

Guide to Calculation Methods For FTSE All-World Indices



CONTENTS

- 1.0 Purpose of Guide
- 2.0 Statement of Principles
- 3.0 Index Calculation Method
- 4.0 Statistical Procedures
- 5.0 Total Returns
- 6.0 Foreign Exchange Rates
- 7.0 Free Float Adjustments
- 8.0 FTSE All-World Index Series Algorithms
- 9.0 Review Process
- 10.0 FTSE All-World Large And Medium Cap indices
- 11.0 Guidelines for the application of the Nationality Rule.
- 12.0 Further Information

SECTION 1

1.0 PURPOSE OF GUIDE

1.1 The aims of the guide are:

- (a) to describe how the indices are calculated;
- (b) to make it easier for users to replicate the indices in order to support their investment and trading activities; and
- (c) to assist users in understanding the component factors which influence the performance of the indices.

SECTION 2

2.0 STATEMENT OF PRINCIPLES

2.1 The guiding principles behind the calculation methods described in the guide are:

- (a) the indices and index statistics are produced primarily for use in analysing investment strategies and as a measure of portfolio performance for professional investors such as pension funds, insurance companies and other institutional investors;
- (b) all calculations are based on declared dividends;
- (c) the calculation methods should reflect reality wherever practical;
- (d) the indices should be capable of being replicated by users. The calculation methods should not, therefore, be over-complex or use data not readily available;
- (e) only historic data should be used in calculating the index statistics;
- (f) data used in the indices should originate from an authoritative source. Wherever possible, data published in audited accounts and other public statements from companies (including interim statements) will be used with minimal amendment;
- (g) continuity with the past should be retained wherever possible;
- (h) consistency of calculation methods and data should be maintained wherever practical;
- (i) market practitioners from among both investors and brokers should be actively involved in determining 'best practice' to be used in the calculation of the indices and in ensuring that the indices continue to meet current market needs;
- (j) the views of users from around the world should be represented on our practitioner committees. Our decisions should be consensus driven wherever possible;
- (k) decisions should be taken independent of any single interest group. The interests of investors, analysts and constituent companies will be balanced in managing the indices;
- (l) the indices should be transparent and predictable;
- (m) in applying stock events, the position of the underlying portfolio should be accurately reflected;
- (n) Occam's razor: Wherever possible the simple and practical approach should be preferred;

SECTION 2

- (o) The primary purpose of the indices is to reflect movements in the underlying market accurately.

SECTION 3

3.0 INDEX CALCULATION METHOD

- 3.1 The FTSE All-World indices are arithmetic weighted indices where the weights are the market capitalisation of each company. The price index is the summation of the free float adjusted market values (or capitalisations) of all companies within the index and each constituent company is weighted by its market value (shares-in-issue multiplied by share price multiplied by free float factor) to which an investibility weighting may be applied. The price movement of a larger company (say, representing five per cent of the value of the index) will, therefore, have a larger effect on the index than a smaller company (say, representing one per cent of the value of the index).
- 3.2 The formula used for calculating the indices is straightforward. However, determining the capitalisation of each constituent company and calculating the capitalisation adjustments to the index is more complex. The index value itself is simply a number which relates the total market value of all companies within the index at a particular point in time compared to a comparable calculation at a starting point.
- 3.3 The algorithms used to calculate the index are detailed in Section 8.
- 3.4 The FTSE All-World Index consists of those countries listed in Appendix G of the FTSE All-World Index Ground Rules. The FTSE World Index consists of those countries of the FTSE All-World Index meeting the criteria as described in Ground Rule 10 of the FTSE All-World Index Ground Rules.
- 3.5 Where a company does not list all its shares in an eligible class these unlisted shares are not eligible for index inclusion, but are included for ranking purposes where recognised. Where a company does not list an entire class, these unlisted shares are not eligible.

SECTION 4

4.0 STATISTICAL PROCEDURES

4.1 Capital changes

The general rule for calculating the required adjustment following capital changes is:

$$\text{Adjustment} = \text{Last price} [(\text{total number of shares now in issue} \times \text{adjustment factor}) - \text{previous number of shares in issue} \times \text{adjustment factor}]$$

The "adjustment factor" represents the adjustment to historic prices required to maintain comparability with current prices.

Example 1 - Rights Issue

Current Price	=	300p
Shares in Issue	=	300m
Terms:		1 for 4 at 260p
Theoretical ex-rights	=	$[(4 \times 300) + (1 \times 260)] \div 5$
	=	292p
Adjustment factor	=	Ex-Rights Price/Cum-Rights Price
	=	292/300
	=	0.9733

The required adjustment to overall market capitalisation can be looked at simply as the value of the new equity being added, i.e. $75\text{m} \times 260\text{p} = \text{£}195\text{m}$. The general adjustment rule below would provide the same answer:

Required adjustment	=	$300\text{p} [(375\text{m} \times 0.9733) - 300\text{m}]$
	=	£195m

Please note: In the event that the market price is equal to or below the rights offer price at the close of business immediately before trading ex-dividend, no adjustments will be made. In this circumstance, any resulting new shares will only be added to the index weighting once the take-up proportion is known and together with any associated change to the company's free float.

