



Index Methodology

MSCI Risk Weighted Indices Methodology

May 2012

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Section 1: Introduction

While standard MSCI market cap indices reflect the aggregate holdings of all investors and represent the market return (equity risk premium), many investors are now looking for access to other sources of systematic return (style and strategy risk premia) that can be captured through indices with alternative weighting schemes. For some time, MSCI has been pioneering alternatively weighted indices that provide exposure to systematic beta or that replicate simple investment strategies. In 2008, for example, MSCI introduced its Minimum Volatility indices which were designed to reflect the performance characteristics of a minimum variance strategy using the Barra Global Equity Risk Model and the Barra Open Optimizer. More recently in 2010, the company introduced its Value Weighted indices emphasizing stocks with lower valuations.

The MSCI Risk Weighted Indices use a simple but effective and transparent process to provide passive exposure to the investable market index equity opportunity set but with lower risk than traditional cap weighted indices. Each MSCI Risk Weighted index reweights all the constituents of a cap weighted MSCI parent index so that stocks with lower historical return variance are given higher index weights. By emphasizing low volatility stocks in this way, the MSCI Risk Weighted Indices have historically produced higher return and lower realized volatility compared to their respective parent MSCI indices, while maintaining reasonable liquidity and capacity. The main potential benefits of the MSCI Risk Weighted Indices include:

- Simple and transparent methodology to achieve lower risk
- Exposure to the entire investable market index universe, no stock selection bias
- Attractive absolute and risk adjusted historical performance
- Defensive characteristics, outperformance during recent crises
- Low concentration risk
- Moderate index turnover

The main potential applications for investors of the MSCI Risk Weighted Indices include:

- Strategic asset allocation: equity market exposure with lower risk
- Tactical asset allocation: downside protection in volatile periods
- Portfolio diversification: combine with other systematic betas
- Investment research: tools to study the characteristics of low risk strategies
- Performance analysis: performance benchmarks for actively managed low risk portfolios

Section 2: Index Construction Methodology

Section 2.1: Applicable Universe

The applicable universe includes all the existing constituents of MSCI ACWI IMI Index.

Section 2.2: Reweighting Index constituents

The MSCI Risk Weighted indices are rebalanced at a regional level for the calculation of the security level inclusion factors. The resulting regional indices are then aggregated or broken down further to construct broader regional and country level MSCI Risk Weighted indices. The details of the regions are discussed in Appendix I.

All the existing constituents of the MSCI Parent Index are reweighted by their risk weights. The risk weights are derived from the respective security level price variance. The details of the re-weighting scheme are discussed in sections 2.3 and 2.4.

Section 2.3: Determination of Risk weights

For a given rebalancing date, the security level price index data available until the last Friday preceding this date is used in the construction of the MSCI Risk Weighted indices.

The security level risk weight is computed as the ratio of the inverse of the security variance to the sum of the inverse of security variance of all constituent securities in the MSCI Parent Index.

$$w_j = \frac{1/\sigma_j^2}{\sum_1^n 1/\sigma_j^2}$$

The security level variance (σ_j^2), used in the above calculation, is the squared term of security level standard deviation (σ_j) computed using weekly returns over three years prior to the rebalancing date. In case the price data are not available for a three year period, the respective country-sector average of volatility is used for that security. In the event of country-sector average being unavailable, country average volatility is used. This aims to avoid estimating risk over different volatility regimes. Security standard deviation is capped at 80% on upside and 12% on downside. Only non-zero weekly returns are considered for computation of variance to deal with stale prices due to suspensions/ market disruptions etc.

The final security level inclusion factor (IF) is computed as the ratio of the final security level risk weight and security level pro forma market capitalization weight in the MSCI Parent Index.

Section 2.4: Determination of Final Security Level Risk weights in MSCI Country / Regional Indices

The final security level risk weights in the respective MSCI Country / Regional Indices is determined by applying the security level inclusion factor (IF) derived in section 2.3 on the corresponding market cap weights in the MSCI Country / Regional indices and renormalizing them accordingly.

Section 3: Maintaining MSCI Risk Weighted Indices

Section 3.1: Semi-Annual Index Reviews

The MSCI Risk Weighted Indices are rebalanced on a semi-annual basis, usually as of the close of the last business day of May and November, coinciding with the May and November Semi-Annual Index Review of the MSCI Global Investable Market Indices. The pro forma MSCI Risk Weighted Indices are in general announced nine business days before the effective date.

