



FTSE Global Factor Index Series

v4.3



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Section 1

Introduction

1.0 Introduction

- 1.1 This document sets out the Ground Rules for the construction and management of the FTSE Global Factor Index Series. Copies of the Ground Rules are available from www.ftserussell.com.
- 1.2 The FTSE Global Factor Index Series is designed to reflect the performance of stocks representing a specific set of factor characteristics.
- 1.3 These Ground Rules should be read in conjunction with the FTSE Global Equity Index Series Ground Rules, FTSE UK Index Series Ground Rules, FTSE/JSE Africa Index Series Ground Rules, the Corporate Actions and Events Guide for Non Market Cap Weighted Indexes and the Russell U.S. Equity Indexes Construction and Methodology which are available at www.ftserussell.com. Unless stated in these Ground Rules, the FTSE Global Factor Index Series will follow the same process as the FTSE Global Equity Index Series.
- 1.4 Price and Total Return Indexes will be calculated on an end of day basis.

Total return indexes include income based on ex dividend adjustments. All dividends are applied as declared in FTSE total return indexes.
- 1.5 The base currency of the benchmark is US Dollars. Index values may also be published in other currencies.
- 1.6 The indexes may be calculated in real time (See Appendix A).
- 1.7 **FTSE Russell**

FTSE Russell is a trading name of FTSE International Limited, Frank Russell Company, FTSE Global Debt Capital Markets Limited (and its subsidiaries FTSE Global Debt Capital Markets Inc. and MTSNext Limited), Mergent, Inc., FTSE Fixed Income LLC and The Yield Book Inc.
- 1.8 FTSE Russell hereby notifies users of the index series that it is possible that circumstances, including external events beyond the control of FTSE Russell, 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.
- 1.9 Index users who choose to follow this index series or to buy products that claim to follow this index series should assess the merits of the index series 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 Russell (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 series or any constituent data.



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.

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

- maintain records of the index weightings of all constituents;
- make changes to the constituents and their weightings in accordance with the Ground Rules;
- carry out periodic index reviews of the Index Series and apply the changes resulting from the reviews as required by the Ground Rules;
- publish changes to the constituent weightings resulting from their ongoing maintenance and the periodic reviews;
- disseminate the indexes.

2.2 Amendments to These Ground Rules

2.2.1 These Ground Rules shall be subject to regular review by FTSE Russell to ensure that they continue to meet the current and future requirements of investors and other index users. 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.

2.2.2 As provided for in the Statement of Principles for FTSE Russell Equity 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 Ground 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 Corporate Actions and Events Guide

- 3.2 Full details of changes to constituent companies due to corporate actions and events can be accessed in the Corporate Actions and Events Guide for Non Market Cap Weighted Indexes using the following link:

[Corporate Actions and Events Guide for Non Market Cap Weighted Indices.pdf](#)

3.3 Statement of Principles for FTSE Russell Equity 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 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 FTSE Russell's Product Governance Board.

The Statement of Principles can be accessed using the following link:

[Statement of Principles.pdf](#)

3.4 Queries and Complaints

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

[Benchmark Determination Complaints Handling Policy.pdf](#)

3.5 Index Policy for Trading Halts and Market Closures

- 3.5.1 Guidance for the treatment of index changes in the event of trading halts or market closures can be found using the following link:

[Index Policy for Trading Halts and Market Closures.pdf](#)

3.6 Index Policy in the Event Clients are Unable to Trade a Market

- 3.6.1 Details of FTSE Russell's treatment can be accessed using the following link:

[Index Policy in the Event Clients are Unable to Trade a Market.pdf](#)

3.7 **Recalculation Policy and Guidelines**

- 3.7.1 The FTSE Global Factor Index Series are recalculated whenever errors or distortions occur that are deemed to be significant. Users of the FTSE Global Factor Index Series are notified through appropriate media.

For further information refer to the FTSE Russell Recalculation Policy and Guidelines document which is available from the FTSE Russell website using the link below or by contacting

info@ftserussell.com.

[Recalculation Policy and Guidelines Equity Indexes.pdf](#)

3.8 **Policy for Benchmark Methodology Changes**

- 3.8.1 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

Eligible Securities

4.0 Eligible Securities

4.1 The eligible securities of each factor index are the constituents of indexes defined by the FTSE Global Equity Index Series, FTSE UK Index Series, FTSE/JSE Africa Index Series and the Russell US Equity Indexes.

4.1.1 The eligible universe of the FTSE All-World ex CW Balanced Factor Index, including the March and September annually reviewed indexes will consist of constituent securities of the FTSE All-World Index excluding companies that manufacture or provide specific parts for anti-personnel mines, cluster munitions, chemical and biological weapons. The controversial weapon (CW) exclusions will be reviewed semi-annually in March and September (see Rule 7.1).

4.2 Multiple Lines

4.2.1 All lines of the same company that are eligible securities are eligible for inclusion in the relevant factor indexes.

4.3 Single Factor Indexes

The FTSE Global Factor Index Series consists of the following single factor indexes. The base currency of all indexes is USD.

Table 1: Single Factor Indexes

Underlying Universe	Single Factor Indexes
FTSE All-World	Momentum, Quality, Size, Value, Volatility, Yield
FTSE Developed	Momentum, Quality, Size, Value, Volatility, Yield
FTSE Developed ex US	Momentum, Quality, Size, Value, Volatility, Yield Country Relative Momentum, Country Relative Volatility
FTSE Developed Asia Pacific	Momentum, Quality, Size, Value, Volatility, Yield
FTSE Developed Europe	Momentum, Quality, Size, Value, Volatility, Yield
FTSE Developed ex Korea	Momentum, Quality, Size, Value, Volatility, Yield
FTSE Emerging	Momentum, Quality, Size, Value, Volatility, Yield Country Relative Momentum, Country Relative Volatility
FTSE Asia ex Japan	Momentum, Quality, Size, Value, Volatility, Yield
FTSE Brazil Capped 10%*	Momentum, Quality, Size, Value, Volatility, Yield
FTSE/JSE All-Share Capped 5%	Momentum, Quality, Size, Value, Volatility, Yield
Russell 1000	Momentum, Quality, Size, Value, Volatility, Yield
Russell 2000	Momentum, Quality, Size, Value, Volatility, Yield
FTSE USA	Momentum, Quality, Size, Value, Volatility, Yield
FTSE USA Small Cap	Momentum, Quality, Size, Value, Volatility, Yield
FTSE Japan	Momentum, Quality, Size, Value, Volatility, Yield
FTSE 350 ex Inv Trust Capped 2%	Momentum, Quality, Size, Value, Volatility, Yield

* Resolution 3792 Compliant: the index excludes DRs or stocks that do not qualify for the "Novo Mercado" Level 2 nor for the Bovespa Mais (plus) with the exception of those issued prior to May 29th 2001. Details are available at:

<http://www.bmfbovespa.com.br/en-us/corporate-governance.aspx?idioma=en-us>.

