

Ground Rules

JP Morgan Global Diversified Factor Equity Index Series

v1.6

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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 JP Morgan Global Diversified Factor Equity Index Series. Copies of the Ground Rules are available from www.ftserussell.com.
- 1.1 The JP Morgan Global Diversified Factor Equity Index Series is designed to reflect the performance of stocks representing different factor characteristics.
- 1.2 These Ground Rules should be read in conjunction with the FTSE Global Equity Index Series Ground Rules which are available at www.ftserussell.com and Corporate Actions and Events Guide for Non Market Cap Weighted Indexes (see Section 9). Unless stated in these Ground Rules, the JP Morgan Global Diversified Factor Equity Index Series will follow the same process as the FTSE Global Equity Index Series.
- 1.3 A Price Index and Total Return Index will be calculated in real-time and published in US dollars for the JP Morgan Global Diversified Factor Equity Index Series. The Total Return and Net of Tax Indexes include income based on ex dividend adjustments.
- 1.4 The Net of Tax Total Return Index is calculated based on the maximum withholding tax rates applicable to dividends received by institutional investors who are not resident in the same country as the remitting company and who do not benefit from double taxation treaties.
- 1.5 **FTSE Russell**
- 1.6 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, The Yield Book Inc. and Beyond Ratings
- 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 series or to buy products that claim to follow this index series 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 (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.¹

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.

2.1.3 FTSE is responsible for monitoring the performance of the JP Morgan Global Diversified Factor Equity Index Series throughout the day and will determine whether the status of the Index should be Firm, Closed, Indicative or Held (see Appendix B).

2.1.4 These Ground Rules set out the methodology and provide information about the publication of the JP Morgan Global Diversified Factor Equity Index Series.

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 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)."

- 2.2.2 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 2

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 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](#)

3.2 Queries and Complaints

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

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

3.3 Index Policy for Trading Halts and Market Closures

3.3.1 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](#)

3.4 Recalculation Policy and Guidelines

3.4.1 The JP Morgan Global Diversified Factor Equity Index Series is recalculated whenever errors or distortions occur that are deemed to be significant. Users of the JP Morgan Global Diversified Factor Equity 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](#)

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

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

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

3.6 **Policy for Benchmark Methodology Changes**

3.6.1 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 Underlying Indexes

The underlying index of each index in the JP Morgan Global Diversified Factor Equity Index Series is shown below.

JP Morgan Diversified Factor Equity Index	Underlying Index	Eligible Country/Regions
JP Morgan Diversified Factor Global Developed Equity Index	FTSE Developed Index	North America, Europe, Japan, Asia-Pacific ex Japan
JP Morgan Diversified Factor Global Developed (Region Aware) Equity Index	FTSE Developed Index	North America, Europe, Japan, Asia-Pacific ex Japan
JP Morgan Diversified Factor International Equity Index	FTSE Developed ex North America Index	UK, Europe ex UK, Japan, Asia-Pacific ex Japan
JP Morgan Diversified Factor Europe Equity Index	FTSE Developed Europe Index	Europe
JP Morgan Emerging Diversified Factor Equity Index	FTSE Emerging Index	China, Asia Pacific ex China, Europe, Middle East & Africa (EMEA), Latin America

4.2 Multi Factor Indexes

The eligible universe of each index in the JP Morgan Global Diversified Factor Equity Index Series consists of the securities, excluding all lines of the J.P. Morgan stock, from the relevant underlying index subject to the eligible country and regions outlined in Table 4.1

Section 5

Factor Construction

5.0 Factor Construction

5.1 Data Cut-off Date

- 5.1.1 The data cut-off date for the determination of factor data is the close of business on the last trading day of the month before the review month.

5.2 Liquidity

- 5.2.1 Liquidity is defined as the median daily trading volume over the 22 business days prior to the data cut-off date (Rule 5.1) adjusted for corporate actions multiplied by the price as of the data cut-off date.

5.3 Multiple Lines

- 5.3.1 If a company consists of multiple lines, only one eligible line per region (see Rule 4.1 for eligible regions) is included in the ranking procedure.

If the line is an existing security in a JP Morgan Global Factor Equity Index it remains the eligible line, otherwise the eligible line is the most liquid line (see Rule 5.2).

