

# JP Morgan Global Diversified Factor Equity Index Series

v2.5



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## Section 1

# Introduction

## 1. 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.lseg.com/en/ftse-russell/](http://www.lseg.com/en/ftse-russell/).
- 1.2** The JP Morgan Global Diversified Factor Equity Index Series is designed to reflect the performance of stocks representing different factor characteristics.
- 1.3** These ground rules should be read in conjunction with the FTSE Global Equity Index Series ground rules, which are available at [www.lseg.com/en/ftse-russell/](http://www.lseg.com/en/ftse-russell/) and Corporate Actions and Events Guide for Non Market Cap Weighted Indices (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.
- 1.4** 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 indices include income based on ex-dividend adjustments.
- 1.5** 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.
- 1.6** 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 FTSE Fixed Income Europe Limited), FTSE Fixed Income LLC, FTSE (Beijing) Consulting Limited, Refinitiv Benchmark Services (UK) Limited, Refinitiv Limited 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;
  - any inaccuracies in these ground rules;
  - any non-application or misapplication of the policies or procedures described in these ground rules; and/or
  - any inaccuracies in the compilation of the index series or any constituent data.

## Section 2

# Management responsibilities

## 2. Management responsibilities

### 2.1 FTSE International Limited (FTSE)

2.1.1 FTSE is the benchmark administrator of the index series<sup>1</sup>.

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; and
- disseminate the indices.

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 Index Governance Board before approval is granted.

2.2.2 As provided for in the Statement of Principles for FTSE Russell Equity Indices, 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.

<sup>1</sup> 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) and [The Benchmarks \(Amendment and Transitional Provision\) \(EU Exit\) Regulations 2019](#) (the UK Benchmark Regulation).

## Section 3

# FTSE Russell index policies

## 3. 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 Indices (the Statement of Principles)

Indices 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 Index 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 Where an inaccuracy is identified, FTSE Russell will follow the steps set out in the FTSE Russell Index Recalculation Guidelines when determining whether an index or index series should be recalculated and/or associated data products reissued. Users of the JP Morgan Global Diversified Factor Equity Index Series will be 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](mailto:info@ftserussell.com).

[Recalculation\\_Policy\\_and\\_Guidelines\\_Equity\\_Indices.pdf](#)

### 3.5 Index Policy in the Event Clients are Unable to Trade a Market or a Security

3.5.1 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\\_or\\_a\\_Security.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](#)

### **3.7 FTSE Russell Governance Framework**

3.7.1 To oversee its indices, FTSE Russell employs a governance framework that encompasses product, service and technology governance. The framework incorporates the London Stock Exchange Group's three lines of defence risk management framework and is designed to meet the requirements of the IOSCO Principles for Financial Benchmarks<sup>2</sup>, the European benchmark regulation<sup>3</sup> and the UK benchmark regulation<sup>4</sup>. The FTSE Russell Governance Framework can be accessed using the following link:

[FTSE Russell Governance Framework.pdf](#)

### **3.8 Real Time Status Definitions**

3.8.1 For indices that are calculated in real time, please refer to the following guide for details of real time status definitions:

[Real Time Status Definitions.pdf](#)

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<sup>2</sup> IOSCO Principles for Financial Benchmarks Final Report, FR07/13 July 2013.

<sup>3</sup> 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.

<sup>4</sup> The Benchmarks (Amendment and Transitional Provision) (EU Exit) Regulations 2019.

## Section 4

# Eligible securities

## 4. Eligible securities

### 4.1 Underlying indices

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 (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 Emerging Diversified Factor Equity Index	FTSE Emerging Index	China, Asia Pacific ex China, Europe, Middle East and Africa (EMEA), Latin America

### 4.2 Multi-factor indices

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 JP Morgan stock, from the relevant underlying index subject to the eligible country and regions outlined in table 4.1.

### 4.3 At the review JP Morgan will be excluded from the underlying index.

## Section 5

# Factor construction

## 5. 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<sup>5</sup> 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 more 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),  $\omega_p$ , to the composite multi-factor score are described in the following subsections.

<sup>5</sup> FTSE indices migrated to the new ICB classification system in March 2021.



