

S&P GIVI Indices *Methodology*

March 2024

Table of Contents

Introduction	4
Index Objective	4
Highlights	4
Supporting Documents	4
Index Construction	5
Index Universe	5
Index Maintenance	6
Index Calculations	6
Rebalancing	6
Additions and Deletions	6
Corporate Actions	7
Other Adjustments	7
Currency of Calculation and Additional Index Return Series	7
Index Data	8
Calculation Return Types	8
S&P GIVI Sub-Indices	9
S&P GIVI GDP Weighted Index Series	9
S&P GIVI Global Growth Markets Tilt Index Series	9
S&P Intrinsic Value Weighted Indices	10
S&P Low Beta Indices	11
S&P GIVI Shariah Index	12
S&P GIVI South Africa Indices	13
Index Governance	14
Index Committee	14
Index Policy	15
Announcements	15
Pro-forma Files	15
Holiday Schedule	15
Rebalancing	15
Unexpected Exchange Closures	15
Recalculation Policy	15
Contact Information	15

Index Dissemination	16
Tickers	16
Index Data	17
Web site	17
Appendix I	18
Beta Calculation	18
Appendix II	22
Intrinsic Value Calculation	22
Appendix III	27
Methodology Changes	27
Disclaimer	28
Performance Disclosure/Back-Tested Data	28
Intellectual Property Notices/Disclaimer	29
ESG Indices Disclaimer	31

Introduction

Index Objective

The S&P GIVI (Global Intrinsic Value Index) Indices measure the performance of strategies utilizing specific measures of risk and intrinsic value to select and weight constituents as detailed in *Index Construction* and other sections. Constituents are generally weighted by their derived intrinsic value, with exceptions noted in *S&P GIVI Sub-Indices* and *S&P Low Beta Indices*. Details of the intrinsic value calculation are in *Appendix II*. The indices are subsets of the S&P Global BMI (the “Index Universe”), excluding China A Shares.

For more information on the S&P Global BMI, please refer to the *S&P Global BMI, S&P/IFCI Methodology* at www.spglobal.com/spdji.

Highlights

The S&P Global BMI is divided into three size-based sub-indices: large-cap (the top 70% by weight), mid-cap (the next 15%), and small-cap (the bottom 15% weight). The S&P GIVI follows the size classification of the S&P Global BMI.

Country, region, and currency versions of the index series are also available. For more information, please refer to the *S&P Global BMI Methodology*.

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' Float Adjustment Methodology	Float Adjustment Methodology
S&P Dow Jones Indices' Global Industry Classification Standard (GICS) Methodology	GICS 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 Universe

The S&P GIVI is constructed from the S&P Global BMI, excluding China A Shares. Companies with negative or zero intrinsic values are not eligible for the S&P GIVI Indices.

Intrinsic Value Weights. Each stock in the S&P GIVI is weighted by its derived intrinsic value. The intrinsic value of each stock is determined by its book value and its discounted projected earnings. The discount rate is calculated using a stock's beta, derived from the stock's previous five years of price returns, a risk-free interest rate, and an assumed global static equity risk premium of 3.5%. The intrinsic value of each stock is updated twice a year at the March and September rebalancings.

Please refer to Appendix II for details of the intrinsic value (IV) calculation.

Cap on Intrinsic Value Weights. A stock's weight is capped if its intrinsic value weight is above its S&P Global BMI float-adjusted market cap weight by a specific upper bound. The bound for a stock is set as the minimum of:

- a. its float-adjusted market cap weight + $\frac{1}{2\sqrt{N}}$, where N is the number of stocks in the country's IV index, or
- b. three (3) times its float-adjusted market cap weight.

Note that the capping algorithm redistributes the excess weight to other stocks in the index in proportion to their original intrinsic value weight. Capping of the IV weights occurs twice a year on the IV index rebalancing date.

Low Risk Stock Selection. The risk of each stock in the S&P BMI universe is measured by the regional market beta of the stock, where beta is calculated as defined in *Appendix I*. For each country, stocks are sorted by their betas and 70% of the universe with the lowest betas is selected. The 70% selection is measured by float-adjusted market capitalization. The resulting stocks form the S&P GIVI.

Buffer Rule for Index Constituents' Beta. A 5% buffer is applied to stocks already in the index. For a constituent to be removed from the index during a rebalancing, it must be among the highest 25% of float-adjusted weights when ranked by beta. This 5% buffer reduces index turnover.

Index Maintenance

Index Calculations

The indices calculate using the divisor methodology used in all S&P Dow Jones equity indices.

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

Each company's primary share listing is used to calculate index levels. Some index constituents use ADRs, GDRs or foreign ordinary shares if the common stock in their local market is illiquid. Pricing for these issues is based on the ADR, GDR or foreign ordinary share in the listing market's currency. In cases of multiple foreign listings, the issue with the majority of the trading volume is used. All Chinese A-shares are excluded from the S&P GIVI Indices. However, any non-domestic listed Chinese shares included in the S&P Global BMI index family are eligible for inclusion in the corresponding S&P GIVI indices. Any changes to pricing sources are announced with as much notice as is reasonably possible.

Rebalancing

The indices rebalance twice a year after the close on the fourth Friday of March and September. In years where the first business week of September consists of all five weekdays (Monday – Friday), the indices will rebalance on the third Friday of September. The S&P GIVI South Africa Indices rebalance twice a year after the close on the third Friday of March and September. The fundamental data reference date, used for beta and to obtain financial statement inputs to the intrinsic value model, is six weeks prior to the rebalancing date. The rebalancing reference date, used to calculate intrinsic value with additional inputs including float-adjusted market capitalization and to determine constituent weights, is the last trading day of the month prior to the rebalancing month. The reference universe, shares outstanding, and IWFs are as of the rebalancing effective date.

Additions and Deletions

Constituents removed from an underlying headline universe index are also removed from the respective S&P GIVI Indices simultaneously.

Initial Public Offerings. IPO additions to the index take place semi-annually on the rebalancing dates. To be considered eligible for inclusion to the S&P GIVI, an IPO must first meet the requirements of the S&P Global BMI.