The most illiquid securities, representing 1% of investable market capitalisation are also removed. Illiquidity is defined using the Amihud Ratio, the median ratio of absolute daily return-to-volume over the 12 month period prior to the review month. A minimum of 120 daily observations are required. The Amihud Ratio can be interpreted as the price impact per dollar traded; the greater the Amihud Ratio, the greater the degree of illiquidity.

4.4 Multi-Factor Indexes

The FTSE Global Factor Index Series consists of the following multi-factor indexes. The base currency of all indexes is USD.

Table 2: Multi-Factor Indexes

Underlying Universe	Multiple Factor Index
FTSE All-World	FTSE All-World Qual/Val/Vol Factor Index FTSE All-World Comprehensive Factor Index FTSE All-World ex CW Balanced Factor Index FTSE All-World ex CW Balanced Factor (Mar) Index* FTSE All-World ex CW Balanced Factor (Sep) Index*
FTSE All-World ex US	FTSE All-World ex US Comprehensive Factor Index
FTSE Developed	FTSE Developed Qual/Val/Vol Factor Index FTSE Developed Comprehensive Factor Index
FTSE Developed ex US	FTSE Developed ex US Qual/Val/Vol Factor Index FTSE Developed ex US Comprehensive Factor Index FTSE Developed ex US Qual/Vol/Yield Factor Index FTSE Developed ex US Qual/Vol/Yield 5% Capped Factor Index FTSE Developed ex US Select Factor Index
FTSE Developed Asia Pacific	FTSE Developed Asia Pacific Qual/Vol/Yield Factor Index FTSE Developed Asia Pacific Qual/Vol/Yield 5% Capped Factor Index
FTSE Developed Europe	FTSE Developed Europe Qual/Vol/Yield Factor Index FTSE Developed Europe Qual/Vol/Yield 5% Capped Factor Index FTSE Developed Europe Comprehensive Factor Index
FTSE Developed ex Korea	FTSE Developed ex Korea Qual/Vol Factor Index FTSE Developed ex Korea Qual/2Vol Factor Index
FTSE Emerging	FTSE Emerging Qual/Val/Vol Factor Index FTSE Emerging Comprehensive Factor Index FTSE Emerging Qual/Vol/Yield Factor Index FTSE Emerging Qual/Vol/Yield 5% Capped Factor Index
FTSE Asia ex Japan	FTSE Asia ex Japan Qual/Val/Vol 10% Capped Factor Index FTSE Asia ex Japan Comprehensive 10% Capped Factor Index FTSE Asia ex Japan Yield Focused 10% Capped Factor Index
FTSE/JSE All-Share Capped 5%	FTSE/JSE All-Share Comprehensive Factor Index FTSE/JSE All-Share Low Volatility Focused Factor Index
Russell 1000	Russell 1000 Comprehensive Factor Index Russell 1000 Low Volatility Focused Factor Index Russell 1000 Low Volatility Focused ex Tobacco Factor Index Russell 1000 Yield Focused Factor Index Russell 1000 Momentum Focused Factor Index Russell 1000 Mom/2Val Factor Index Russell 1000 2Size/2Val 5% Capped Factor Index Russell 1000 2Mom/Size/Val 5% Capped Factor Index Russell 1000 2Qual/2Vol 5% Capped Factor Index Russell 1000 2Mom/2Qual/2Vol 5% Capped Factor Index Russell 1000 2Qual/Val 5% Capped Factor Index
Russell 2000	Russell 2000 Comprehensive Factor Index Russell 2000 2Size/2Val 3% Capped Factor Index Russell 2000 2Mom/Size/Val 3% Capped Factor Index Russell 2000 2Qual/2Vol 3% Capped Factor Index Russell 2000 2Mom/2Qual/2Vol 3% Capped Factor Index
FTSE USA	FTSE USA Qual/Val/Vol Factor Index FTSE USA Qual/Vol/Yield Factor Index FTSE USA Qual/Vol/Yield 5% Capped Factor Index

Underlying Universe	Multiple Factor Index
FTSE USA Small Cap	FTSE USA Small Cap Qual/Vol/Yield Factor Index FTSE USA Small Cap Qual/Vol/Yield 3% Capped Factor Index
FTSE USA Small Cap ex Real Estate	FTSE USA Small Cap ex Real Estate 2Qual/Vol/ Yield 3% Capped Factor Index
FTSE Japan	FTSE Japan Qual/Val/Vol Factor Index FTSE Japan Qual/Size/Val Factor Index FTSE Japan Qual/Val Factor Index FTSE Japan Val/Vol Factor Index FTSE Japan Comprehensive Factor Index
FTSE 350 ex Inv Trust Capped 2%	FTSE 350 ex Inv Trust Qual/Vol/Yield Factor Index FTSE 350 ex Inv Trust Qual/Vol/Yield 5% Capped Factor Index FTSE 350 ex Inv Trust Comprehensive Factor Index

* Indexes are reviewed annually and are used in the phased reviews of the FTSE All-World ex CW Balanced Factor Index (see Rule 7.3)

Section 5

Factor Construction

5.0 Factor Construction

The data cut-off date for the calculation of all factor data is the close of business on the last business day of the month prior to the review month.

5.1 Factor Normalisation and Missing Data Treatment

5.1.1 Individual stock factor values are normalised cross-sectionally to create Z-Scores within each eligible universe according to:

$$Z_{J,i} = (F_{J,i} - \mu_J) / \sigma_J \quad (1)$$

where $F_{J,i}$ is the J^{th} factor value of the i^{th} stock and μ_J and σ_J are the cross-sectional factor mean and standard deviation respectively. Z-Scores that are greater (less) than three (minus three) are truncated to a value of three (minus three). Post-truncation, individual Z-Scores are renormalized by the re-application of equation (1). All Z-Scores, including truncated ones are included in this re-application. This process is repeated until all Z-Scores lie in a range between plus and minus three.

5.1.2 If a factor consists of multiple sub-factors, e.g. Profitability which has three components, a stock's initial factor Z-Score is formed by taking the average of its individual sub-factor Z-Scores calculated via Rule 5.1.1. This average is taken across non missing sub-factor Z-Scores. The normalisation procedure detailed in Rule 5.1.1 is then re-applied to this average to form the final factor Z-Score.

5.1.3 For all factors with the exception of Yield, stocks with missing factor data are allocated a neutral Z-Score of zero after the application of the normalisation procedure detailed in Rules 5.1.1 and 5.1.2. For Yield missing (or zero) values are assigned a Z-Score of minus three.

5.2 Momentum

Momentum is defined as the cumulative total local return, calculated over the period that starts twelve months prior to the effective date, and ends the Monday following the third Friday of the previous month. A full history is required to calculate Momentum. Country Relative Momentum is calculated in excess of the country median stock level of Momentum. A Z-Score for Momentum and Country Relative Momentum is created following the procedure detailed in Rules 5.1.1 and 5.1.3.

