

# **S&P Low Volatility Indices** *Methodology*

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# Introduction

## Index Objective

The S&P Low Volatility Indices measure the performance of the least volatile stocks within their respective underlying benchmark index. Index constituents are weighted relative to the inverse of their corresponding volatility, with the least volatile stocks receiving the highest weights, as detailed in *Eligibility Criteria and Index Construction*.

## Highlights and Index Family

### *Global/Regional Indices*

- **S&P BMI Emerging Markets Low Volatility Index** measures the performance of the 200 least volatile stocks in the S&P Emerging Plus LargeMidCap Index, an S&P Global BMI sub-index.
- **S&P BMI International Developed Low Volatility Index** measures the performance of the 200 least volatile stocks in the S&P Developed Ex. US & South Korea LargeMidCap Index, an S&P Global BMI sub-index.
- **S&P Developed Asia Low Volatility Index** measures the performance of 150 of the least volatile stocks in the S&P Asia Pacific LargeMidCap Index.
- **S&P Developed Low Volatility Index** measures the performance of 200 of the least volatile stocks in the S&P Developed LargeMidCap, an S&P Global BMI sub-index.
- **S&P BMI Developed Ex.- U.S. Low Volatility Index** measures the performance of the top quintile of least volatile stocks in the S&P Developed LargeMidCap, excluding stocks domiciled in the U.S.
- **S&P Emerging Markets Low Volatility Select Index** measures the performance of the 50 least volatile stocks in the S&P Emerging Plus LargeMidCap, an S&P Global BMI sub-index.
- **S&P EPAC Ex. Korea Low Volatility Index** measures the performance of 200 of the least volatile stocks in the S&P EPAC Ex-Korea LargeMidCap Index.
- **S&P Europe 350 Carbon Efficient Select Low Volatility Index** measures the performance of 50 of the least volatile stocks in the S&P Europe 350 Carbon Efficient Select Index.
- **S&P Europe 350 Low Volatility Index** measures the performance of the 100 least volatile stocks in the S&P Europe 350 Index.
- **S&P Eurozone Low Volatility Index** measures the performance of 80 of the least volatile stocks in the S&P Eurozone BMI Index, an S&P Global BMI sub-index.
- **S&P GCC Composite Low Volatility Index** measures the performance of the least volatile stocks in the S&P GCC Composite index.
- **S&P GCC Composite Low Volatility Shariah Index** measures the performance of the least volatile stocks in the S&P GCC Composite Shariah index.
- **S&P Pan Arab Composite LargeMidCap Low Volatility Index** measures the performance of the least volatile stocks in the S&P Pan Arab Composite LargeMidCap Index.
- **S&P Pan Arab Composite LargeMidCap Shariah Low Volatility Index** measures the performance of the least volatile stocks in the S&P Pan Arab Composite LargeMidCap Shariah Index.

- **S&P Global Low Volatility Index** measures the performance of 300 of the least volatile stocks in the S&P Global LargeMidCap, an S&P Global BMI sub-index.
- **S&P Nordic Low Volatility Index** measures the performance of the 30 least volatile stocks in the S&P Nordic BMI.
- **S&P Pan Asia Low Volatility Index** measures the performance of the 50 least volatile stocks in the S&P Pan Asia Ex-New Zealand LargeMidCap Index.
- **S&P Southern Europe Low Volatility Index** measures the performance of the 25 least volatile locally listed stocks in the S&P Italy BMI, S&P Portugal BMI and S&P Spain BMI.
- **Dow Jones Islamic Market World Low Volatility 300 Index** measures the performance of the 300 least volatile stocks in the Dow Jones Islamic Market World Index.

#### *Americas*

- **S&P 500 Low Volatility Index** measures the performance of the 100 least volatile stocks in the S&P 500.
- **S&P 500 Low Volatility Top 80% Index** measures the performance of the 400 least volatile stocks in the S&P 500.
- **S&P MidCap 400 Low Volatility Index** measures the performance of the 80 least volatile stocks in the S&P MidCap 400.
- **S&P SmallCap 600 Low Volatility Index** measures the performance of the 120 least volatile stocks in the S&P SmallCap 600.

#### *Asia/Pacific*

- **S&P Korea Low Volatility Index** measures the performance of the 50 least volatile stocks in the S&P Korea BMI.
- **S&P Japan 500 Low Volatility Index** measures the performance of 100 of the least volatile stocks in the S&P Japan 500.
- **S&P/ASX 200 Low Volatility Index** measures the performance of 40 of the least volatile stocks in the S&P/ASX 200.
- **S&P China A-Share Low Volatility Index** measures the performance of 100 of the least volatile stocks in the combined universe of the S&P China A Domestic BMI, excluding stocks designated as Special Treatment (ST or \*ST) by the Shanghai or Shenzhen Stock Exchanges. Subject to S&P Dow Jones Indices' compliance with the applicable law (including, without limitation, sanctions law), the index is maintained from a China based investor perspective<sup>1</sup> and may include securities that would not be eligible for inclusion if maintained from a U.S./U.K./EU investor perspective.

#### *EMEA*

- **S&P South Africa Low Volatility Index** measures the performance of 40 of the least volatile stocks in the S&P South Africa Composite.
- **S&P Saudi Arabia Low Volatility Index** measures the performance of the least volatile stocks in the S&P Saudi Arabia Index.
- **S&P Saudi Arabia Shariah Low Volatility Index** measures the performance of the least volatile stocks in the S&P Saudi Arabia Shariah Index.

*For more information on the benchmark indices referred to above, please refer to the underlying index methodologies documents located on our Web site at [www.spglobal.com/spdji/](http://www.spglobal.com/spdji/).*

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<sup>1</sup> The investor perspective is the viewpoint of the investor relative to the index and component securities.

## Supporting Documents

This methodology is meant to be read in conjunction with supporting documents providing greater detail with respect to the policies, procedures and calculations described herein. References throughout the methodology direct the reader to the relevant supporting document for further information on a specific topic. The list of the main supplemental documents for this methodology and the hyperlinks to those documents is as follows:

Supporting Document	URL
S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology	<a href="#">Equity Indices Policies &amp; Practices</a>
S&P Dow Jones Indices' Index Mathematics Methodology	<a href="#">Index Mathematics Methodology</a>
S&P Dow Jones Indices' Float Adjustment Methodology	<a href="#">Float Adjustment Methodology</a>
S&P Dow Jones Indices' Global Industry Classification Standard (GICS) Methodology	<a href="#">GICS Methodology</a>
S&P Dow Jones Indices' Country Classification Methodology	<a href="#">Country Classification Methodology</a>

This methodology was created by S&P Dow Jones Indices to achieve the aforementioned objective of measuring the underlying interest of each index governed by this methodology document. Any changes to or deviations from this methodology are made in the sole judgment and discretion of S&P Dow Jones Indices so that the index continues to achieve its objective.

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# Eligibility Criteria and Index Construction

To be eligible for index inclusion, stocks must first be constituents of the respective underlying benchmark indices.

For information on the eligibility criteria for an underlying index, please refer to the respective underlying index methodology, available at [www.spglobal.com/spdji/](http://www.spglobal.com/spdji/).

## Global/Regional Indices

### Eligibility Factors

**Liquidity.** Stocks must, as of the rebalancing reference date, have a minimum three-month average daily value traded (3M ADVT), three-month median daily value traded (3M MDVT), or six-month median daily value traded (6M MDVT) over and above their parent indices for the following indices:

Index	Minimum ADVT / MDVT (Buffer for Current Constituents)
S&P BMI International Developed Low Volatility	3M ADVT US\$ 3 million (US\$ 2.5 million)
S&P BMI Emerging Markets Low Volatility	3M ADVT US\$ 3 million (US\$ 2.5 million)
S&P Emerging Markets Low Volatility Select	3M ADVT US\$ 7 million (US\$ 6 million)
S&P Nordic Low Volatility	3M ADVT US\$ 1.5 million (US\$ 1.2 million)
S&P Southern Europe Low Volatility	3M ADVT EUR 5 million (EUR 4 million)
S&P Eurozone Low Volatility	3M ADVT EUR 3 million (EUR 2.5 million)
S&P Developed Asia Low Volatility	3M ADVT US\$ 3 million (US\$ 2.5 million)
S&P Pan Asia Low Volatility	3M ADVT US\$ 5 million (US\$ 4 million)
S&P EPAC Ex. Korea Low Volatility <sup>2</sup>	3M ADVT US\$ 3 million (US\$ 2.5 million)
S&P Europe 350 Carbon Efficient Select Low Volatility	3M ADVT EUR 7 million (EUR 5.6 million)
S&P Global Low Volatility	3M ADVT US\$ 3 million (US\$ 2.5 million)
S&P Developed Low Volatility	3M ADVT US\$ 3 million (US\$ 2.5 million)
S&P GCC Composite Low Volatility Index	6M MDVT US\$ 1 million (US\$ 500,000)
Dow Jones Islamic Market World Low Volatility 300 Index	3M MDVT US\$ 3 million (US\$ 2.5 million)
S&P Pan Arab Composite LargeMidCap Low Volatility Index	6M MDVT US\$ 1 million (US\$ 500,000)
S&P GCC Composite Low Volatility Shariah Index	6M MDVT US\$ 1 million (US\$ 500,000)
S&P Pan Arab Composite LargeMidCap Shariah Low Volatility Index	6M MDVT US\$ 1 million (US\$ 500,000)
S&P BMI Developed Ex-U.S. Low Volatility Index	6M MDVT US\$ 3 million (US\$ 2.5 million) <sup>3</sup>

**Listing and Trading History.** Each stock must have been issued and trading for at least one calendar year before becoming an index constituent. However, there is no minimum number of days that each stock must have actually traded.

For the S&P Eurozone Low Volatility Index, stocks must trade in euros on Eurozone-domiciled exchanges.

For the S&P Emerging Markets Low Volatility Select Index, local listed shares of companies domiciled in Africa, Latin America, and the Middle East are excluded, except for those from South Africa, Saudi Arabia, and Kuwait. However, those companies' developed-market listings, which include ADRs (only

<sup>2</sup> For history prior to 2005, there was no liquidity minimum above the S&P Global BMI liquidity threshold.

<sup>3</sup> For history prior to 2001, the MDVT threshold was US \$2 million (current constituents US \$1.5 million).

levels II and III) and GDRs, are eligible. The developed-market listings are first screened to ensure that they meet the liquidity criteria as detailed in *Eligibility Criteria*. Additionally, the volatilities for these developed-market candidates are calculated and analyzed as part of the index universe.

For the S&P Nordic Low Volatility Index and S&P Southern Europe Low Volatility Index, only locally listed stocks are eligible for index inclusion.

**Size.** For the S&P Europe 350 Carbon Efficient Select Low Volatility Index, stocks must have a minimum float-adjusted market capitalization of US\$ 2.5 billion as of the rebalancing reference date.

## **Multiple Share Classes and Dual Listed Companies**

Each company is represented once by the Designated Listing. For more information regarding the treatment of multiple share classes, please refer to Approach B within the Multiple Share Classes section of the S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

## **Eligible Markets**

Please refer to *Appendix A* for index-specific information on eligible markets.

## **Other Stocks with Zero Float**

Any stock with an IWF (Investible Weight Factor) of zero is excluded from the S&P Low Volatility Indices.

*For more information on the Investable Weight Factor (IWF), please refer to S&P Dow Jones Indices' Float Adjustment Methodology.*

## **Constituent Selection**

The selection process of index constituents is as follows:

1. Using available price return data for the trailing one year of trading days leading up to and including each index rebalancing reference date, the volatilities of the constituents within each eligible universe are calculated.
2. Constituents meeting eligibility requirements as described under Eligibility Criteria are, then, ranked in descending order based on the inverse of the realized volatility. The top securities with the least volatility, as determined by each index's targeted constituent count (see the *Index Family* section) form the index.

The S&P Pan Asia Low Volatility Index is comprised of the 50 least volatile stocks in the eligible universe subject to a maximum number of 15 stocks per GICS Sector and a maximum number of 10 stocks per country. During each quarterly rebalancing, if a current index constituent is ranked in the top 20<sup>th</sup>-percentile of the total number of eligible stocks, it remains in the index. If not, the stock is deleted and the least volatile stock, that is not an index constituent and while respecting sector and country limits mentioned above, is added.

The target stock count for the S&P GCC Composite Low Volatility, the S&P Pan Arab Composite LargeMidCap Low Volatility, the S&P GCC Composite Low Volatility Shariah, and the S&P Pan Arab Composite LargeMidCap Shariah Low Volatility is the maximum number of stocks (ranked by inverse volatility) that satisfy the following conditions:

- 30,
- 20% of the number of constituents in the universe,
- The sum of the free-float market capitalizations of the selected stocks in each country must make up 50% of the free-float market capitalization of the underlying stocks within the country.



**Buffer Rule.** In order to reduce turnover at each rebalancing, a 20% buffer rule based on realized volatility is applied to the security selection process for the S&P Eurozone, S&P Developed Asia, S&P EPAC Ex. Korea, S&P Europe 350 Carbon Efficient Select, S&P Global, S&P Developed Low Volatility, S&P BMI Developed Ex-U.S. Low Volatility, and Dow Jones Islamic Market World Low Volatility 300 indices. Securities are selected as follow:

1. All securities ranked within the top 80% of the target stock count are automatically selected for the index.
2. Current index constituents not already selected in Step 1 that are within the top 120% of the target stock count are added to the index in rank order until the target stock count has been reached.
3. If, following Step 2, the target stock count has not been reached, non-constituent securities not already selected in Step 1 that are ranked from 80% to 100% of the target stock count are added to the index in rank order until the target stock count has been reached.

Additionally, for the S&P GCC Composite Low Volatility, the S&P Pan Arab Composite LargeMidCap Low Volatility, the S&P GCC Composite Low Volatility Shariah, and the S&P Pan Arab Composite LargeMidCap Shariah Low Volatility, if a target of 50% of the free-float market capitalization of the underlying universe has not been reached, remaining stocks are selected by order of rank until this target has been reached. Moreover, the 50% free-float market capitalization target is applied for each country that has constituents in the underlying universe.

## Constituent Weightings

At each rebalancing, the weight,  $w_i$ , for each index constituent,  $i$ , is set inversely proportional to its volatility.

$$w_i = \frac{\frac{1}{Volatility_i}}{\sum_{i=1}^N \frac{1}{Volatility}}$$

Where  $N$  refers to the index count, the index count for each index is as follows:

Index	Constituent Count
S&P BMI International Developed Low Volatility	200
S&P BMI Emerging Markets Low Volatility	200
S&P Emerging Markets Low Volatility Select	50
S&P Europe 350 Low Volatility	100
S&P Eurozone Low Volatility	80
S&P Nordic Low Volatility	30
S&P Southern Europe Low Volatility	25
S&P Developed Asia Low Volatility	150
S&P Pan Asia Low Volatility	50
S&P EPAC Ex. Korea Low Volatility <sup>4</sup>	200
S&P Europe 350 Carbon Efficient Select Low Volatility	50
S&P Global Low Volatility	300
S&P Developed Low Volatility	200
Dow Jones Islamic Market World Low Volatility 300 Index	300
S&P BMI Developed Ex-U.S. Low Volatility Index	Top Quintile

Volatility is defined as the standard deviation of the security's daily price returns, in local currency, over the prior one year of trading days. It can be mathematically expressed as:

<sup>4</sup> Prior to 2005, the constituent count was 100.

$$\sqrt{\frac{\sum_{i=1}^N (X_i - \bar{X})^2}{N-1}}$$

where:

$$X_i = \text{Price change} = \frac{P_t}{P_{t-1}} - 1$$

$P_t$  = Closing price of the stock on day  $t$

$P_{t-1}$  = Closing price of the stock on day  $t-1$

$t$  = 1 to  $N$

$\bar{X}$  = Average price change

$N$  = Number of trading days in a year based on local calendar

In the S&P Pan Asia Low Volatility Index, modifications are made to stock weights at each rebalancing to ensure diversification across individual stocks and countries. At each rebalancing, the weight for each index constituent is constrained between 0.05% and 3.0% and the weight of each country is capped at 20%.

For the S&P GCC Composite Low Volatility and S&P GCC Composite Low Volatility Shariah Indices, the maximum weight for each security is set at 5% or the stock's weight in the universe, whichever is greater. The maximum weight of any country, as defined by a stock's country of domicile, is 60%. Moreover, the weight for each security is also capped at 20 times its market capitalization weight in the underlying index universe. The maximum weight of any given GICS sector is 40%. Each stock's weight is floored at 0.05%. Note that the capping algorithm redistributes the excess weight to the other stocks in proportion to their inverse volatility weights, such that the tracking error is minimized.