SECTION 4

Example 2 - Scrip Issue

Current Price	=	300p
Shares in Issue	=	300m
		Terms: 1 for 1 scrip (equivalent to 2 for 1 US stock split)
Ex-Scrip Price	=	150p
Ex-Scrip Shares in issue	=	600m
Adjustment factor	=	$150/300 = 0.5$

Application of the general adjustment rule would show that no adjustment to the overall market capitalisation is required:

Required adjustment	=	$300p [(600m \times 0.5) - 300m]$
	=	Nil

The following table shows the adjustment to overall market capitalisation following capital changes. The example overleaf illustrates how those adjustments maintain the continuity of the indices;

SECTION 4

Example 3 - Maintaining Continuity

	EVENT	ACTION	START CAPITALISATION	MARKET MOVEMENT	END CAPITALISATION	CLOSING INDEX*
					1000.0	100.00
DAY 1			1000.0	2.0 %	1020.0	102.00
DAY 2	Stock XYZ added	Add market cap (50m)	1070.0	3.0 %	1102.1	105.06
DAY 3	Rights issue	Add value of rights (100m)	1202.1	- 4.0 %	1154.0	100.86
DAY 4	Scrip issue	None	1154.0	5.0 %	1211.7	105.90
DAY 5	Stock XYZ deleted	Decrease market cap (60m)	1151.7	1.0 %	1163.2	106.96

*Index = Previous Index (End Cap/Start Cap)

Corporate actions

TYPE OF ACTION	ADJUSTMENT FACTOR	ADJUSTMENT REQUIRED
Rights issue	$\frac{(\text{No of shares held before issue} \times \text{Last cum-rights}) + (\text{Number of new shares} \times \text{Call})}{(\text{Number of old shares held} + \text{new shares}) \times \text{last cum-rights price}}$	Increase Cap by: (New shares \times Call) *
Scrip issue (sometimes known as capitalisation bonus or gratis issue)	$\frac{\text{Number of shares held before issue}}{\text{No of shares held after issue}}$	None

SECTION 4

Corporate actions (Con't)

Scrip issue of different, eligible security	Value of both securities after issue ÷ Value of security before issue	None
Scrip issue of different, ineligible security	Value of original security after issue ÷ Value of security before issue	Decrease Cap by: (New shares × Price of other stock) *
Combined scrip and rights issue	Rights issue adj factor × Scrip issue adj factor	Increases Cap by: New equity raised *
Consolidation (Reverse split)	No of shares held before issue ÷ No of shares held after issue	None
Combined sub-division and scrip issue	Sub-division adj factor × Scrip issue adj. Factor	None
Stock dividend	$100 \div 100 + \text{stock dividend amount}$	None
Capital repayment and spin-off	Price of parent company after spin-off ÷ Price of parent before spin-off	Decrease Cap by: Value of spin-off
New Issue		Increase Cap by: (New shares × Price at Inclusion) *

*Investibility weights are also applied where necessary.

SECTION 4

4.2 Share Weighting Changes

For the purposes of computing the FTSE All-World Index and to prevent a large number of small weighting changes, changes to shares in issue are limited to cases where the impact is 1% or more, i.e. share changes are only considered on a cumulative basis from the number actually used in the index. For example, two or more changes, cumulatively below the threshold will be applied at the point when the total change exceeds 1%. The number of shares in issue for each constituent security is expressed to the nearest share.

4.3 Stocks trading on a non-domestic exchange

The price source and nationality of constituent stocks is decided individually (see FTSE All World Index Ground Rule 4.1), therefore the constituents of a Country Index may price from non-domestic stock exchanges. Thus, price movements and exchange rate movements may be reflected in a Country Index when the domestic exchange is closed. Companies trading in a currency other than the currency of the domestic market (e.g., Jardine Group companies) or in markets that share currencies with other markets (e.g., Eurozone markets, Shanghai & Shenzhen stock markets) may cause that market index to change when the market is closed, due to movements in the foreign exchange rate.

- 4.3.1 FTSE monitors the relative liquidity of the foreign board and domestic quotes of Thai and Malaysian stocks, and the most liquid line is used for pricing constituent stocks. Should there be a change in relative liquidity, measured on a monthly basis FTSE will swap to the most liquid line. Any changes are announced prior to implementation, which will be after the close of business on the third Friday in the month.

SECTION 4

4.4 Dividends

4.4.1 The dividends used are the declared dividends, re-invested on the effective date.

4.5 Pricing of Brazilian Constituents.

4.5.1 Constituents of the FTSE All-World Brazil are priced in lots. FTSE uses the "Quote Lot" size, which may be altered from time to time by the Brazilian Stock Exchange. For more details please contact FTSE Client Services, whose details may be found in Section 12, below.