5.3 Quality

Quality is defined as a composite of Profitability and Leverage. Indexes derived from the FTSE Global All Cap Index Series, FTSE UK Index Series, FTSE/JSE Africa Index Series, Russell 1000 and the Russell 2000 Indexes consider three individual measures of Profitability and a single measure of Leverage. The Profitability and Leverage Z-Scores are combined to create a single Z-

Score for Quality following the procedure described in Rules 5.1.2 and 5.1.3. Annual reported financial statement items are sourced from a third party data provider.

5.3.1 Profitability

Profitability is defined for indexes derived from the FTSE Global All Cap Index Series, FTSE UK Index Series, FTSE/JSE Africa Index Series, Russell 1000 and the Russell 2000 Indexes by combining the Z-Scores of the following three measures according to Rule 5.1.2:

$$A. \quad ROA = \frac{Net\ Income}{Average\ Total\ Assets} \quad (4)$$

$$B. \quad \Delta\ Asset\ Turnover = \frac{Sales_t}{Total\ Assets_t} - \frac{Sales_{t-1}}{Total\ Assets_{t-1}} \quad (5)$$

$$C. \quad Accruals = \frac{\Delta WC + \Delta NCO + \Delta FIN}{Average\ Total\ Assets} * (-1) \quad (6)$$

Note, a high level of Accruals is considered an indicator of lower levels of future profitability. We therefore reverse the sign by multiplying by minus 1 in equation (6). All the above measures are calculated relative to the relevant regional median stock level.

Note that the terms in equations (4), (5), (6) are defined by:

$$Average\ Total\ Assets = (Total\ Assets_t + Total\ Assets_{t-1})/2$$

$$WC\ (Working\ Capital) = (Current\ Assets - Cash\ \&\ Short-term\ Investments) - (Current\ Liability - Short-term\ Debt)$$

$$Non-current\ Net\ Operating\ Assets\ (NCO) = (Total\ Assets - Current\ Assets - Investments\ and\ Advances) - (Total\ Liability - Current\ Liabilities - Long-term\ Debt)$$

$$Net\ Financial\ Assets\ (FIN) = (Short-term\ Investments + Long-term\ Investments) - (Long-term\ Debt + Short-term\ Debt + Preferred\ Stock)$$

Negative total or average assets are assigned a neutral Z-Score of zero.

5.3.2 Leverage Ratio

Leverage for indexes derived from the the FTSE Global All Cap Index Series, FTSE UK Index Series, FTSE/JSE Africa Index Series, Russell 1000 and Russell 2000 Indexes is the ratio of Operating Cash Flow to Total Debt measured relative to the regional industry (ICB) median stock level.

$$Leverage\ Ratio = \frac{Operating\ Cash\ Flow}{Total\ Debt} \quad (8)$$

The Leverage measure is normalised following the procedure described in Rule 5.1.1 and Rule 5.1.3.

A company whose net operating cash flow is greater than total debt or has no debt is assigned a maximum Leverage Ratio of one.

5.3.3 Financials

Securities of the FTSE Global All Cap Index Series, FTSE UK Index Series, FTSE/JSE Africa Index Series, Russell 1000 and Russell 2000 Indexes that are classified as financials (ICB Industry Code 8000), utilise ROA as the sole measure of Quality. Certain Quality measures such as operating cash flow and accruals cannot meaningfully be calculated or are not applicable to financial companies.

5.4 Size

Size is calculated as the natural logarithm of each company's full market capitalisation in USD. Shares in issue as of the review effective date and price and foreign exchange rates as of the data cut-off date are used to calculate each company's full market capitalisation. A Z-Score for Size is created following the procedure detailed in Rules 5.1.1 and 5.1.3.

5.5 Value

For indexes derived from the FTSE Global All Cap Index Series, FTSE UK Index Series, FTSE/JSE Africa Index Series, Russell 1000 and the Russell 2000 Indexes, Value is represented by a composite of three common valuation measures:

- A. Cash-flow Yield = Latest Annual Cash-Flow / Full Market Capitalisation
- B. Earnings Yield = Latest Annual Net Income / Full Market Capitalisation
- C. Sales to Price = Latest Annual Sales / Full Market Capitalisation

Sales to Price is calculated in excess of the country median stock level. Annual measures of cash-flow, net income and sales are sourced from a third party data provider.. Individual value Z-Scores are combined to create a single Z-Score for Value following the procedure described in Rules 5.1.2 and 5.1.3.

5.6 Volatility

Volatility is defined as the standard deviation of five years of weekly (Wednesday to Wednesday) total local returns prior to the rebalance month. A minimum of 52 weekly return observations are required to calculate volatility. Country Relative Volatility is calculated in excess of the country median stock level of Volatility. A Z-Score for Volatility and Country Relative Volatility is created following the procedure detailed in Rules 5.1.1 and 5.1.3.

5.7 Yield

Yield is calculated as the natural logarithm of each company's twelve month trailing dividend yield. Companies whose trailing dividend yield is zero are assigned a Z-Score of minus three. A Z-Score for Yield is created following the procedure detailed in Rules 5.1.1 and 5.1.3.

Section 6

Index Construction

6.0 Index Construction

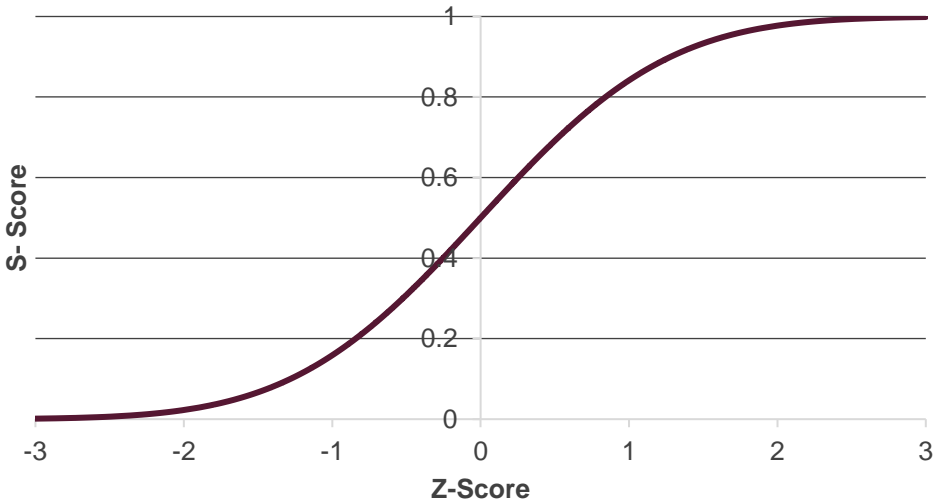
6.1 Single Factor Index Construction

6.1.1 Normalised factor Z-Scores are mapped to a score $S_i \in (0, 1)$, using the cumulative normal distribution with mean zero and standard deviation one.

$$S_i = CN(Z_i) = \int_{-\infty}^{Z_i} \frac{e^{-x^2/2}}{\sqrt{2\pi}} dx \tag{8}$$

Chart 1 illustrates the relationship between Z-Scores and mapped Z-Scores.

