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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 RAFI Low Volatility Index Series, which is calculated in association with Research Affiliates, LLC.

1.2 The FTSE RAFI Low Volatility Index Series is designed to reflect the performance of a low volatility set of stocks, where constituent weightings are determined using specific fundamental factors (see Rule 4.5.1), rather than market capitalisation.

1.3 The following indexes are calculated:

Global & Regional Indexes:
- FTSE RAFI All-World Low Volatility Index*
- FTSE RAFI Developed Low Volatility Index*
- FTSE RAFI Developed Ex US Low Volatility Index*
- FTSE RAFI Developed Ex UK Low Volatility Index*
- FTSE RAFI Developed Europe Low Volatility Index*
- FTSE RAFI Emerging Low Volatility Index*

Country Indexes:
- FTSE RAFI US Low Volatility Index *
- FTSE RAFI UK Low Volatility Index*

1.4 Price, Total Return and Net of Tax indexes are calculated on an end of day and real time(*) basis. The total return indexes include income based on ex dividend adjustments.

1.5 The base currency of the benchmark is US Dollars (USD). Index values may also be published in other currencies.

1.6 These Ground Rules should be read in conjunction with the FTSE Global Equity Index Series Ground Rules which are available at www.ftserussell.com.

1.7 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.
1.8 Index users who choose to follow this index or to buy products that claim to follow this index should assess the merits of the index’s 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 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 or any constituent data.

1.9 FTSE Russell

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.¹

2.2 FTSE is responsible for the daily calculation, production and operation of the FTSE RAFI Low Volatility 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 the 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.

2.3 Research Affiliates (RAFI)

2.3.1 Research Affiliates is responsible for calculating the RAFI Low Volatility Score of companies based on FTSE Russell’s universes at the annual review.

2.4 Status of These Ground Rules

2.4.1 These Ground Rules set out the methodology and provide information about the publication of the FTSE RAFI Low Volatility Index Series.

2.5 Amendments to these Ground Rules

2.5.1 These Ground Rules shall be subject to regular review by FTSE Russell to ensure that they continue to best reflect the aims of the index series. 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.

¹ The term administrator is used in this document in the same sense as it is defined in Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds (the European Benchmark Regulation).
2.5.2 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)

3.3.1 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 the FTSE Russell Product Governance Board.

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


3.4 Queries, Complaints and Appeals

3.4.1 A constituent or prospective constituent company (or professional advisor acting on behalf of the company), a national organisation or a group of no fewer than ten users of the Indexes from different organisations acting in their professional capacity may appeal against decisions taken by FTSE Russell.

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

Benchmark_Determination_Complaints_Handling_Policy.pdf

FTSE Russell’s Appeal Process can be accessed using the following link:

Appeals_Against_Decisions.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**

The FTSE RAFI Low Volatility Index Series is recalculated whenever errors or distortions occur that are deemed to be significant. Users of the FTSE RAFI Index Series are notified through appropriate media.

For further information please 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](mailto: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 FTSE RAFI Global Universe

4.1.1 The eligible securities of each global or regional FTSE RAFI Low Volatility Index are determined by selecting companies by cumulative fundamental weight from the relevant regional and or country FTSE Global All Cap Index. The determination of a stock’s fundamental weight is detailed in Rule 5.5.1.

Companies ranked within the top 86% of each regional or country FTSE index, as specified in Table 1, by fundamental weight adjusted for free-float and the liquidity limits detailed in Rule 5.6 form the relevant FTSE RAFI global universe.

4.1.2 Existing constituents of a FTSE RAFI global universe ranked within the top 92% by free-float adjusted fundamental weight will remain eligible for inclusion in the relevant FTSE RAFI global universe.