5.4 Factor Ranks

- 5.4.1 The factor rank of each stock is defined as the percentile rank within the relevant ICB industry of the eligible universe, where factor values are available. The percentile rank for constituent i in industry k is calculated as:

$$p_i = 100 \times \frac{1 + c_i + 0.5f_i}{1 + N}, \forall i \in k$$

where c_i is the number of constituents in industry k with factor values less attractive than the factor value of the i^{th} constituent, f_i is the number of constituents with an identical factor value to constituent i (excluding itself) and N is the total number of eligible constituents in industry k .

- 5.4.2 Constituents with missing factor values are assigned a factor rank of 50.5 and are not included in the percentile ranking calculation detailed in Rule 5.4.1.
- 5.4.3 Stocks with lower percentile rank are more attractive than stocks with a higher percentile rank. Where two or more constituents have identical ranks, they are ordered by liquidity (Rule 5.2) and then free float adjusted market capitalisation (Rule 6.1), such that the least liquid and smaller constituent is considered the least attractive.

5.5 Composite Multi Factor Score

5.5.1 The Composite Multi Factor Score comprises of a weighted sum of all the metrics used in each of the three single factors. The single factors, metrics and their contribution (multiplier), ω_p , to the Composite Multi Factor Score are described in the following subsections.

5.6 Value

5.6.1 Value is comprised of the following four metrics:

1. Earnings Yield = $\frac{\text{Latest 12 month Net Income}}{\text{Market Capitalisation}}$
2. Book to Price = $\frac{\text{Latest reported Book Value}}{\text{Market Capitalisation}}$
3. Free Cash Flow = $\frac{\text{Latest 12 month Net Operating Cash Flow less Capital Expenditure}}{\text{Market Capitalisation}}$
4. Dividend Yield = $\frac{\text{Latest 12 month Trailing Dividend}}{\text{Market Capitalisation}}$

5.6.2 Free Cash Flow, 12 month Net Income, latest Book Value and Dividend Yield are sourced from third party data providers as of the data cut-off date (Rule 5.1). Market Capitalisation is the full market capitalisation as of the data cut-off date.

5.6.3 Securities are ranked independently on each value metric within each ICB industry of each Region according to Rule 5.4 such that higher value characteristics (or relatively cheaper stocks) are more attractive. An overall value score is assigned to each security by taking the average of the individual value metric rankings. The overall value score is re-ranked according to Rule 5.4, such that a lower overall score is more attractive.

5.6.4 Securities classified as financials (ICB industry 8000) are assigned a factor rank of 50.5 for Free Cash Flow

5.6.5 The contribution(multiplier) of each Value factor metric rank in the Composite Multi Factor Score is $\omega_p = 9$:

5.7 Momentum

5.7.1 Momentum is calculated as the one year total return in local currency divided by the standard deviation of daily local returns over one year.

$$\text{Momentum} = \frac{\text{12 Month Local Return}}{\text{Standard Deviation of 1 Year of Daily Local Returns}}$$

5.7.2 A minimum of 200 daily price observations is required. A security with fewer than 200 daily price observations is awarded a neutral score of 50.5.

5.7.3 The momentum score is determined by ranking momentum values according to Rule 5.4, where higher momentum stocks are more attractive.

