

**S&P Dow Jones
Indices**

A Division of **S&P Global**

Dow Jones Relative Risk Indices *Methodology*

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Introduction

Index Objective, Highlights, and Index Family

The Dow Jones Relative Risk Indices measure the performance of weighted return indices that consist of varying allocations to equity, fixed income, and cash component indices to represent a respective level of relative risk. The index family includes global and U.S. indices for five risk profiles—aggressive, moderately aggressive, moderate, moderately conservative, and conservative. These profiles are defined based on incremental levels of potential risk relative to the risk of an all-stock index.

Index	% of All-Stock Portfolio Risk
Global Series:	
Dow Jones Aggressive Portfolio Index	100%
Dow Jones Moderately Aggressive Portfolio Index	80%
Dow Jones Moderate Portfolio Index	60%
Dow Jones Moderately Conservative Portfolio Index	40%
Dow Jones Conservative Portfolio Index	20%
U.S. Series:	
Dow Jones Aggressive U.S. Portfolio Index	100%
Dow Jones Moderately Aggressive U.S. Portfolio Index	80%
Dow Jones Moderate U.S. Portfolio Index	60%
Dow Jones Moderately Conservative U.S. Portfolio Index	40%
Dow Jones Conservative U.S. Portfolio Index	20%

Each Dow Jones Relative Risk Index is made up of composite indices representing the three major asset classes: stocks, bonds, and cash. The asset class indices are weighted differently within each relative risk index to achieve the targeted risk level. The weightings are rebalanced monthly to maintain these levels.

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	Equity Indices Policies & Practices
S&P Dow Jones Indices' Index Mathematics Methodology	Index Mathematics Methodology
S&P Dow Jones Indices' Fixed Income Policies & Practices Methodology	Fixed Income Policies & Practices
S&P Dow Jones Indices' Fixed Income Index Mathematics Methodology	Fixed Income Index Mathematics Methodology

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.

Index Construction

Index Composition

Each Dow Jones Relative Risk Index tracks three Composite Major Asset Classes (CMACs)—stocks, bonds, and cash. The CMACs are represented by equal-weighted sub-asset class component indices listed below. All stock, bond, and cash (T-Bill) sub-indices are products of S&P Dow Jones Indices.

Global Series	U.S. Series
<i>Dow Jones Global Stock CMAC Index</i>	<i>Dow Jones U.S. Stock CMAC Index</i>
Dow Jones U.S. Large-Cap Growth Index	Dow Jones U.S. Large-Cap Growth Index
Dow Jones U.S. Large-Cap Value Index	Dow Jones U.S. Large-Cap Value Index
Dow Jones U.S. Mid-Cap Growth Index	Dow Jones U.S. Mid-Cap Growth Index
Dow Jones U.S. Mid-Cap Value Index	Dow Jones U.S. Mid-Cap Value Index
Dow Jones U.S. Small-Cap Growth Index	Dow Jones U.S. Small-Cap Growth Index
Dow Jones U.S. Small-Cap Value Index	Dow Jones U.S. Small-Cap Value Index
Dow Jones Europe/Canada/Middle East Developed Markets Index	
Dow Jones Asia/Pacific Developed Markets Index	
S&P Emerging LargeMidCap Index	
<i>S&P Bond Composite – Global Index</i>	<i>S&P Bond Composite – U.S. Index</i>
S&P U.S. Government Bond Index	S&P U.S. Government Bond Index
S&P U.S. Dollar Global Investment Grade Corporate Bond Index	S&P U.S. Dollar Global Investment Grade Corporate Bond Index
S&P U.S. Mortgage-Backed Securities Index	S&P U.S. Mortgage-Backed Securities Index
S&P Global Developed Sovereign Ex-U.S. Bond Index	
<i>S&P Cash Composite – Global Index</i>	<i>S&P Cash Composite – U.S. Index</i>
S&P U.S. Treasury Bill 0-3 Month Index	S&P U.S. Treasury Bill 0-3 Month Index

For information on the underlying component indices, please refer to their respective index methodologies available at www.spglobal.com/spdji/.

Index Calculations

Index returns are calculated daily. Each index return is equal to the sum of the weighted returns of its components.

Determining CMAC Allocations

Within each index, the three CMACs are re-weighted each month to reflect a risk profile that is set at the start of the month based on the current risk level of the stock CMAC. Risk is calculated based on historic rolling 36-month below-mean semi-variance of monthly returns.

- The risk level of the Dow Jones Aggressive Portfolio Index is set monthly to 100% of the current risk of the stock CMAC. The three CMACs are re-weighted within the index to maximize the allocation to the CMAC with the greatest expected return at the 100% risk level.
- The risk levels of the Dow Jones Moderately Aggressive, Moderate, Moderately Conservative, and Conservative Portfolio Indices are assigned based on the efficient frontier, as shown below. For example, the Dow Jones Moderately Aggressive Portfolio Index is designed to reflect 80% of the risk of the stock CMAC.