Table 1: FTSE RAFI Global Universe

<table>
<thead>
<tr>
<th>FTSE RAFI Global Universe</th>
<th>FTSE Regional or Country Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>FTSE US All Cap</td>
</tr>
<tr>
<td>Japan</td>
<td>FTSE Japan All Cap</td>
</tr>
<tr>
<td>Developed Europe</td>
<td>FTSE Developed Europe All Cap</td>
</tr>
<tr>
<td>Other Developed</td>
<td>FTSE Developed All Cap ex US, Japan and Europe</td>
</tr>
<tr>
<td>Emerging</td>
<td>FTSE Emerging All Cap</td>
</tr>
<tr>
<td>Developed</td>
<td>FTSE RAFI US+FTSE RAFI Japan + FTSE RAFI Developed Europe + FTSE RAFI Other Developed</td>
</tr>
<tr>
<td>All-World</td>
<td>FTSE RAFI Developed + FTSE RAFI Emerging</td>
</tr>
</tbody>
</table>

4.1.3 The FTSE RAFI Developed and Emerging selection universes are formed by combining the relevant FTSE RAFI regional and country component universes.

4.2 FTSE RAFI Country Universe

The eligible securities of each FTSE RAFI Low Volatility country index are defined by the relevant FTSE RAFI country index.
### Table 2: FTSE RAFI Country Universe

<table>
<thead>
<tr>
<th>FTSE RAFI Global Universe</th>
<th>FTSE Regional or Country Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>FTSE RAFI US 1000 Index</td>
</tr>
<tr>
<td>UK</td>
<td>FTSE RAFI UK 300 Index</td>
</tr>
</tbody>
</table>

4.2.1 The following FTSE RAFI Low Volatility indexes are calculated:

### Table 3: FTSE RAFI Low Volatility Indexes

<table>
<thead>
<tr>
<th>FTSE RAFI Low Volatility Index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global Indexes</strong></td>
</tr>
<tr>
<td>FTSE RAFI All-World Low Volatility Index</td>
</tr>
<tr>
<td>FTSE RAFI Developed Low Volatility Index</td>
</tr>
<tr>
<td>FTSE RAFI Developed ex US Low Volatility Index</td>
</tr>
<tr>
<td>FTSE RAFI Developed ex UK Low Volatility Index</td>
</tr>
<tr>
<td>FTSE RAFI Developed Europe Low Volatility Index</td>
</tr>
<tr>
<td>FTSE RAFI Emerging Low Volatility Index</td>
</tr>
<tr>
<td><strong>Country Indexes</strong></td>
</tr>
<tr>
<td>FTSE RAFI US Low Volatility Index</td>
</tr>
<tr>
<td>FTSE RAFI UK Low Volatility Index</td>
</tr>
</tbody>
</table>
Section 5

Periodic Review of Constituents

5.0 Periodic Review of Constituents

5.1 The FTSE RAFI Low Volatility Index Series is based on the same fundamental weighting methodology as the FTSE RAFI Index Series. Fundamental weights are determined annually based on data as at the close of business on the Monday 4 weeks prior to the review effective date, taking into account any additions and deletions planned in the underlying indexes. The determination of fundamental weights follows the process detailed in Rule 5.5.1.

5.2 The FTSE RAFI Low Volatility Index Series will be reviewed annually at the close of business on the Wednesday before the first Friday in March.

5.3 Weighting changes and constituent additions and deletions arising from the annual review will be implemented in four stages, using data as of the close of business on the Wednesday before the first Friday in March, June, September and December. The mechanism by which the FTSE RAFI Low Volatility Index Series is rebalanced using the results of the annual March rebalance is the FTSE RAFI QSR methodology with phased deletions as set out in Section 6.

5.4 Changes will be effective after the close on the third Friday of March, June, September and December each year.

Constituent securities of each FTSE RAFI Low Volatility index are determined by the Valuation and Risk Measures detailed in Rules 5.5.2 and 5.5.3 respectively. The weight of constituent securities is proportional to their fundamental weights, after the application of the maximum stock weight of 5% and the liquidity limits detailed in Rule 5.6. Maximum stock weights and liquidity limits are applied simultaneously, where the lower or more restrictive of the two limits is applicable. The minimum constituent weighting is 0.05%. Constituent weights below 0.05% are set to zero and the excess weight is distributed across the remaining index constituents in proportion to their existing index weight.