Chart 1: Mapping Factor Z-Score to S-Score



6.1.2 A set of broad factor index weights, \widehat{W}_i , are calculated for each single factor index:

$$\widehat{W}_i = \frac{S_i * W_i}{\sum_j S_j * W_j} \tag{9}$$

where W_i are the underlying eligible universe free float market capitalisation index weights.

6.1.3 A factor index may be determined by a factor tilt in either direction. A tilt in the opposite direction i.e. with a negative tilt towards a given factor may be achieved by reversing the sign of a stock's Z-Score and applying the cumulative normal mapping.

$$S_i = CN(-Z_i) \tag{10}$$

Table 3 shows the direction of the tilt applied to each factor.

Table 3: Single Factor Indexes: Tilt Direction

Single Factor Indexes	Tilt Direction
Momentum Factor Index	Positive
Quality Factor Index	Positive
Size Factor Index	Negative
Value Factor Index	Positive
Volatility Factor Index	Negative
Yield Factor Index	Positive

6.2 Multi-Factor Index Construction

- 6.2.1 Where factors are highly positively correlated, a composite Z-Score may be formed from the normalised arithmetic average of individual factor Z-Scores. The calculation of each single factor Z-Score follows the methodology of Section 5 and the tilt direction of Table 3. The determination of the broad index weights for a multi-factor index follows the single factor index construction methodology of Rule 6.1. Table 4 details the application of a single or composite factor approach to each multi-factor index.
- 6.2.2 The application of consecutive factor tilts towards individual (single or composite) factors through the repeated application of the single factor methodology of Rule 6.1 results in a set of broad multi-factor index weights. Table 4 details the application of the multiple tilt approach within each multi-factor index. The order of the tilt is one, unless shown.

Table 4: Multi-Factor Indexes

Multi-Factor Indexes	Tilt 1 Composite or Single Factor	Tilt 2 Composite or Single Factor	Tilt 3 Composite or Single Factor	Tilt 4 Composite or Single Factor	Tilt 5 Composite or Single Factor	Tilt 6 Composite or Single Factor
FTSE All-World Qual/Val/Vol Factor Index	Quality, Volatility	Value				
FTSE All-World Comprehensive Factor Index	Quality	Value	Volatility	Momentum	Size	
FTSE All-World ex US Comprehensive Factor Index	Quality	Value	Volatility	Momentum	Size	
FTSE All-World ex CW Balanced Factor Index#	Quality	Value	Volatility	Size ^{0.25}		
FTSE Developed Qual/Val/Vol Factor Index	Quality, Volatility	Value				
FTSE Developed Comprehensive Factor Index	Quality	Value	Volatility	Momentum	Size	
FTSE Developed ex US Qual/Val/Vol Factor Index	Quality, Volatility	Value				
FTSE Developed ex US Comprehensive Factor Index	Quality	Value	Volatility	Momentum	Size	
FTSE Developed ex US Select Factor Index	Quality	Value	Volatility	Momentum	Size ^{0.5}	
FTSE Developed ex US Qual/Vol/Yield Factor Index	Quality	Volatility	Yield			

	Tilt 1	Tilt 2	Tilt 3	Tilt 4	Tilt 5	Tilt 6
Multi-Factor Indexes	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor
FTSE Developed ex US Qual/Vol/Yield 5% Capped Factor Index	Quality	Volatility	Yield			
FTSE Developed ex Korea Qual/Vol Factor Index	Quality	Volatility				
FTSE Developed ex Korea Qual/2Vol Factor Index	Quality	Volatility	Volatility			
FTSE Developed Asia Pacific Qual/Vol/Yield Factor Index	Quality	Volatility	Yield			
FTSE Developed Asia Pacific Qual/Vol/Yield 5% Capped Factor Index	Quality	Volatility	Yield			
FTSE Developed Europe Qual/Vol/Yield Factor Index	Quality	Volatility	Yield			
FTSE Developed Europe Comprehensive Factor Index	Quality	Value	Volatility	Momentum	Size	
FTSE Developed Europe Qual/Vol/Yield 5% Capped Factor Index	Quality	Volatility	Yield			
FTSE Emerging Qual/Val/Vol Factor Index	Quality, Volatility	Value				
FTSE Emerging Comprehensive Factor Index	Quality	Value	Volatility	Momentum	Size	
FTSE Emerging Qual/Vol/Yield Factor Index	Quality	Volatility	Yield			
FTSE Emerging Qual/Vol/Yield 5% Capped Factor Index	Quality	Volatility	Yield			
FTSE Asia ex Japan Qual/Val/Vol 10% Capped Factor Index	Quality	Value	Volatility			
FTSE Asia ex Japan Comprehensive 10% Capped Factor Index	Quality	Value	Volatility	Momentum	Size	
FTSE Asia ex Japan Yield Focused 10% Capped Factor Index	Quality	Value	Size	Yield	Yield	
FTSE/JSE All-Share Comprehensive Factor Index	Quality	Value	Volatility	Momentum	Size	
FTSE/JSE All-Share Low Volatility Focused Factor Index	Quality	Value	Size	Volatility	Volatility	
Russell 1000 Comprehensive Factor Index	Quality	Value	Volatility	Momentum	Size	
Russell 1000 Low Volatility Focused Factor Index	Quality	Value	Size	Volatility	Volatility	
Russell 1000 Low Volatility Focused ex Tobacco Factor Index*	Quality	Value	Size	Volatility	Volatility	
Russell 1000 Yield Focused Factor Index	Quality	Value	Size	Yield	Yield	
Russell 1000 Momentum Focused Factor Index	Quality	Value	Size	Momentum		
Russell 1000 Mom/2Val Factor Index	Momentum	Value	Value			