SECTION 5

5.0 Total Return Indices

The total return index calculations add the income a stock's dividend provides to the performance of the index. The total return calculation is completed differently depending on which type of index is being calculated, the FTSE All-World Index calculation can be expressed as:

$$RI_j = RI_{j-1} \cdot X_j / (X_{j-1} - (AD_j / (M_j / X_j)))$$

where

i = time period.

RI_j = Return Index at time i .

X_i = Capital Index at time i .

X_{j-1} = Capital Index at time $i-1$.

AD_j = Market Value of Dividends effective at time i .

M_j = market capitalisation of constituents at time i .

Note the formula $(AD_j / (M_j / X_j))$ calculates the XD adjustment for an index.

Aggregate Dividend

The aggregate dividend (D_j) represents the sum of the dividend value of all stocks included in the index:

$$AD_j = \sum ad_j \cdot n_j \cdot w_j$$

where

ad_j = the actual dividend for the stock in period i .

n_j = the number of shares issued and outstanding at the end of the period i .

w_j = the investibility weight of the stock in the index in period i

Dividend Yield

The dividend yield for a stock is calculated as follows:

$$\underline{\text{Stock Annual Dividend} / \text{Stock Price} = \text{Stock Yield (\%)}}$$

SECTION 5

The dividend yield for an index is calculated as follows:

$$\text{Dividend Mkt Cap} / \text{Index Mkt Cap} = \text{Index Yield (\%)}$$

NOTES:

- 1) Dividend Mkt Cap is the sum of the stock dividend market values within that index e.g. annual dividend x shares x weight. Dividends will need to be converted into the currency of that index if different)
- 2) Index Market Cap is the net market cap for the index in question

SECTION 6.0

6.0 Foreign exchange rates

Foreign exchange rate values against the US dollar at the base date, 31 December 1986, were as follows:

REGION	COUNTRY	CURRENCY	EXCHANGE RATE AT 31 DECEMBER 1986
Europe/	Austria	Schilling	13.5425
Middle East/	Belgium	Franc	40.55
Africa	Czech Republic	Koruna	5.750000
	Denmark	Kroner	7.3525
	Egypt	Pound	0.693657
	Eurobloc	Euro	0.8684
	Finland	Markka	4.7669
	France	Franc	6.3750
	Germany	Deutsche Mark	1.9235
	Greece	Drachma	139.5000
	Hungary	Forint	0.021774
	Ireland	Punt	0.7097
	Israel	Shekel	149.797600
	Italy	Lira	1339.0
	India	Rupee	12.951350
	Luxembourg	Luxembourg franc	40.5500
	Morocco	Dirham	8.616734
	Netherlands	Guilder	2.1910
	Norway	Krone	7.3675
	Pakistan	Rupee	17.004050
	Poland	Zloty	0.0050602
	Portugal	Escudo	146.1000
	Russia*	Ruble	1.00*
	Spain	Peseta	132.0
	Sweden	Krona	6.7550
	Switzerland	Franc	1.6130
	Turkey	Turkish Lira	0.001323
	United Kingdom	Pound	0.6745

* The FTSE All-World Russia index uses US Dollars as the local currency

SECTION 6.0

(Foreign exchange rates, Con't)

REGION	COUNTRY	CURRENCY	EXCHANGE RATE AT 31 DECEMBER 1986
Americas	Argentina	Peso	1.256613
	Brazil	Real	0.5432 *
	Chile	Peso	198.576200
	Columbia	Peso	218.839400
	Canada	Dollar	1.3810
	Mexico	Peso (Comm)	914.6220
	Peru	Sol	14.001350
	United States	Dollar	1.0000
	Venezuela	Bolivar	4.257760

Pacific Basin	Australia	Dollar	1.5035
	Hong Kong	Dollar	7.7890
	Indonesia	Rupiah	1630.0840
	Japan	Yen	158.20
	Korea	Won	853.861700
	Malaysia	Ringgit	2.5965
	New Zealand	Dollar	1.8832
	Philippines	Peso	20.0661
	Singapore	Dollar	2.17
	Thailand	Baht	25.7655
	Taiwan	New Dollar	35.053980

* adjusted for hyperinflation

*Further information on The WM/Reuters Closing Spot Rates™ service is available from
The WM Company, World Markets House, Crewe Toll, Edinburgh, EH4 2PY.
Tel: + 44 (0) 131 315 2000*

0 SECTION 7.0

7.0 Free Float Adjustment

- 7.1.1 Free float is the proportion of shares tradable within the market place for a given stock. The free float adjustment which FTSE makes within its indices is to reflect situations where a party owns a proportion of a line of stock and that proportion is unlikely to be for sale. An example would be that, at the time of writing, Olivetti SpA owns 55% of Telecom Italia (Ord). In accordance with the banding structures as defined in Ground Rule 10.4.3 (vii), Telecom Italia would therefore be weighted at 50% in the index.
- 7.1.2 Free float is not purely restricted to which listed companies or other constituents own what proportion of other listed companies, but also takes into consideration interests held by other parties. An example of this case could be the Peugeot family, who own 25.11% of Peugeot. This would lead to a freefloat banding of 50%.
- 7.1.3 When testing the liquidity of existing constituents of an index, the banded free float weight as at the last date in the period of liquidity to be tested will be used for the calculation for the whole of that period.
- 7.2 The calculation of the investibility weight will use the following algorithm:

BW_{t-1}	= Width of Free-Float Band (previous)
B_{t-1}	= Free-Float Banded Value (previous)
ff_{t-1}	= Free-Float (previous)
ff_t	= Free-Float (current)
R	= Total Free-Float Restriction
R_D	= Domestic Free-Float Restriction
R_F	= Foreign Free-Float Restriction
F_I	= Foreign Ownership Restriction (Investible (%))
F_N	= Foreign Ownership Restriction (Non-Investible (%))
I_w	= Investible Free-Float adjusted Index Weighting (current)
I_{w-1}	= Investible Free-Float adjusted Index Weighting (previous)

$$\left[R = R_D + R_F \right] \left[100 = F_I + F_N \right] \left[F_I \geq R_F \right]$$

SECTION 7.0

We will be testing the inequality: $F_I - R_F \leq 100 - (R_F + R_D) = 100 - R$

This can be simplified by adding R_F either side of the equation, to give:

$$F_I \leq 100 - R_D$$

Now to show only the Non-Investible portion of the Foreign Ownership Restriction, we substitute F_I with $100 - F_N$ to give:

$$100 - F_N \leq 100 - R_D$$

This is further simplified by taking 100 and multiplying either side of the inequality by -1, to give:

$$F_N \geq R_D$$

[CASE 1]

If $F_N \geq R_D$

Then $100 - F_N - R_F$ takes precedence

$ff_t = 100 - F_N - R_F \Rightarrow$ GO TO BANDING ALGORITHM

If $I_w \leq 100 - F_N$, Then $ff_t = I_w \Rightarrow$ EXIT

Else $ff_t = 100 - F_N \Rightarrow$ EXIT

[CASE 2]

Else If $F_N < R_D$

Then $100 - R$ takes precedence

$ff_t = 100 - R \Rightarrow$ GO TO BANDING ALGORITHM

If $I_w \leq 100 - F_N$, Then $ff_t = I_w \Rightarrow$ EXIT

Else $ff_t = 100 - F_N \Rightarrow$ EXIT

SECTION 7.0

7.3 FREE-FLOAT BANDING ALGORITHM:

if (exists ff_{t-1}) and not (exists B_{t-1}) then $B_{t-1} = ff_{t-1}$

if not (exists ff_{t-1}) or ($ff_t \leq 15\%$) or ($ff_t + 5 < B_{t-1} - BW_{t-1}$) or ($ff_t > B_{t-1} + 5$) then

$ff_t \leq 5\%$; $I_w = 0\%$, $B_t = 0\%$, $BW_t = 0\%$
$5\% < ff_t^* \leq 15\%$; $I_w = 0\%$, $B_t = 0\%$, $BW_t = 0\%$
$15\% < ff_t \leq 20\%$; $I_w = 20\%$, $B_t = 20\%$, $BW_t = 10\%$
$20\% < ff_t \leq 30\%$; $I_w = 30\%$, $B_t = 30\%$, $BW_t = 10\%$
$30\% < ff_t \leq 40\%$; $I_w = 40\%$, $B_t = 40\%$, $BW_t = 10\%$
$40\% < ff_t \leq 50\%$; $I_w = 50\%$, $B_t = 50\%$, $BW_t = 10\%$
$50\% < ff_t \leq 75\%$; $I_w = 75\%$, $B_t = 75\%$, $BW_t = 25\%$
$75\% < ff_t$; $I_w = 100\%$, $B_t = 100\%$, $BW_t = 25\%$

else

$$I_w = I_w^{-1}$$

$$* I_{w_{t+\delta t}} \in \mathbb{Z}[6, 15]$$

t+ δt = next review date.

7.4 IMPLEMENTING CHANGES TO FREE FLOAT BANDINGS

7.4.1 Corporate events: changes to free float (subject to the five percentage points threshold) will be applied on the effective date of the corporate event. Where possible, users will be notified via the standard pre-announcements issued by FTSE. If no pre-announcement has been made by the constituent company, changes to free float bandings will still be applied on the effective date of the corporate event and will be announced on the day prior to the effective date.

7.4.2 Advance warning of sales of restricted equity: if FTSE is alerted to a change in a restricted holding, the change to the free float (subject to the five percentage points threshold, see FTSE All World Index ground rule 10.4.3 (xi)) will be made as close as possible to the timing of the event and announced accordingly.