For the S&P BMI Developed Ex-U.S. Low Volatility Index, the maximum weight of each security is the lower of 5% and 20 times its market capitalization weight in the eligible universe. Each stock's weight is floored at 0.05%. The maximum weight of any given GICS sector is 40%. The maximum weight of any country, as defined by a stock's country of domicile, is 40%. Where the optimization procedure fails for a given period, the constraints are then relaxed in the following order: the maximum weight of the security, then the maximum weight of the sector, then the maximum weight of the country (if applicable), then 20 times its market capitalization weight.

For the S&P Pan Arab Composite LargeMidCap Low Volatility and S&P Pan Arab Composite LargeMidCap Shariah Low Volatility Indices the maximum weight for each security is set at 5% or the stock's weight in the universe, whichever is greater. The maximum weight of any country, as defined by a stock's country of domicile, is 60%. Moreover, the weight for each security is also capped at 20 times its market capitalization weight in the underlying universe. The maximum weight of any given GICS sector is 50%. Each stock's weight is floored at 0.05%. Note that the capping algorithm redistributes the excess weight to the other stocks in proportion to their inverse volatility weights, such that the tracking error is minimized.

Furthermore, for the S&P GCC Composite and S&P Pan Arab LargeMidCap Indices, the above optimization process includes one additional constraint; the maximum weight of each security should not exceed a multiple of 4 times its liquidity weight (see *Appendix B*). Where the optimization procedure fails for a given period, the constraints are then relaxed in the following order: the maximum weight of the security, then the maximum weight of the sector, then the maximum weight of the country (if applicable), then 20 times its market capitalization weight and finally, four times its liquidity weight.

## Americas Indices

### Eligibility Factors

**Listing and Trading History.** Stocks must have been issued and trading for at least 252 trading days prior to the rebalancing reference date; however, Index Committee discretion may be used in situations where a stock was subject to a temporary trading halt during that period.

### Multiple Share Classes and Dual Listed Companies.

Each company is represented once by the Designated Listing. For more information regarding the treatment of multiple share classes, please refer to Approach B within the Multiple Share Classes section of the S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

### Eligible Markets

Please refer to *Appendix A* for index-specific information on eligible markets.

### Constituent Selection

The selection process of index constituents is as follows:

1. Using available price return data for the trailing one year (252 trading days) leading up to each index rebalancing reference date, the volatilities of the constituents within each eligible universe are calculated.
2. Constituents meeting eligibility requirements as described under Eligibility Criteria are then ranked in descending order based on the inverse of the realized volatility. The top securities with the least volatility, as determined by each index's targeted constituent count (see Index Family section of the Introduction) form the index.

### Constituent Weightings

At each rebalancing, the weight,  $w_i$ , for each index constituent,  $i$ , is set inversely proportional to its volatility.

$$w_i = \frac{\frac{1}{Volatility_i}}{\sum_{i=1}^N \frac{1}{Volatility}}$$

Where  $N$  refers to the index count, the index count for each index is as follows:

Index	Constituent Count
S&P 500 Low Volatility	100
S&P MidCap 400 Low Volatility	80
S&P SmallCap 600 Low Volatility	120
S&P 500 Low Volatility Top 80%	400

Volatility is defined as the standard deviation of the security's daily price returns, in local currency, over 252 trading days. It can be mathematically expressed as:

$$\sqrt{\frac{\sum_{i=1}^N (X_i - \bar{X})^2}{N-1}}$$

where:

$$X_i = \text{Price change} = \frac{P_t}{P_{t-1}} - 1$$

$P_t$  = Closing price of the stock on day  $t$

$P_{t-1}$  = Closing price of the stock on day  $t-1$

$t$  = 1 to  $N$

$\bar{X}$  = Average price change

$N$  = Number of trading days in a year based on local calendar

## Asia/Pacific Indices

### Eligibility Factors

**Liquidity.** Stocks must, as of the rebalancing reference date, have a minimum three-month average daily value traded (3M ADVT) over and above their parent indices for the following indices:

Index	Minimum ADVT (Buffer for Current Constituents)
S&P Korea Low Volatility	3M ADVT KRW 1 billion (KRW 800 million)
S&P Japan 500 Low Volatility	3M ADVT JPY 300 million (JPY 250 million)
S&P/ASX 200 Low Volatility	3M ADVT AUD 2 million (AUD 1.5 million)
S&P China A-Share Low Volatility	3M ADVT RMB 20 million (RMB 18 million)

**Listing and Trading History.** For the S&P Korea, S&P Japan 500, and S&P/ASX 200 Low Volatility indices, each stock must have been issued and trading for at least one calendar year before becoming an index constituent. However, there is no minimum number of days that each stock must have actually traded. Index Committee discretion may be used in situations where a stock was subject to a temporary trading halt during that period.

To be eligible for the S&P China A-Share Low Volatility Index, stocks must have been issued for at least one calendar year, with a minimum of 180 traded days in the trailing 12 months leading up to the rebalancing reference date.

All Korean preferred stocks and KOSDAQ listed stocks are excluded from the S&P Korea Low Volatility Index. These stocks currently are eligible in the S&P Korea BMI. Stocks that reach their foreign ownership limit continue to be eligible for the S&P Korea Low Volatility Index provided the stocks remains in the S&P Korea BMI.

**Size.** For the S&P China A-Share Low Volatility Index, stocks must have a minimum float-adjusted market capitalization of RMB 1 billion (RMB 900 million for current constituents) as of the rebalancing reference date.

### Multiple Share Classes and Dual Listed Companies.

Each company is represented once by the Designated Listing. For more information regarding the treatment of multiple share classes, please refer to Approach B within the Multiple Share Classes section of the S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

The multiple share class treatment is not relevant to the S&P/ASX 200, S&P Japan 500, S&P Korea Low Volatility, or S&P China A-Share Low Volatility indices.

### Eligible Markets

Please refer to *Appendix A* for index-specific information on eligible markets.

### Other Stocks with Zero Float

Any stock with an IWF (Investible Weight Factor) of zero is excluded from the S&P Low Volatility Indices.

*For more information on the Investible Weight Factor (IWF), please refer to S&P Dow Jones Indices' Float Adjustment Methodology.*

## Constituent Selection

The selection process of index constituents is as follows:

1. Using available price return data for the trailing one year of trading days leading up to each index rebalancing reference date, the volatilities of the constituents within each eligible universe are calculated.
2. Constituents meeting eligibility requirements as described under Eligibility Criteria are, then, ranked in descending order based on the inverse of the realized volatility. The top securities with the least volatility, as determined by each index's targeted constituent count (see Index Family section of the Introduction) form the index.

The S&P Korea Low Volatility Index is comprised of the 50 least volatile stocks in the eligible universe subject to a maximum number of 15 stocks per GICS Sector.

**Buffer Rule.** In order to reduce turnover, at each rebalancing a 20% buffer rule based on realized volatility is applied to the security selection process for the S&P Japan 500, S&P/ASX 200 Low Volatility, and S&P China A-Share Low Volatility indices. Securities are selected as follow:

1. All securities ranked within the top 80% of the target stock count are automatically selected for the index.
2. Current index constituents not already selected in Step 1 that are within the top 120% of the target stock count are added to the index in rank order until the target stock count has been reached.
3. If, following Step 2, the target stock count has not been reached, non-constituent securities not already selected in Step 1 that are ranked from 80% to 100% of the target stock count are added to the index in rank order until the target stock count has been reached.

## Constituent Weightings

At each rebalancing, the weight,  $w$ , for each index constituent,  $i$ , is set inversely proportional to its volatility.

$$w_i = \frac{\frac{1}{Volatility_i}}{\sum_{i=1}^N \frac{1}{Volatility}}$$

Where N refers to the index count, the index count for each index is as follows:

Index	Constituent Count
S&P Korea Low Volatility	50
S&P Japan 500 Low Volatility	100
S&P/ASX 200 Low Volatility	40
S&P China A-Share Low Volatility	100

In the S&P Korea Low Volatility Index, modifications are made to stock weights at each rebalancing to ensure diversification across individual stocks and sectors. At each rebalancing, the weight for each index constituent is constrained between 0.05% and 3.0% and the weight of each sector is capped at 30%.