	Tilt 1	Tilt 2	Tilt 3	Tilt 4	Tilt 5	Tilt 6
Multi-Factor Indexes	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor
Russell 1000 2Size/2Val 5% Capped Factor Index	Value	Value	Size	Size		
Russell 1000 2Mom/Size/Val 5% Capped Factor Index	Momentum	Momentum	Size	Value		
Russell 1000 2Qual/2Vol 5% Capped Factor Index	Quality	Quality	Volatility	Volatility		
Russell 1000 2Mom/2Qual/2Vol 5% Capped Factor Index	Momentum	Momentum	Quality	Quality	Volatility	Volatility
Russell 1000 2Qual/Val 5% Capped Factor Index	Quality	Quality	Value			
Russell 2000 Comprehensive Factor Index	Quality	Value	Volatility	Momentum	Size	
Russell 2000 2Size/2Val 3% Capped Factor Index	Value	Value	Size	Size		
Russell 2000 2Mom/Size/Val 3% Capped Factor Index	Momentum	Momentum	Size	Value		
Russell 2000 2Qual/2Vol 3% Capped Factor Index	Quality	Quality	Volatility	Volatility		
Russell 2000 2Mom/2Qual/2Vol 3% Capped Factor Index	Momentum	Momentum	Quality	Quality	Volatility	Volatility
FTSE USA Qual/Val/Vol Factor Index	Quality, Volatility	Value				
FTSE USA Qual/Vol/Yield Factor Index	Quality	Volatility	Yield			
FTSE USA Qual/Vol/Yield 5% Capped Factor Index	Quality	Volatility	Yield			
FTSE USA Small Cap Qual/Vol/Yield Factor Index	Quality	Volatility	Yield			
FTSE USA Small Cap Qual/Vol/Yield 3% Capped Factor Index	Quality	Volatility	Yield			
FTSE USA Small Cap ex Real Estate 2Qual/Vol/Yield 3% Capped Factor Index	Quality	Quality	Volatility	Yield		
FTSE Japan Comprehensive Factor Index	Quality	Value	Volatility	Momentum	Size	
FTSE Japan Qual/Val/Vol Factor Index	Quality	Value	Volatility			
FTSE Japan Qual/Size/Val Factor Index	Quality	Size	Value			
FTSE Japan Qual/Val Factor Index	Quality	Value				
FTSE Japan Val/Vol Factor Index	Value	Volatility				
FTSE 350 ex Inv Trust Qual/Vol/Yield Factor Index	Quality	Volatility	Yield			
FTSE 350 ex Inv Trust Qual/Vol/Yield 5% Capped Factor Index	Quality	Volatility	Yield			

	Tilt 1	Tilt 2	Tilt 3	Tilt 4	Tilt 5	Tilt 6
Multi-Factor Indexes	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor	Composite or Single Factor
FTSE 350 ex Inv Trust Comprehensive Factor Index	Quality	Value	Volatility	Momentum	Size	

* Russell 1000 Low Volatility Focused ex Tobacco Factor Index* is derived from Russell 1000 Low Volatility Focused Factor Index

Including both March and September annually reviewed indexes.

6.2.3 Diversification, capacity and factor exposure constraints are applied to each broad single and multi-factor index through the application of the methodology of Rule 6.3 to form a provisional narrow factor index. Country and Industry constraints are subsequently applied using the process detailed in Rule 6.4, to form the final narrow factor index.

6.3 Diversification, Capacity, Factor Exposure and Provisional Narrow Factor Indexes

6.3.1 Let the factor exposure of an index with weights W_i^* be defined by:

$$\text{Index Factor Exposure} = \sum_{i=1}^N W_i^* Z_i \quad (11)$$

Let Active Index Factor Exposure = Index Factor Exposure – Underlying Factor Exposure.

6.3.2 Let the index level diversification of an index be defined as the index Effective N:

$$\text{Effective N} = 1 / \sum_{i=1}^N (W_i^*)^2 \quad (12)$$

6.3.3 Index capacity is defined as the index level Weighted Capacity Ratio (WCR):

$$\text{WCR} = \sum_{i=1}^n W_i^* CR_i \quad (13)$$

where $CR_i = W_i^*/W_i$ is the stock level capacity ratio and W_i are the free float market capitalisation weights of the underlying eligible universe. The WCR is inversely related to investment capacity and is defined relative to the capitalisation weighted index WCR, which assumes a value of one.

6.3.4 The constituents and weightings of each provisional narrow single factor index are derived from the broad factor index weights \widehat{W}_i . The broad single factor index is “narrowed” by sequentially removing stocks with the smallest factor contribution $\widehat{W}_i Z_i$ to yield weights W_i^* which target greater index factor exposure, whilst satisfying capacity, exposure and diversification constraints.

6.3.5 After the removal of a stock from a single factor index, the Active Index Factor Exposure, the Effective N and WCR of the resulting index are re-determined and the process continues until any one of the following constraints is violated:

Effective N of provisional narrow index $\geq 0.67 \times$ Effective N of broad index

WCR of provisional narrow index $\leq 2.5 \times$ WCR of broad index

Active provisional narrow index Factor Exposure $\leq 2.0 \times$ Active broad index Factor Exposure

except for Momentum Factor Indexes and all single factor FTSE/JSE All-Share Capped 5% Indexes where narrowing is not applied.

6.3.6 A broad multi-factor index resulting from n factor tilts is narrowed by sequentially removing stocks with the smallest product of scores $P_i = S_{1,j}^k \times S_{1,j}^k \times \dots \times S_{1,j}^k$ where k is the order or strength of the tilt and $S_{j,i} = CN(Z_{j,i})$ and $Z_{j,i}$ is the Z-Score of the i^{th} stock for factor J. This again improves index exposure, whilst satisfying capacity and diversification constraints.

6.3.7 Stocks in a multiple tilted index are removed until one of the following constraints is violated:

Effective N of provisional narrow index $\geq 0.67 \times$ Effective N of broad index

WCR of provisional narrow index $\leq 2.5 \times$ WCR of broad index

except for the following indexes:

- Comprehensive Factor Indexes
- Russell 1000 Momentum Focused Factor Index
- Russell 1000 2Mom/Size/Val 5% Capped Factor Index
- Russell 1000 2Mom/2Qual/2Vol 5% Capped Factor Index
- Russell 2000 2Mom/Size/Val 3% Capped Factor Index
- Russell 2000 2Mom/2Qual/2Vol 3% Capped Factor Index
- FTSE/JSE All-Share Low Volatility Focused Factor Index
- All FTSE All-World ex CW Balanced Factor Indexes including the annually reviewed March and September versions.
- FTSE Developed ex US Select Factor Index

6.4 Country and Industry Constraints and Final Narrow Factor Index

Country and Industry constraints are applied after the application of the diversification, capacity and exposure constraints detailed in Rule 6.3 to the resulting provisional narrow factor index. Factor indexes derived from the FTSE Global All Cap Index Series, FTSE UK Index Series, FTSE/JSE Africa Index Series, Russell 1000 and Russell 2000 Indexes use the Industry Classification Benchmark (ICB) Industry definition

Let the weight of a given country (or index level industry) be X % in the underlying index. Then that country's (or index level industry's) weight in the final narrow factor index is bounded by:

$$\text{Max}((1 - P) * X - Q, 0) \text{ and } \text{Min}((1 + P) * X + Q, 100)$$

When the lower country (industry) bound is greater than twice the country (industry) weight in the provisional narrow factor index, the lower country (industry) bound is replaced by twice the country (industry) weight of that provisional narrow factor index. This ensures that individual stock capacity limits are considered.