5.7.4 The contribution (multiplier) of Momentum ranks in the Composite Multi Factor is $\omega_p = 36$

5.8 Quality

5.8.1 Quality is comprised of ten metrics spanning three themes; Profitability, Solvency & Risk and Earnings Quality.

Theme	Metric	Definition
Profitability	ROE	$\frac{\text{Net Income}}{\text{Average Total Shareholders' Equity}}$
Profitability	Cash Flow ROI	$\frac{\text{Cash Flow} + \text{Interest Expenditure} \times (1 - \text{Tax Rate})}{\text{Average Total Equity} + \text{Average Total Debt}}$
Profitability	Free Cash Flow / Sales	$\frac{\text{Cash Flow} - \text{Capital Expenditure}}{\text{Sales}}$
Solvency & Financial Risk	Cash Flow Interest Cover	$\frac{\text{Cash Flow} + \text{Cash Interest Paid} + \text{Cash Taxes Paid}}{\text{Cash Interest Paid}}$
Solvency & Financial Risk	Free Cash Flow / Current Liabilities	$\frac{\text{Cash Flow} - \text{Capital Expenditure}}{\text{Average Current Liabilities}}$
Solvency & Financial Risk	Cash Flow / Total Debt	$\frac{\text{Cash Flow}}{\text{Average Total Debt}}$
Solvency & Financial Risk	Low Volatility	Two Year Standard Deviation of Daily Local Total Returns
Earnings Quality	Change in Accruals	$\frac{\text{Accruals}}{\text{Previous Accruals}} - 1, \text{ where Accruals} = (\text{Total Assets} - \text{Cash}) - (\text{Total Liability} - \text{Total Debt})$
Earnings Quality	Balance Sheet Based Operating Accruals	$\frac{\Delta(\text{Total Assets} - \text{Cash}) - \Delta(\text{Total Liab.} - \text{Short Term Debt} - \text{Long Term Debt})}{\text{Average Total Assets}}$
Earnings Quality	Cash Flow Based Operating Accruals	$\frac{\text{Net Income} - \text{Cash Flow} - \text{Csh Flow from Investing}}{\text{Average Net Operating Assets}}$

5.8.2 The averages of Total Shareholders' Equity, Total Equity, Total Debt, Current Liabilities Total Assets, and Net Operating Assets are the average of the latest annual or interim value and value from the corresponding period 12 months previously.

5.8.3 Net Income, Cash Flow, and Capital Expenditure are the latest reported 12 month values. Cash, Debt, Liabilities and Assets are the latest reported values. All data is sourced from the third party data providers as of the data cut-off date (Rule 5.1).

5.8.4 Low Volatility Score is defined as the inverse of the standard deviation of local daily total returns over a two year period. The volatility score is determined by ranking the securities according to Rule 5.4 such that lower volatility stocks are more attractive.

5.8.5 A minimum of 400 daily price observations is required. A security with fewer than 400 daily price observations is awarded a neutral score of 50.5.

5.8.6 Securities are ranked independently on each Quality metric within each ICB industry of each Region according to Rule 5.4. Higher values of the following characteristics are more attractive: ROE, Cash Flow ROI, Free Cash Flow/Sales, Cash Flow Interest Cover, Free Cash Flow/Current Liabilities, Cash Flow/Total Debt. Lower values of the following measures are more attractive: Volatility, Change in Accruals, Balance Sheet Based Operating Accruals, Cash Flow Based Operating Accruals.

5.8.7 Securities classified as financials (ICB industry 8000) are assigned a factor rank of 50.5 for Cash Flow ROI, Free Cash Flow/Sales, Cash Flow Interest Coverage, Free Cash Flow/Current Liabilities, Cash

Flow/Total Debt, Change in Accruals, Balance Sheet Based Operating Accruals, and Cash Flow Based Operating Accruals.

5.8.8 The contribution (multiplier), ω_p , of metrics ranks to the Composite Multi Factor Score are:

1. Metrics within the Profitability Theme: $\omega_p = 4$
2. Metrics within the Solvency & Financial Risk Theme: $\omega_p = 3$
3. Metrics within the Earnings Quality Theme: $\omega_p = 4$

5.9 Composite Multi Factor Score Construction

5.9.1 The Composite Multi Factor Score is a weighted sum of the three factors: Value, Momentum and Quality. The weighting scheme ensures:

1. Metrics used within each Quality factor theme are equally weighted; Metrics within Value factor are equally weighted; Metrics within Momentum factor are equally weighted.
2. Each Quality factor theme is equally weighted
3. Each factor is equally weighted

5.9.2 The Composite Multi Factor Score is:

$$z_i = \sum_p \omega_p z_{i,p}$$

where ω_p is the contribution (multiplier) of each rank $z_{i,p}$ of metric p (Rules 5.6.5, 5.7.4 and 5.8.8).

5.9.3 Securities are ranked independently on each Composite Multi Factor Score z_i within each ICB industry of each Region according to Rule 5.4.

5.10 Index Back Histories

5.10.1 In order to simulate the availability of factor data prior to the June 2015 launch date of the JP Morgan Factor Equity Index Series, index reviews of the JP Morgan Diversified Factor Global Developed Equity Index, JP Morgan Diversified Factor International Equity Index and JP Morgan Diversified Factor Europe Equity Index, prior to this date, utilize fundamental data that is lagged by a period of three months. The remaining indexes in Table 4.1, prior to June 2018, utilize fundamental data that is lagged by a period of three months.