If the stock has fewer than six months of history or fewer than 100 valid daily observations, its beta is defaulted to one (1). Stock inclusion in the S&P GIVI is still subject to the Low Risk Stock Selection 70% rule as defined in the *Index Construction* section. For the IPO, all other ratios required for calculation of the S&P GIVI defaults to its regional sector average until there is sufficient information to calculate the company specific IV weight.

Spin-Offs. The spin-off company is added to all 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). If a spin-off company is determined not to be eligible to remain in the index, it will be removed after at least one day of regular way trading (with a divisor adjustment). Spin-off eligibility is determined by index universe eligibility; all spin-offs that are eligible for inclusion within the index universe will remain in the S&P GIVI.

The IV weight of the original stock is allocated to the parent and spin-off based on the ratio of their float-adjusted market cap weights.

Upon rebalancing, if the spin-off is kept in the S&P GIVI, the IV weights and beta are calculated as if spin-offs are IPOs and follow the rules of IPOs above.

For further information, please refer to the Treatment of Spin-offs in Non-Market Capitalization Weighted section of the S&P Dow Jones Indices' Equity Indices Policies & Practices Methodology.

Mergers and Acquisitions. If two constituents of the S&P GIVI merge, the combined company remains in the index at least through the next rebalancing, when it is reviewed. The merged company carries the combined IV weights if the acquisition is a stock transaction or stock and cash transaction. The weighting of the acquiring company increases by the terms of the offer, and the weight adjustment is applied on the effective date of the acquisition. The exception occurs when a constituent is acquired by a non-constituent; the constituent is removed from the index on the merger ex-date and the weight is redistributed proportionately across the index.

Corporate Actions

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

Other Adjustments

Large-Mid-Small Size Classification. The GIVI Global indices follows the size classification of the S&P Global BMI. During the semi-annual review, the size classification changes from the S&P Global BMI are effective with the GIVI Global rebalance effective date.

Country Classification. The GIVI Global indices follow the country classification from the S&P Global BMI. During the semi-annual review, the country classification changes from the S&P Global BMI are effective with the GIVI Global rebalancing effective date.

Country of Domicile. The GIVI Global indices follow the country of domicile from the S&P Global BMI. During the semi-annual review, the country of domicile changes from the S&P Global BMI are effective with the GIVI Global rebalancing effective date.

Currency of Calculation and Additional Index Return Series

The indices are calculated in seven currencies: U.S. dollars, Euros, British pounds, Japanese Yen, Canadian dollars, Australian dollars, and Domestic Currency Return (DCR).

WMR 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 WMR based on LSEG data and appear on LSEG pages.

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 various index calculations, 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.

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.

S&P GIVI Sub-Indices

The S&P GIVI indices include a Global GDP Weighted version as well as a Global hybrid of both the IV & GDP Weighted GIVI versions.

S&P GIVI GDP Weighted Index Series

The S&P GDP Weighted GIVI Indices apply alternate country weights derived from their gross domestic product (GDP). Country weights are reset during the semi-annual index rebalancing to reflect the relative gross domestic products for each country, as reported by the International Monetary Fund (IMF).

The IMF's World Economic Outlook (WEO) database contains selected macroeconomic data series from the statistical appendix of the [World Economic Outlook report](#), which presents the IMF staff's analysis and projections of economic developments at the global level, in major country groups and in many individual countries. The WEO is released in April and September/October each year. At each rebalancing, the latest available WEO report, as of the rebalancing reference date, is used.

During each rebalancing, the GDP values are priced in current U.S. dollars for each country from the latest available WEO report. The GDP values are based upon GDP in each country's national currency and the exchange rate projections provided by country economists for the group of other emerging market and developing countries. Exchange rates for advanced economies are established in the WEO assumptions for each WEO exercise. To smooth out annual abnormal changes in the GDP values, a three-year rolling average of the reported GDP values is used and multiplied by the country's intrinsic value weight to calculate GIVI GDP weights.

S&P GIVI Global Growth Markets Tilt Index Series

The S&P GIVI Global Growth Markets Tilt Index is a composite of the base GIVI indices and the GIVI GDP weighted indices. At each rebalancing, each country's Growth Markets Tilt weight is 50% of the original GIVI country weight, and 50% of the GDP weight.

S&P Intrinsic Value Weighted Indices

The S&P Intrinsic Value Weighted Indices are constructed from the S&P Global BMI. Companies with negative or zero intrinsic values are not eligible for the S&P Intrinsic Value Weighted Indices.

The S&P Intrinsic Value Weighted Indices utilize the same intrinsic value weighting methodology as the S&P Global Intrinsic Value Indices but do not include the low risk stock selection mechanism that is used in the S&P GIVI Indices.

The corporate action treatment for the S&P Intrinsic Value Weighted Indices mirrors that of the S&P GIVI Indices. Thus, divisors and constituent weights do not change for corporate actions except for deletions and special dividends.

S&P Low Beta Indices

The S&P Low Beta Indices are constructed from the S&P Global BMI. Companies with negative or zero intrinsic values are eligible for the S&P Low Beta Indices.

The S&P Low Beta Indices utilize the same low risk stock selection rules as the S&P Global Intrinsic Value Indices but are weighted by float-adjusted market cap rather than by intrinsic value.

The S&P Low Beta Indices are weighed based on float-adjusted market capitalization, using the same share and IWF data used to calculate the S&P BMI. However, the corporate action treatment for the S&P Low Beta Indices mirrors that of the S&P GIVI Indices. Thus, divisors and constituent weights do not change for corporate actions except for deletions and special dividends.

S&P GIVI Shariah Index

The S&P GIVI Shariah Indices apply Shariah screens to the stocks in the S&P GIVI Indices. Shariah screenings are provided by Ratings Intelligence Partners (RI) and are performed monthly due to changes in compliance, resulting in additions and deletions to the index. These updates are made on the third Friday of the month. The monthly additions to the S&P GIVI Shariah Index are entered into the index with the weight factors from the underlying S&P GIVI index.

There are currently four Shariah compliant regional indices and one country index:

- S&P GIVI Developed Shariah Index
- S&P GIVI Emerging Shariah Index
- S&P GIVI Europe Shariah Index
- S&P GIVI Pan Asia ex Japan Shariah Index
- S&P GIVI United States Shariah Index

The history begins on November 30, 2007, with a base value of 100.

For more information, please refer to the S&P Shariah Indices Methodology at www.spglobal.com/spdji.