All factor indexes apply country and industry constraints $P = 0.2$ and $Q = 5$ except for:

- FTSE Brazil Capped 10% Indexes – no constraints applied
- FTSE USA Small Cap Qual/Vol/Yield Factor Indexes: $P = 0$ and $Q = 5$.
- FTSE USA Small Cap ex Real Estate 2Qual/Vol/ Yield Factor 3% Capped Index: $P = 0$ and $Q = 2$

The solution method sets the weight of industries and countries that breach the relevant constraint to the nearest of their upper and lower bounds. Weight is then re-assigned proportionately to industries/countries that are not in breach of their upper or lower bounds. Where such a reallocation causes breaches in previously “good” industries or countries then all original constraints are marginally and repeatedly relaxed until no such breaches occur.

A final iteration is performed to ensure consistency between the newly constrained country and industry positions in order to form the final narrow factor index.

6.5 Maximum Stock Level Capacity Ratio

6.5.1 A maximum stock level capacity ratio is applied at 20x. Any stock level capacity ratio greater than 20 will be set to 20. The resulting excess weight will be redistributed amongst the remaining constituents. The stock level capacity ratios are recalculated and again, those over 20 are set to 20. This process repeats iteratively until all stocks have a capacity ratio less than or equal to 20. This process may cause breaches of the constraints in Rules 6.3 and 6.4.

6.6 Turnover Constraint

- 6.6.1 A turnover constraint is applied at each index review (see Rule 7.1.2) to the indexes listed in Table 5. The constraint is applied to the constituent weights calculated on the price cut-off dates, specified in Rule 7.1.1.

Table 5: Turnover Constraint

Factor Indexes	Maximum Two Way Turnover
Russell 1000 2Qual/Val 5% Capped Factor Index	50%

The turnover control is applied such that:

$$W_{new_i} = (1 - A) * W_{current_i} + A * W_i$$

where

- W_{new_i} is the turnover controlled weight of stock i
- $W_{current_i}$ is the current weight of stock i as of the price cut-off date
- W_i is the rebalance or pre-turnover controlled weight of stock i as of the price cut-off date
- A is a constant determined by:

$$A = \text{Min}\left[\frac{\text{Max TO}}{\sum_i^N \text{ABS}(W_i - W_{current_i})}, 1.0\right]$$

where Max TO is the maximum two way turnover specified in Table 5 for each index.

6.7 Minimum Stock Weight

- 6.7.1 Table 6 shows the minimum security level weight thresholds that are applied to each final factor index. Any security level factor index weight that is less than the minimum weight threshold is treated as having a zero weight in the relevant FTSE Global Factor Index. Any resulting excess weight will be redistributed amongst the remaining constituents and may cause breaches of the constraints in Rules 6.3, 6.4 and 6.5.

Table 6: Minimum Stock Weights

Factor Indexes	Minimum Weight
FTSE Developed ex US Select Factor Index	2bps
FTSE Asia ex Japan Factor Indexes	2bps
FTSE 350 ex Inv Trust Factor Indexes	2bps
FTSE/JSE All-Share Factor Indexes	2bps
FTSE Japan Comprehensive Factor Index	2bps
FTSE Developed Europe Comprehensive Factor Index	2bps
FTSE All World ex US Comprehensive Factor Index	2bps
FTSE USA Small Cap ex Real Estate 2Qual/Vol/Yield 3% Capped Factor Index	2bps
Russell 1000 2Size/2Val 5% Capped Factor Index	2bps
Russell 1000 2Mom/Size/Val 5% Capped Factor Index	2bps
Russell 1000 2Qual/2Vol 5% Capped Factor Index	2bps
Russell 1000 2Mom/2Qual/2Vol 5% Capped Factor Index	2bps
Russell 1000 2Qual/Val 5% Capped Factor Index	2bps

Factor Indexes	Minimum Weight
Russell 2000 2Size/2Val 3% Capped Factor Index	2bps
Russell 2000 2Mom/Size/Val 3% Capped Factor Index	2bps
Russell 2000 2Qual/2Vol 3% Capped Factor Index	2bps
Russell 2000 2Mom/2Qual/2Vol 3% Capped Factor Index	2bps
Russell 1000 Size Factor Index	2bps
Russell 1000 Value Factor Index	2bps
Russell 1000 Quality Factor Index	2bps
Russell 1000 Volatility Factor Index	2bps
Russell 1000 Momentum Factor Index	2bps
Russell 1000 Yield Factor Index	2bps
FTSE Developed ex US Country Relative Momentum Factor Index	2bps
FTSE Developed ex US Country Relative Volatility Factor Index	2bps
FTSE Emerging Country Relative Momentum Factor Index	2bps
FTSE Emerging Country Relative Volatility Factor Index	2bps
FTSE Brazil Single Factor Indexes	40bps
All Other Factor Indexes	0.5bps

6.8 Index Back-Histories

- 6.8.1 The availability of factor data prior to the launch date of each index is simulated through the application of six month lag on fundamental data. All index reviews prior to the launch date that utilise realised fundamental data incorporate a lag of six months. For example each component of the value factor detailed in Rule 5.7 incorporates annual Cash-flow, Net Income and Sales measures that were announced six months prior to the data cut-off date.



Section 7

Periodic Review of Constituents

7.0 Periodic Review of Constituents

7.1 Review and Price Dates

7.1.1 FTSE Global Factor Indexes are reviewed periodically based on the stock prices available at the close of Wednesday before first Friday of the review month (Price Cut-off Date) incorporating underlying index constituent changes according to the implementation dates shown in Rules 7.1.2 and 7.1.4.

Factor indexes derived from a Russell 1000 or Russell 2000 underlying are reviewed periodically based on the stock prices available at close of Wednesday before second Friday in June (Price Cut-off Date) incorporating underlying index constituent changes according to the Russell implementation dates shown in Rule 7.1.4. The December review is periodically based on the stock prices available at close of Wednesday before first Friday incorporating underlying index constituent changes according to the Russell implementation dates shown in Rule 7.1.3

Factor indexes derived from a FTSE underlying will be reviewed annually in September with the following exceptions:

FTSE Indexes	Review Months
Momentum Factor Indexes	March and September
Comprehensive Factor Indexes	March and September
FTSE All-World ex CW Balanced Factor Index*	March and September
FTSE All-World ex CW Balanced Factor (Mar) Index	March
FTSE All-World ex CW Balanced Factor (Sep) Index	September
FTSE Developed ex US Select Index	March and September

* Phased implementation - see (rule 7.3).