5.5 Determination of Fundamental Weights

5.5.1 Constituents of the FTSE RAFI Low Volatility Index Series are weighted by the fundamental measures of company size using the following items drawn from a company’s annual financial statements:

A. Sales = company sales averaged over the prior five years
B. Cash Flow = company cash flow averaged over the prior five years
C. Book Value = latest company book value at the review date
D. Dividends = total dividend distributions averaged over the last five years
Where a company has less than five years of available financial data, fundamental weights are calculated by averaging as many years of data as are available.

Four fundamental ratios are calculated for each security:

A. The representation of each security in the universe as a percentage of Sales.
B. The representation of each security in the universe as a percentage of Cash Flow.
C. The representation of each security in the universe as a percentage of Book Value.
D. The representation of each security in the universe as a percentage of Dividends. If a stock has not paid a dividend in the past five years, it will have a percentage representation of zero.

The RAFI fundamental value is defined as the average of the four percentage representation figures above. However, for a stock with a zero dividend percentage, its RAFI fundamental value is defined as the average of the three remaining percentage representation figures (sales, cash flow and book value).

The fundamental value is calculated for each company as a whole, rather than for individual securities issued by the company. Where a company is represented within the FTSE RAFI Low Volatility Index Series by two or more lines of stock, the company’s RAFI fundamental value is allocated between these lines of stock in proportion to their investable market capitalizations.

Companies will be ineligible for the FTSE RAFI Low Volatility Indexes if fundamental data is unavailable. For example, companies such as recent listings, recently merged companies or investment entities that do not report the necessary fundamental data will be ineligible.

5.5.2 Valuation Ratio

A valuation screen is applied to eligible securities detailed in Rule 4. Securities for which the ratio of full market capitalisation weight to the fundamental weight is greater than 1.5 are excluded from the relevant FTSE RAFI Low Volatility index. The market capitalisation to fundamental weight comparison is conducted within each industry (ICB) country group.

5.5.3 Risk Measure

Eligible securities passing Rule 5.5.2 are ranked in ascending order of risk. Risk is calculated as the variance (var) of a company’s daily total USD hedged excess return over five years explained by country, global industry and global equity level USD hedged excess returns.

\[
\begin{align*}
    r_{i,t} &= \alpha_i + \beta_{G,i}r_{G,t} + \beta_{C,i}r_{C,t} + \beta_{I,i}r_{I,t} \\
    \text{risk measure} &= R^2 \frac{\text{var}(r_{i,t})}{\text{var}(r_{G,t})}
\end{align*}
\]

Where \( r_G, r_C, r_I \) are the daily USD hedged excess total return of the global equity market index (FTSE All-World), the relevant country (e.g. FTSE Japan) and global industry (e.g. FTSE All-World Basic Materials) respectively on business days that are common to each component of regression. \( R^2 \) is the coefficient of determination from the OLS regression specified above. USD hedged returns are chosen for ease of calculation, however the choice of currency numeraire does not influence the hedged excess return used in the regression.

The USD hedged excess returns of each security and index are calculated by subtracting the daily yield of the 3 month US Treasury Bill.

Daily excess total returns greater than plus or minus two standard deviations of the mean, calculated over the five year estimation period, are restricted to two standard deviations in the determination of the risk measure. A minimum of 510 daily return observations are required for the calculation of the company level risk metric and therefore for the company to be eligible for inclusion in the index.
5.5.4 Selection
The FTSE RAFI Low Volatility indexes select low risk companies from two independent perspectives: The lowest risk securities from the universe of eligible securities satisfying the valuation screen in 4.5.2; 20% by number from each country and ICB industry group are independently selected.

5.5.5 Banding
The valuation ratio and risk measure of existing constituents of the FTSE RAFI Low Volatility Index Series are decreased by 10% and 20%, respectively, prior to the application of Rules 5.5.2, 5.5.3 and 5.5.4.

5.6 Application of Liquidity Limits
The following liquidity limits are applied to determine the eligible securities from each underlying FTSE universe as detailed in Rule 4. Additionally, all companies passing the Periodic Review criteria detailed in Rule 5.5.2 – 5.5.5 are subject to the re-application of these liquidity limits and the maximum stock weight of 5%.