Volatility is defined as the standard deviation of the security's daily price returns, in local currency, over the prior one year of trading days. It can be mathematically expressed as:

$$\sqrt{\frac{\sum_{i=1}^N (X_i - \bar{X})^2}{N-1}}$$

where:

$$X_i = \text{Price change} = \frac{P_t}{P_{t-1}} - 1$$

$P_t$  = Closing price of the stock on day  $t$

$P_{t-1}$  = Closing price of the stock on day  $t-1$

$t$  = 1 to  $N$

$\bar{X}$  = Average price change

$N$  = Number of trading days in a year based on local calendar

## EMEA Indices

### Eligibility Factors

**Liquidity.** Stocks must, as of the rebalancing reference date, have a minimum six-month median daily value traded (6M MDVT) over and above their parent indices for the following indices:

Index	Minimum MDVT (Buffer for Current Constituents)
S&P South Africa Low Volatility	6M MDVT ZAR 10 million (ZAR 8 million)
S&P Saudi Arabia Low Volatility Index	6M MDVT US\$ 1 million (US\$ 500,000)
S&P Saudi Arabia Shariah Low Volatility Index	6M MDVT US\$ 1 million (US\$ 500,000)

**Listing and Trading History.** For the S&P South Africa, S&P Saudi Arabia Low Volatility, and S&P Saudi Arabia Shariah Low Volatility indices, each stock must have been issued and trading for at least one calendar year before becoming an index constituent. However, there is no minimum number of days that each stock must have actually traded.

### Multiple Share Classes and Dual Listed Companies.

Each company is represented once by the Designated Listing. For more information regarding the treatment of multiple share classes, please refer to Approach B within the Multiple Share Classes section of the S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

### Eligible Markets

Please refer to *Appendix A* for index-specific information on eligible markets.

### Other Stocks with Zero Float

Any stock with an IWF (Investible Weight Factor) of zero is excluded from the S&P Low Volatility Indices.

*For more information on the Investible Weight Factor (IWF), please refer to S&P Dow Jones Indices' Float Adjustment Methodology.*

### Constituent Selection

The selection process of index constituents is as follows:

1. Using available price return data for the trailing one year of trading days leading up to each index rebalancing reference date, the volatilities of the constituents within each eligible universe are calculated.
2. Constituents meeting eligibility requirements as described under *Eligibility Criteria* are, then, ranked in descending order based on the inverse of the realized volatility. The top securities with the least volatility, as determined by each index's targeted constituent count (see *Index Family* section of the *Introduction*) form the index.

The target stock count for the S&P Saudi Arabia Low Volatility Index and S&P Saudi Arabia Shariah Low Volatility Index is the maximum of:

- 30,
- 20% of the number of constituents in the universe,
- The number of stocks (ranked by inverse volatility) such that the sum of their free-float market capitalizations is at least 50% of the free-float market capitalization of the underlying universe.



If the target stock count results in a fractional company amount, the number of companies selected is rounded to the nearest integer.

**Buffer Rule.** In order to reduce turnover, a 20% buffer rule based on realized volatility is applied to the security selection process at each rebalancing for S&P South Africa Low Volatility index. Securities are selected as follow:

1. All securities ranked within the top 80% of the target stock count are automatically selected for the index.
2. Current index constituents not already selected in Step 1 that are within the top 120% of the target stock count are added to the index in rank order until the target stock count has been reached.
3. If, following Step 2, the target stock count has not been reached, non-constituent securities not already selected in Step 1 that are ranked from 80% to 100% of the target stock count are added to the index in rank order until the target stock count has been reached.

Additionally, for the S&P Saudi Arabia Low Volatility and S&P Saudi Arabia Shariah Low Volatility indices, if a target of 50% of the free-float market capitalization of the underlying universe has not been reached, remaining stocks are selected by order of rank until this target has been reached.

### Constituent Weightings

At each rebalancing, the weight,  $w_i$ , for each index constituent,  $i$ , is set inversely proportional to its volatility.

$$w_i = \frac{\frac{1}{Volatility_i}}{\sum_{i=1}^N \frac{1}{Volatility}}$$

Where N refers to the index count, the index count for each index is as follows:

Index	Constituent Count
S&P South Africa Low Volatility	40

For the S&P Saudi Arabia Low Volatility and the S&P Saudi Arabia Shariah Low Volatility indices, the maximum weight for each security is set at 8% or the stocks weight in the universe, whichever is greater. Moreover, the weight for each security is also capped at 20 times its market capitalization weight in the underlying universe.

The maximum weight of any given GICS sector is 40%. Each stock's weight is floored at 0.05%. Note that the capping algorithm redistributes the excess weight to the other stocks in proportion to their inverse volatility weights, such that the tracking error is minimized.

Furthermore, for the S&P Saudi Arabia Low Volatility and S&P Saudi Arabia Shariah Low Volatility indices, the above optimization process includes one additional constraint; the maximum weight of each security should not exceed a multiple of 4 times its liquidity weight (see *Appendix B*). Where the optimization procedure fails for a given period, the constraints are then relaxed in the following order: the maximum weight of the security, then the maximum weight of the sector, then the maximum weight of the country (if applicable), then 20 times its market capitalization weight and finally, four times its liquidity weight.

# Index Calculations

The indices are calculated by means of the divisor methodology used in all S&P Dow Jones Indices' equity indices.

*For more information on index calculations, please refer to the Non-Market Capitalization Weighted Indices section of S&P Dow Jones Indices' Index Mathematics Methodology.*

# Index Maintenance

## Rebalancing

Index	Effective Date (after the close of)	Reference Date (after the close of)
S&P 500, S&P MidCap 400, S&P SmallCap 600, S&P 500 Low Volatility Top 80%, and S&P Pan Asia Low Volatility	Third Friday of February, May, August, and November	Last trading dates of January, April, July and October
S&P BMI International Developed Low Volatility	Third Friday of March, June, September, and December	Last trading dates of February, May, August, November
S&P BMI Emerging Markets Low Volatility		
S&P Emerging Markets Low Volatility Select		
S&P Europe 350 Low Volatility		
S&P Eurozone Low Volatility		
S&P Nordic Low Volatility		
S&P Southern Europe Low Volatility		
S&P South Africa Low Volatility		
S&P Developed Asia Low Volatility		
S&P EPAC Ex. Korea Low Volatility		
S&P Japan 500 Low Volatility		
S&P Global Low Volatility		
S&P Developed Low Volatility		
S&P BMI Developed Ex-U.S. Low Volatility Index		
S&P/ASX 200 Low Volatility		
S&P China A-Share Low Volatility		
Dow Jones Islamic Market World Low Volatility 300 Index		
S&P Korea Low Volatility	Third Friday of April and October	Last trading dates of March and September
S&P Europe 350 Carbon Efficient Low Volatility	Third Friday of January, April, July, and October	Last trading dates of December, March, June, and September
S&P GCC Composite Low Volatility	Sunday after the third Friday of March, June, September, and December	Last trading dates of February, May, August, and November
S&P Saudi Arabia Low Volatility		
S&P Saudi Arabia Shariah Low Volatility		
S&P Pan Arab Composite LargeMidCap Low Volatility		
S&P GCC Composite Low Volatility Shariah		
S&P Pan Arab Composite LargeMidCap Shariah Low Volatility		

Index shares are calculated using closing prices on the Wednesday prior to the second Friday of the rebalancing month as the reference price. Index shares are calculated and assigned to each stock to arrive at the weights determined on the reference date. Since index shares are assigned based on prices prior to rebalancing, the actual weight of each constituent at the rebalancing differs somewhat from these weights due to market movements.