Section 6

Periodic Review of Constituents

6.0 Periodic Review

- 6.1 JP Morgan Global Diversified Factor Equity Index Series will be reviewed quarterly in March, June, September and December, based on fundamental at the close of business on the last trading day of the month prior to review and price data at the close of the 1st Friday of the review month. Constituents as of the Monday following the third Friday of the review month will be used.
- 6.2 The review will be implemented after the close of business on the third Friday of March, June September and December.

Section 7

Industry Allocation

7.0 Regional-Industry Allocation

7.1 The JP Morgan Global Diversified Factor Equity Index Series aims to achieve a set of Regional-Industry Target Weights.

7.1.1 Regional-Industry Target Weights are derived from the following Reference Indexes.

JP Morgan Diversified Factor Equity Index	Regional Industry Target Weights	Z _{ref}
JP Morgan Diversified Factor Global Developed Equity Index	JP Morgan Diversified Factor North America Reference Index JP Morgan Diversified Factor Europe Reference Index, JP Morgan Diversified Factor Japan Reference Index, JP Morgan Diversified Factor Asia-Pacific ex Japan Reference Index	70
JP Morgan Diversified Factor Global Developed (Region Aware) Equity Index	JP Morgan Diversified Factor North America Reference Index JP Morgan Diversified Factor Europe Reference Index, JP Morgan Diversified Factor Japan Reference Index, JP Morgan Diversified Factor Asia-Pacific ex Japan Reference Index	
JP Morgan Diversified Factor International Equity Index	JP Morgan Diversified Factor UK Reference Index, JP Morgan Diversified Factor Europe ex UK Reference Index, JP Morgan Diversified Factor Japan Reference Index, JP Morgan Diversified Factor Asia-Pacific ex Japan Reference Index	70
JP Morgan Diversified Factor Europe Equity Index	JP Morgan Diversified Factor Europe Reference Index	70

JP Morgan Diversified Factor Equity Index	Regional Industry Target Weights	Z_{ref}
JP Morgan Emerging Diversified Factor Equity Index	JP Morgan Diversified Factor China Reference Index, JP Morgan Diversified Factor Europe, Middle East & Africa Reference Index, JP Morgan Diversified Factor Asia Pacific ex China Reference Index, JP Morgan Diversified Factor Latin America Reference Index	70

7.2 Reference Indexes

- 7.2.1 Each Reference Index is comprised of all eligible constituents that have a Composite Factor percentile rank $z_i \leq z_{ref}$.
- 7.2.2 Constituents in each Reference Index are equally weighted.
- 7.2.3 Each Reference Index is reviewed concurrently with the JP Morgan Global Diversified Factor Equity Index Series.

7.3 Regional Industry Target Weights

- 7.3.1 The Regional-Industry Target Weights of each index in the JP Morgan Global Diversified Factor Equity Index Series are the inverse volatility weight of each regional ICB industry in the relevant Reference Index (Rule 7.1.1).
- 7.3.2 The volatility of each regional industry is determined using three years of weekly (Wednesday-Wednesday) USD total return information of the regional ICB industry in the relevant Reference Index.
- 7.3.3 For Region-Neutral Indexes, the aggregate regional weight (sum of Regional-Industry Target Weights) is rescaled such that it equals the free float adjusted market capitalisation weight of each region in the underlying index as at the price date defined in Rule 6.1.

7.4 Emerging Custom Industry Classifications

- 7.4.1 In the JP Morgan Emerging Diversified Factor Equity Index the ICB industries are combined into five custom groups:
1. Consumer – Consumer Goods, Consumer Services (ICB 3000, 5000)
 2. Commodities – Basic Materials, Oil & Gas (ICB 0001, 1000)
 3. Industrials – Industrials, Technology (ICB 2000, 9000)
 4. Financials (ICB 8000)
 5. Defensives – Healthcare, Utilities, Telecoms (ICB 4000, 6000, 7000)
- 7.4.2 The custom industry groups in conjunction with the JP Morgan Emerging Diversified Factor Equity Reference indexes outlined in Rule 7.1.1 determine the Regional Industry Target Weights for the JP Morgan Emerging Diversified Factor Equity Index.