S&P GIVI South Africa Indices

S&P GIVI South Africa Composite

The S&P GIVI South Africa Composite index applies the standard GIVI methodology to a universe defined by the S&P South Africa Composite. The S&P South Africa Composite is a market capitalization weighted index designed to measure the South African equity market performance. The index covers equities listed on the Johannesburg Stock Exchange with float-adjusted market values of US\$ 100 million and meet two median daily value traded liquidity measures. The history for the S&P GIVI South Africa Composite begins on March 23, 2009, with a base value of 1000.

In addition to the S&P GIVI South Africa Composite, S&P Dow Jones Indices also calculates Low Beta and Intrinsic Value Weighted versions of the S&P South Africa Composite applying the methodologies described in S&P Low Beta Indices and S&P Intrinsic Value Weighted Indices, respectively.

For more information on the S&P South Africa Composite, please refer to the S&P South Africa Composite Indices Methodology at www.spglobal.com/spdji.

S&P GIVI South Africa Top 50

The S&P GIVI South Africa Top 50 is a subset of the S&P GIVI South Africa Composite. The index represents the 50 companies within the S&P GIVI South Africa Composite with the largest intrinsic value, subject to the following eligibility constraints:

- Companies must have a minimum float-adjusted market capitalization of at least ZAR 10 billion.
- Companies must have a minimum average daily value traded of ZAR 15 million.
- Preferred stocks are not eligible for index inclusion.

The index is weighted by intrinsic value. The maximum weight of each company in the index is capped at 10%. If at any given rebalancing there are less than 50 eligible companies, the minimum float-adjusted market capitalization and minimum average daily value traded eligibility constraints will be reduced by 5% at a time until at least 50 companies are eligible for the index.

Index Governance

Index Committee

An S&P Dow Jones Indices Index Committee maintains the S&P GIVI Indices. All members of the Committee are full time employees of S&P Dow Jones Indices. The Committee meets regularly. It is the responsibility of the Committee to decide all matters relating to methodology, maintenance, constituent selection and index procedures. Committee decisions are based on publicly available information no confidential or non-public information is available to the Index Committee.

The Committee is separate from and independent of other analytical groups at S&P Global. In particular, the Index Committee has no access to any information or decisions by S&P Global's ratings analysts or S&P Capital IQ equity analysts.

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 additions, deletions, and other events affecting index calculation are typically pre-announced in advance via the Index Corporate Actions 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.

Pro-forma Files

In addition to the corporate actions report (.SDE), S&P Dow Jones Indices provides constituent pro-forma files for each index 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. Since index shares are assigned based on prices prior to the rebalancing, the actual weight of each stock at the rebalancing will differ from these weights due to market movements.

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

Holiday Schedule

The S&P GIVI is calculated on all business days of the year. S&P Dow Jones Indices publishes a holiday calendar during the fourth quarter of each year.

The S&P GIVI South Africa Top 50 follows exchange holidays.

A complete holiday schedule for the year is available at 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 questions regarding an index, please contact: index_services@spglobal.com.

Index Dissemination

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 (USD)	Price Return	BBG Tickers	
		Total Return	Net Total Return
S&P GIVI Global Index	SPVGLUP	SPVGLUT	SPVGLUN
S&P GIVI Developed Index	SPVRWDUP	SPVRWDUT	SPVRWDUN
S&P GIVI Developed Ex. U.S. Index	SPVRWUUP	SPVRWUUT	SPVRWUUN
S&P GIVI Emerging Index	SPVREMUP	SPVREMUT	SPVREMUN
S&P GIVI Emerging Asia Pacific Index	SPVRAEUP	SPVRAEUT	SPVRAEUN
S&P GIVI Europe Index	SPVREUUP	SPVREUUT	SPVREUUN
S&P GIVI GDP Weighted Index	SPVGDPUP	SPVGDPUT	SPVGDPUN
S&P GIVI Global Growth Markets Tilt Index	SPVGMTUP	SPVGMTUT	SPVGMTUN
S&P GIVI Japan Index	SPVJPUP	SPVJPUT	SPVJPUN
S&P GIVI Pan Asia Ex. Japan, Australia & New Zealand Index	SPVRP3UP	SPVRP3UT	SPVRP3UN
S&P GIVI United Kingdom Index	SPVGBUP	SPVGBUT	SPVGBUN
S&P GIVI United States Index	SPVUSUP	SPVUSUT	SPVUSUN
<i>South Africa Indices:</i>			
S&P GIVI South Africa Composite	SPVSAUP	SPVSAUT	SPVSAUN
S&P GIVI South Africa Top 50	SPVSA5ZP	SPVSA5ZT	SPVSA5ZN
S&P GIVI South Africa Financials	SPVSAFZP	SPVSAFZT	SPVSAFZN
S&P GIVI South Africa Resources	SPVSARZP	SPVSARZT	SPVSARZN
S&P GIVI South Africa Industrials	SPVSAIZP	SPVSAIZT	SPVSAIZN
<i>Shariah Indices:</i>			
S&P GIVI Developed Shariah Index	SHGVWDUP	SHGVWDUT	SHGVWDUN
S&P GIVI Emerging Shariah Index	SHGVEMUP	SHGVEMUT	SHGVEMUN
S&P GIVI Europe Shariah Index	SHGVEUUP	SHGVEUUT	SHGVEUUN
S&P GIVI Pan Asia Ex. Japan Shariah Index	SHGVPJUP	SHGVPJUT	SHGVPJUN
S&P GIVI United States Shariah Index	SHGVUSUP	SHGVUSUT	SHGVUSUN
S&P GIVI Developed Ex. U.S. & South Korea Shariah Index	SPGSXKUP	SPGSXKUT	SPGSXKUN
<i>Low Beta Indices:</i>			
S&P Low Beta Global Index	SPBGLUP	SPBGLUT	SPBGLUN
S&P Low Beta Developed Index	SPBRWDUP	SPBRWDUT	SPBRWDUN
S&P Low Beta Developed Ex. U.S. Index	SPBRWUUP	SPBRWUUT	SPBRWUUN
S&P Low Beta Emerging Index	SPBREMUP	SPBREMUT	SPBREMUN
S&P Low Beta Emerging Asia Pacific Index	SPBRAEUP	SPBRAEUT	SPBRAEUN
S&P Low Beta Europe Index	SPBREUUP	SPBREUUT	SPBREUUN
S&P Low Beta Japan Index	SPBCJPUP	SPBCJPUT	SPBCJPUN
S&P Low Beta Pan Asia Ex. Japan, Australia & New Zealand Index	SPBRP3UP	SPBRP3UT	SPBRP3UN
S&P Low Beta United Kingdom Index	SPBCGBUP	SPBCGBUT	SPBCGBUN
S&P Low Beta United States Index	SPBCUSUP	SPBCUSUT	SPBCUSUN
<i>Intrinsic Value Weighted Indices:</i>			
S&P Intrinsic Value Weighted Global Index	SPIGLUP	SPIGLUT	SPIGLUN
S&P Intrinsic Value Weighted Developed Index	SPIRWDUP	SPIRWDUT	SPIRWDUN
S&P Intrinsic Value Weighted Developed Ex. U.S. Index	SPIRWUUP	SPIRWUUT	SPIRWUUN
S&P Intrinsic Value Weighted Emerging Index	SPIREMUP	SPIREMUT	SPIREMUN
S&P Intrinsic Value Weighted Emerging Asia Pacific Index	SPIRAEUP	SPIRAEUT	SPIRAEUN
S&P Intrinsic Value Weighted Europe Index	SPIREUUP	SPIREUUT	SPIREUUN
S&P Intrinsic Value Weighted Japan Index	SPICJPUP	SPICJPUT	SPICJPUN
S&P Intrinsic Value Weighted Pan Asia Ex. Japan, Australia & New Zealand Index	SPIRP3UP	SPIRP3UT	SPIRP3UN
S&P Intrinsic Value Weighted United Kingdom Index	SPICGBUP	SPICGBUT	SPICGBUN
S&P Intrinsic Value Weighted United States Index	SPICUSUP	SPICUSUT	SPICUSUN