Targeted % of Stock CMAC Risk Reflected in Index	
Global Series:	
Dow Jones Aggressive Portfolio Index	100%
Dow Jones Moderately Aggressive Portfolio Index	80%
Dow Jones Moderate Portfolio Index	60%
Dow Jones Moderately Conservative Portfolio Index	40%
Dow Jones Conservative Portfolio Index	20%
U.S. Series:	
Dow Jones Aggressive U.S. Portfolio Index	100%
Dow Jones Moderately Aggressive U.S. Portfolio Index	80%
Dow Jones Moderate U.S. Portfolio Index	60%
Dow Jones Moderately Conservative U.S. Portfolio Index	40%
Dow Jones Conservative U.S. Portfolio Index	20%

Once the risk level of the index has been determined each month, the three CMACs are re-weighted within the index to maximize the allocation to the CMAC with the greatest expected return at that risk level. To prevent the complete exclusion of any asset class, the weighting of each CMAC is not allowed to drop below 5% in any index.

Application of Modern Portfolio Theory Principles

An assumption underlies the Dow Jones Relative Risk Indices: The primary goal of any portfolio is to maximize return for the amount of risk incurred. To incorporate this premise into the index construction process, the Dow Jones Relative Risk Indices utilize an optimization algorithm to derive CMAC allocations.

In Modern Portfolio Theory (MPT) optimization, the optimal allocation depends on three aspects of the returns being optimized: historical risk, expected return, and historical covariance of returns. The optimization program seeks allocations that maximize expected return for a given portfolio risk based on below-average historical risk, as well as historical covariance.

The Optimization Process

The model attempts to maximize returns for given levels of risk. Running the optimization process with a given portfolio risk means that the individual risk and portfolio covariance leads to a set of allocations that historically produced the particular portfolio risk. The optimal return of this portfolio, therefore, is a function of the weighted expected returns of the CMACs:

$$R_{ab} = X_a R_a + X_b R_b + X_c R_c$$

where:

R_{ab} = Index Expected Return

R_a = Expected Return Cash CMAC

R_b = Expected Return Bond CMAC

R_c = Expected Return Stock CMAC

X_a = Allocation to Cash CMAC

X_b = Allocation to Bond CMAC

X_c = Allocation to Stock CMAC

The Dow Jones Relative Risk Indices use expected returns of 6% for the stock CMAC, 3% for the bond CMAC, and 1% for the cash equivalent CMAC as inputs to the optimization calculation. The model is constrained to a minimum allocation of 5% for any of the three CMACs (in all but the Dow Jones Aggressive Portfolio Index). These minimums can, in certain cases, affect the allocations of the optimal portfolio.

Additional Constraints and Rules Affecting CMAC Allocations

Dow Jones Risk Indices' risk levels are defined by the risk allocation mentioned above. Optimization is used to tilt allocations around the targeted risk level to enhance risk management.

The Dow Jones Relative Risk Indices impose two additional rules on the optimized allocations:

1. Each Relative Risk Index's equity exposure must fall within plus or minus 5% of its targeted level of equity risk.
 - a. To implement Rule 1, if an index's optimized equity allocation falls within plus or minus 5%, no adjustment is made. If an index's equity allocation falls outside the plus or minus 5% range, an adjustment is made, as follows:
 - i. **Equity Allocation Exceeds Acceptable Ceiling.** If the equity allocation exceeds the targeted equity risk by more than 5%, the equity allocation is lowered to equal the targeted equity risk plus 5%. Bond exposure is increased by an amount equal to the reduction in equity. In other words, any reduction in equity is offset by an increase in bonds.
 - ii. **Equity Allocation below Acceptable Floor.** If the equity allocation falls below the targeted equity risk by more than 5%, the equity allocation is increased to equal the target equity risk minus 5%. The cash allocation is lowered to offset the increase in equity exposure. Once the minimum cash allocation has been reached, a reduction in the bond allocation is implemented.
2. The month-to-month allocation changes for both the equity and bond asset classes are limited to 3%.
 - a. If optimized stock or bond allocations move more than 3% from the end-of-prior-month allocations, the stock and bond allocations are limited to a 3% change with the cash allocation changing to accommodate a 100% allocation over the combined three asset classes.

Interaction of Rule 1 and Rule 2. If the optimized stock allocations move to an amount outside the 5% risk bands, Rule 1 takes precedence and the final stock allocation for the month is set at the upper or lower limit as necessary. The bond allocation is then set based on Rule 1 unless this causes a violation of Rule 2 which then automatically limits the change in the bond allocation to within 3% of the previous month's bond allocation. The cash allocation makes up the remaining allocation after Rules 1 and 2 are applied.