Section 8

Weighting Methodology

8.0 Weighting Methodology

8.1 Common Parameters

8.1.1 The following parameters are used throughout the Weighting Methodology:

	Parameter									
JP Morgan Diversified Factor Equity Index	τ (bps)	l_{max}	δ_{max}	x_1 (bps)	x_2 (bps)	z_{turn}	z_{max}	w_{min} (bps)	w_{max} (bps)	γ_{min}
JP Morgan Diversified Factor Global Developed Equity Index	10	4	1	30	20	60	80	5	50	5
JP Morgan Diversified Factor Global Developed (Region Aware) Equity Index	10	4	1	30	20	60	80	5	50	5
JP Morgan Diversified Factor International Equity Index	10	4	1	40	30	60	80	5	75	5
JP Morgan Diversified Factor Europe Equity Index	10	4	1	40	30	60	80	5	60	5
JP Morgan Emerging Diversified Factor Equity Index	10	4	1	$f_1(w_{cap})$	$f_2(w_{cap})$	60	80	5	225	5

where:

τ is the proportion of underlying index free float adjusted market capitalisation that determines the notional index size

l_{max} is the liquidity in days that determines maximum unlimited constituent weight

δ_{max} is the liquidity in days that determines the maximum permitted weight change

x_1 and x_2 are intermediate constituent weight limits. For the JP Morgan Emerging Diversified Factor Equity Index these parameters are a function of the free float adjusted market capitalisation weights of each constituent i , $w_{cap,i}$:

$$x_{1,i} = f_1(w_{cap,i}) = \min(0.2\% + 1.8 \times w_{cap,i}, 2\%)$$

and

$$x_{2,i} = f_2(w_{cap,i}) = \min(0.1\% + 1.65 \times w_{cap,i}, 1.75\%)$$

z_{turn} and z_{max} are maximum ranks which determine constituent eligibility.

w_{min} is the minimum permitted weight of a new constituent

w_{max} is the maximum permitted (limited) weight of a constituent. For the JP Morgan Emerging Diversified Factor Equity Index there is an additional parameter, $w_{ult,max}^i$ which is a function of the free float adjusted market capitalisation weight of each constituent i , $w_{cap,i}$:

$$w_{ult,max}^i = \min(0.3\% + 1.95 \times w_{cap,i}, 2.25\%)$$

γ_{min} is the one-way turnover threshold.

8.2 Liquidity Constraints

8.2.1 The weighting of the JP Morgan Global Diversified Factor Equity Index Series employs two liquidity constraints:

8.2.2 The maximum weight of a constituent is limited to:

$$w_{L,i} = \frac{l_{max}}{\tau V} l_i$$

where l_i is the value of the liquidity (Rule 5.2) of constituent i , V is the free float adjusted market capitalisation of the underlying index on the price date defined in Rule 6.1, and l_{max} , and τ are defined in Rule 8.1

8.2.3 The maximum possible weight change of a constituent is limited to:

$$\Delta_{L,i} = \frac{\delta_{max}}{\tau V} l_i$$

where l_i is the value of the liquidity factor of constituent i , V is the free float adjusted market capitalisation of the underlying index on the price date defined in Rule 6.1, and δ_{max} , and τ are defined in Rule 8.1.

8.2.4 Within each region R , the Regional-Industry Target Weights are capped by a liquidity limit. The liquidity limit for an industry i is defined as a sum of constituent liquidity weighting limits

$$S_{cap,i} = \sum_{k \in S_i} \min(w_{L,k}, x_2)$$

where $w_{L,k}$ is a liquidity based limit for stock k (see Rule 8.2.2) and x_2 is a predefined constituent weight limit (see Rule 8.1.1). Capped Regional-Industry Target Weights that are above the liquidity limit have their weight set to the liquidity limit and the excess weight is redistributed to the rest of the uncapped industries in region R in proportion to their weights. This process is repeated until all Regional-Industry Target Weights in region R satisfy their liquidity limit or a maximum of 10 iterations has been reached.

8.2.5 If after the application of Rule 8.2.4 there are Regional-Industry Target Weights above their liquidity limit, their weight is set to the liquidity limit and the excess weight is redistributed to the rest of the uncapped industries in proportion to their weights. This process is repeated until all Regional-Industry Target Weights in the index satisfy their liquidity limit or a maximum of 10 iterations has been reached.