SECTION 7.0

- 7.4.3 **Retrospective sales of restricted equity:** if FTSE is alerted to a historic change in a restricted holding, the change to the free float (subject to the five percentage points threshold) will be made and four working days notice will be provided accordingly.
- 7.4.4 **Greenshoes:** those shares potentially to be offered as a greenshoe will not be included in the initial calculation of the free float of a company offering shares to the market. Following the offering, if the greenshoe option is exercised, these shares will be treated as free float and the company's investibility weighting adjusted, in accordance with rules 5.3.4 and 5.4, above.
- 7.4.5 Investibility weight changes, other than those arising from corporate actions and corporate events, resulting from the collation of data gathered by or supplied to FTSE intra review, for constituents incorporated in countries other than those specifically under review in a given quarter will usually be accumulated throughout each quarter. Any such changes will be announced via an additional technical notice and identified as intra review changes, the announcement will usually be made after the index review technical notice announcements pertaining to scheduled country review changes, and made effective after the close of business on the third Friday of March, June, September and December

7.5 COMPANIES WITH FREE FLOAT LESS THAN 15%

- 7.5.1 The market value test (USD 5.0 bn or USD 2.5 bn) will only be applied at the time of an periodic index review and the launch of a new issue (IPO);
- 7.5.2 Company valuations will be based on their full market capitalisation using official closing (end of day) prices and Reuters/WM 16:00hrs fx rates;
- 7.5.3 The FTSE Equity Indices Committee will have the right to review and amend the USD 5.0 bn or USD 2.5 bn values over time to reflect longer-term changes in the markets.

SECTION 8.0

8.0 FTSE WORLD INDEX SERIES ALGORITHMS

8.1 Introduction

8.1.1 The indices are calculated using the Chained Paasche methodology.

8.1.2 The index for an individual country in local currency is calculated after all security prices and capital changes affecting constituents since the previous calculation have been collected (i.e. since the last working day). Country indices in other currencies are derived by applying currency factors. In this description of the algorithms we discuss translation into dollars and sterling. Composite indices are derived by calculating the weighted mean performance of the constituent countries. This can be proved to be equivalent to the calculation of composite indices from first principles.

8.2 Country Index in Local Currency

8.2.1 Notation

Free Float of company <i>s</i> in country <i>c</i> at time <i>t</i>	F_{cst}
Number of shares in issue for company <i>s</i> in country <i>c</i> at time <i>t</i>	N_{cst}
Price in local currency for company <i>s</i> in country <i>c</i> at time <i>t</i>	P_{cst}
Value in local currency of capital changes adjusted for free float for each capital change in country <i>c</i> at time <i>t</i>	C_{ct}
Value in dollars of each unit of local currency in country <i>c</i> at time <i>t</i>	D_{ct}
Value in sterling of each unit of local currency in country <i>c</i> at time <i>t</i>	S_{ct}
Summation of company data within country <i>c</i>	s
Summation of country data within region <i>r</i>	c
Value of index for country <i>c</i> at time <i>t</i>	I_{ct}
Value of composite index at time <i>t</i>	I_{rt}

A country index at time *t*
$$I_{ct} = \frac{\sum_s N_{cst} P_{cst} F_{cst}}{B_{ct}}$$

where B_{ct} is the index base adjusted for past capital changes.

At the start of the index the base is
$$B_{co} = \sum_s N_{cso} P_{cso} F_{cso}$$

SECTION 8.0

or, the total market capitalisation of the constituent stocks at the start of the index.
Until the first capital change, the value of N_{cst} will not change and the index is:

$$\frac{\sum_s N_{cso} P_{cst} F_{cso}}{\sum_s N_{cso} P_{cso} F_{cso}}$$

This can be written as:

$$\frac{\sum_s N_{cso} P_{cso} F_{cso} \left(\frac{P_{cst}}{P_{cso}} \right)}{\sum_s N_{cso} P_{cso} F_{cso}}$$

establishing that the index reflects the weighted-average price performance of the constituents

To ensure continuity, it is necessary to adjust the base whenever a capital change takes place. The capital change, C_{ct} , is deemed to occur after the close of trading on day $t-1$ and before the calculation of the index on day t .

Thus:

$$I_{cst} = \frac{\sum_s N_{cst-1} P_{cst-1} F_{cst-1}}{B_{ct-1}} = \frac{\left(\sum_s N_{cst-1} P_{cst-1} F_{cst-1} \right) + C_{ct}}{B_{ct}}$$

The new base, B_{ct} , therefore becomes:

$$B_{ct-1} \left[1 + \frac{C_{ct}}{\sum_s N_{cst-1} P_{cst-1} F_{cst-1}} \right]$$

or:

$$B_{ct-1} + \frac{C_{ct}}{I_{ct-1}}$$

SECTION 8.0

Alternatively, the change in an index on any day can be viewed as reflecting the percentage change in market capitalisation for capital changes.

