

**S&P 500 Quality, Value &
Momentum Multi-factor Index**
Methodology

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Introduction

Highlights

The S&P 500 Quality, Value & Momentum Multi-factor Index is designed to measure the performance of 100 stocks within the S&P 500 that are characterized as having the top combination of quality, value, and momentum as determined by a multifactor score detailed in *Index Construction*.

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.

Eligibility Criteria

Index Eligibility

To qualify for index membership, a stock must first, on the rebalancing reference date, be a member of the S&P 500.

For information on the S&P 500, including index eligibility criteria, please refer to the S&P U.S. Indices Methodology available at www.spdji.com.

Eligibility Factors

Multiple Share Classes. Some companies may have more than one share class line in the S&P 500. In the S&P 500 Quality, Value & Momentum Multi-factor Index, each company is represented once by the most liquid share line, which is generally the company's primary listing.

Index Construction

Approaches

There are two steps in the creation of the index. The first is the selection of the index constituents; the second is the weighting of the constituents within the index.

Constituent Selection

The selection of index constituents is done as follows:

1. Quality, value, and momentum z-scores are computed for each of the stocks that satisfy the criteria as detailed in the *Eligibility Criteria*.

For more information on the calculation of the quality, value, and momentum z-scores, please refer to the S&P Quality Indices, S&P Enhanced Value Indices, and S&P Momentum Indices Methodologies, respectively. These documents are available at www.spdji.com.

2. For each set of z-scores (quality, value, and momentum), percentile scores are calculated as follows:¹

$$P_i = \frac{R_i}{N+1}$$

where:

P_i = Constituent percentile score

R_i = Constituent fractional rank

N = Number of constituents

Note that constituents with stronger underlying z-scores are given higher percentile scores.

3. Each set of percentile scores is then transformed into a new set of z-scores (Z') using the inverse of the normal cumulative distribution function with a mean of 0 and a standard deviation of 1.
4. An overall multifactor z-score ($Z'_{i_{MF}}$) is calculated for each constituent by taking the average of the underlying quality, value, and momentum z-scores which have been derived from the percentile scores.

$$Z'_{i_{MF}} = (Z'_{i_Q} + Z'_{i_V} + Z'_{i_M})/3$$

where:

$Z'_{i_{MF}}$ = Constituent multifactor z-score

Z'_{i_Q} = Constituent quality z-score

Z'_{i_V} = Constituent value z-score

Z'_{i_M} = Constituent momentum z-score

5. Finally, a multifactor score (S_i) is calculated as follows:

$$\text{If } Z'_{i_{MF}} > 0, S_i = 1 + Z'_{i_{MF}}$$

¹ Note that the quality and value z-scores used to calculate percentiles are average z-scores (i.e. non-winsorized) according to the *S&P Quality Indices* and *S&P Enhanced Value Indices Methodologies*, respectively. With respect to momentum, z-scores are not based on an average as this score is derived from one underlying factor. The momentum z-score is non-winsorized.

$$\text{If } Z'_{i_{MF}} < 0, S_i = 1/(1 - Z'_{i_{MF}})$$

$$\text{If } Z'_{i_{MF}} = 0, S_i = 1$$

If there are no data for the computation of one of the underlying z-scores then that stock is excluded from the final index composition. The 100 stocks with the highest multifactor scores are selected and form the index.

Buffer Rule

A 20% buffer is applied to stocks already in the index in order to reduce portfolio turnover and is implemented as follows:

1. Stocks are ranked based on their final multifactor scores and those ranked within the top 80% of the target stock count are automatically chosen for index inclusion.
2. Stocks which are current constituents that fall within the top 120% of the target stock count are then chosen for index inclusion in order of their final multifactor score.
3. If at this point the target stock count has still not been met, the remaining stocks are chosen based on their multifactor score.