## 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 financials 30) 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 10 metrics spanning three themes: profitability, solvency and 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 and financial risk	Cash flow interest cover	$\frac{\text{Cash Flow} + \text{Cash Interest Paid} + \text{Cash Taxes Paid}}{\text{Cash Interest Paid}}$
Solvency and financial risk	Free cash flow/current liabilities	$\frac{\text{Cash Flow} - \text{Capital Expenditure}}{\text{Average Current Liabilities}}$
Solvency and financial risk	Cash flow/total debt	$\frac{\text{Cash Flow}}{\text{Average Total Debt}}$
Solvency and financial risk	Low volatility	Two-year standard deviation of daily local total returns

Theme	Metric	Definition
Earnings quality	Change in accruals	$\frac{\text{Accruals}}{\text{Previous Accruals}} - 1$ , where $\text{Accruals} = (\text{Total Assets} - \text{Cash}) - (\text{Total Liability} - \text{Total Debt})$
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 and cash flow based operating accruals.
- 5.8.7 Securities classified as financials (ICB financials 30) 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),  $\omega_p$ , of metrics ranks to the composite multi-factor score are:
1. Metrics within the profitability theme:  $\omega_p = 4$
  2. Metrics within the solvency and 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  $\omega_p$  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, utilise fundamental data that is lagged by a period of three months. The remaining indices in table 4.1, prior to June 2018, utilise fundamental data that is lagged by a period of three months.

## Section 6

# Periodic review of constituents

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## 6. 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 first 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. 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 indices.

JP Morgan Diversified Factor Equity Index	Regional Industry target weights	$Z_{ref}$
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	70
	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	
JP Morgan Emerging Diversified Factor Equity Index	JP Morgan Diversified Factor China Reference Index	70
	JP Morgan Diversified Factor Europe, Middle East and Africa Reference Index	
	JP Morgan Diversified Factor Asia Pacific ex China Reference Index	
	JP Morgan Diversified Factor Latin America Reference Index	

### 7.2 Reference indices

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 to Wednesday) USD total return information of the regional ICB industry in the relevant reference index.

7.3.3 For region-neutral indices, 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 consumer discretionary 40, consumer staples 45)
  2. Basic materials – basic materials, oil and gas (ICB energy 60, basic materials 55)
  3. Industrials – industrials, technology (ICB industrials 50, technology 10)
  4. Financials (ICB financials 30), real estate investment trusts (ICB REITS 35)
  5. Defensives – healthcare, utilities, telecoms (ICB healthcare 20, telecommunications 15, utilities 65)
- 7.4.2 The custom industry groups in conjunction with the JP Morgan Emerging Diversified Factor Equity Reference indices 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. Weighting methodology

### 8.1 Common parameters

8.1.1 The following parameters are used throughout the weighting methodology:

JP Morgan Diversified Factor Equity Index	Parameter									
	$\tau$ (bps)	$l_{max}$	$\delta_{max}$	$x_1$ (bps)	$x_2$ (bps)	$z_{turn}$	$z_{max}$	$w_{min}$ (bps)	$w_{max}$ (bps)	$\gamma_{min}$
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 Emerging Diversified Factor Equity Index	10	4	1	$f_1(w_{cap})$	$f_2(w_{cap})$	60	80	5	225	5

where:

$\tau$  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.

$\delta_{max}$  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  $i$ ,  $w_{cap,i}$ :

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

$\gamma_{min}$  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  $\tau$  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  $\delta_{max}$ , and  $\tau$  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 of stock  $k$  (see rule 8.2.2) and  $x_2$  is a predefined constituent weight limit (see rule 8.1.1). Capped regional industry targets 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 targets 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 indices except the region-neutral indices, 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, 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:

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

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:

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

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:

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

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:

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

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  $\gamma_{min}$  (rule 8.1), then attempt to divest from unattractively ranked current constituents and reinvest into attractively ranked eligible constituents. One-way turnover,  $\gamma$ , 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  $\Delta$  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  $\Delta$ , 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:

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

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

$$w_{4,i} = w_{4,i} - \Delta$$

$$w_{4,j} = w_{4,j} + \Delta$$

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 rules 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

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## 9. 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

9.2.1 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 two 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. 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 (with the exception of tender offers), 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 Indices 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); and
- 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 Indices.

## Section 11

# Index calculation method

## 11. 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; and

$d$  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

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Index	Open	Close
JP Morgan Diversified Factor International Equity Index		
Monday to Friday	00:30	21:10

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**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

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A price index, total return index and net of tax index will be calculated on a real-time basis in US Dollars.

For further details of real-time definitions, please refer to the following guide:

[Real Time Status Definitions.pdf](#)

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

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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](mailto:info@ftserussell.com).

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