The performance of an index can be derived from

$$\frac{I_{ct}}{I_{ct-1}}$$

This equals:

$$\begin{aligned} & \frac{\sum_s N_{cst} P_{cst} F_{cst}}{B_{ct}} \bigg/ \frac{\sum_s N_{cst-1} P_{cst-1} F_{cst-1}}{B_{ct-1}} \\ &= \frac{\sum_s N_{cst} P_{cst} F_{cst}}{\sum_s N_{cst-1} P_{cst-1} F_{cst-1}} \left(\frac{B_{ct-1}}{B_{ct}} \right) \\ &= \frac{\sum_s N_{cst} P_{cst} F_{cst}}{\sum_s N_{cst-1} P_{cst-1} F_{cst-1}} \left(\frac{\sum_s N_{cst-1} P_{cst-1} F_{cst-1}}{\sum_s (N_{cst-1} P_{cst-1} F_{cst-1}) + C_{ct}} \right) \\ &= \frac{\sum_s N_{cst} P_{cst} F_{cst}}{\sum_s (N_{cst-1} P_{cst-1} F_{cst-1}) + C_{ct}} \end{aligned}$$

The denominator in this expression is subsequently referred to as adjcap_{ct} .

SECTION 8.0

8.3 Country Indices in Local Currencies and Dollars

A country index in dollars at time t is:
$$\$I_{ct} = \frac{\left(\sum_s N_{cst} P_{cst} F_{cst} \right) D_{ct}}{\$B_{ct}}$$

where $\$B_{ct}$ = Base of dollar index.

At the start,

$$\$B_{co} = \left(\sum_s N_{cso} P_{cso} F_{cso} \right) D_{co}$$

Changes in the base are derived as before such that:

$$\$B_{ct} = \$B_{ct-1} \left(1 + \frac{C_{ct} D_{ct-1}}{\left(\sum_s N_{cst-1} P_{cst-1} F_{cst-1} \right) D_{cst-1}} \right)$$

$$= \$B_{ct-1} \left(1 + \frac{C_{ct}}{\left(\sum_s N_{cst-1} P_{cst-1} F_{cst-1} \right)} \right)$$

SECTION 8.0

and, from the derivation of B_{ct} in Section A, it can be seen that: $\frac{\$B_{ct}}{\$B_{ct} - 1} = \frac{B_{ct}}{B_{ct} - 1}$

showing that the proportional changes in dollar base values are the same as those for local currency base values.

A dollar index can therefore be derived more simply from:

$$\$I_{ct} = I_{ct} \cdot \left(\frac{D_{ct}}{D_{co}} \right)$$

Similarly, a sterling index can be derived from:

$$\pounds I_{ct} = I_{ct} \cdot \left(\frac{S_{ct}}{S_{co}} \right)$$

or

$$\pounds I_{ct} = \$I_{ct} \cdot \frac{(\$/\pounds)_t}{(\$/\pounds)_o}$$

8.4 Local Currencies for Composite indices

Composite (regional) Indices are calculated for regional areas, including the FTSE All-World Index .

A composite index is one which has constituent stocks denominated in multiple currencies. Two different types of calculation are carried out on these indices, the first is a standard index calculation (as described above), the second is a calculation of an index value with currency movements stripped out.

SECTION 8.0

The formula for composite indices is:

$$XL_i = ((PI_i / M'_i) + 1) \cdot XL_{i-1}$$

and when $i=1$,

$$XL_i = 100$$

where

- i = time period
- XL_i = composite local index at time i
- PI_i = Index performance adjusted for exchange rate fluctuations at time i .
- M'_i = adjusted market capitalisation (adjusted for stock splits, stock dividends, rights issues, new issues of stock, stock cancellations for constituents, changes in free float and the addition or deletion of constituents) represented in dollars using the exchange rates at $i-1$.

The index performance is used in the calculation of composite local indices, essentially it is the performance of the constituent indices and is calculated by:

$$PI_i = \sum (M_i - M'_i) \cdot E_{i-1}$$

where

- M_i = market capitalisation of constituent index at time i .
- M'_i = adjusted market capitalisation of the constituent index (adjusted for stock splits, stock dividends, rights issues, new issues of stock, stock cancellations for constituents, free float changes and the addition or deletion of constituents)
- E_{i-1} = Exchange rate of the constituent index at $i-1$

SECTION 9.0

9.0 REVIEW PROCESS

9.1 Addition of countries

- 9.1.2 New countries may be added at any time after a prior announcement. The dollar value of the country index on inclusion is the dollar value of the FTSE All-World Index at that date. The local currency value of the country index on inclusion is the dollar value adjusted for the local currency movement against the dollar between 31st December 1986 and the inclusion date, except that some smaller adjustment may be made where a country that has experienced a period of hyperinflation is included.
- 9.1.3 New regional Indices may be added at any time after a prior announcement. The values of the new regional index in all currencies take the equivalent value of the FTSE All-World Index at that date.