Let \( FV_i \) be the RAFI fundamental value of the \( i \)th company. The fundamental weight \( FW_i \) for company \( i \) is:

\[
FW_i = \frac{FV_i}{\sum_{i=1}^{N} FV_i}
\]

Let \( ADTV_i \) be the maximum of the 30-day and 90-day median daily traded value in USD as of the last business day of January. The liquidity weight \( LW_i \) for company \( i \) is:

\[
LW_i = \frac{ADTV_i}{\sum_{i=1}^{N} ADTV_i}
\]

The 30-day median traded value will be used where there is less than 90 days of historical data. Where there is less than 30 days of historical data, the stock will have a RAFI fundamental value of zero. Where there are multiple lines of equity capital in a company, the traded value will be the aggregation of all lines in the aforementioned company.

The liquidity ratio (LR) is defined as the ratio of fundamental weight to liquidity weight. The liquidity ratio for company \( i \) is:

\[
LR_i = \frac{FW_i}{LW_i}
\]

Where the liquidity ratio is more than 4, the new fundamental value is calculated as:

\[
FV_i^\hat{} = 4 \times LW_i \times \sum_{i=1}^{N} FV_i
\]

After the fundamental values are updated for all companies using the above formula, new fundamental weights and liquidity ratios are calculated. The process is repeated until all liquidity ratios attain a value not exceeding 4. Note that this process will only modify the fundamental values of stocks that exceed the liquidity limit.

5.7 The fundamental values obtained after the application of the liquidity limits detailed in Rule 5.6 and the maximum stock weights determine the annual weightings applied to index constituents determined under Rules 5.5.2 to 5.5.5, subject to a minimum index weight or effective zero index weight of 0.05%. Constituents are weighted in proportion to these fundamental values.
Section 6

FTSE RAFI QSR Methodology

6.0 FTSE RAFI QSR Methodology

6.1 Figure 1 illustrates the mechanics of the FTSE RAFI QSR methodology. The March annual weights of the FTSE RAFI Low Volatility Index replace the pre March rebalance FTSE RAFI Low Volatility Index weights in four separate stages (or tranches). Each stage is implemented in March, June, September and December. The weights of each quarterly tranche are initialised to the new set of weights determined in March of that year.

- In March, three quarters (by weight) of the old (pre-rebalance) index will be combined with one quarter of the March tranche.
- In June half the drifted old index will be combined with one quarter of the drifted March tranche plus one quarter of June tranche.
- In September a quarter of the drifted old index will be combined with a quarter of each of the drifted March and June tranches plus a quarter of the September tranche.
- The December portfolio will consist of one quarter each of the drifted March, June and September tranches along with one quarter of the December tranche.
- Post the December rebalance, the new weights have been entirely implemented and no contribution from pre March rebalance FTSE RAFI Low Volatility index remains. These weights now drift to become the FTSE RAFI Low Volatility Index pre-rebalance weights in March of the following year.
- The process repeats.
Figure 1: Mechanics of FTSE RAFI QSR Methodology

The December weights of the FTSE RAFI Low Volatility Index Series depend only on that year’s weights such that the indexes may initialise in December of any year for which weights exist.

Rather than maintain separate indexes for each individual tranche, a set of stock & tranche specific ratios are derived that permit the recovery of individual stock weightings each quarter and the subsequent determination of the updated FTSE RAFI Low Volatility Index weightings.

Let the pre-rebalance March FTSE RAFI Low Volatility Index weights be $O_i$ and the set of new index weights corresponding to the annual March rebalance of the corresponding FTSE RAFI Low Volatility Index be $M_i$. The pre-rebalance FTSE RAFI Low Volatility Index weights in March will be transitioned to the new set of weights in four tranches implemented in March, June, September and December in the manner detailed below.