Index Data

Daily constituent and index level data are available via subscription.

Web site

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

Appendix I

Beta Calculation

Beta is used in two ways in the S&P GIVI methodology: 1) to determine the discount rate used to compute intrinsic value, and 2) to sort stocks into risk stratified sub-indices.

A few key characteristics of beta calculations are the following:

Reference index:	Unhedged S&P Global BMI regional indices
Frequency of return data:	Daily
Estimation window / half-life:	Five-year (5) estimation window, two-and-one-half-year (2 ½) half-life.
Non-synchronous returns:	Scholes-Williams approach.
Estimation bias handling:	Shrink towards 1.0 using the Vasicek approach (i.e., shrink based on each beta's standard error).
Extreme beta estimates:	Winsorize at 0.5 and 2.0.

In short, on each of the rebalancing reference dates, up to five years of daily returns are used to compute Scholes-Williams betas with exponential weights and Vasicek shrinkage through the most recent fundamental reference date.

Regions

The following six S&P BMI regional indices are used as references in beta calculations:

- North America
- EMEA Developed
- EMEA Emerging
- Latin America
- Asia-Pacific Developed
- Asia-Pacific Emerging

South Africa

The S&P GIVI South Africa Composite uses the S&P South Africa Composite index in beta calculations.

Non-trading Days

Non-trading days are business days where a company's stock return is missing, but the relevant index is calculated. If a stock has a non-trading day, the day is excluded from the beta calculation and the stock's return for the following day is adjusted to be a multi-day return. Multi-day returns are used for up to five days. If a stock does not trade for more than five consecutive days, the non-trading days are excluded from the beta calculation, as is the first day trading resumes.

Required Observations

Companies with fewer than six months of history or fewer than 100 valid daily observations (including multi-day returns) are assigned a beta of one (1).

Return Calculations

The steps required to compute stock price and index returns for beta calculations are as follows.

1. Use five (5) years of closing price history for both the stock and its relative index, in US\$.
2. In rare cases when a daily stock price is available, but the related index value is not, this day's observation is excluded from the beta calculation.
3. Compute the stock return as follows:

$$\text{StockReturn} = \frac{\text{ClosePrice} - \text{PreviousDayClosePrice}}{\text{PreviousDayClosePrice}}$$

4. Compute the index return as follows:

$$\text{IndexReturn} = \frac{\text{IndexValue} - \text{PreviousDayIndexValue}}{\text{PreviousDayIndexValue}}$$

5. These stock and index returns are used for the beta calculations.

Exceptions Handling

1. In some cases, a stock may have the same price for two consecutive days and the price return is 0.0%. This is a valid scenario and this observation, and the corresponding index return is used for the beta calculation.
2. If a stock's closing price is reported to S&P Dow Jones Indices as US\$ 0.00 or a null value, it is excluded from the return calculation, as is its corresponding index value.
3. If a stock does not trade for more than five consecutive days, the non-trading days are excluded from the beta calculation, as is the first day trading resumes.
4. Standard beta calculations are for a five-year time period, but beta values will be calculated if a stock does not have five years of closing values.
5. However, if the stock has fewer than six months of history or fewer than 100 valid daily observations its beta is defaulted to one (1).

Exponential Weighting

The calculation of beta places more weight on recent observations, with exponential decay and a half-life of 2.5 years.

Exponential weights are based on a stock's trading days. W_d is the weight on day d , where d ranges from 1 to D , the total number of valid stock returns in the estimation window. D can be up to five years (1,260 observations) if closing prices are available. Day d is measured from the fundamental reference date, where $d = 1$ means the data point is one trading day away from the fundamental reference date, and $d = D$ means the data point is 1,260 trading days away from the fundamental reference date.

$$W_d = 2^{-d/\lambda}$$

where $\lambda = 630$ days is the half-life of the decay for all stocks.

Scholes-Williams Beta

In the formulae for beta estimation for stock i below, the subscript t refers to daily observations used in the estimation, where t ranges from 1 to T , the total number of observations used (after removing dates with missing stock returns).

$$Stk_{i,t} = \log(1 + \text{return of stock } i \text{ on day } t);$$

$$Ind_t = \log(1 + \text{return of index on day } t);$$

$$Ind3_t = Ind_{t-1} + Ind_t + Ind_{t+1} = \text{the three-day return on the index}$$

The Scholes-Williams Beta is the ratio of two regression coefficients:

$$\beta_{sw,i} = \frac{Cov(Stk_{i,t}, Ind3_t) / Var(Ind3_t)}{Cov(Ind_t, Ind3_t) / Var(Ind3_t)}$$

The variances $Var()$ and covariances $Cov()$ are computed using stocks returns and index returns, weighted by the exponential weight W_t .