## Corporate Actions

Corporate Action	Adjustment Made to the Index	Divisor Adjustment?
<b>Spin-off</b>	The spun-off company is added to all the indices of which the parent is a constituent, at a zero price at the market close of the day before the ex-date (with no divisor adjustment). The spun-off company is removed after at least one day of regular way trading (with a divisor adjustment).	
<b>Rights Offering</b>	The price is adjusted to the Price of the Parent Company minus (the Price of the Rights Offering/Rights Ratio). Index shares change so that the company's weight remains the same as its weight before the rights offering.	No
<b>Stock Split</b>	Index shares are multiplied by and the price is divided by the split factor.	No
<b>Share Issuance or Share Repurchase</b>	None. Actual shares outstanding of the company play no role in the daily index calculation.	No
<b>Special Dividends</b>	The price of the stock making the special dividend payment is reduced by the per share special dividend amount after the close of trading on the day before the dividend ex-date.	Yes
<b>Constituent Change</b>	Except for spin-offs, there are no intra-rebalancing additions.	-
	Deletions due to delistings, acquisition or any other corporate event resulting in the deletion of the stock from the index causes the weight of the rest of the stocks in the index to change. Relative weights stay the same. Constituents removed from their respective benchmark index are also removed from their Low Volatility Index simultaneously.	Yes

For more information on Corporate Actions, please refer to the Non-Market Capitalization Weighted Indices section of S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

## Currency of Calculation and Additional Index Return Series

The indices calculate in the following currencies:

Index	Currency of Calculation
S&P 500 Low Volatility	USD, EUR, SEK
S&P 500 Low Volatility Top 80%	USD
S&P 500 Low Volatility (Hedged)	CAD, EUR
S&P MidCap 400 Low Volatility	USD
S&P SmallCap 600 Low Volatility	USD
S&P BMI International Developed Low Volatility	USD
S&P BMI Emerging Markets Low Volatility	USD
S&P Emerging Markets Low Volatility Select	USD, EUR, SEK
S&P Europe 350 Low Volatility	USD, EUR
S&P Eurozone Low Volatility Index	USD, EUR
S&P Eurozone Low Volatility USD Hedged Index	USD
S&P Nordic Low Volatility	USD, EUR, SEK
S&P Southern Europe Low Volatility	USD, EUR
S&P Developed Asia Low Volatility	USD
S&P Pan Asia Low Volatility	USD, EUR, SEK
S&P Korea Low Volatility	USD, KRW
S&P South Africa Low Volatility	USD, ZAR
S&P EPAC Ex. Korea Low Volatility	USD, CAD
S&P EPAC Ex. Korea Low Volatility (Hedged)	USD, CAD
S&P Japan 500 Low Volatility	USD, JPY

Index	Currency of Calculation
S&P Japan 500 Low Volatility USD Hedged Index	USD
S&P Europe 350 Carbon Efficient Select Low Volatility	USD, EUR
S&P Global Low Volatility	USD
S&P Developed Low Volatility	USD
S&P BMI Developed Ex-U.S. Low Volatility Index	USD
S&P/ASX 200 Low Volatility	USD, AUD
S&P China A-Share Low Volatility	RMB
S&P GCC Composite Low Volatility	USD
S&P Saudi Arabia Low Volatility	USD, SAR
S&P Saudi Arabia Shariah Low Volatility	USD, SAR
Dow Jones Islamic Market World Low Volatility 300 Index	USD
S&P Pan Arab Composite LargeMidCap Low Volatility	USD
S&P GCC Composite Low Volatility Shariah Index	USD
S&P Pan Arab Composite LargeMidCap Shariah Low Volatility Index	USD

Real-time spot Forex rates, as supplied by Refinitiv, are used for ongoing index calculation of real-time indices.

WM/Refinitiv foreign exchange rates are taken daily at 4:00 PM London time and used in the calculation of the indices. These mid-market fixings are calculated by the WM Company based on Refinitiv data and appear on Refinitiv pages WMRA.

The S&P Korea Low Volatility, S&P Japan 500 Low Volatility and S&P/ASX Low Volatility indices are calculated in U.S. dollars using spot exchange rates taken at 4:17 PM Sydney Time as supplied by Refinitiv so that closing values can be provided in local time zones.

In addition to the indices detailed in this methodology, additional return series versions of the indices may be available, including, but not limited to the following: currency, currency hedged, decrement, fair value, inverse, leveraged, and risk control versions. For a list of available indices, please refer to the [S&P DJI Methodology & Regulatory Status Database](#).

*For information on the calculation of different types of indices, please refer to S&P Dow Jones Indices' Index Mathematics Methodology.*

*For the inputs necessary to calculate certain types of indices, including decrement, dynamic hedged, fair value, and risk control indices, please refer to the Parameters documents available at [www.spglobal.com/spdji/](http://www.spglobal.com/spdji/).*

## Base Dates and History Availability

Index history availability, base dates, and base values are shown in the table below.

Index	Launch Date	First Value Date	Base Date	Base Value
S&P 500 Low Volatility	04/04/2011	11/16/1990	11/16/1990	1000
S&P 500 Low Volatility Top 80%	08/08/2022	11/16/1990	11/16/1990	1000
S&P 500 Low Volatility (CAD Hedged)	01/24/2012	11/29/2002	11/29/2002	1000
S&P MidCap 400 Low Volatility	09/24/2012	08/16/1991	08/16/1991	100
S&P SmallCap 600 Low Volatility	09/24/2012	02/17/1995	02/17/1995	100
S&P BMI International Developed Low Volatility	12/05/2011	06/21/1991	06/21/1991	1000
S&P BMI Emerging Markets Low Volatility	12/05/2011	09/19/1997	09/19/1997	1000
S&P Emerging Markets Low Volatility Select	11/13/2014	09/19/1997	09/19/1997	1000
S&P Europe 350 Low Volatility	07/09/2012	03/20/1998	03/20/1998	1000
S&P Eurozone Low Volatility Index	03/30/2015	12/17/1999	12/17/1999	100
S&P Eurozone Low Volatility USD Hedged Index	03/30/2015	11/29/2002	11/29/2002	100
S&P Nordic Low Volatility	05/17/2013	12/20/2002	12/20/2002	1000

Index	Launch Date	First Value Date	Base Date	Base Value
S&P Southern Europe Low Volatility	02/28/2014	12/17/1999	12/17/1999	100
S&P Developed Asia Low Volatility	08/05/2015	12/19/2003	12/19/2003	100
S&P Pan Asia Low Volatility	11/19/2012	11/19/1999	11/19/1999	1000
S&P Korea Low Volatility	05/08/2013	04/21/2000	04/21/2000	1000
S&P South Africa Low Volatility	01/29/2014	09/19/2008	09/19/2008	1000
S&P EPAC Ex. Korea Low Volatility	05/25/2015	03/16/1990	03/16/1990	100
S&P EPAC Ex. Korea Low Volatility USD Hedged Index	05/25/2015	11/29/2002	11/29/2002	100
S&P Japan 500 Low Volatility	06/08/2015	03/19/1993	03/19/1993	100
S&P Japan 500 Low Volatility USD Hedged Index	06/08/2015	03/31/1993	03/31/1993	100
S&P Europe 350 Carbon Efficient Select Low Volatility	01/18/2016	01/16/2009	01/16/2009	1000
S&P Global Low Volatility	04/11/2016	03/17/1995	03/17/1995	1000
S&P Developed Low Volatility	04/11/2016	03/17/1995	03/17/1995	1000
S&P BMI Developed Ex-U.S. Low Volatility Index	11/24/2021	03/19/1993	03/19/1993	1000
S&P/ASX 200 Low Volatility	10/17/2017	06/16/2000	06/16/2000	100
S&P China A-Share Low Volatility	07/11/2018	06/16/2006	06/16/2006	1000
S&P GCC Composite Low Volatility	01/07/2019	12/21/2008	12/21/2008	100
S&P Saudi Arabia Low Volatility	01/07/2019	12/21/2008	12/21/2008	100
S&P Saudi Arabia Shariah Low Volatility	01/07/2019	12/21/2008	12/21/2008	100
Dow Jones Islamic Market World Low Volatility 300 Index	05/21/2020	12/15/2000	12/15/2000	100
S&P Pan Arab Composite LargeMidCap Low Volatility	06/29/2020	12/21/2008	12/21/2008	1000
S&P GCC Composite Low Volatility Shariah	05/26/2021	12/21/2008	12/21/2008	100
S&P Pan Arab Composite LargeMidCap Shariah Low Volatility	05/31/2021	12/21/2008	12/21/2008	1000

# Index Data

## Calculation Return Types

S&P Dow Jones Indices calculates multiple return types which vary based on the treatment of regular cash dividends. The classification of regular cash dividends is determined by S&P Dow Jones Indices.

- Price Return (PR) versions are calculated without adjustments for regular cash dividends.
- Gross Total Return (TR) versions reinvest regular cash dividends at the close on the ex-date without consideration for withholding taxes.
- Net Total Return (NTR) versions, if available, reinvest regular cash dividends at the close on the ex-date after the deduction of applicable withholding taxes.

In the event there are no regular cash dividends on the ex-date, the daily performance of all three indices will be identical.

For a complete list of indices available, please refer to the daily index levels file (“SDL”).

