MSCI RISK CONTROL INDEXES METHODOLOGY

April 2012
CONTENTS

Introduction.................................................................................................................. 3
Applicable Universe, Cash Component and Specific Risk Levels ........ 4
Volatility Estimation....................................................................................................... 5
Index Leverage of MSCI Risk Control Indexes......................................................... 6
Turnover Buffers and Exchange Holidays................................................................. 7
Treatment of Corporate Events ............................................................................... 8
Index Calculations....................................................................................................... 9
Appendix..................................................................................................................... 10
  List of Existing MSCI Risk Control Indexes .......................................................... 10
  Risk Control Index Methodology Parameters....................................................... 10
  Calculation of Return on Cash Component using T-Bills ................................. 11
INTRODUCTION

The MSCI Risk Control Indexes aim to replicate the performance of an investment strategy that targets a specific level of risk by varying the weights of an underlying MSCI equity index and a cash component. The weights of the MSCI parent index and the cash component are determined daily based on the ratio of the specific risk level and the realized volatility of the MSCI parent index and are subject to a maximum leverage.

The MSCI Risk Control Indexes may serve as benchmarks for managed volatility strategies and as the basis for exchange traded funds and structured products.
APPLICABLE UNIVERSE, CASH COMPONENT AND SPECIFIC RISK LEVELS

The MSCI Risk Control Index methodology is applicable to any existing MSCI parent index. MSCI Risk Control Indexes for a given MSCI parent index are available in the following base currencies: USD, EUR, GBP, JPY, AUD, NZD, CAD, CHF and SEK.

The MSCI Risk Control Index methodology uses the 3-month Libor rates in USD, EUR, GBP, JPY, AUD, NZD, CAD, CHF and SEK for determining the returns of the cash component.

The MSCI Risk Control Indexes are available for four specific risk levels: 10%, 12.5%, 15%, and 17.5%.
VOLATILITY ESTIMATION

The returns of the MSCI parent index in a specific base currency are used for volatility estimation. The volatility estimation approach takes into account both the short-term and the long-term volatility trends of the MSCI parent index.

The MSCI Parent Index Volatility of an MSCI Risk Control Index is calculated as the maximum of two volatility estimates: the short-term realized volatility estimate, calculated over a short horizon of 20 days, and the long-term realized volatility estimate, calculated over a long horizon of 60 days. The volatility estimation approach uses equally weighted daily gross total returns of the MSCI parent index for both horizons. The volatility calculation formulas are described below:

\[
\text{Realized Volatility}_t = \sqrt{\frac{252}{n} \times \text{Variance}(t)}
\]

\[
\text{Variance}(t) = \frac{1}{N} \times \sum_{i=N+1}^{t} \left[ \ln(\text{MSCI Parent Index}(i)/\text{MSCI Parent Index}(i - n)) \right]^2
\]

- \(n\) = Number of interval days used for return calculation; \(n=1\) for daily returns.
- \(N\) = Total number of historical trading days used for variance calculation and varies for short-term volatility estimate (\(N = 20\)) and long-term volatility estimate (\(N = 60\))

\[
\text{MSCI Parent Index Volatility}_t = \max(\text{Short- term Realized Volatility}_t, \text{Long- term Realized Volatility}_t)
\]
INDEX LEVERAGE OF MSCI RISK CONTROL INDEXES

The objective of the MSCI Risk Control Indexes is to replicate the performance of a strategy that targets a specific level of risk by varying the weights of the MSCI parent index and a cash component.

The Index Leverage of an MSCI Risk Control Index is the weight of the MSCI parent index and is calculated daily as the ratio of the specific risk level and the MSCI Parent Index Volatility subject to a maximum leverage of 150% and turnover buffers.

If the MSCI Parent Index Volatility is higher than the specific risk level then the weight of the MSCI parent index will be less than 100% while the weight of the cash component will be 100% minus the weight of the MSCI parent index. The daily return on the cash component is determined using the 3-month Libor rate in the applicable currency. Similarly, if the MSCI Parent Index Volatility is lower than the specific risk level, the weight of the MSCI parent index will be more than 100% subject to a maximum leverage of 150%. The borrowing cost associated with daily Index Leverage is calculated using the 3-month Libor rate in the applicable currency.