8.3 Initial Review

8.3.1 The JP Morgan Global Diversified Factor Equity Index Series is initialized at the June 1999 review.

8.3.2 The initial input weights for all eligible constituents prior to the initial review are zero.

8.3.3 In May 2018 the enhanced review methodology detailed in this document was introduced. The initial review and simulated histories were made using the previous methodology for all indexes except the Region-Neutral indexes which use the enhanced review methodology throughout.

8.4 Constituent Reweighting

8.4.1 Current constituent weights $w_{cut,i}$ at the close on the data cut-off date (Rule 5.1) are the review starting weights. The data cut-off date weights for eligible constituents not in the current index are zero.

8.4.2 Constituents that are not eligible for inclusion (Section 4) are deleted.

8.4.3 Suspended China A stocks in the JP Morgan Emerging Diversified Factor Equity Index are retained in the index at their last known weight and the liquidity (Rule 5.2) of the suspended China A stock is set to zero.

8.4.4 Remaining constituents weights that exceed the upper weight limit x_1 defined in Rule 8.1 are reduced:

$$w_{0,i} = \max(w_{cut,i} - \Delta_{L,i}, x_{1,i})$$

where $\Delta_{L,i}$ is the maximum permitted weight change of constituent i (Rule 8.2.3), $w_{0,i}$ is the weight of constituent i after adjustment and $x_{1,i}$ is defined in Rule 8.1.

8.4.5 Within each Regional-Industry, if after the application of Rules 8.4.1 to 8.4.3, the combined weight of current constituents in the Regional-Industry is less than the corresponding Regional-Industry Target Weight (Rule 7.3), the weight of constituents in this Regional-Industry are increased to achieve the target weights (with the stocks to increase determined by Rule 8.4.5), subject to weight and liquidity constraints (Rule 8.2).

8.4.6 Sequentially, starting with the most attractively ranked (composite multi factor score percentile rank) stock in the Regional-Industry increase the weight of each stock subject to:

$$w_{1,i} = \min \left(w_{0,i} + w_{s,k} - \sum_{j \in ICB_k} w_j, w_{L,i}, w_{cut,i} + \Delta_{L,i}, x_{2,i} \right), i \in ICB_k$$

where $w_{1,i}$ is the weight of constituent i after adjustment, $w_{s,k}$ is the target regional-industry weight, ICB_k denotes the constituents in the current industry k , $\sum_{j \in ICB_k} w_j$ is the current weight in the Regional-Industry and $x_{2,i}$ is an upper weight limit defined in Rule 8.1, z_{max} (Rule 8.1) is the least attractive rank which can be invested into and $w_{L,i}$ (Rule 8.1) is a maximum weight limit.

New constituents ($w_{0,i} = 0$) are subject to an additional constraint, $w_{1,i} \geq w_{min}$, where w_{min} (Rule 8.1) is the minimum permitted weight for a new constituent.

The reweighting sequence in the current regional-industry stops when the target regional-industry weight has been achieved, or all constituents in the industry has been reweighted or all constituents with their composite multi factor score percentile rank (Rule 5.9) more attractive than z_{max} (Rule 8.1) has been reweighted, permitted by the weight adjustment constraints.

8.4.7 Within each Regional-Industry, if after the application of Rules 8.4.1 to 8.4.3, the combined weight of current constituents in the Regional-Industry is greater than the corresponding Regional-Industry Target Weight (Rule 7.2 to 7.4), the weight of the constituents in this regional-industry is decreased to achieve the target weight (with the stocks to increase determined by Rule 8.4.7), subject to the weight and liquidity constraints (Rule 8.2).

8.4.8 Sequentially, starting with the least attractively ranked (composite multi factor score percentile rank) stock in the Regional-Industry decrease the weight of each stock subject to:

$$w_{1,i} = \max \left(w_{0,i} + w_{s,k} - \sum_{j \in ICB_k} w_j, w_{cut,i} - \Delta_{L,i}, 0 \right)$$

where $w_{1,i}$ is the weight of constituent i after adjustment, $w_{0,i}$ is the weight before adjustment, $w_{s,k}$ is the target regional-industry weight, $\sum_{j \in ICB_k} w_j$ is the current weight in regional-industry k .

8.5 Achieving Full Investment

8.5.1 Following the application of Rules 8.4.1 to 8.4.7 if the constituent weights do not sum to one, the constituent weights are adjusted, subject to the weight and liquidity constraints (Rule 8.2).