Vasicek Shrinkage

Betas are shrunk towards one (1) based on the standard error of the estimates.

First, for each stock i , Scholes-Williams betas are estimated, and one-day betas are also estimated using a linear regression with exponential weights.

$$Stk_{i,t} = \alpha_i + \beta_i Ind_t + U_{SW,i,t}$$

Scholes-Williams residuals are:

$$U_{SW,i,t} = Stk_{i,t} - \alpha_i - \beta_i Ind_t$$

The volatility of the residuals is calculated as:

$$W_h = \text{exponential weight for observation } h$$

$$\sigma_{e,i}^2 = \text{decay-weighted variance of Scholes-Williams residuals}$$

$$\sigma_{e,i}^2 = \frac{1}{(N-2)} \sum_{h=1}^N u_{SW,i,N-h}^2 w_h^2$$

where N is the total number of observations. (When there are no missing returns in the observation window, $N = D = 1,260$.)

Autocorrelation terms and the Index variance are as follows:

$$\rho_i = \text{correlation}(Stk_{i,t}, Stk_{i,t-1})$$

$$\rho_{ind} = \text{correlation}(Ind_i, Ind_{3i})$$

$$\sigma_{Ind}^2 = \text{variance}(Ind)$$

Scholes-Williams standard error is given by:

$$\sigma_{SW,i} = \frac{\sigma_{e,i} \sqrt{1 + 2\rho_{ind} + 2\rho_i}}{\sigma_{ind} \rho_{ind} \sqrt{N}}$$

Scholes-Williams betas with Vasicek shrinkage are:¹

$$k_i = 1 - \frac{\sigma_{SW,i}^2}{\sigma_{SW,i}^2 + \text{Cross sectional Dispersion of } \beta_{SW,i}}$$

$$\beta_{SW,i}^{vasicek} = k_i * \beta_{SW,i} + (1 - k_i)$$

¹ Assumes universe beta of 1.

Appendix II

Intrinsic Value Calculation

The estimates of intrinsic value (IV) are used to determine index weights. Extreme estimates of intrinsic value (both absolute and relative to float-adjusted market capitalization) are not trimmed. However, the intrinsic value weight of a stock is capped according to a formula discussed later in the section.

Using the residual income model (RIM), let V_0 denote the estimate of intrinsic value for stock j (subscript omitted) as of the beginning of the current fiscal year (the fiscal year corresponding to the estimate, FY1):

$$V_0 = B_0 + \frac{(\rho_1 - r)B_0}{(1+r)^{1/2}} + \sum_{t=2}^{21} \frac{(\rho_t - r)B_{t-1}}{(1+r)^{t-1/2}} \quad (1)$$

where:

- V_0 = Intrinsic value at the end of fiscal year $t = 0$ at the beginning of FY1
- B_t = Book value of common equity at the end of year t
- ρ_t = Return on equity (ROE) during year t (details below)
- r = Discount rate/cost of capital (a ratio assumed constant for all periods t as of a given valuation date)
- t = 21 is the number of years for which abnormal earnings are nonzero: $\rho_t \neq r$. In the model it is assumed there are no abnormal earnings after 21 years.

B_0 is for the fiscal year or quarter that is closest to the beginning of the current year (as defined by FY1). For example, if FY1 corresponds to calendar year 2010, then book value is measured as of December 2009 (or September 2009 if the company has not yet released its December 2009 financial statements).

The following expression (clean surplus relation) is used to compute the book value of common equity over time:

$$B_t = B_{t-1} + (1 - k^b) \rho_t B_{t-1}, \quad \text{for } t = 1, 2, 3, \dots \quad (2)$$

Where k^b is the dividend payout ratio and ρ_t is the forecasted return on equity (ROE) for year t (both defined below).

Estimates of ROE are updated at each index rebalancing date using the most recent estimates for the next two fiscal years (FY1 and FY2).

The discount rate r for each stock j on valuation date t is computed using the following expression:

$$r = r_f + \beta * ERP$$

where r_f is the risk-free rate, β is the beta for stock j (described in Appendix I), and ERP is the equity risk premium.

The risk-free rate is updated at each index rebalancing and differs across regions. It is the yield on intermediate-term government bonds for stock j 's region (see below). The ERP is a global constant taken to be 3.5% at all index rebalancings in all regions.

Risk-free Rate

The S&P GIVI uses country or region-specific measures of the risk-free rate. The following table lists the corresponding yield used as the risk-free rate for each country or region. For a country or region where a benchmark bond yield is not available, the risk-free rate is determined by the simple average of all available rates in the list, with the removal of the highest and lowest rate.