Section 3.2: Ongoing Event Related changes

In general, the MSCI Risk Weighted Indices follow the event maintenance of the MSCI Parent Index.

Section 3.2.1: IPOs and other early inclusions

IPOs and other newly listed securities will be added at the time of their inclusion in the MSCI Parent Index. Their inclusion factor will be computed as described in Section 2.3 using their respective country-sector or country average volatility at the time of the inclusion.

Section 3.2.2: Additions and Deletions due to corporate events

The general treatment of additions and deletions due to corporate events aims at minimizing turnover in the MSCI Risk Weighted Indices.

A constituent deleted from the MSCI Parent Index following a corporate event or during the Quarterly Index Review of the Parent Index will be simultaneously deleted from the MSCI Risk Weighted Index.

Please refer to Appendix II for more details on the treatment of corporate events.

Appendix I: Regional Indices

The MSCI Risk Weighted indices are rebalanced at a regional level as described below for the calculation of the security level inclusion factors. The resulting regional indices are then aggregated or broken down further to construct broader regional and country level MSCI Risk Weighted indices.

MSCI Regional Risk Weighted Index	Region	MSCI Parent index
MSCI AC Asia Pacific IMI Risk Weighted Index	Developed and Emerging Asia Pacific	MSCI AC Asia Pacific IMI Index
MSCI Europe & Middle East IMI Risk Weighted Index	Developed Europe & Middle East	MSCI Europe & Middle East IMI Index
MSCI EM EMEA IMI Risk Weighted Index	Emerging Europe, Middle East & Africa	MSCI EM EMEA IMI Index
MSCI AC Americas IMI Risk Weighted Index	Developed and Emerging Americas	MSCI AC Americas IMI Index

Appendix II: Corporate Events Treatment

This appendix describes the treatment of the most common corporate events in the MSCI Indices. Details regarding the treatment of all other corporate events not covered in this appendix can be found in the MSCI Corporate Events Methodology book, available at

http://www.mscibarra.com/products/indices/international_equity_indices/gimi/stdindex/methodology.html

Event Type	Event details	Action
Acquisition	Risk Weighted Index constituent acquires another Risk Weighted Index constituent	Maintain acquiring company and remove acquired company
	Risk Weighted Index constituent acquires non Risk Weighted Index constituent	Maintain acquiring company
	Non Risk Weighted Index constituent acquires Risk Weighted Index constituent	Remove acquired company without adding acquiring company
Merger	Risk Weighted Index constituent merges with Risk Weighted Index constituent	Add new company with a constraint factor that is the weighted average of the two constituents
	Risk Weighted Index constituent merges with non Risk Weighted Index constituent	Add new company if MSCI links its price history to the Risk Weighted Index constituent. New company not added if price history is linked to the non Risk Weighted Index constituent
IPO	IPO added to Parent Index	IPO added to the Risk Weighted Index using country sector or country average as volatility estimator and determination of weight (please refer to section 2.3 for more details)
Spin-off	Risk Weighted Index constituent spins off security	Add spun-off security to the Risk Weighted index with the constraint factor of the spinning security, if it is included in the Parent Index
Conversion	Security A converted to B, A deleted from Parent Index, B added	B inherits constraint factors from A
Country Reclassification	Domicile of company reviewed: Security A deleted from country A, security B added to country B	B inherits constraint factors from A if it is added to the Parent Index
Stock exchange reclassification	Stock exchange (price source) of company reviewed: Security A deleted, security B added	B inherits constraint factors from A if it is added to the Parent Index

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clientservice@msci.com

Americas

Americas	1.888.588.4567 (toll free)
Atlanta	+ 1.404.551.3212
Boston	+ 1.617.532.0920
Chicago	+ 1.312.675.0545
Montreal	+ 1.514.847.7506
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Sao Paulo	+ 55.11.3706.1360
Stamford	+ 1.203.325.5630
Toronto	+ 1.416.628.1007

Europe, Middle East & Africa

Amsterdam	+ 31.20.462.1382
Cape Town	+ 27.21.673.0100
Frankfurt	+ 49.69.133.859.00
Geneva	+ 41.22.817.9777
London	+ 44.20.7618.2222
Madrid	+ 34.91.700.7275
Milan	+ 39.02.5849.0415
Paris	0800.91.59.17 (toll free)
Zurich	+ 41.44.220.9300

Asia Pacific

China North	10800.852.1032 (toll free)
China South	10800.152.1032 (toll free)
Hong Kong	+ 852.2844.9333
Seoul	+ 827.0768.88984
Singapore	800.852.3749 (toll free)
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