9.2 Addition of Fast Entrants to the FTSE All-World Index

- 9.2.1 All potential new issues will be valued as soon as the number of shares and offer price range are known. FTSE will release a technical notice confirming the eligibility of any new issue whose estimated full market capitalisation, i.e. before the application of investibility weightings, based on the mid of the offer price range, will exceed twice the Auto Add Level (AAL), index adjusted (for FTSE World Index constituents) or results in the company ranking within the top 70% of the full market capitalisation of its country index (for FTSE Emerging Index). FTSE will endeavour to make such announcements before the close of any book-building process.
- 9.2.2 New issues which do not qualify as fast entrants to the FTSE All-World Index will be reconsidered for inclusion at the following regular meeting of the appropriate FTSE Regional Committee. For constituents of the FTSE World Index, the requirement is that its full market capitalisation i.e. before the application of any investibility weightings is greater than twice the AAL, index adjusted. For constituents of the FTSE Emerging Market Index, the requirement is that the company's full market capitalisation ranks it within the top 70% of the full market capitalisation of its country index. The valuations of these companies will be conducted using data as at 11 February, 11 May, 11 August or 11 November. Inclusion will only be considered subject to all such companies also passing the free float requirement, 20 day trading and liquidity rules.

SECTION 9.0

9.3 Data used for conducting a review

- 9.3.1 All data used in reviews is as at the quarter end preceding the quarter in which the review is presented to the FTSE Regional Committees. For example, a review to be presented to the Committee in September will be conducted using data from the close on the last business day in June.
- 9.3.2 A company will be deleted from the Index at the quarterly meeting of the appropriate FTSE Regional Committee if its market capitalisation, before the application of investibility weightings, falls below the minimum market size for a country for two consecutive quarters.
- 9.3.3 A company will be defined as falling below the minimum market size if its market capitalisation, before the application of investibility weightings, is less than 80% of the market's minimum market size (index adjusted) for two consecutive quarters, using data as at 11 February, 11 May, 11 August or 11 November as appropriate.
- 9.3.4 When considering the eligibility of a company that has been involved in a merger during the period in which liquidity is considered for a review, the figures of the most liquid of the unmerged entities will be used for the period before the merger became effective. Companies resulting from a spin-off or demerger will be treated as new, and must have a 20 day trading record to be eligible.

9.4 Addition and deletion of stocks

- 9.4.1 If the market from which a stock is priced is closed on the day it is to be added or deleted, the stock will be added or deleted at the close price on the previous day's trading, except in cases when the stock is to be deleted at zero pence.

SECTION 10.0

10.0 FTSE WORLD INDEX SERIES LARGE AND MEDIUM CAP INDICES

10.1 Capitalisation Indices

10.1.1 The Large Cap and Medium Cap Indices are only calculated for the FTSE World Index.

10.1.2 The FTSE World Index Large Cap and Medium Cap series are designed to complement the main FTSE World Index series.

10.1.3 All constituents of the FTSE World Index Series will be included in either the Large Cap or the Medium Cap Index.

10.1.4 In order to take into account the size of the company, the following adjustments are made to the constituent data of the FTSE World Index Series when determining the classifications for Large Cap/Medium Cap:

- (i) The market capitalisation used for the ranking is determined by multiplying shares outstanding by price. Since rankings are made within each country, the market capitalisations are left in their local currencies. Those stocks trading in a foreign currency are converted to the local currency using the 16:00hrs (London time) rates from Reuters/WM Company. Percentage weightings, reflecting the portion of a company's shares available to foreigners, are ignored.
- (ii) If a company has multiple security lines included in the FTSE World Index Series, these securities are aggregated and each company is ranked by its aggregate stock market capitalisation.
- (iii) These two adjustments affect only this classification process. During Index calculation, the market capitalisation used in the Index is calculated using shares outstanding multiplied by price multiplied by percentage weightings, just as in the official FTSE World Index Series.

SECTION 10.0

10.2 Constituent changes

Securities added to the FTSE World Index Series other than at the re-balancing dates are simultaneously assigned to either the Large Cap or the Medium Cap Indices.

10.2.1 Additions

When a new company is added to the Index Series, it will be classified immediately as Large if, based on a current ranking, it is among the companies representing the top 75 per cent of the appropriate FTSE World country "full" index capitalisation. If it is among the companies representing the bottom 25 per cent of the appropriate FTSE World country "full" index capitalisation, it will be classified as Medium.

10.2.2 If an additional security of an existing FTSE World Index Series constituent company is added, the security will be classified as the aggregated company would be classified. Other securities of the company will not be moved from one index to the other until the next semi-annual rebalancing.

10.2.3 No changes are made to the rankings of any existing companies, even if their sizes have changed significantly since the last re-balancing, before the next regular re-balancing.

10.2.4 When a security is deleted from the FTSE World Index Series, it is simultaneously deleted from the appropriate Large Cap or Medium Cap index.

10.3 Semi-annual re-balancing of constituents

10.3.1 Prior to the beginning of a new six-month period, a new ranking of all FTSE World Index Series companies is performed by country. In order to decrease turnover resulting from companies moving back and forth across the 75/25 division, a ± 2.5 per cent band has been added around the 75/25 cut-off.

10.3.2 The securities of existing Large Cap companies will continue to be classified as Large as long as their aggregate capitalisation is within the top 77.5 per cent (75+2.5 band) of the appropriate FTSE World country index's "full" capitalisation. Any Large companies that fall below this point are reclassified to Medium.