8.5.2 For each region R with weight less than the target weight of the region, $\sum_R w_{s,k}$, the remaining weight in the regional-industry is redistributed in proportion to free float adjusted market capitalisation according to the following iterative procedure:

$$w_{2,i} = \min \left(w'_{2,i} + \left(\sum_{k \in R} w_k - \sum_{j \in R} w_{2,j} \right) \times \frac{c_i}{\sum_j c_j}, w_{L,i}, w_{cut,i} + \Delta_{L,i}, w_{max} \right) \quad \forall w'_{2,i} > 0$$

where $w'_{2,i}$ is the weight of constituent i before the adjustment (after previous iteration), $\sum_{j \in R} w_{2,j}$ is the current weight in region R , $\sum_{k \in R} w_k$ is the target weight for region R , c_i is the free float adjusted market capitalisation of constituent i and w_{max} and $w_{L,i}$ are maximum weight limits defined in Rule 8.1. For the first iteration, the weights $w'_{2,i} = w_{1,i}$. For the JP Morgan Emerging Diversified Factor Equity Index, w_{max} is determined by the function $w_{ult,max}^i$ detailed in Rule 8.1.1.

8.5.3 For each region R with weight greater than the target weight of the region, $\sum_R w_{s,k}$, the excess weight in the regional-industry is removed in proportion to index weight according to the following iterative procedure:

$$w_{2,i} = \max \left(w'_{2,i} - \left(\sum_j w_{2,j} - \sum_{k \in R} w_k \right) \times \frac{w'_{2,i}}{\sum_j w'_{2,j}}, w_{cut,i} - \Delta_{L,i}, 0 \right) \quad \forall w'_{2,i} > 0$$

8.5.4 If after the application of Rule 8.5.2 and Rule 8.5.3 the sum of the constituent weights is less than one, the remaining weight is redistributed in proportion to free float adjusted market capitalisation according to the following iterative procedure:

$$w_{3,i} = \min \left(w'_{3,i} + \left(1 - \sum_j w_{3,j} \right) \times \frac{c_i}{\sum_j c_j}, w_{L,i}, w_{cut,i} + \Delta_{L,i}, w_{max} \right) \quad \forall w'_{3,i} > 0$$

where $w'_{3,i}$ is the weight of constituent i before the adjustment, $\sum_j w_{3,j}$ is the current weight of the index (after previous iteration), c_i is the free float adjusted market capitalisation of constituent i and w_{max} and $w_{L,i}$ are maximum weight limits defined in Rule 8.1. For the first iteration, the weights $w'_{3,i} = w_{2,i}$.

8.5.5 If after the application of Rule 8.5.2 and Rule 8.5.3 the sum of the constituent weights is greater than one, the excess weight is removed in proportion to index weight according to the following iterative procedure:

$$w_{3,i} = \max \left(w'_{3,i} - \left(\sum_j w_{3,j} - 1 \right) \times \frac{w'_{3,i}}{\sum_j w'_{3,j}}, w_{cut,i} - \Delta_{L,i}, 0 \right) \quad \forall w'_{3,i} > 0$$

where $w'_{3,i}$ is the weight of constituent i before this adjustment, $\sum_j w_{3,j}$ is the current weight of the index (after previous iteration). For the first iteration, the weights $w'_{3,i} = w_{2,i}$.

- 8.5.6 Rules 8.5.1 to 8.5.5 are repeated until the sum of constituent weights is one. If the application of these rules fails to achieve full investment (i.e. sum of weights equal to 100%), the liquidity and weight constraints are relaxed and the review is reinitiated using the new constraints starting from Rule 7. The relaxed constraints are:

$$\begin{aligned}\delta_{\max} &= 1.2 \times \delta_{\max} \\ l_{\max} &= 1.2 \times l_{\max} \\ w_{\max} &= 1.1 \times w_{\max}\end{aligned}$$