**March:**

Old FTSE RAFI Low Volatility Index weights are $O_i$. First Tranche: $N_i=M_i$

March FTSE RAFI Low Volatility Index Weights: $W_i=0.75*O_i+0.25*N_i$

March Ratios: $R_{ji}=(0.75*O_i/W_i, 0.25*N_i/W_i); j=1,2$

Where $R_{ji}$ are the ratios for stock $i$ in the old index ($j=1$) and tranche one ($j=2$) required to calculate their separate contributions at the June rebalance.

**June:**

Drifted FTSE RAFI Low Volatility Index Weights: $\tilde{W}_i$. Second Tranche: $P_i=M_i$ (restricted to stocks in $\tilde{W}_i$ and normalised).

Drifted Contributions: $O_i=R_{j1}*\tilde{W}/\sum_k (R_{1k} *\tilde{W}_k), N_i=R_{j2}*\tilde{W}/\sum_k (R_{2k} *\tilde{W}_k)$

June FTSE RAFI Low Volatility Index Weights: $W_i=0.5*O_i+0.25*N_i+0.25*P_i$

June Ratios: $R_{ji}=(0.5*O_i/W_i, 0.25*N_i/W_i, 0.25*P_i/W_i); j=1,2,3$
September:
Drifted FTSE RAFI Low Volatility Index Weights: $\tilde{W}_i$ Third Tranche: $Q_i=M_i$ (restricted to stocks in $\tilde{W}_i$ and normalised).

Drifted Contributions:

$O_i = R_{3i} \cdot \frac{\tilde{W}_i}{\sum_k (R_{3k} \cdot \tilde{W}_k)}$

$N_i = R_{2i} \cdot \frac{\tilde{W}_i}{\sum_k (R_{2k} \cdot \tilde{W}_k)}$

$P_i = R_{1i} \cdot \frac{\tilde{W}_i}{\sum_k (R_{1k} \cdot \tilde{W}_k)}$

September FTSE RAFI Low Volatility Index Weights = $W_i = 0.25 \cdot O_i + 0.25 \cdot N_i + 0.25 \cdot P_i + 0.25 \cdot Q_i$

September Ratios: $R_{ji} = 0.25 \cdot \frac{O_i}{W_i}, 0.25 \cdot \frac{N_i}{W_i}, 0.25 \cdot \frac{P_i}{W_i}, 0.25 \cdot \frac{Q_i}{W_i}$; $j=1,2,3,4$

December:

Drifted FTSE RAFI Low Volatility Index Weights: $\tilde{W}_i$ Fourth Tranche: $T_i=M_i$ (restricted to stocks in $\tilde{W}_i$ and normalised).

Drifted Contributions:

$O_i = R_{4i} \cdot \frac{\tilde{W}_i}{\sum_k (R_{4k} \cdot \tilde{W}_k)}$

$N_i = R_{3i} \cdot \frac{\tilde{W}_i}{\sum_k (R_{3k} \cdot \tilde{W}_k)}$

$P_i = R_{2i} \cdot \frac{\tilde{W}_i}{\sum_k (R_{2k} \cdot \tilde{W}_k)}$

$Q_i = R_{1i} \cdot \frac{\tilde{W}_i}{\sum_k (R_{1k} \cdot \tilde{W}_k)}$

December FTSE RAFI Low Volatility Index Weights: $W_i = 0.25 \cdot N_i + 0.25 \cdot P_i + 0.25 \cdot Q_i + 0.25 \cdot T_i$

The December FTSE RAFI Low Volatility Index weights subsequently drift with price movements to become “old” or pre-rebalance weights” in March of the following year and the process repeats using tranches formed from that March’s annual rebalance of the FTSE RAFI Low Volatility Index weights.
Section 7

Changes to Constituent Companies

7.0 Changes to Constituent Companies

7.1 Additions

7.1.1 Additions to the FTSE RAFI Low Volatility Index Series occur only as part of the annual review.

7.2 Deletions

7.2.1 If a constituent of the underlying FTSE Russell regional or country universe is removed, the constituent will be removed concurrently from the relevant FTSE RAFI Low Volatility Index.
Section 8

Corporate Actions and Events

8.0 Corporate Actions and Events

8.1 If a constituent 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 FTSE RAFI Low Volatility Index Series will remain unchanged pre and post such an event.