10.3.3 The securities of existing Medium Cap companies will continue to be classified as Medium as long as their company is below the top 72.5 per cent (75-2.5 band) of the appropriate FTSE World country index's "full" capitalisation. Any company that has risen above this cut-off will be re-classified as Large.

SECTION 10.0

- 10.3.3 Re-balancings will be undertaken using closing prices from the Monday before the third Friday in March and September and will take into consideration any constituent changes announced by the FTSE Regional Committees at their meetings, but will be conducted before the implementation date of these changes on the next trading day following the third Friday in March, June, September and December. The implementation of any changes to previous constituent classifications (Large to Medium or Medium to Large) will also be effective on the next trading day following the third Friday in March and September.
- 10.3.4 New securities added to the FTSE World Index Series at any other time will be simultaneously assigned to either the Large or Medium Cap Indices following the process outlined in Rule 10.2, above.

10.4 Creation of the Indices

- 10.4.1 On 1 January 1987 within each FTSE World Country Index, the constituent companies were ranked by their "full" index market capitalisation - i.e. all the securities of a company included in FTSE World Index Series were aggregated without account being taken of any applicable investibility weighting factors.
- 10.4.2 Those companies that made up the largest 75 per cent of each FTSE World Index country "full" index's market capitalisation were allocated to a Large Cap index. The remaining companies, from the bottom 25 per cent, were allocated to a Medium Cap index. In addition each of those designated as Large or Medium companies were aggregated to create Large and Medium indices for then 12 FTSE World Index regions.
- 10.4.3 This method was chosen in preference to a ranking of companies within the regions, which would have created Large Cap indices dominated by US, Japanese and UK companies, with companies from smaller countries falling predominantly into the Medium Cap.
- 10.4.4 On 1 July 1987 the indices were re-balanced, taking into account the 2.5 per cent bands. For the remainder of the creation of the back history up to the launch of the FTSE World Large and Medium Cap indices in September 1993, the re-balancings were carried out and implemented on the first working days of January and July.
- 10.4.5 After the launch of the indices, the re-balancings were carried out and implemented on the 15th of the month to give users of the indices sufficient notice of the changes. However, the change did not allow pre-announcement of the rankings in time for the regular quarterly changes.

SECTION 10.0

10.4.6 In order to address this issue, the semi-annual re-balancings were moved from January and July to March and September, with the changes effective from 1 April and 1 October respectively. The 1 January 1995 re-balancing was omitted and the first re-balancing on the new basis was carried out in March 1995.

10.5 Index History

10.5.1 The index levels from 31 December 1985 to 31 December 1986 have been back-dated using the above re-balancing procedures. The 31 December 1985 rankings were based on the 75/25 split, whilst the end-June 1986 ranking took into account the 2.5 per cent bands. The resulting indices were linked to the indices calculated from 1 January 1987 and rebased so as to form continuous series based at 100 at 1 January 1987.

SECTION 11.0

11.0 Guidelines for the application of the Nationality Rule.

- 11.1 A company will be allocated to a single country and this allocation shall be consistent across all FTSE indices.
- 11.2 FTSE will normally allocate the country in which the company is incorporated and listed at the time of the company's listing. However, FTSE reserve the right to defer an allocation decision.
- 11.3 If a company is incorporated in a developed country, and solely listed in another developed country, FTSE will normally allocate the company to the country of listing.
- 11.4 In circumstances other than those described above, FTSE will make a recommendation to the Nationality Working Party (NWP) who will decide a company's country allocation based on the following considerations:
- **If a company is incorporated in a country other than a developed country and is solely listed in another country:** the NWP will normally allocate the company to the country of listing. However, the NWP may also take other factors into account including, but not limited to, the investor protection regulations under which the company is governed, the country in which the company is resident for tax purposes, market perception and currency of trading.
 - **If a company is incorporated in a country represented by a FTSE index and has multiple listings:** the NWP would normally decide on its inclusion in the country of listing where it is most liquid. However, the NWP may also take into account factors including, but not limited to, the country in which the company is resident for tax purposes, market perception and currency of trading.
 - **If a company is incorporated in a country not represented by a FTSE index and has multiple listings:** the NWP would normally decide on its inclusion in the country of listing where it is most liquid. However, the NWP may also take into account factors including, but not limited to, the investor protection regulations under which the company is governed, the country in which the company is resident for tax purposes, market perception and currency of trading.
- 11.5 The NWP will decide the country allocation of each company on its merits having regard to its particular circumstances.
- 11.6 The country allocation of any FTSE index constituents may be reassessed at any time at FTSE's discretion.
- 11.7 An appeal against a decision of the NWP can only be made to the FTSE Equity Indices Committee.

SECTION 12.0

12.0 Further information on the FTSE All-World Index Series ^{TM/SM}

Further information on the FTSE All-World Index Series^{TM/SM} is available from FTSE, who will also welcome comments on the Index Series.

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