8.6 Achieving Further Increases in Factor Exposure

- 8.6.1 Following the application of Rules 8.4 and 8.5 if the one way turnover is less than γ_{\min} (Rule 8.1) then attempt to divest from unattractively ranked current constituents and reinvest into attractively ranked eligible constituents. One way turnover, γ , is calculated as half the aggregate change in constituent weightings (including additions and deletions):

$$\gamma = \frac{1}{2} \sum_i |w_i - w_{cut,i}|$$

- 8.6.2 Eligible and current constituents are ranked at the index level from least attractive to most attractive using the composite multi factor score percentile ranks. In the case where two or more constituents have identical ranks, they are reverse ordered by liquidity (Rule 5.2) and then free float adjusted market capitalisation, such that the most liquid and largest constituent is considered least attractive.
- 8.6.3 Sequentially, starting with the least attractively ranked current constituent i , transfer weight Δ from constituent i to the most attractive eligible (or current) constituent j that have its factor percentile rank (Rule 5.4) no less attractive than z_{turn} (Rule 8.1) in the same Regional-Industry. The reinvested weight Δ , must not exceed the remaining available weight for investment in the Regional-Industry, that is the total weight change within the Regional-Industry must be zero:

$$\Delta = \min\left(\Delta_{L,i} + w_{4,i} - w_{cut,i}, \Delta_{L,j} - w_{4,j} + w_{cut,j}, w_{4,i}, \min(x_{1,j} - w_{4,j}, 0), \min(w_{L,j} - w_{4,j}, 0)\right)$$

the weights of the stocks i and j are adjusted using:

$$\begin{aligned}w_{4,i} &= w_{4,i} - \Delta \\ w_{4,j} &= w_{4,j} + \Delta\end{aligned}$$

- 8.6.4 New constituents ($w_{3,j} = 0$) are subject to an additional constraint, $w_{4,j} \geq w_{\min}$, where w_{\min} (Rule 8.1) is the minimum permitted weight for a new constituent.
- 8.6.5 The iterative procedure described in 8.6.2 to 8.6.4 is continued until the one way turnover target is achieved, $\gamma = \gamma_{\min}$, or insufficient liquidity remains to effect any further reweighting. For the first iteration, the weights $w_{4,i} = w_{3,i}$.

Section 9

Changes to Constituent Companies

9.0 Changes to Constituent Companies

9.1 Intra-review Additions

- 9.1.1 Additions to the underlying Index will be considered for inclusion in the relevant JP Morgan Global Diversified Factor Equity Index at the next review.

9.2 Intra-review Deletions

A constituent will be removed from a JP Morgan Diversified Factor Equity Index if it is also removed from its corresponding underlying index. A minimum of 2 days notice will be provided and its weight will be distributed pro-rata amongst the remaining constituents in the relevant index.

Section 10

Corporate Actions and Events

10.0 Corporate Actions and Events

- 10.1 If a constituent of a JP Morgan Diversified Factor Equity 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 relevant index remains unchanged pre and post such an event.
- 10.2 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 Capitalisation 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. 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, if 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 Russell will provide notice advising of the timing of the change.

10.3 Takeovers, Mergers and Demergers

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

Section 11

Index Calculation Method

11.0 Index Calculation Method

11.1 Prices

- 11.1.1 The JP Morgan Global Diversified Factor Index Series uses 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](#)

11.2 Calculation Frequency

- 11.2.1 The index series will be calculated on an end of day basis.

11.3 Index Calculation

- 11.3.1 The index series is 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 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 Weight Adjustment 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.

$$c_i = \frac{\widehat{W}_i}{W_i}$$

where \widehat{W}_i are the constituent index weights as calculated in Section 5 and W_i are the underlying eligible universe investable market capitalisation index weights as at the most recent review date.

- 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
JP Morgan Diversified Factor Global Developed Equity Index		
JP Morgan Diversified Factor International Equity Index		
JP Morgan Diversified Factor Europe Equity Index		
Monday to Friday	00:30	21:10

Notes:

1. Timings are UK hours.
2. Reuters real time exchange rates are used in 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

A Price Index, Total Return Index and Net of Tax Index will be calculated on a real-time basis in US Dollars. The JP Morgan Global Diversified Factor Equity Index Series may exist in the following states.

A) Firm

The index is being calculated during Official Market Hours (see Appendix A). No message will be displayed against the Index value.

B) Closed

The index has ceased all calculations for the day. The message 'CLOSE' will be displayed against the index value calculated by FTSE Russell.

C) Held

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

D) Indicative

If there is a system problem or situation in the market that is judged to affect the quality of the constituent prices at any time when the Index is being calculated, the Index 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 value calculated by FTSE Russell.

The official opening and closing hours of the JP Morgan Diversified Factor Equity Index Series are set out in Appendix A. Variations to the official hours of the Index 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](#)

Further information on the JP Morgan Global Diversified Factor Equity 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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