If neither Rule 1 nor 2 is triggered, then the allocations are set as indicated by the optimizer.

Sub-Index Weights within each CMAC. Each sub-index is equally weighted within each CMAC.

Index Maintenance

Rebalancing

The indices are rebalanced monthly after the close of the last index calculation day of each month. The new CMAC allocation will take effect on the first index calculation day of the following month.

Currency of Calculation and Additional Index Return Series

The indices calculate in U.S. dollars.

In addition to the indices detailed in this methodology, additional return series versions of the indices may be available, including, but not limited to: 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 index calculation, 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/.

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
Dow Jones Relative Risk Indices	07/01/2003	12/31/1982	12/31/1982	100

Index Governance

Index Committee

An S&P Dow Jones Indices Index Committee maintains the indices. All Committee members are full-time professional members of S&P Dow Jones Indices' staff. The Committee meets regularly.

The Committee may revise index policy covering rules for including other component indices, currencies, the timing of rebalancing, 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

Index data is evaluated daily. Anything affecting the daily index calculation is announced to clients via an index announcement.

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

Holiday Schedule

The global series is calculated daily, Sunday through Friday. The U.S. series is calculated daily Monday through Friday. The U.S. series is not calculated on U.S. market holidays.

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

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 questions regarding an index, please contact: index_services@spglobal.com.

Index Dissemination

Index levels are available through S&P Dow Jones Indices' Web site at 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 [S&P DJI Methodology & Regulatory Status Database](#) for a complete list of indices covered by this document.

Index	BBG	RIC
Global Series:		
Dow Jones Global Stock CMAC Index	DJSCMAC	.DJSCMAC
Dow Jones Aggressive Index	P100GLB	.P100GLB
Dow Jones Moderately Aggressive Index	P80GLB	.P80GLB
Dow Jones Moderate Index	P60GLB	.P60GLB
Dow Jones Moderately Conservative Index	P40GLB	.P40GLB
Dow Jones Conservative Index	P20GLB	.P20GLB
U.S. Series:		
Dow Jones U.S. Stock CMAC Index	DJUSCMAC	.DJUSCMAC
Dow Jones U.S. Aggressive Index	P100US	.P100US
Dow Jones U.S. Moderately Aggressive Index	P80US	.P80US
Dow Jones U.S. Moderate Index	P60US	.P60US
Dow Jones U.S. Moderately Conservative Index	P40US	.P40US
Dow Jones U.S. Conservative Index	P20US	.P20US

Index Data

Daily index levels and data are available via subscription.

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

Web site

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

Appendix I

Methodology Changes

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

Change	Effective Date (After Close)	Previous	Methodology Updated
Fixed Income Component Indices	12/31/2017	<ul style="list-style-type: none"> • Barclays Government Bond Index • Barclays Corporate Bond Index • Barclays Mortgage Bond Index • Barclays Majors (ex U.S.) Index • Barclays 1-3 month T-bill index 	<ul style="list-style-type: none"> • S&P U.S. Government Bond Index • S&P U.S. Dollar Global Investment Grade Corporate Bond Index • S&P U.S. Mortgage-Backed Securities Index • Global Developed Sovereign Ex-U.S. Bond Index • S&P U.S. Treasury Bill 0-3 Month Index
Equity Component Index	07/31/2017	<ul style="list-style-type: none"> • Dow Jones Emerging Markets Large-Cap Total Stock Market Specialty Index 	<ul style="list-style-type: none"> • S&P Emerging LargeMidCap Index

Appendix II

ESG Disclosures

EXPLANATION OF HOW ENVIRONMENTAL, SOCIAL & GOVERNANCE (ESG) FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY¹	
1.	Name of the benchmark administrator. S&P Dow Jones Indices LLC.
2.	Underlying asset class of the ESG benchmark.² N/A
3.	Name of the S&P Dow Jones Indices benchmark or family of benchmarks. S&P DJI Multi-Asset Indices Benchmark Statement
4.	Do any of the indices maintained by this methodology take into account ESG factors? No
Appendix latest update: January 2021	
Appendix first publication: January 2021	

¹ The information contained in this Appendix is intended to meet the requirements of the European Union Commission Delegated Regulation (EU) 2020/1817 supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards the minimum content of the explanation of how environmental, social and governance factors are reflected in the benchmark methodology and the retained EU law in the UK [The Benchmarks (amendment and Transitional Provision) (EU Exit) Regulations 2019].