Factor indexes derived from a Russell 1000 or Russell 2000 underlying will be reviewed annually in June with the following exceptions:

Russell 1000 / Russell 2000 Indexes	Review Months
Momentum Factor Index	June and December
Comprehensive Factor Index	June and December
Momentum Focused Factor Index	June and December
Russell 1000 2Mom/Size/Val 5% Capped Factor Index	June and December
Russell 1000 2Mom/2Qual/2Vol 5% Capped Factor Index	June and December
Russell 2000 2Mom/Size/Val 3% Capped Factor Index	June and December
Russell 2000 2Mom/2Qual/2Vol 3% Capped Factor Index	June and December
Mom/2Val Factor Index	March, June, September and December

- 7.1.2 For factor indexes derived from a FTSE underlying index the review will be implemented after the close of business on the third Friday of the review month.
- 7.1.3 For factor indexes derived from a Russell 1000 or Russell 2000 underlying the review will be implemented on the same date as the Russell annual reconstitution. For details of the implementation dates of Russell 1000 and Russell 2000, please refer to the Russell U.S. Equity Indexes Construction and Methodology available at [Russell-US](#)
- 7.1.4 The FTSE Brazil Capped 10% Index and the FTSE Brazil Factor Indexes will be reviewed in compliance with Res. 3792 each quarter, the Monday 4 weeks prior to the third Friday in March, June, September and December. If no longer Res. 3792 compliant, a stock will be removed from the FTSE Brazil Capped 10% Index and the FTSE Brazil Factor indexes at the review effective date.
- 7.2 Capping**
- 7.2.1 The following maximum stock (company level) weights are applied to each factor index in Table 7. The company level capping is applied quarterly using prices as at the close of business on the second Friday in March, June, September and December.

Table 7: Maximum Stock Weights

Factor Indexes	Maximum Weight
FTSE Brazil Momentum Factor Index Res. 3792 Compliant	10%
FTSE Brazil Quality Factor Index Res. 3792 Compliant	10%
FTSE Brazil Size Factor Index Res. 3792 Compliant	10%
FTSE Brazil Value Factor Index Res. 3792 Compliant	10%
FTSE Brazil Volatility Factor Index Res. 3792 Compliant	10%
FTSE Brazil Yield Factor Index Res. 3792 Compliant	10%
FTSE Asia ex Japan Momentum 10% Capped Factor Index	10%
FTSE Asia ex Japan Quality 10% Capped Factor Index	10%
FTSE Asia ex Japan Size 10% Capped Factor Index	10%
FTSE Asia ex Japan Value 10% Capped Factor Index	10%
FTSE Asia ex Japan Volatility 10% Capped Factor Index	10%
FTSE Asia ex Japan Yield 10% Capped Factor Index	10%

Factor Indexes	Maximum Weight
FTSE Asia ex Japan Qual/Val/Vol 10% Capped Factor Index	10%
FTSE Asia ex Japan Comprehensive 10% Capped Factor Index	10%
FTSE Asia ex Japan Yield Focused 10% Capped Factor Index	10%
FTSE USA Qual/Vol/Yield 5% Capped Factor Index	5%
FTSE USA Small Cap Qual/Vol/Yield 3% Capped Factor Index	3%
FTSE Developed Europe Qual/Vol/Yield 5% Capped Factor Index	5%
FTSE Developed Asia Pacific Qual/Vol/Yield 5% Capped Factor Index	5%
FTSE Developed ex US Qual/Vol/Yield 5% Capped Factor Index	5%
FTSE Emerging Qual/Vol/Yield 5% Capped Factor Index	5%
FTSE 350 ex Inv Trust Qual/Vol/Yield 5% Capped Factor Index	5%

7.2.2 The following maximum stock (company level) weights are applied to each factor index in Table 8. The company level capping is applied at the reviews of corresponding indexes specified in Rule 7.1.2 using stock prices available at the price cut off date as specified in Rule 7.1.

Table 8: Maximum Stock Weights

Factor Indexes	Maximum Weight
Russell 1000 2Size/2Val 5% Capped Factor Index	5%
Russell 1000 2Mom/Size/Val 5% Capped Factor Index	5%
Russell 1000 2Qual/2Vol 5% Capped Factor Index	5%
Russell 1000 2Mom/2Qual/2Vol 5% Capped Factor Index	5%
Russell 1000 2Qual/Val 5% Capped Factor Index	5%
Russell 2000 2Size/2Val 3% Capped Factor Index	3%
Russell 2000 2Mom/Size/Val 3% Capped Factor Index	3%
Russell 2000 2Qual/2Vol 3% Capped Factor Index	3%
Russell 2000 2Mom/2Qual/2Vol 3% Capped Factor Index	3%
FTSE USA Small Cap ex Real Estate 2Qual/Vol/Yield 3% Capped Factor Index	3%

7.3 Phased Rebalance

7.3.1 The FTSE All-World ex CW Balanced Factor Index consists of a combination of two annually reviewed indexes - the FTSE All-World ex CW Balanced Factor (Mar) Index and the FTSE All-World ex CW Balanced Factor (Sep) Index. The two indexes are reviewed annually in March and September respectively, and a set of constituent review weights for each index determined following Rules 6.2-6.6. The effective weight of each constituent in the FTSE All-World ex CW Balanced Factor Index is calculated as a equal combination of each annually reviewed index:

$$w_{i,t}^* = 0.5 \times w_{i,t}^{Mar} + 0.5 \times w_{i,t}^{Sep}$$

where

$w_{i,t}^{Mar}$ is the weight of stock i in the FTSE All-World ex CW Balanced Factor (Mar) Index.

$w_{i,t}^{Sep}$ is the weight of stock i in the FTSE All-World ex CW Balanced Factor (Sep) Index.

$w_{i,t}^*$ is the effective weight of stock i in the FTSE All-World ex CW Balanced Factor Index.

- 7.3.2 A constituent will be removed from the FTSE All-World ex CW Balanced Factor Indexes if it is also removed from the underlying FTSE All-World Index.



Section 8

Changes to Constituent Companies

8.0 Changes to Constituent Companies

8.1 Intra-review Additions

8.2 Additions to the FTSE Global All Cap Index Series, FTSE UK Index Series, FTSE/JSE Africa Index Series, Russell 1000 Index or Russell 2000 Indexes will be considered for inclusion in the relevant FTSE Global Factor Indexes at the next review of the relevant FTSE Global Factor Index, FTSE UK Factor Index, FTSE/JSE Factor Index, Russell 1000 Factor Index or Russell 2000 Factor Index respectively.

8.3 Intra-review Deletions

8.3.1 A constituent will be removed from a FTSE Global Factor Index if it is also removed from its corresponding underlying index. The deletion will be concurrent with the deletion from the underlying index and its weight will be distributed pro-rata amongst the remaining constituents in their respective FTSE Global Factor Index.

Section 9

Corporate Actions and Events

9.0 Corporate Actions and Events

9.1 If a constituent in the underlying index has a stock split, stock consolidation, rights issue, bonus issue, a change in the number of shares in issue or a change in free float, the constituent's weighting in the corresponding FTSE Global Factor Index will remain unchanged pre and post such an event.

