 2001 to September 2016. Past performance is no guarantee of future results. Returns shown may reflect hypothetical historical performance. See disclaimer page for legal disclosures. Chart shows active factor loading relative to the FTSE Developed Index, calculated using an annual rebalance frequency.

Tilt-Tilt also improves factor exposure for negatively correlated factors



Greater factor exposure across all target factors, compared to other approaches:

- Composite approaches result in subdued levels of exposure to target factors.
- Tilt-tilt results in a factor index with approximately the same level of exposure as the single factor indexes.
- Highlights stocks displaying all characteristics.

Source: FTSE Russell. Data as of September 2001 to September 2016. Past performance is no guarantee of future results. Returns shown may reflect hypothetical historical performance. See disclaimer page for legal disclosures. Chart shows active factor loading relative to the FTSE Developed Index, calculated using an annual rebalance frequency.

A case study: Tilt-tilt methodology in single and multi-factor indexes

Constituent weights are derived using FTSE Russell's 'Tilt-Tilt' methodology. Factor scores are combined with the underlying market cap weight (or other starting universe) to create a factor weight for each constituent. The weight is rescaled (to sum to 100%), the index can be narrowed, and constraints are applied to arrive at the final weight in the factor index.

Case study I: Single factor index (Value).

	Cap Weight	X	Value Score	=	Unadj Wgt	Rescale wgts, narrow index & apply constraints	Final Wgt.
Ford	0.33%	X	1.00	=	0.33%	→	0.67%
Costco Wholesale	0.29%	X	0.5	=	0.15%	→	0.29%
Facebook	0.83%	X	0.07	=	0.06%	→	0.12%

Information for illustrative purposes only.

Case study 2: Multi-factor index (Value + Quality).

	Cap Weight	X	Value Score	X	Quality Score	=	Unadj Wgt	Rescale wgts, narrow index & apply constraints	Final Wgt.
Ford	0.33%	X	1.00	X	0.26	=	0.09%	→	0.34%
Costco Wholesale	0.29%	X	0.5	X	0.68	=	0.10%	→	0.39%
Facebook	0.83%	X	0.07	X	0.42	=	0.03%	→	0.10%

Information for illustrative purposes only.

Narrowing and constraints

When building single or multi-factor indexes, we want to capture factor risk premia through maintaining controlled exposure to the target factor, while retaining the benefits of the market cap-weighted benchmark, namely diversification and capacity. In constructing these indexes, certain diversification parameters are applied, such as maximum stock level capacity ratios, minimum stock weights, and country or industry constraints. In addition, single factor indexes undergo index narrowing which helps increase the exposure to the target factor. In this process, constraints relating to effective N, weighted capacity ratio, and active factor exposure are considered.

Please see the FTSE Global Factor Series Index Ground Rules for constraints on individual indexes.

Disclaimer

© 2023 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 Global Debt Capital Markets Inc. and FTSE Global Debt Capital Markets Limited (together, "FTSE Canada"), (4) FTSE Fixed Income Europe Limited ("FTSE FI Europe"), (5) FTSE Fixed Income LLC ("FTSE FI"), (6) The Yield Book Inc ("YB") and (7) Beyond Ratings S.A.S. ("BR"). All rights reserved.

FTSE Russell® is a trading name of FTSE, Russell, FTSE Canada, FTSE FI, FTSE FI Europe, YB and BR. "FTSE®", "Russell®", "FTSE Russell®", "FTSE4Good®", "ICB®", "The Yield Book®", "Beyond Ratings®" and all other trademarks and service marks used herein (whether registered or unregistered) are trademarks 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, FTSE Canada, FTSE FI, FTSE FI Europe, YB or BR. FTSE International Limited is authorised and regulated by the Financial Conduct Authority as a benchmark administrator.

All information is provided for information purposes only. All information and data contained in this publication is obtained by the LSE Group, from sources believed by it to be accurate and reliable. Because of the possibility of human and mechanical error as well as other factors, however, such information and data is provided "as is" without warranty of any kind. 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 accuracy, timeliness, completeness, merchantability of any information or of results to be obtained from the use of FTSE Russell products, including but not limited to indexes, data and analytics, or the fitness or suitability of the FTSE Russell products for any particular purpose to which they might be put. Any representation of historical data accessible through FTSE Russell products is provided for information purposes only and is not a reliable indicator of future performance.

No responsibility or liability can be accepted by any member of the LSE Group nor their respective directors, officers, employees, partners or licensors for (a) any loss or damage in whole or in part caused by, resulting from, or relating to any error (negligent or otherwise) or other circumstance involved in procuring, collecting, compiling, interpreting, analysing, editing, transcribing, transmitting, communicating or delivering any such information or data or from use of this document or links to this document or (b) any direct, indirect, special, consequential or incidental damages whatsoever, even if any member of the LSE Group is advised in advance of the possibility of such damages, resulting from the use of, or inability to use, such information.

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 or whether such investment creates any legal or compliance risks for the investor. 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 nor confirmation that any particular investor may lawfully buy, sell or hold the asset or an index containing the 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.

The information contained in this report should not be considered "research" as defined in recital 28 of the Commission Delegated Directive (EU) 2017/593 of 7 April 2016 supplementing Directive 2014/65/EU of the European Parliament and of the Council ("MiFID II") and is provided for no fee.

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 document may contain forward-looking assessments. These are based upon a number of assumptions concerning future conditions that ultimately may prove to be inaccurate. Such forward-looking assessments are subject to risks and uncertainties and may be affected by various factors that may cause actual results to differ materially. No member of the LSE Group nor their licensors assume any duty to and do not undertake to update forward-looking assessments.

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 data requires a licence from FTSE, Russell, FTSE Canada, FTSE FI, FTSE FI Europe, YB, BR and/or their respective licensors.

About FTSE Russell

FTSE Russell is a leading global provider of index and benchmark solutions, spanning diverse asset classes and investment objectives. As a trusted investment partner we help investors make better-informed investment decisions, manage risk, and seize opportunities.

Market participants look to us for our expertise in developing and managing global index solutions across asset classes. Asset owners, asset managers, ETF providers and investment banks choose FTSE Russell solutions to benchmark their investment performance and create investment funds, ETFs, structured products, and index-based derivatives. Our clients use our solutions for asset allocation, investment strategy analysis and risk management, and value us for our robust governance process and operational integrity.

For over 35 years we have been at the forefront of driving change for the investor, always innovating to shape the next generation of benchmarks and investment solutions that open up new opportunities for the global investment community.

To learn more, visit lseg.com/ftse-russell; email info@ftserussell.com; or call your regional Client Service team office:

EMEA +44 (0) 20 7866 1810

North America +1 877 503 6437

Asia-Pacific

Hong Kong +852 2164 3333

Tokyo +81 (3) 6441 1430

Sydney +61 (0)2 7228 5659

FTSE RUSSELL
An LSEG Business

FR2855695/05-23