Country/Region	Risk Free Rate Used
Australia	Australia Govt Bonds Generic Yield 10 Year
Austria	Austria Govt Bonds 10 Year
Belgium	Belgium Govt Bonds 10 Year Note, Belgium BB
Canada	Canadian Govt Bonds 10 Year Note
Denmark	Denmark Government Bonds 10 Year Note Generic Bid Yield
Finland	Finland Government Bond Generic 10 Year
France	France Govt Oats Btan 10 Year Oat
Germany	German Government Bonds 10 Year Dbr
Greece	Greece Govt Bond 10 Year Acting as Benchmark
Hong Kong	HKMA Hong Kong Exchange Fund Notes 10 Year
Ireland	Ireland Government Bonds 10 Year Note Generic Bid Yield
Israel	ILS Israel Sovereign (IYC 325) Zero Coupon Yield 10 Year
Italy	Italy Govt Bonds 10 Year Note Generic Bid Net Yield
Japan	Japan Govt Bond Year to maturity 10 Year Simple Yield
Kuwait	Average of all countries in GIVI Global
Luxembourg	Euro Generic Govt Bond 10 Year
Netherlands	Netherlands Governments 10 Year Bond NA
New Zealand	New Zealand Govt Bond 10 Year
Norway	Norway Government Bonds 10 Year Norway NO
Portugal	Portuguese Govt Bonds 10 Year Note Portugal PL
Saudi Arabia	Average of all countries in GIVI Global
Singapore	Monetary Authority of Singapore Benchmark Govt Bond Yield 10 Year
South Korea	Korea Securities Dealers Association South Korea Treasury Bond 10 Year
Spain	Spanish Govt Generic Bonds - 10 Year Note
Sweden	Swedish Govt Bond 10 Year Note
Switzerland	Switzerland Govt Bonds 10 Year Note Generic Bid Yield
UK	UK Govt Bonds 10 Year Note Generic Bid Yield
US	US Generic Govt 10 Year Yield
Brazil	Brazil Government Generic Bond 5 Year
China	China Govt Bond Generic Bid Yield 10 Year
Colombia	Colombia Government Generic Bond 10 Year Yield
Czech Republic	Czech Republic Governments Bonds 10 Year Note Generic Bid Yield
Egypt	Egyptian 10 Year Treasury Bill
Hungary	GDMA Hungarian Govt Bond 10 Year
India	India Govt Bond Generic Bid Yield 10 Year
Indonesia	Indonesia Govt Bond Generic Bid Yield 10 Year
Malaysia	Malaysia Govt Bonds 10 Year Yield
Mexico	Mexico Generic 10 Year
Pakistan	Pakistan Revaluation for 10 Year Govt Investment Bond
Peru	Peru Government Generic 9 Year Yield
Philippines	PDEX PDST-F Fixing 10 Year
Poland	Poland Government 10 Year Note Generic Bid Yield
Qatar	Average of all countries in GIVI Global
Russia	Russia Government Bonds 9 Year Generic Bid Yield
South Africa	South Africa Govt Bonds 10 Year Note Generic Bid Yield
Taiwan	Taiwan Govt Note Generic Bid Yield 10 Year
Thailand	Thailand Govt Bond 10 Year Note
Turkey	Turkish Government Bond 10 Year T+0 Simple Yield
UAE	Average of all countries in GIVI Global

Dividend Payout Ratio

Let H denote the number of years during the past five years for which dividend and earnings data are available.

Let k^r denote the raw five-year (or H -year) earnings-weighted mean dividend payout ratio for stock j (stock subscript omitted):

$$k^r = (D_{-4} + D_{-3} + D_{-2} + D_{-1} + D_0) / (E_{-4} + E_{-3} + E_{-2} + E_{-1} + E_0)$$

Let k^w denote the dividend payout ratio winsorized at 0.0 and 1.0. Please note, if k^r lies between the two k^w extremes, then $k^w = k^r$, otherwise k^w is assigned the cap of 1.0 or floor of 0.0.

If the sum of earnings over the past five years is zero or negative, and the sum of dividends are positive, then the dividend payout ratio defaults to 1.0. If the sum of earnings and dividends are both 0, then the ratio is defaulted to 0.0.

Let ND^{rs} denote the number of stocks in stock j 's region-sector for which k^w is available, and let k^{rs} denote the equal-weighted region-sector mean of k^w .

Let k^{gs} denote the equal-weighted global-sector mean of k^w .

Let k^s denote the sector mean dividend payout ratio for stock j , defined as:

$$k^s = (\min\{ND^{rs}, 50\}/50) * k^{rs} + (1 - \min\{ND^{rs}, 50\}/50) * k^{gs}$$

Finally, let k^b denote the blended dividend payout ratio for stock j :

$$k^b = (H/10) * k^w + (1 - H/10) * k^s$$

The blended dividend payout ratio k^b is a measure of the dividend payout ratio k used in the book value calculation (equation 2) above and ROE calculations below.

Return on Equity

Let $ROE1^r$ and $ROE2^r$ denote raw forecasts of return on equity (ROE) based on mean annual analyst earnings forecasts for FY1 and FY2:

$$ROE1^r = Nshrs_{FY1} * E_{FY1} / B_0$$

$$ROE2^r = (Nshrs_{FY2} * E_{FY2}) / (B_0 + (1 - k^b) * Nshrs_{FY1} * E_{FY1})$$

where $Nshrs_{FY1}$ and $Nshrs_{FY2}$ are the number of shares outstanding, E_{FY1} and E_{FY2} are earnings-per-share forecasts that are corresponding to FY1 and FY2, B_0 is the book value of common equity at the end of year 0 (the beginning of the year corresponding to FY1), and k^b is the dividend payout ratio defined above.

Let $ROE1^w$ and $ROE2^w$ denote the winsorized values of $ROE1^r$ and $ROE2^r$, where the lower and upper bounds are -0.25 and 0.5. Please note, if either ROE^r lies between the two ROE^w extremes, then $ROE^w = ROE^r$, otherwise ROE^w it is assigned the cap of 0.5 or floor of -0.25.

Let $NR1^{rs}$ and $NR2^{rs}$ denote the numbers of stocks in the region-sector of stock j for which $ROE1^w$ and $ROE2^w$ are available, and let $ROE1^{rs}$ and $ROE2^{rs}$ denote the equal-weighted region-sector means of $ROE1^w$ and $ROE2^w$.

Let $ROE1^{gs}$ and $ROE2^{gs}$ denote the equal-weighted global-sector means of $ROE1^w$ and $ROE2^w$.

Let $ROE1^s$ ($ROE2^s$) denote the sector mean ROE for stock j , defined to be the following combination of $ROE1^{rs}$ ($ROE2^{rs}$) and $ROE1^{gs}$ ($ROE2^{gs}$):

$$ROE1^s = (\min\{NR1^{rs}, 50\}/50) * ROE1^{rs} + (1 - \min\{NR1^{rs}, 50\}/50) * ROE1^{gs}$$

$$ROE2^s = (\min\{NR2^{rs}, 50\}/50) * ROE2^{rs} + (1 - \min\{NR2^{rs}, 50\}/50) * ROE2^{gs}$$

Finally, let $ROE1^b$ and $ROE2^b$ denote the 50-50 blended ROEs for stock j :

$$ROE1^b = \frac{1}{2} ROE1^w + \frac{1}{2} ROE1^s$$

$$ROE2^b = \frac{1}{2} ROE2^w + \frac{1}{2} ROE2^s$$

If $ROE1^w$ or $ROE2^w$ is missing, $ROE1^b$ and $ROE2^b$ become $ROE1^s$ and $ROE2^s$ (their sector averages) respectively.