8.2 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_Indexes.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. 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.

8.3 Suspension of Dealing

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

8.4 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 9

FTSE RAFI QSR Index Series Calculation

9.0 FTSE RAFI QSR Index Series Calculation

9.1 The formula for index calculation is:

\[ \sum_{i=1}^{N} \left( p_i \times e_i \times s_i \times f_i \times c_i \right) \]

where,

- \( i=1, 2, \ldots, N \)
- \( N \) 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.
- \( d \) 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.
- \( c_i \) is the RAFI Low Volatility Weight Adjustment Factor to be applied to a security to correctly weight that security in the index. This factor maps the free-float adjusted market capitalisation weight \( m_i \) of a stock \( i \) to its notional market capitalisation for inclusion in the Index according to the formula \( c_i = w_i / \hat{m}_i \) where \( \hat{m}_i = m_i / (\sum_{j=1}^{N} m_j) \). This factor is published by FTSE Russell for each security in the index.

9.2 Reuter’s real-time exchange rates are used in the index calculations which are disseminated in real-time. Exchange rates used in the End of Day calculations are WM/Reuters Closing Spot Rates, collected at 16:00 hours UK time.
# Appendix A: Index Series Opening and Closing Hours

<table>
<thead>
<tr>
<th>Index</th>
<th>Open</th>
<th>Close</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTSE RAFI All World Low Volatility Index</td>
<td>00:30</td>
<td>21:10</td>
</tr>
<tr>
<td>FTSE RAFI Developed Low Volatility Index</td>
<td>00:30</td>
<td>21:10</td>
</tr>
<tr>
<td>FTSE RAFI Developed ex US Low Volatility Index</td>
<td>00:30</td>
<td>21:10</td>
</tr>
<tr>
<td>FTSE RAFI Developed Europe Low Volatility Index</td>
<td>08:00</td>
<td>16:30</td>
</tr>
<tr>
<td>FTSE RAFI Emerging Low Volatility Index</td>
<td>00:30</td>
<td>21:10</td>
</tr>
<tr>
<td>FTSE RAFI US Low Volatility Index</td>
<td>14:30</td>
<td>21:10</td>
</tr>
<tr>
<td>FTSE RAFI UK Low Volatility Index</td>
<td>08:00</td>
<td>16:30</td>
</tr>
</tbody>
</table>

Notes:

Closing values at 21:10 will be disseminated at 21:30.
Timings are UK hours, from Monday to Friday.
WM/Reuters Closing Spot Rates compiled by The WM Company are used.
Appendix B: Status of Indexes

Price Indexes calculated on a real-time basis may exist in the following states:

A) Firm

The Indexes are being calculated during Official Market Hours (see Appendix A). No message will be displayed against the Index values calculated by FTSE Russell.

B) Closed

The Indexes have ceased all calculations for the day. The message 'CLOSE' will be displayed against the Index values calculated by FTSE Russell.

C) Held

During Official Market Hours, Indexes have exceeded pre-set operating parameters and the calculations have been suspended pending resolution of the problem. The message 'HELD' will be displayed against the last Index values calculated by FTSE Russell.

D) Indicative

If there is a system problem or a situation in the market that is judged to affect the quality of the constituent prices at any time when the Indexes are being calculated, the Indexes will be declared indicative (e.g. normally where a 'fast market' exists in the equity market). The message 'IND' will be displayed against the Index values calculated by FTSE Russell.

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.
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](#)

For further information on the FTSE RAFI Low Volatility Index Series visit [www.ftserussell.com](http://www.ftserussell.com) or e-mail [info@ftserussell.com](mailto:info@ftserussell.com). Contact details can also be found on this website.

**Research Affiliates can be contacted at:-**
Research Affiliates, 620 Newport Center Dr, Ste 900
Newport Beach, CA 92660
Phone +1 (949) 325-8700
[info@rallc.com](mailto:info@rallc.com)