*For more information on the classification of regular versus special cash dividends as well as the tax rates used in the calculation of net return, please refer to S&P Dow Jones Indices’ Equity Indices Policies & Practices Methodology.*

*For more information on the calculation of return types, please refer to S&P Dow Jones Indices’ Index Mathematics Methodology.*

# Index Governance

## Index Committee

S&P Dow Jones Indices' Index Committees manage the indices. The Committees meet regularly. At each meeting, the Committee reviews pending corporate actions that may affect index constituents, statistics comparing the composition of the indices to the market, companies that are being considered as candidates for addition to an index, and any significant market events. In addition, the Index Committee may revise index policy covering rules for selecting companies, treatment of dividends, share counts or other matters.

S&P Dow Jones Indices considers information about changes to its indices and related matters to be potentially market moving and material. Therefore, all Index Committee discussions are confidential.

S&P Dow Jones Indices' Index Committees reserve the right to make exceptions when applying the methodology if the need arises. In any scenario where the treatment differs from the general rules stated in this document or supplemental documents, clients will receive sufficient notice, whenever possible.

In addition to the daily governance of indices and maintenance of index methodologies, at least once within any 12-month period, the Index Committee reviews the methodology to ensure the indices continue to achieve the stated objectives, and that the data and methodology remain effective. In certain instances, S&P Dow Jones Indices may publish a consultation inviting comments from external parties.

*For information on Quality Assurance and Internal Reviews of Methodology, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.*



# Index Policy

## Announcements

All index constituents are evaluated daily for data needed to calculate index levels and returns. All events affecting the daily index calculation are typically announced in advance via the Index Corporate Events report (.SDE), delivered daily to all clients. Any unusual treatment of a corporate action or short notice of an event may be communicated via email to clients.

*For more information, please refer to the Announcements section of S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.*

## Pro-forma Files

In addition to the corporate events file (.SDE), S&P Dow Jones Indices provides constituent pro-forma files each time the indices rebalance. The pro-forma file is typically provided daily in advance of the rebalancing date and contains all constituents as well as their corresponding weights and index shares effective for the upcoming rebalancing.

*Please visit [www.spglobal.com/spdji/](http://www.spglobal.com/spdji/) for a complete schedule of rebalancing timelines and pro-forma delivery times.*

## Holiday Schedule

The S&P Low Volatility Indices are calculated daily, throughout the calendar year. The only days the indices are not calculated are on days when all exchanges where the S&P Low Volatility Indices' constituents are listed are officially closed.

*A complete holiday schedule for the year is available at [www.spglobal.com/spdji/](http://www.spglobal.com/spdji/).*

## Rebalancing

The Index Committee may change the date of a given rebalancing for reasons including market holidays occurring on or around the scheduled rebalancing date. Any such change will be announced with proper advance notice where possible.

## Unexpected Exchange Closures

For information on Unexpected Exchange Closures, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

## Recalculation Policy

For information on the recalculation policy, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

*For information on Calculations and Pricing Disruptions, Expert Judgment and Data Hierarchy, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.*

## Contact Information

For any questions regarding an index, please contact: [index\\_services@spglobal.com](mailto:index_services@spglobal.com).

# Index Dissemination

Index levels are available through S&P Dow Jones Indices' Web site at [www.spglobal.com/spdji/](http://www.spglobal.com/spdji/), major quote vendors (see codes below), numerous investment-oriented Web sites, and various print and electronic media.

## Tickers

The table below lists headline indices covered by this document. All versions of the below indices that may exist are also covered by this document. Please refer to the [S&P DJI Methodology & Regulatory Status Database](#) for a complete list of indices covered by this document.

Index (Currency)	Return Type	Bloomberg	RIC
S&P 500 Low Volatility Index (USD)	Price Return	SP5LVI	.SP5LVI
	Total Return	SP5LVIT	.SP5LVIT
	Net Total Return	SP5LVIN	.SP5LVIN
S&P 500 Low Volatility Index (EUR)	Price Return	SP5LVIE	--
	Total Return	SP5LVIET	--
	Net Total Return	SP5LVIENT	--
S&P 500 Low Volatility Index (EUR) Hedged	Price Return	SP5LVHEP	--
	Total Return	SP5LVHET	--
	Net Total Return	SP5LVHEN	--
S&P 500 Low Volatility Index (SEK)	Price Return	SP5LVIS	--
	Total Return	SP5LVIST	--
S&P 500 Low Volatility Index (CAD) Hedged	Price Return	SP5LVICH	.SP5LVICH
	Total Return	SP5LVCTH	.SP5LVCTH
	Net Total Return	SP5LVCNH	.SP5LVCNH
S&P MidCap 400 Low Volatility Index (USD)	Price Return	SP4LVI	.SP4LVI
	Total Return	SP4LVIT	.SP4LVIT
	Net Total Return	SP4LVIN	.SP4LVIN
S&P 500 Low Volatility Top 80% Index (USD)	Price Return	SP5LVTUP	.SP5LVTUP
	Total Return	SP5LVTUT	.SP5LVTUT
	Net Total Return	SP5LVTUN	.SP5LVTUN
S&P SmallCap 600 Low Volatility Index (USD)	Price Return	SP6LVI	.SP6LVI
	Total Return	SP6LVIT	.SP6LVIT
	Net Total Return	SP6LVIN	.SP6LVIN
S&P BMI International Developed Low Volatility Index (USD)	Price Return	SPIDLVP	--
	Total Return	SPIDLVT	--
	Net Total Return	SPIDLVN	--
S&P BMI Emerging Markets Low Volatility Index (USD)	Price Return	SPEMLVP	--
	Total Return	SPEMLVT	--
	Net Total Return	SPEMLVN	--
S&P Emerging Markets Low Volatility Select Index (USD)	Price Return	SPBELSUP	--
	Total Return	SPBELSUT	--
	Net Total Return	SPBELSUN	--
S&P Emerging Markets Low Volatility Select Index (EUR)	Price Return	SPBELSEP	--
	Total Return	SPBELSET	--
	Net Total Return	SPBELSEN	--
S&P Emerging Markets Low Volatility Select Index (SEK)	Price Return	SPBELSSP	--
	Total Return	SPBELSST	--
	Net Total Return	SPBELSSN	--
S&P Europe 350 Low Volatility Index (USD)	Price Return	SPEULV	--
	Total Return	SPEULVT	--
	Net Total Return	SPEULVN	--

Index (Currency)	Return Type	Bloomberg	RIC
S&P Europe 350 Low Volatility Index (EUR)	Price Return	SPEULVE	--
	Total Return	SPEULVET	--
	Net Total Return	SPEULVEN	--
S&P Eurozone Low Volatility Index (USD)	Price Return	SPELVUP	--
	Total Return	SPELVUT	--
	Net Total Return	SPELVUN	--
S&P Eurozone Low Volatility Index (EUR)	Price Return	SPELVEP	--
	Total Return	SPELVET	--
	Net Total Return	SPELVEN	--
S&P Eurozone Low Volatility USD Hedged Index	Price Return	SPELVUPH	--
	Total Return	SPELVUTH	--
	Net Total Return	SPELVUNH	--
S&P Nordic Low Volatility Index (USD)	Price Return	SPNLVUP	--
	Total Return	SPNLVUT	--
	Net Total Return	SPNLVUN	--
S&P Nordic Low Volatility Index (EUR)	Price Return	SPNLVEP	--
	Total Return	SPNLVET	--
	Net Total Return	SPNLVEN	--
S&P Nordic Low Volatility Index (SEK)	Price Return	SPNLVSP	--
	Total Return	SPNLVST	--
	Net Total Return	SPNLVSN	--
S&P Southern Europe Low Volatility Index (USD)	Price Return	SPSELVUP	--
	Total Return	SPSELVUT	--
	Net Total Return	SPSELVUN	--
S&P Southern Europe Low Volatility Index (EUR)	Price Return	SPSELVEP	--
	Total Return	SPSELVET	--
	Net Total Return	SPSELVEN	--
S&P Developed Asia Low Volatility (USD)	Price Return	SPDALVUP	--
	Total Return	SPDALVUT	--
	Net Total Return	SPDALVUN	--
S&P Pan Asia Low Volatility Index (USD)	Price Return	SPPALV	--
	Total Return	SPPALVT	--
	Net Total Return	SPPALVN	--
S&P Pan Asia Low Volatility Index (EUR)	Price Return	SPPALVE	--
	Total Return	SPPALVET	--
	Net Total Return	SPPALVEN	--
S&P Pan Asia Low Volatility Index (SEK)	Price Return	SPPALVS	--
	Total Return	SPPALVST	--
	Net Total Return	SPPALVSN	--
S&P Korea Low Volatility Index (USD)	Price Return	SPKLVUP	--
	Total Return	SPKLVUT	--
	Net Total Return	SPKLVUN	--
S&P Korea Low Volatility Index (KRW)	Price Return	SPKLVKP	--
	Total Return	SPKLVKT	--
	Net Total Return	SPKLVKN	--
S&P South Africa Low Volatility Index (USD)	Price Return	SPSALVUP	.SPSALVUP
	Total Return	SPSALVUT	.SPSALVUT
	Net Total Return	SPSALVUN	.SPSALVUN
S&P South Africa Low Volatility Index (ZAR)	Price Return	SPSALVZP	.SPSALVZP
	Total Return	SPSALVZT	.SPSALVZT
	Net Total Return	SPSALVZN	.SPSALVZN
S&P EPAC Ex. Korea Low Volatility Index (USD)	Price Return	SPEPLVUP	--
	Total Return	SPEPLVUT	--
	Net Total Return	SPEPLVUN	--
S&P EPAC Ex. Korea Low Volatility USD Hedged Index	Price Return	SPEPLVUPH	--
	Total Return	SPEPLVUTH	--
	Net Total Return	SPEPLVUNH	--
S&P EPAC Ex-Korea Low Volatility Index (CAD)	Price Return	--	--