The Index Leverage applicable on an effective date is determined using the MSCI Parent Index Volatility estimated two trading days before the effective date.
TURNOVER BUFFERS AND EXCHANGE HOLIDAYS

The MSCI Risk Control Indexes apply turnover buffers to reduce turnover associated with changes in Index Leverage arising from changes in the realized volatility of the MSCI parent index. These indexes are rebalanced daily subject to a turnover buffer of 5% and are rebalanced only when the percentage change in daily Index Leverage exceeds 5%. On days when the MSCI Risk Control Indexes are not rebalanced, the Index Leverage from the previous trading day is maintained.

The MSCI Risk Control Indexes are not rebalanced when 10% or more of the constituents of the MSCI parent index (calculated by the constituent weights) are not traded due to exchange holidays on the day prior to the effective date.
TREATMENT OF CORPORATE EVENTS

The MSCI Risk Control Indexes are derived from the existing underlying MSCI parent indexes. As a result, corporate events are reflected in the MSCI Risk Control Indexes as they occur and as they are captured in the underlying MSCI parent indexes.
INDEX CALCULATIONS

The objective of the MSCI Risk Control Indexes is to replicate the performance of a strategy that targets a specific level of risk by varying the weights of an MSCI parent index and a cash component. The MSCI Risk Control Indexes take into account:

1. Return of the MSCI parent index, and
2. Return of the cash component.

For the MSCI Risk Control Indexes, two index level variants are calculated:

1. The Total Return Index that represents the weighted return of the MSCI parent index and the cash component.
2. The Excess Return Index that represents the return of the Total Return Index minus the return of the cash component.

These index levels variants are determined for both the Gross Daily Total Return Index level and the Net Daily Total Return Index\(^3\) level of the MSCI parent index.

The Index calculation formulas are described below:

\[
MSCI \text{ Risk Control Total Return Index Level}_t = MSCI \text{ Risk Control Total Return Index Level}_{t-1} \times (1 + MSCI \text{ Risk Control Total Return Index Return}_t)
\]

\[
MSCI \text{ Risk Control Total Return Index Return}_t = \text{Index Leverage}_t \times MSCI \text{ Parent Index Return}_t + (1 - \text{Index Leverage}_t) \times \text{Return on Cash Component}_t
\]

\[
MSCI \text{ Risk Control Excess Return Index Level}_t = MSCI \text{ Risk Control Excess Return Index Level}_{t-1} \times (1 + MSCI \text{ Risk Control Excess Return Index Return}_t)
\]

\[
MSCI \text{ Risk Control Excess Return Index Return}_t = \text{Index Leverage}_t \times (MSCI \text{ Parent Index Return}_t - \text{Return on Cash Component}_t)
\]

\[
\text{Index Leverage}_t = \text{Minimum}(1.5, \frac{\text{Specific Risk Level}}{MSCI \text{ Parent Index Volatility}_{t-2}})
\]

\[
MSCI \text{ Parent Index Return}_t = \frac{MSCI \text{ Parent Index Level}_t}{MSCI \text{ Parent Index Level}_{t-1}} - 1
\]

\[
\text{Return on Cash Component}_t = \frac{\text{Libor}_t}{360} \times (\text{Number of calendar days between } t \text{ and } t-1)
\]

\(^3\) MSCI Gross total return indexes reinvest all of the constituent companies’s dividend distributions. Net total return indexes reinvest dividends after the deduction of withholding taxes.
APPENDIX

LIST OF EXISTING MSCI RISK CONTROL INDEXES

Exhibit 1: List of MSCI Risk Control Indexes

<table>
<thead>
<tr>
<th>MSCI Parent Index</th>
<th>Base Currencies*</th>
<th>Specific Risk Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSCI World Risk Control Index</td>
<td>USD, EUR, GBP</td>
<td>10.0%, 12.5%, 15.0%, 17.5%</td>
</tr>
<tr>
<td>MSCI EAFE Risk Control Index</td>
<td>USD, EUR, GBP</td>
<td>10.0%, 12.5%, 15.0%, 17.5%</td>
</tr>
<tr>
<td>MSCI Europe Risk Control Index</td>
<td>USD, EUR, GBP</td>
<td>10.0%, 12.5%, 15.0%, 17.5%</td>
</tr>
<tr>
<td>MSCI EM Risk Control Index</td>
<td>USD, EUR, GBP</td>
<td>10.0%, 12.5%, 15.0%, 17.5%</td>
</tr>
<tr>
<td>MSCI EM50 Risk Control Index</td>
<td>USD, EUR, GBP</td>
<td>10.0%, 12.5%, 15.0%, 17.5%</td>
</tr>
<tr>
<td>MSCI Kokusai Risk Control Index</td>
<td>USD, EUR, YEN</td>
<td>10.0%, 12.5%, 15.0%, 17.5%</td>
</tr>
<tr>
<td>MSCI USA Risk Control Index</td>
<td>USD, EUR, GBP</td>
<td>10.0%, 12.5%, 15.0%, 17.5%</td>
</tr>
</tbody>
</table>

* For the MSCI Risk Control Indexes, three month Libor rates in the respective base currencies are used to determine the returns of the Cash component. For example, for the MSCI World Risk Control Index (USD) with US dollar as the base currency, the three month Libor rate in USD is used to determine the return of the Cash component.