If a company has multiple share classes, each share class uses the same company-level earnings-per-share estimate. If the company level earnings estimate is not available but share-class level estimates are available, then the per-share estimate from the share-class with the largest market capitalization is used as the company-level per-share estimate. If neither the company level nor the share-class level earnings estimate is available, then the regional and sector average detailed above is used.

For equation (1) above, the estimates of ROE for stock j appearing in the residual income model (RIM), ρ_t , decays towards the stock's discount rate r as follows:

$$\rho_t = \begin{cases} ROE1^b & \text{for } t = 1 \\ \delta_t ROE2^b + (1 - \delta_t) r & \text{for } t = 2, 3 \dots 21, \\ r & \text{for } t \geq 22 \end{cases}$$

The multipliers δ_t take on the values in the following table:

Year	Multiplier
2	1.0000
3	0.9205
4	0.8456
5	0.7748
6	0.7079
7	0.6446
8	0.5848
9	0.5281
10	0.4743
11	0.4234
12	0.3750
13	0.3290
14	0.2853
15	0.2436
16	0.2039
17	0.1661
18	0.1299
19	0.0953
20	0.0622
21	0.0304

The multipliers are based on a combination of an exponential decay with a 10-year half-life and a 20-year linear decay (to ensure the multiplier converges to 0.0 in year 22).

IV Weight Calculation Details

The IV weights on each individual stock in the index are calculated as follows:

1. **For each country in the S&P GIVI, remove the most volatile stocks while retaining 70% of the country's float-adjusted market capitalization (MCAP).**
 - a. For each country, first consider all index constituents as of the rebalancing day.
 - b. Sort the stocks in descending order of IVs (null values on top).
 - c. All stocks for which the IV is either unavailable or less than or equal to 0 are removed.
 - d. If the remaining MCAP is more than 70% of the original MCAP, list the remaining stocks in descending order of beta.
 - e. Remove the stocks with the highest beta until, but no lower than, 70% of the original MCAP is reached. (For example: assuming the next stock has a 3% country index weight and the remaining MCAP is 72%, this stock is not removed, as the MCAP will fall to 69% of the original.)
2. **Compute the IV weight for all the stocks in the S&P GIVI.**

For any index stock i its weight is calculated as follows:

$$StockIVWeight_i = \frac{IVvalue_i * IWF_i}{\sum_{j=1}^N IVvalue_j * IWF_j}$$

where:

$StockIVWeight_i$ = Weight of stock i in the index, as of the index rebalancing date.

$IVvalue_j$ = Intrinsic value of stock j as of the index rebalancing reference date, as calculated in equation (1)

IWF_j = Investable Weight Factor of stock j .

N = Number of stocks in the index.

For information on Investable Weight Factors (IWFs) please refer to S&P Dow Jones Indices' Index Mathematics Methodology.

3. Multiple share classes

If a company is represented by multiple share classes in the index, then the IV weight of each share class is calculated based on the stock's beta and the company's earnings forecasts, with the company book value allocated to each share class according to the ratio of their respective float-adjusted market-cap weights. For Chinese companies with off-shore listings, only the proportion of total capitalization represented by the offshore listing(s) is used in the determination of the IV weight.

4. Capping of the IV weights

A stock's weight is capped if its intrinsic value weight is above its Global BMI float-adjusted market cap weight by a specific upper bound. The bound for a stock is set as the minimum of:

- a. its float-adjusted market cap weight + $\frac{1}{2\sqrt{N}}$, where N is the number of stocks in the country's IV index, or
- b. three (3) times its float-adjusted market cap weight.

Note that the capping algorithm redistributes the excess weight to other stocks in the index in proportion to their original intrinsic value weight. Capping of the IV weights occurs twice a year on the IV index rebalancing date. The excess weight redistribution is limited by the maximum weight limit outlined in points a) and b).

Appendix III

Methodology Changes

Methodology changes since September 29, 2017, are as follows:

Change	Effective Date (After Close)	Methodology	
		Previous	Updated
Rebalancing Schedule: All Indices Except S&P GIVI South Africa Indices	09/25/2020	The indices rebalance twice a year after the close of the fourth Friday of March and third Friday of September. The fundamental data reference date, used for beta and to obtain financial statement inputs to the intrinsic value model, is six weeks prior to the rebalancing date. The rebalancing reference date, used to calculate intrinsic value with additional inputs including float-adjusted market capitalization and to determine constituent weights, is the last trading day of the month prior to the rebalancing month.	The indices rebalance twice a year after the close of the fourth Friday of March and September. In years where the first business week of September consists of all five weekdays (Monday-Friday), the indices will rebalance on the third Friday of September. The fundamental data reference date, used for beta and to obtain financial statement inputs to the intrinsic value model, is six weeks prior to the rebalancing date. The rebalancing reference date, used to calculate intrinsic value with additional inputs including float-adjusted market capitalization and to determine constituent weights, is the last trading day of the month prior to the rebalancing month.

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).

Intellectual Property Notices/Disclaimer

© 2024 S&P Dow Jones Indices. All rights reserved. S&P, S&P 500, SPX, SPY, The 500, US500, US 30, S&P 100, S&P COMPOSITE 1500, S&P 400, S&P MIDCAP 400, S&P 600, S&P SMALLCAP 600, S&P GIVI, GLOBAL TITANS, DIVIDEND ARISTOCRATS, Select Sector, S&P MAESTRO, S&P PRISM, S&P STRIDE, GICS, SPIVA, SPDR, INDEXOLOGY, iTraxx, iBoxx, ABX, ADBI, CDX, CMBX, MBX, MCDX, PRIMEX, HHPI, and SOVX are registered trademarks of S&P Global, Inc. (“S&P Global”) or its affiliates. DOW JONES, DJIA, THE DOW and DOW JONES INDUSTRIAL AVERAGE are trademarks of Dow Jones Trademark Holdings LLC (“Dow Jones”). These trademarks together with others have been licensed to S&P Dow Jones Indices LLC. Redistribution or reproduction in whole or in part are prohibited without written permission of S&P Dow Jones Indices LLC. This document does not constitute an offer of services in jurisdictions where S&P DJI does not have the necessary licenses. Except for certain custom index calculation services, all information provided by S&P DJI is impersonal and not tailored to the needs of any person, entity, or group of persons. S&P DJI receives compensation in connection with licensing its indices to third parties and providing custom calculation services. Past performance of an index is not an indication or guarantee of future results.