S&P Dow Jones Indices believes turnover in index membership should be avoided when possible. At times a company may appear to temporarily violate one or more of the addition criteria. However, the addition criteria are for addition to an index, not for continued membership. As a result, an index constituent that appears to violate criteria for addition to that index will not be deleted unless ongoing conditions warrant an index change.

Constituent Weightings

For a given rebalance, all the securities eligible for inclusion in the S&P 500 Quality, Value & Momentum Multi-factor Index are weighted by the product of their market capitalization in the S&P 500 and their multifactor score subject to security and sector constraints. This is done by using an optimization procedure such that the maximum weight of each security is the lower of 5% and 20 times its market capitalization weight in the S&P 500 and the maximum weight of any given Global industry Classification Standard (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 multifactor weights (pre-optimization weights).

Where the optimization procedure fails for a given period, the constraints are relaxed in the following order: the maximum weight of the security and then the maximum weight of the sector.

Index Calculations

The index is calculated by means of the divisor methodology used in most S&P Dow Jones Indices equity indices.

For more information on the index calculation methodology, please refer to the Modified Market Capitalization Weighted Indices section of S&P Dow Jones Indices' Index Mathematics Methodology available at www.spdji.com.

Index Maintenance

Rebalancing

The index is rebalanced semi-annually, effective after the close on the third Friday of June and December. The fundamental data reference date is five weeks prior to the rebalancing date. As part of the rebalancing process, constituent stock weights are updated. The rebalancing reference dates are the last business day of May and November, respectively. Weights calculated as a result of the reference date data are implemented in the index using closing prices as of the Wednesday prior to the second Friday of June and December.

Additions and Deletions

Additions. Except for spin-offs, no additions are made to the index between rebalancings.

Deletions. Index constituents removed from the S&P 500 are removed from the S&P 500 Quality, Value & Momentum Multi-factor Index simultaneously.

Corporate Actions

Corporate Action	Adjustment Made to the Index	Divisor Adjustment?
Spin-off	The spun-off company is added to the index at a zero price and is dropped from the index after the first day of regular way trading provided the drop event has been announced at least two days prior to the drop date. <i>For further information, please refer to the Treatment of Spin-offs in S&P Dow Jones Indices' Equity Indices Policies & Practices document.</i>	
Rights Offering	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
Stock Split	Index shares are multiplied by and the price is divided by the split factor.	No
Share Issuance or Share Repurchase	None. Actual shares outstanding of the company play no role in the daily index calculation.	No
Special Dividends	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
Delisting, acquisition or any other corporate action resulting in the deletion of the stock from the S&P 500.	The stock is dropped from the index. This causes the weights of the rest of the stocks in the index to change proportionately. Additions are made to the index only at the semi-annual rebalancings.	Yes

For more information on Corporate Actions, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices document located on our Web site, www.spdji.com.

Investable Weight Factor (IWF)

All issues in the S&P 500 Quality, Value & Momentum Multi-factor Index are assigned a float factor, called an Investable Weight Factor (IWF). The IWF ranges between 0 and 1 and is an adjustment factor that accounts for the publicly available shares of a company.

Please refer to S&P Dow Jones Indices' Float Adjustment Methodology for details.

Other Adjustments

In cases where there is no achievable market price for a stock being deleted, it may be removed at a zero or minimal price at the Index Committee's discretion, in recognition of the constraints faced by investors in trading bankrupt or suspended stocks.

Currency of Calculation

The index is calculated in U.S. dollars, Canadian dollars, British pounds, and euros.

Exchange Rate

WM/Reuters foreign exchange rates are taken daily at 04:00 PM London time and used in the calculation of the non-U.S. dollar versions of the index. These mid-market fixings are calculated by the WM Company based on Reuters' data and appear on Reuters pages WMRA.

Base Date and History Availability

The index history availability, base date and base value are shown in the table below.

Index	Launch Date	First Value Date	Base Date	Base Value
S&P 500 Quality, Value & Momentum Multi-factor Index	01/30/2017	12/16/1994	12/16/1994	1000

Index Data

Total Return Indices

The index has a total return counterpart, which assumes dividends are reinvested in the index after the close on the ex-date.

