Construction and methodology

FTSE Russell

Russell Index Calculation

Contents

Introduction

This document describes FTSE Russell's general index calculation methodology for the Russell US Indexes.

An index value is, by design, a tool for measuring the return from holding shares of the constituent stocks. The return that an index value is designed to measure is the time-weighted return of the holdings. In time-weighted return methodology, any change in holdings (share changes due to corporate actions or reconstitution, for example) represents an implied cash flow into or out of the index portfolio. Time-weighted return methodology removes the effect of cash flows on the measured return. Accordingly, an index value does not change due to share changes (implied cash flows); an index value only changes as a result of price gains or income generated by the holdings.

Indexes are calculated in "local currency" with price, total and net returns. Index levels are also available in several currencies, e.g., USD, AUD, CAD, CHF, EUR, GBP, JPY.

Indexes are calculated five days a week, from Monday to Friday.

Construction and methodology for the Russell US Indexes can be accessed on www.ftserussell.com.

Section 1

Price and total returns

Index holdings are valued on a daily basis using closing prices. The share positions to be held on day t, valued at the closing prices from day $t-1$ (the night before day t), gives the *beginning market value* BMV_t on day t:

$$BMV_t = \sum_i Q_{it} P_{it-1}$$

where

BMV_t = beginning market value on day t

Q_{it} = number of shares of security i held on day t

P_{it-1} = closing price of security i on day t-1

After the close on day t, the *ending market value* EMV_t of the index holdings is calculated from:

$$EMV_t = \sum_i Q_{it} P_{it}$$

where

EMV_t = ending market value on day t
P_{it} = closing price of security i on day t

The *price return* of the index for day t is calculated, and the corresponding price return index value IV_t at the end of the day is updated by:

$$\text{price return} = \frac{EMV_t}{BMV_t} - 1$$

$$IV_t = IV_{t-1} \frac{EMV_t}{BMV_t}, \quad \text{for a price return index}$$

where

IV_t = price return index value on day t
IV_{t-1} = price return index value on day t-1

For a total return index, dividend amounts are handled on the ex-dates. Special cash dividends, which are non-recurring dividends outside of the normal dividends paid by the company, are treated differently from regular cash dividends. Regular cash dividends are added to ending market values, while special cash dividends are subtracted from beginning market values. The *total return* of the index for day *t* is calculated, and the corresponding total return index value at the end of the day is updated by:

$$\text{total return} = \frac{EMV_t + DIV_t}{BMV_t - SDIV_t} - 1$$

$$IV_t = IV_{t-1} \frac{EMV_t + DIV_t}{BMV_t - SDIV_t}, \quad \text{for a total return index}$$

where

$$DIV_t = \sum_i Q_{it-1} DPS_{it}$$

$$SDIV_t = \sum_i Q_{it-1} SDPS_{it}$$

Q_{it-1}=number of shares of security i held on day *t*-1

DPS_{it}=regular dividend per share of security i with ex-date *t*

$SDPS_{it}$=special dividend per share of security i with ex-date *t*

IV_t= total return index value on day *t*

IV_{t-1}= total return index value on day *t*-1

Also after the close, the shares of securities are adjusted (for corporate actions or reconstitution, for example). The new share positions to be held on day *t*+1, valued at the closing prices from day *t* (the night before day *t*+1), gives the *beginning market value* BMV$_{t+1}$ for day *t*+1:

$$Q_{it+1} = Q_{it} + \Delta Q_{it}$$

$$BMV_{t+1} = \sum_i Q_{it+1} P_{it}$$

where

Q_{it+1}=number of shares of security i held on day *t*+1

ΔQ_{it}=change in number of shares of security *i* on day *t*

BMV_{t+1}=beginning market value on day *t*+1

The calculations repeat the next day.

Section 2

Currency converted returns

Russell index values are calculated in local currencies and then converted to the currencies below:

AUD	Australian Dollar
CAD	Canadian Dollar
CHF	Swiss Franc
EUR	Euro
GBP	Pound Sterling
JPY	Japanese Yen
SGD	Singapore Dollar
ZAR	South African Rand
USD	United States Dollar

The following formula is used to convert country index returns from their local returns to the various currencies.

Daily Index return in foreign currency:

$$IndexReturn\_FC_i(n) = (1 + IndexReturn\_LOC(n)) * (S^{(i)}(n)/S^{(i)}(n-1)) - 1$$

Where

IndexReturn_FC$_i$ (n) = Index return in the ith foreign currency at day n, n=0, 1, 2, …

IndexReturn_LOC (n) = Index return in its local currency at day n, n = 0, 1, 2, …

$S^{(i)}$ (n) = Spot exchange rate for the ith foreign currency per unit of the index's local currency at day n, n = 0, 1, 2, …

Section 3

Net returns

Russell indexes are calculated net of taxes. Net returns are calculated to provide applicable returns to foreign investors who are subject to a foreign tax withholding on dividends received.

Security level Net Return Relative calculation:

$$\text{NetReturn(n)} = \sum (\text{AEMV(n)} + (\text{Cashdividend(n)} * (1 - \text{CountryTaxRate(n)})))/\text{ABMV(n)}$$

Where:

SecurityNetReturn(n) = Security-level net return at day n, n = 0, 1, 2, …

AEMV(n) = Adjusted Ending market value at day n. AEMV equals the index float-adjusted market value based on the primary exchange closing prices for the day.

ABMV(n) = Adjusted Beginning market value at day n. ABMV reflects the index float-adjusted market value based on the previous day's close prices adjusted for any corporate actions.

Note: Special cash dividends are not included in cash dividend calculations as they are already accounted for within the ABMV calculation. Special cash dividends are those non-recurring dividends outside of the normal dividends paid by the company.

Section 4

Hedged returns

Domestic investors may minimize the currency risk of holding stocks traded in foreign currencies by entering into a set of forward contracts. These contracts offset investors' currency exposure and allow investors to lock exchange rates in advance, so that their foreign assets are immune to the underlying foreign exchange rate volatility. Hedged returns are also calculated for the U.S. index series from a non-US investor's viewpoint.

Hedged return calculation methodology can be found at the following link:

http://www.ftse.com/products/downloads/Currency_Hedging_Ground_Rules.pdf.

For more information about our indexes, please visit ftserussell.com.

About FTSE Russell

FTSE Russell is a leading global index provider creating and managing a wide range of indexes, data and analytic solutions to meet client needs across asset classes, style and strategies. Covering 98% of the investable market, FTSE Russell indexes offer a true picture of global markets, combined with the specialist knowledge gained from developing local benchmarks around the world.

FTSE Russell index expertise and products are used extensively by institutional and retail investors globally. More than $10 trillion is currently benchmarked to FTSE Russell indexes. For over 30 years, leading asset owners, asset managers, ETF providers and investment banks have chosen FTSE Russell indexes to benchmark their investment performance and create investment funds, ETFs, structured products and index-based derivatives. FTSE Russell indexes also provide clients with tools for asset allocation, investment strategy analysis and risk management.

A core set of universal principles guides FTSE Russell index design and management: a transparent rules-based methodology is informed by independent committees of leading market participants. FTSE Russell is focused on index innovation and customer partnership applying the highest industry standards and embracing the IOSCO Principles. FTSE Russell is wholly owned by London Stock Exchange Group.

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