RISK CONTROL INDEX METHODOLOGY PARAMETERS

Exhibit 2: Main methodology parameters for MSCI Risk Control Indexes

<table>
<thead>
<tr>
<th>MSCI Risk Control Index Methodology Parameters</th>
<th>Available Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MSCI Parent Index</td>
<td>Any MSCI parent index</td>
</tr>
<tr>
<td>2 Cash Component</td>
<td>3 Month Libor rates in specific base currencies applicable for the MSCI Risk Control Indexes*</td>
</tr>
<tr>
<td>3 Base Currency of MSCI Parent Index and Cash Component</td>
<td>USD, GBP, JPY, EUR, CHF, AUD, CAD, SEK, NZD</td>
</tr>
<tr>
<td>4 Specific Risk Level</td>
<td>10%, 12.5%, 15%, 17.5% or any custom risk level specified</td>
</tr>
</tbody>
</table>
5  Number of days used for Volatility Calculation  as specified
6  Maximum Leverage  as specified
7  Turnover Buffer  as specified
8  Exchange Holiday Rule Threshold  as specified
9  Lag between Rebalancing Date and Effective Date  as specified

*MSCI custom indexes may alternatively use US T-bill rates of different maturities or Euribor rates as applicable for determining the returns of the Cash component

CALCULATION OF RETURN ON CASH COMPONENT USING T-BILLS

When US Treasury Bills are used the return on Cash component is calculated as follows:

\[
Return\ on\ Cash\ Component_t = \left(1 + Cash\ Rate_{t-1}\right)^{\text{Number of calendar days between } t \text{ and } t-1 - 1}
\]

\[
Cash\ Rate = \left[\frac{1}{(1 - (T-Bill\ Tenor/360 \times T\ Bill\ Rate_{t-1})))}^{1/T-Bill\ Tenor - 1}
\]

\[
T-Bill\ Tenor = \text{Maturity of the US Treasury Bill};\ for\ example\ T-Bill\ Tenor\ is\ 91\ for\ a\ 91\text{-day T-Bill}
\]
**MSCI RISK CONTROL INDEXES METHODOLOGY | APRIL 2012**

**CONTACT US**

**AMERICAS**

- Americas: 1 888 588 4567 *
- Atlanta: + 1 404 551 3212
- Boston: + 1 617 532 0920
- Chicago: + 1 312 675 0545
- Monterrey: + 52 81 1253 4020
- New York: + 1 212 804 3901
- San Francisco: + 1 415 836 8800
- Sao Paulo: + 55 11 3706 1360
- Toronto: + 1 416 628 1007

**EUROPE, MIDDLE EAST & AFRICA**

- Cape Town: + 27 21 673 0100
- Frankfurt: + 49 69 133 859 00
- Geneva: + 41 22 817 9777
- London: + 44 20 7618 2222
- Milan: + 39 02 5849 0415
- Paris: 0800 91 59 17 *

**ASIA PACIFIC**

- China North: 10800 852 1032 *
- China South: 10800 152 1032 *
- Hong Kong: + 852 2844 9333
- Mumbai: + 91 22 6784 9160
- Seoul: 00798 8521 3392 *
- Singapore: 800 852 3749 *
- Sydney: + 61 2 9033 9333
- Taipei: 008 0112 7513 *
- Tokyo: + 81 3 5290 1555

* = toll free

---

**ABOUT MSCI**

For more than 40 years, MSCI’s research-based indexes and analytics have helped the world’s leading investors build and manage better portfolios. Clients rely on our offerings for deeper insights into the drivers of performance and risk in their portfolios, broad asset class coverage and innovative research.

Our line of products and services includes indexes, analytical models, data, real estate benchmarks and ESG research.

MSCI serves 98 of the top 100 largest money managers, according to the most recent P&I ranking.