S&P Dow Jones Indices calculates daily return series using both gross and net cash dividends reinvested. Net return reinvested is reflective of the return to an investor where dividends are reinvested after the deduction of withholding tax. The tax rate applied is the rate to non-resident institutions that do not benefit from double taxation treaties.

For more information on the tax rates used in the calculation of net return indices, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices document located on our Web site, www.spdji.com.

Please refer to the S&P Dow Jones Indices' Index Mathematics Methodology for more information on total return calculations.

Index Governance

Index Committee

The index is maintained by S&P Dow Jones Indices' Global Benchmarks Index Committee. All committee members are full-time professional members of S&P Dow Jones Indices' staff. The Committee meets monthly. At each meeting, the Committee reviews pending corporate actions that may affect index constituents, statistics comparing the composition of the index to the market, companies that are being considered as candidates for addition to the 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.

For information on Quality Assurance and Internal Reviews of Methodology, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices document located on our Web site, www.spdji.com.

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 via ftp to all clients. Any unusual treatment of a corporate action or short notice of an event may be communicated via email to clients.

Index methodology is constantly under review for best practices, and any changes are announced well ahead of time via the Web site and email to all clients.

For more information, please refer to the Announcements section of S&P Dow Jones Indices' Equity Indices Policies & Practices document located on our Web site, www.spdji.com.

Pro-forma Files

In addition to the corporate events file (.SDE), S&P Dow Jones Indices provides constituent pro-forma files each time the index rebalances. The pro-forma file is typically provided daily in advance of the rebalancing date and contains all constituents and their corresponding weights and index shares effective for the upcoming rebalancing. Since index shares are assigned based on prices prior to the rebalancing, the actual weight of each stock at the rebalancing differs from these weights due to market movements.

Please visit www.spdji.com for a complete schedule of rebalancing timelines and pro-forma delivery times.

Holiday Schedule

The index is calculated daily, throughout the calendar year, when the U.S. equity markets are open.

A complete holiday schedule for the year is available on S&P Dow Jones Indices' Web site at www.spdji.com.

Unexpected Exchange Closures

For information on Unexpected Exchange Closures, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices document located on our Web site, www.spdji.com.

Recalculation Policy

For information on the recalculation policy, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices document located on our Web site, www.spdji.com.

Real-Time Calculation

Real-time, intra-day, index calculations are executed for the U.S. dollar and British pound versions of the index, whenever the index's primary exchanges are open. Real-time indices are not restated.

For information on Calculations and Pricing Disruptions, Expert Judgment and Data Hierarchy, please refer to S&P Dow Jones Indices' Equity Indices Policies & Practices document located on our Web site, www.spdji.com.

Index Dissemination

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

Tickers

Index (Currency)	Return Type	Bloomberg	Reuters
S&P 500 Quality, Value & Momentum Multi-factor Index (USD)	Price Return	SPXQVMUP	
	Total Return	SPXQVMUT	
	Net Total Return	SPXQVMUN	.SPXQVMUN
S&P 500 Quality, Value & Momentum Multi-factor Index (CAD)	Price Return	SPXQVMCP	
	Total Return	SPXQVMCT	
	Net Total Return	SPXQVMCN	
S&P 500 Quality, Value & Momentum Multi-factor Index (GBP)	Price Return	SPXQVMGP	
	Total Return	SPXQVMGT	
	Net Total Return	SPXQVMGN	
S&P 500 Quality, Value & Momentum Multi-factor Index (EUR)	Price Return	SPXQVMGP	
	Total Return	SPXQVMET	
	Net Total Return	SPXQVMEN	

FTP

Daily stock level and index data are available via FTP subscription.

For product information, please contact S&P Dow Jones Indices, www.spdji.com/contact-us.

Web Site

For further information, please refer to S&P Dow Jones Indices' Web site at www.spdji.com.

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