² The 'underlying assets' are defined in European Union Commission Delegated Regulation (EU) 2020/1816 supplementing Regulation (EU) 2016/1011 of the European Parliament and of the Council as regards the explanation in the benchmark statement of how environmental, social and governance factors are reflected in each benchmark provided and published.

Disclaimer

Performance Disclosure/Back-Tested Data

Where applicable, S&P Dow Jones Indices and its index-related affiliates (“S&P DJI”) defines various dates to assist our clients by providing transparency. The First Value Date is the first day for which there is a calculated value (either live or back-tested) for a given index. The Base Date is the date at which the index is set to a fixed value for calculation purposes. The Launch Date designates the date when the values of an index are first considered live: index values provided for any date or time period prior to the index’s Launch Date are considered back-tested. S&P DJI defines the Launch Date as the date by which the values of an index are known to have been released to the public, for example via the company’s public website or its data feed to external parties. For Dow Jones-branded indices introduced prior to May 31, 2013, the Launch Date (which prior to May 31, 2013, was termed “Date of introduction”) is set at a date upon which no further changes were permitted to be made to the index methodology, but that may have been prior to the Index’s public release date.

Please refer to the methodology for the Index for more details about the index, including the manner in which it is rebalanced, the timing of such rebalancing, criteria for additions and deletions, as well as all index calculations.

Information presented prior to an index’s launch date is hypothetical back-tested performance, not actual performance, and is based on the index methodology in effect on the launch date. However, when creating back-tested history for periods of market anomalies or other periods that do not reflect the general current market environment, index methodology rules may be relaxed to capture a large enough universe of securities to simulate the target market the index is designed to measure or strategy the index is designed to capture. For example, market capitalization and liquidity thresholds may be reduced. In addition, forks have not been factored into the back-test data with respect to the S&P Cryptocurrency Indices. For the S&P Cryptocurrency Top 5 & 10 Equal Weight Indices, the custody element of the methodology was not considered; the back-test history is based on the index constituents that meet the custody element as of the Launch Date. Also, the treatment of corporate actions in back-tested performance may differ from treatment for live indices due to limitations in replicating index management decisions. Back-tested performance reflects application of an index methodology and selection of index constituents with the benefit of hindsight and knowledge of factors that may have positively affected its performance, cannot account for all financial risk that may affect results and may be considered to reflect survivor/look ahead bias. Actual returns may differ significantly from, and be lower than, back-tested returns. Past performance is not an indication or guarantee of future results.

Typically, when S&P DJI creates back-tested index data, S&P DJI uses actual historical constituent-level data (e.g., historical price, market capitalization, and corporate action data) in its calculations. As ESG investing is still in early stages of development, certain datapoints used to calculate certain ESG indices may not be available for the entire desired period of back-tested history. The same data availability issue could be true for other indices as well. In cases when actual data is not available for all relevant historical periods, S&P DJI may employ a process of using “Backward Data Assumption” (or pulling back) of ESG data for the calculation of back-tested historical performance. “Backward Data Assumption” is a process that applies the earliest actual live data point available for an index constituent company to all prior historical instances in the index performance. For example, Backward Data Assumption inherently assumes that companies currently not involved in a specific business activity (also known as “product involvement”) were never involved historically and similarly also assumes that companies currently involved in a specific business activity were involved historically too. The Backward Data Assumption allows the hypothetical back-test to be extended over more historical years than would be feasible using only actual data. For more information on “Backward Data Assumption” please refer to the FAQ. The methodology and factsheets of any index that employs backward assumption in the back-tested history

will explicitly state so. The methodology will include an Appendix with a table setting forth the specific data points and relevant time period for which backward projected data was used. Index returns shown do not represent the results of actual trading of investable assets/securities. S&P DJI maintains the index and calculates the index levels and performance shown or discussed but does not manage any 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 investment funds that are intended to track the performance of the Index. The imposition of these fees and charges would cause actual and back-tested performance of the securities/fund to be lower than the Index performance shown. As a simple example, if an index returned 10% on a US \$100,000 investment for a 12-month period (or US \$10,000) and an actual asset-based fee of 1.5% was imposed at the end of the period on the investment plus accrued interest (or US \$1,650), the net return would be 8.35% (or US \$8,350) for the year. Over a three-year period, an annual 1.5% fee taken at year end with an assumed 10% return per year would result in a cumulative gross return of 33.10%, a total fee of US \$5,375, and a cumulative net return of 27.2% (or US \$27,200).

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In addition, S&P Dow Jones Indices provides a wide range of services to, or relating to, many organizations, including issuers of securities, investment advisers, broker-dealers, investment banks, other financial institutions, and financial intermediaries, and accordingly may receive fees or other economic benefits from those organizations, including organizations whose securities or services they may recommend, rate, include in model portfolios, evaluate, or otherwise address.

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