Index (Currency)	Return Type	Bloomberg	RIC
	Total Return Net Return	SPEXLCT SPEXLCN	.SPEXLCT .SPEXLCN
S&P EPAC Ex-Korea Low Volatility Index (CAD) Hedged	Price Return  Total Return Net Return	--  SPEXLCHT SPEXLCHN	--  .SPEXLCHT .SPEXLCHN
S&P Japan 500 Low Volatility Index (USD)	Price Return Total Return Net Total Return	SPJ5LVUP SPJ5LVUT SPJ5LVUN	-- -- --
S&P Japan 500 Low Volatility Index (JPY)	Price Return Total Return Net Total Return	SPJ5LVJP SPJ5LVJT SPJ5LVJN	-- -- --
S&P Japan 500 Low Volatility USD Hedged Index	Price Return Total Return Net Total Return	SPJ5LHUP SPJ5LHUT SPJ5LHUN	-- -- --
S&P Europe 350 Carbon Efficient Select Low Volatility Index (USD)	Price Return Total Return Net Total Return	SPEUCLUP SPEUCLUT SPEUCLUN	-- -- --
S&P Europe 350 Carbon Efficient Select Low Volatility Index (EUR)	Price Return Total Return Net Total Return	SPEUCLEP SPEUCLET SPEUCLEN	-- -- --
S&P Global Low Volatility Index (USD)	Price Return Total Return Net Total Return	SPGLLVUP SPGLLVUT SPGLLVUN	-- -- --
S&P Developed Low Volatility Index (USD)	Price Return Total Return Net Total Return	SPDELVUP SPDELVUT SPDELVUN	-- -- --
S&P BMI Developed Ex-U.S. Low Volatility Index (USD)	Price Return Total Return Net Total Return	SPDULVUP SPDULVUT SPDULVUN	-- -- --
S&P/ASX 200 Low Volatility Index (AUD)	Price Return Total Return Net Total Return	SPLVAXAP SPLVAXAT --	-- -- --
S&P China A-Share Low Volatility Index (CNY)	Price Return Total Return Net Total Return	SPCALVCP SPCALVCT SPCALVCN	-- -- --
S&P GCC Composite Low Volatility (USD)	Price Return Total Return Net Total Return	-- SPGCLVUT --	-- -- --
S&P Saudi Arabia Low Volatility (SAR)	Price Return Total Return Net Total Return	-- SPSDLVST --	-- -- --
S&P Saudi Arabia Shariah Low Volatility (SAR)	Price Return Total Return Net Total Return	-- SPSSLVST --	-- -- --
Dow Jones Islamic Market World Low Volatility 300 Index (USD)	Price Return Total Return Net Total Return	DJIML3UP DJIML3UT DJIML3UN	-- -- --
S&P Pan Arab Composite LargeMidCap Low Volatility (USD)	Price Return Total Return Net Total Return	SPLPALUP SPLPALUT SPLPALUN	-- -- --
S&P GCC Composite Low Volatility Shariah Index (USD)	Price Return Total Return Net Total Return	SPGSLVUP SPGSLVUT SPGSLVUN	-- -- --
S&P Pan Arab Composite LargeMidCap Shariah Low Volatility Index (USD)	Price Return Total Return Net Total Return	SPPSLVUP SPPSLVUT SPPSLVUN	-- -- --

**Index Data**

Daily constituent and index level data are available via subscription.

*For product information, please contact S&P Dow Jones Indices, [www.spglobal.com/spdji/en/contact-us](http://www.spglobal.com/spdji/en/contact-us).*

**Web site**

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# Appendix A – Eligible Markets per Index

Markets	S&P Low Volatility Indices					
	S&P 500, S&P MidCap 400, S&P SmallCap 600	S&P BMI International Developed	S&P BMI Emerging Markets	S&P Emerging Markets Select	S&P Europe 350	S&P Eurozone
Australia		•				
Austria		•			•	•
Belgium		•			•	•
Brazil			•	Δ		
Canada		•				
Chile			•	Δ		
China			□	□		
Colombia			•	Δ		
Czech Republic			•	•		
Denmark		•			•	
Egypt			•	Δ		
Finland		•			•	•
France		•			•	•
Germany		•			•	•
Greece			•	•		
Hong Kong		•				
Hungary			•	•		
India			□	□		
Indonesia			•	•		
Ireland		•			•	•
Israel		•				
Italy		•			•	•
Japan		•				
Kuwait			•	•		
Luxembourg		•			•	•
Malaysia			•	•		
Mexico			•	Δ		
Morocco			•	Δ		
Netherlands		•			•	•
New Zealand		•				
Norway		•			•	
Pakistan			•	•		
Peru			•	Δ		
Philippines			•	•		
Poland			•	•		
Portugal		•			•	•
Qatar			•	Δ		
Russia			□	□		
Saudi Arabia		•	•	•		
Singapore		•				
South Africa			•	•		
South Korea			•	•		
Spain		•			•	•
Sweden		•			•	
Switzerland		•			•	
Taiwan			•	•		
Thailand			•	•		
Turkey			•	•		
UAE			•	Δ		
UK		•			•	
US	•					

□ For China, India, and Russia, only developed market listings are eligible. These may include HK, NY and LSE listings.

Δ Constituents from these countries must be trading in Developed markets.

In September 2014, Greece was reclassified to emerging market status from developed market status. Qatar and the UAE were reclassified to emerging market status from frontier market status.

Markets	S&P Low Volatility Indices				
	S&P Nordic	S&P Southern Europe	S&P Developed Asia	S&P Pan Asia	S&P Korea
Australia			•	•	
Austria					
Belgium					
Brazil					
Canada					
Chile					
China				□	
Colombia					
Czech Republic					
Denmark	•				
Egypt					
Finland	•				
France					
Germany					
Greece					
Hong Kong			•	•	
Hungary					
India				□	
Indonesia				•	
Ireland					
Israel					
Italy		•			
Japan			•	•	
Luxembourg					
Malaysia				•	
Mexico					
Morocco					
Netherlands					
New Zealand			•		
Norway	•				
Pakistan				•	
Peru					
Philippines				•	
Poland					
Portugal		•			
Qatar					
Russia					
Singapore			•	•	
South Africa					
South Korea			•	•	•
Spain		•			
Sweden	•				
Switzerland					
Taiwan				•	
Thailand				•	
Turkey					
UAE					
UK					
US					

□ For China, India, and Russia, only developed market listings are eligible. These may include HK, NY and LSE listings. In September 2014, Greece was reclassified to emerging market status from developed market status. Qatar and the UAE were reclassified to emerging market status from frontier market status.