For more information, visit us at [www.msci.com](http://www.msci.com).
This document and all of the information contained in it, including without limitation all text, data, graphs, charts (collectively, the “Information”) is the property of MSCI Inc. or its subsidiaries (collectively, “MSCI”), or MSCI’s licensors, direct or indirect suppliers or any third party involved in making or compiling any information (collectively, with MSCI, the “Information Providers”) and is provided for informational purposes only. The Information may not be modified, reverse-engineered, reproduced or redisseminated in whole or in part without prior written permission from MSCI.

The Information may not be used to create derivative works or to verify or correct other data or information. For example (but without limitation), the Information may not be used to create indexes, databases, risk models, analytics, software, or in connection with the issuing, offering, sponsoring, managing or marketing of any securities, portfolios, financial products or other investment vehicles utilizing or based on, linked to, tracking or otherwise derived from the Information or any other MSCI data, information, products or services.

The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. NONE OF THE INFORMATION PROVIDERS MAKES ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EACH INFORMATION PROVIDER EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.

Without limiting any of the foregoing and to the maximum extent permitted by applicable law, in no event shall any Information Provider have any liability regarding any of the Information for any direct, indirect, special, punitive, consequential (including lost profits) or any other damages even if notified of the possibility of such damages. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited, including without limitation (as applicable), any liability for death or personal injury to the extent that such injury results from the negligence or willful default of itself, its servants, agents or sub-contractors.

Information containing any historical information, data or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. Past performance does not guarantee future results.

The Information should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. All Information is impersonal and not tailored to the needs of any person, entity or group of persons.

None of the Information constitutes an offer to sell (or a solicitation of an offer to buy), any security, financial product or other investment vehicle or any trading strategy.

It is not possible to invest directly in an index. Exposure to an asset class or trading strategy or other category represented by an index is only available through third party investable instruments (if any) based on that index. MSCI does not issue, sponsor, endorse, market, offer, review or otherwise express any opinion regarding any fund, ETF, derivative or other security, investment, financial product or trading strategy that is based on, linked to or seeks to provide an investment return related to the performance of any MSCI index (collectively, “Index Linked Investments”). MSCI makes no assurance that any Index Linked Investments will accurately track index performance or provide positive investment returns. MSCI Inc. is not an investment adviser or fiduciary and MSCI makes no representation regarding the advisability of investing in any Index Linked Investments.

Index returns do not represent the results of actual trading of investible assets/securities. MSCI maintains and calculates indexes, but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the index or Index Linked Investments. The imposition of these fees and charges would cause the performance of an Index Linked Investment to be different than the MSCI index performance.

The Information may contain back tested data. Back-tested performance is not actual performance, but is hypothetical. There are frequently material differences between back tested performance results and actual results subsequently achieved by any investment strategy.

Constituents of MSCI equity indexes are listed companies, which are included in or excluded from the indexes according to the application of the relevant index methodologies. Accordingly, constituents in MSCI equity indexes may include MSCI Inc., clients of MSCI or suppliers to MSCI. Inclusion of a security within an MSCI index is not a recommendation by MSCI to buy, sell, or hold such security, nor is it considered to be investment advice.

Data and information produced by various affiliates of MSCI Inc., including MSCI ESG Research Inc. and Barra LLC, may be used in calculating certain MSCI indexes. More information can be found in the relevant index methodologies on www.msci.com.

MSCI receives compensation in connection with licensing its indexes to third parties. MSCI Inc.’s revenue includes fees based on assets in Index Linked Investments. Information can be found in MSCI Inc.’s company filings on the Investor Relations section of www.msci.com.

MSCI ESG Research Inc. is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc. Except with respect to any applicable products or services from MSCI ESG Research, neither MSCI nor any of its products or services recommends, endorses, approves or otherwise expresses any opinion regarding any issuer, securities, financial products or instruments or trading strategies and MSCI’s products or services are not intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such. Issuers mentioned or included in any MSCI ESG Research materials may include MSCI Inc., clients of MSCI or suppliers to MSCI, and may also purchase research or other products or services from MSCI ESG Research. MSCI ESG Research materials, including materials utilized in any MSCI ESG Indexes or other products, have not been submitted to, nor received approval from, the United States Securities and Exchange Commission or any other regulatory body.

Any use of or access to products, services or information of MSCI requires a license from MSCI. MSCI, Barra, RiskMetrics, IPD, FEA, InvestorForce, and other MSCI brands and product names are the trademarks, service marks, or registered trademarks of MSCI or its subsidiaries in the United States and other jurisdictions. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and Standard & Poor’s. “Global Industry Classification Standard (GICS)” is a service mark of MSCI and Standard & Poor’s.