9.2 Full details of changes to constituent companies due to corporate actions and events can be accessed in the Corporate Actions and Events Guide for Non Market Cap Weighted Indexes using the following link:

[Corporate Actions and Events Guide for Non Market Cap Weighted Indices.pdf](#)

A Corporate 'Action' is an action on shareholders with a prescribed ex date. The share price will be subject to an adjustment on the ex date. The index will be adjusted in line with the ex date.

These include the following:

- Capital Repayments
- Rights Issues/Entitlement Offers
- Stock Conversion
- Splits (sub-division) / Reverse splits (consolidation)
- Scrip issues (Capitalisation or Bonus Issue)

A Corporate 'Event' is a reaction to company news (event) that may impact the index depending on the index rules. For example, a company announces a strategic shareholder is offering to sell their shares (secondary share offer) – this could result in a free float weighting change in the index.

Where an index adjustment is required FTSE will provide notice advising of the timing of the change.

9.3 Suspension of Dealing

Suspension of Dealing rules can be found within the Corporate Actions and Events Guide for Non Market Cap Weighted Indexes.

9.4 Takeovers, Mergers and Demergers

The treatment of takeovers, mergers and demergers can be found within the Corporate Actions and Events Guide for Non Market Cap Weighted Indexes.

Section 10

Indexes Algorithm and Calculation Method

10.0 Indexes Algorithm and Calculation Method

10.1 Prices

10.1.1 The FTSE Global Factor Index Series use actual closing mid-market or last trade prices, where available, for securities with local market quotations. Further details can be accessed using the following link:

[Closing Prices Used For Index Calculation.pdf](#)

10.2 Calculation Frequency

10.2.1 The FTSE Global Factor Index Series will be calculated on an end of day basis and displayed to eight decimal points.

10.3 Index Calculation

10.3.1 The FTSE Global Factor Indexes are calculated using the algorithm described below:

$$\sum_{i=1}^N \frac{(p_i \times e_i \times s_i \times f_i \times c_i)}{d}$$

Where,

- $i=1,2,\dots,N$
- N is the number of securities in the Index.
- p_i is the latest trade price of the component security (or the price at the close of the index on the previous day).
- e_i is the exchange rate required to convert the security's currency into the index's base currency.
- s_i is the number of shares in issue used by FTSE Russell for the security, as defined in these Ground Rules.
- f_i is the Investability Weighting Factor to be applied to a security to allow amendments to its weighting, expressed as a number between 0 and 1, where 1 represents a 100% free float. This factor is published by FTSE Russell for each security in the underlying index.
- c_i is the Weighting Factor to be applied to a security to correctly weight that security in the index. This factor maps the investable market capitalisation of each stock to a notional market capitalisation for inclusion in the index.

- d is the divisor, a figure that represents the total issued share capital of the Index at the base date. The divisor can be adjusted to allow changes in the issued share capital of individual securities to be made without distorting the index.



Appendix A: Index Opening and Closing Hours

Index	Open	Close
Monday to Friday		
FTSE Developed ex US Comprehensive Factor Net Tax (US RIC) Index	00:30	21:10
FTSE Developed ex US Qual/Vol /Yield Factor 5% Capped Index	23:30	20:10
FTSE Emerging Comprehensive Factor Net Tax (US RIC) Index	00:30	21:10
FTSE USA Qual/Vol/Yield Factor 5% Capped Index	13:30	20:10
FTSE USA Small Cap Qual/Vol/Yield Factor 3% Capped Index	14:30	21:10
FTSE USA Small Cap ex Real Estate 2Qual/Vol/Yield 3% Capped Factor Index	13:30	21:10
Russell 1000 Comprehensive Factor Index	14:30	21:10
Russell 1000 Low Volatility Factor Index	13:30	20:10
Russell 1000 Low Volatility Focused Factor Index	14:30	21:10
Russell 1000 Momentum Factor Index	13:30	20:10
Russell 1000 Momentum Focused Factor Index	14:30	21:10
Russell 1000 Quality Factor Index	13:30	20:10
Russell 1000 Size Factor Index	13:30	20:10
Russell 1000 Value Factor Index	13:30	20:10
Russell 1000 Yield Factor Index	13:30	20:10
Russell 1000 Yield Focused Factor Index	14:30	21:10
Russell 1000 2Size/2Val 5% Capped Factor Index	14:30	21:10
Russell 1000 2Mom/Size/Val 5% Capped Factor Index	14:30	21:10
Russell 1000 2Qual/2Vol 5% Capped Factor Index	14:30	21:10
Russell 1000 2Mom/2Qual/2Vol 5% Capped Factor Index	14:30	21:10
Russell 1000 2Qual/Val 5% Capped Factor Index	14:30	21:10
Russell 2000 Comprehensive Factor Index		
Russell 2000 2Size/2Val 3% Capped Factor Index	14:30	21:10
Russell 2000 2Mom/Size/Val 3% Capped Factor Index	14:30	21:10

Russell 2000 2Qual/2Vol 3% Capped Factor Index	14:30	21:10
Russell 2000 2Mom/2Qual/2Vol 3% Capped Factor Index	14:30	21:10

Notes:

1. All times are UK hours.
2. Reuters real time exchange rates are used in the real-time index calculations.
3. Exchange rates used in the End of Day calculations are WM/Reuters Closing Spot Rates™, collected at 16:00 UK time.



Appendix B: Status of Index

The FTSE Global Factor Index Series may be calculated in real time and, if so, may exist in the following states:

A. Firm

The indexes are being calculated using trade prices from the relevant local stock exchanges for all constituents during the hours of the Official Index Period.

The Official Closing Index values for the Index Series are the last index values calculated at the end of the firm period.

B. Closed

When the index has ceased all calculations for the day, the message '**CLOSED**' is displayed against the index value.

C. Held

During the firm period, an index has exceeded pre-set operating parameters and calculation has been suspended pending resolution of the problem. The message '**HELD**' is displayed against the last index value calculated.

D. Indicative

If there is a system problem or a situation in the market that is judged to be affecting the quality of the constituent prices at any time when the index is being calculated, the index will be declared indicative. The message '**IND**' will be displayed against the index value.

The official opening and closing hours of the Indexes are set out in Appendix A. Variations to the official hours of the Indexes will be published by FTSE Russell.

The FTSE Global Factor Index Series is calculated on public holidays whenever at least one market is trading. The index series will not be calculated on 1 January.



Appendix C: Further Information

A Glossary of Terms used in FTSE Russell's Ground Rule documents can be found using the following link:
[Glossary.pdf](#)

Further information on the FTSE Global Factor Index Series is available from FTSE Russell.

For contact details please visit the FTSE Russell website or contact FTSE Russell client services at
info@ftserussell.com.

Website: www.ftserussell.com

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