S&P Low Volatility Indices						
Markets	S&P South Africa	S&P EPAC Ex. Korea	S&P Japan 500	S&P Global	S&P Developed	S&P/ASX 200
Australia		•		•	•	•
Austria		•		•	•	
Belgium		•		•	•	
Brazil				•		
Canada				•	•	
Chile				•		
China				□		
Colombia				•		
Czech Republic				•		
Denmark		•		•	•	
Egypt				•		
Finland		•		•	•	
France		•		•	•	
Germany		•		•	•	
Greece				•		
Hong Kong		•		•	•	
Hungary				•		
India				□		
Indonesia				•		
Ireland		•		•	•	
Israel		•		•	•	
Italy		•		•	•	
Japan		•	•	•	•	
Kuwait				•	•	
Luxembourg		•		•	•	
Malaysia				•		
Mexico				•		
Morocco				•		
Netherlands		•		•	•	
New Zealand		•		•	•	
Norway		•		•	•	
Pakistan				•		
Peru				•		
Philippines				•		
Poland				•		
Portugal		•		•	•	
Qatar				•		
Russia				□		
Saudi Arabia				•	•	
Singapore		•		•	•	
South Africa	•			•		
South Korea				•		
Spain		•		•	•	
Sweden		•		•	•	
Switzerland		•		•	•	
Taiwan				•		
Thailand				•		
Turkey				•		
UAE				•		
UK		•		•	•	
US				•	•	

□ For China and India, only developed market listings are eligible. These may include HK, NY, and LSE listings. In September 2014, Greece was reclassified to emerging market status from developed market status. Qatar and the UAE were reclassified to emerging market status from frontier market status.



S&P GCC & Pan Arab Low Volatility Indices						
GCC & Pan Arab Markets	S&P GCC Composite Low Volatility	S&P GCC Composite Low Volatility Shariah	S&P Pan Arab Composite LargeMidCap Low Volatility	S&P Pan Arab Composite LargeMidCap Low Volatility Shariah	S&P Saudi Arabia Low Volatility	S&P Saudi Arabia Shariah Low Volatility
Bahrain	•	•	•	•		
Kuwait	•	•	•	•		
Oman	•	•	•	•		
Qatar	•	•	•	•		
Saudi Arabia	•	•	•	•	•	•
UAE	•	•	•	•		
Jordan			•	•		
Tunisia			•	•		
Morocco			•	•		
Egypt			•	•		

Dow Jones Islamic Market Low Volatility Indices	
Markets	Dow Jones Islamic Market World Low Volatility 300 Index
Developed	•
Emerging	• <sup>5</sup>
Frontier	•

<sup>5</sup> For China only developed market listings are eligible. Such listings may include HK, NY, and LSE listings.

## Appendix B – Liquidity Weight Computation

The liquidity weight of a given stock is defined as:

$$lw_i = \frac{l'_i}{\sum_1^N l'_j}$$

where:

$N$  = number of selected stocks

$l'_i$  = capped stock liquidity

To maintain optimization stability the liquidity of a given stock is capped as follows:

$$l'_i = \text{MIN} ( l_i , 20 \times \text{MinLB} )$$

where:

$l_i$  = stock liquidity

$\text{MinLB}$  = minimum liquidity of selected stocks

# Appendix D – Back-tested History

## Back-tested History

Certain index rules differ in the index history versus the rules at launch. The following historical deviations exist.

**S&P EPAC Ex. Korea Low Volatility.** For history prior to 2005, there was no liquidity minimum above the S&P Global BMI liquidity threshold.

**S&P Developed Ex. US Low Volatility.** For history prior to 2001, the MDVT threshold was US \$2 million (current constituents US \$1.5 million).

# Appendix C – Methodology Changes

Methodology changes since January 1, 2015, are as follows:

Change	Effective Date (After Close)	Methodology	
		Previous	Updated
S&P China A-Share Low Volatility Index:  Addition of Investor Perspective	09/18/2020	--	Subject to S&P Dow Jones Indices' compliance with the applicable law (including, without limitation, sanctions law), the index is maintained from a China based investor perspective <sup>6</sup> and may include securities that would not be eligible for inclusion if maintained from a U.S./U.K./EU investor perspective.
S&P China A-Share Low Volatility Index:  Index Universe	09/18/2020	S&P China A Domestic BMI and S&P China A Venture Enterprises Index.	S&P China A Domestic BMI.
S&P 500 Low Volatility, S&P MidCap 400 Low Volatility, and S&P SmallCap 600 Low Volatility:  Rebalancing – Reference Price for Calculation of Index Shares	04/29/2020	Constituents' shares are calculated using closing prices on the second Friday of the rebalancing month as the reference price.	Index shares are calculated using closing prices on the Wednesday prior to the second Friday of the rebalancing month as the reference price.
S&P Emerging Markets Low Volatility Select, S&P Nordic Low Volatility, S&P Southern Europe Low Volatility, and S&P Europe 350 Carbon Efficient Select Low Volatility:  Addition of Liquidity Buffer Rule	08/10/2018	--	For current index constituents, the minimum three-month average daily value traded (ADVT) is as follows: <ul style="list-style-type: none"> <li>• S&amp;P Emerging Markets Low Volatility Select: US\$ 6 million</li> <li>• S&amp;P Nordic Low Volatility: US\$ 1.2 million</li> <li>• S&amp;P Southern Europe Low Volatility: EUR 4 million</li> <li>• S&amp;P Europe 350 Carbon Efficient Select Low Volatility: EUR 5.6 million</li> </ul>
S&P South Africa Low Volatility:  Change of Index Eligibility Liquidity Measure	08/10/2018	Three-month average daily value traded (3M ADVT) of ZAR 10 million.	Six-month median daily value traded (6M MDVT) of ZAR 10 million (ZAR 8 million for current constituents).
S&P South Africa Low Volatility:  Addition of Selection Buffer for Current Constituents	08/10/2018	--	A 20% buffer rule based on realized volatility is applied to the security selection process at each rebalancing

<sup>6</sup> The investor perspective is the viewpoint of the investor relative to the index and component securities.

Change	Effective Date (After Close)	Previous	Methodology Updated
S&P Korea Low Volatility: Addition of Liquidity Buffer Rule	10/20/2017	--	For current index constituents, the minimum three-month average daily value traded (ADVT) is KRW 800 million.
Dual Listed Companies	06/19/2017	--	Some companies may have more than one listing in the respective benchmark index. In the S&P Low Volatility Indices, each company is represented once by the primary listing, which is generally the most liquid listing.
S&P Developed Asia Low Volatility: Addition of Liquidity Buffer Rule	12/18/2015	--	For current index constituents, the minimum three-month average daily value traded (ADVT) is US\$ 2.5 million.
Treatment of Spin-offs	09/30/2015	Spin-offs are generally not added to the indices and there is no weight change to the parent stock. The price of the parent company is adjusted to the Price of the Parent Company minus (the Price of the Spun-off Company/Share Exchange Ratio). Index shares change so that the company's weight remains the same as its weight before the spin-off. There is no index divisor change.  However, when the price of the spin-off is not known, the spun-off company is added to the index at a zero price. Once the spun-off company trades, the company is dropped from the index and the parent's index shares are adjusted so that the company's weight remains the same as the combined weight of parent and the spin-off, determined on the first day of trading.	The spun-off company is added to all the indices of which the parent is a constituent, at a zero price at the market close of the day before the ex-date (with no divisor adjustment). The spun-off company is removed after at least one day of regular way trading (with a divisor adjustment).
Holiday Schedule	06/23/2015	With the exception of the S&P Pan Asia Low Volatility Index, the S&P Low Volatility Indices are calculated daily, throughout the calendar year. The only days the indices are not calculated are on days when <u>all</u> exchanges where the S&P Low Volatility Indices' constituents are listed are officially closed.  The S&P Pan Asia Low Volatility Index is not calculated on any index calculation day when stocks representing 10% or more of the total weight of the underlying index are not trading due to an exchange holiday. Similarly, the Risk Control indices based on S&P Pan Asia Low Volatility Indices are not calculated on any index calculation day when stocks representing 10% or more of the total weight of the underlying index are not trading due to an exchange holiday. These days are determined at each annual index rebalancing.	The S&P Low Volatility Indices are calculated daily, throughout the calendar year. The only days the indices are not calculated are on days when <u>all</u> exchanges where the S&P Low Volatility Indices' constituents are listed are officially closed.  The Risk Control indices based on the S&P Pan Asia Low Volatility Index are not rebalanced on any index calculation day when stocks representing 15% or more of the total weight of the underlying index are not trading due to an exchange holiday. These days are determined at each annual index rebalancing.

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