It is not possible to invest directly in an index. Exposure to an asset class represented by an index may be available through investable instruments based on that index. S&P DJI does not sponsor, endorse, sell, promote or manage any investment fund or other investment vehicle that is offered by third parties and that seeks to provide an investment return based on the performance of any index. S&P DJI makes no assurance that investment products based on the index will accurately track index performance or provide positive investment returns. S&P DJI is not an investment advisor, commodity trading advisor, fiduciary, “promoter” (as defined in the Investment Company Act of 1940, as amended) or “expert” as enumerated within 15 U.S.C. § 77k(a), and S&P DJI makes no representation regarding the advisability of investing in any such investment fund or other investment vehicle. A decision to invest in any such investment fund or other investment vehicle should not be made in reliance on any of the statements set forth in this document. S&P DJI is not a tax advisor. Inclusion of a security, commodity, crypto currency, or other asset within an index is not a recommendation by S&P DJI to buy, sell, or hold such security, commodity, crypto currency, or other asset, nor is it considered to be investment or trading advice.

These materials have been prepared solely for informational purposes based upon information generally available to the public and from sources believed to be reliable. No content contained in these materials (including index data, ratings, credit-related analyses and data, research, valuations, model, software or other application or output therefrom) or any part thereof (“Content”) may be modified, reverse engineered, reproduced, or distributed in any form or by any means, or stored in a database or retrieval system, without the prior written permission of S&P DJI. The Content shall not be used for any unlawful or unauthorized purposes. S&P DJI and its third-party data providers and licensors (collectively “S&P Dow Jones Indices Parties”) do not guarantee the accuracy, completeness, timeliness, or availability of the Content. S&P Dow Jones Indices Parties are not responsible for any errors or omissions, regardless of the cause, for the results obtained from the use of the Content. THE CONTENT IS PROVIDED ON AN “AS IS” “WHERE IS” BASIS. S&P DOW JONES INDICES PARTIES DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, FREEDOM FROM BUGS, SOFTWARE ERRORS OR DEFECTS, THAT THE CONTENT’S FUNCTIONING WILL BE UNINTERRUPTED OR THAT THE CONTENT WILL OPERATE WITH ANY SOFTWARE OR

HARDWARE CONFIGURATION. In no event shall S&P Dow Jones Indices Parties be liable to any party for any direct, indirect, incidental, exemplary, compensatory, punitive, special, or consequential damages, costs, expenses, legal fees, or losses (including, without limitation, lost income or lost profits and opportunity costs) in connection with any use of the Content even if advised of the possibility of such damages.

Credit-related information and other analyses, including ratings, research and valuations are generally provided by licensors and/or affiliates of S&P Dow Jones Indices, including but not limited to S&P Global's other divisions such as S&P Global Market Intelligence. Any credit-related information and other related analyses and statements in the Content are statements of opinion as of the date they are expressed and not statements of fact. Any opinion, analyses and rating acknowledgement decisions are not recommendations to purchase, hold, or sell any securities or to make any investment decisions, and do not address the suitability of any security. S&P Dow Jones Indices does not assume any obligation to update the Content following publication in any form or format. The Content should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. S&P DJI does not act as a fiduciary or an investment advisor. While S&P DJI has obtained information from sources it believes to be reliable, S&P DJI does not perform an audit or undertake independent verification of any information it receives. S&P DJI reserves the right to vary or discontinue any index at any time for regulatory or other reasons. Various factors, including external factors beyond S&P DJI's control might necessitate material changes to indices.

To the extent that regulatory authorities allow a rating agency to acknowledge in one jurisdiction a rating issued in another jurisdiction for certain regulatory purposes, S&P Global Ratings reserves the right to assign, withdraw or suspend such acknowledgement at any time and in its sole discretion. S&P Dow Jones Indices, including S&P Global Ratings, disclaim any duty whatsoever arising out of the assignment, withdrawal, or suspension of an acknowledgement as well as any liability for any damage alleged to have been suffered on account thereof. Affiliates of S&P Dow Jones Indices LLC, including S&P Global Ratings, may receive compensation for its ratings and certain credit-related analyses, normally from issuers or underwriters of securities or from obligors. Such affiliates of S&P Dow Jones Indices LLC, including S&P Global Ratings, reserve the right to disseminate its opinions and analyses. Public ratings and analyses from S&P Global Ratings are made available on its Web sites, www.standardandpoors.com (free of charge), and www.ratingsdirect.com and www.globalcreditportal.com (subscription), and may be distributed through other means, including via S&P Global Ratings publications and third-party redistributors. Additional information about our ratings fees is available at www.standardandpoors.com/usratingsfees.

S&P Global keeps certain activities of its various divisions and business units separate from each other to preserve the independence and objectivity of their respective activities. As a result, certain divisions and business units of S&P Global may have information that is not available to other business units. S&P Global has established policies and procedures to maintain the confidentiality of certain nonpublic information received in connection with each analytical process.

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.

Some indices use the Global Industry Classification Standard (GICS®), which was developed by, and is the exclusive property and a trademark of, S&P Global and MSCI. Neither MSCI, S&P DJI nor any other party involved in making or compiling any GICS classifications makes any express or implied warranties or representations with respect to such standard or classification (or the results to be obtained by the use thereof), and all such parties hereby expressly disclaim all warranties of originality, accuracy, completeness, merchantability, or fitness for a particular purpose with respect to any of such standard or classification. Without limiting any of the foregoing, in no event shall MSCI, S&P DJI, any of their affiliates or any third party involved in making or compiling any GICS classifications have any liability for any direct,

indirect, special, punitive, consequential or any other damages (including lost profits) even if notified of the possibility of such damages.

S&P Dow Jones Indices products are governed by the terms and conditions of the agreements under which they may be provided. A license is required from S&P Dow Jones Indices to display, create derivative works of and/or distribute any product or service that uses, is based upon and/or refers to any S&P Dow Jones Indices and/or index data.

ESG Indices Disclaimer

S&P DJI provides indices that seek to select, exclude, and/or weight index constituents based on, but not limited to, certain environmental, social or governance (ESG) indicators, or a combination of those indicators, including the following: environmental indicators (including the efficient use of natural resources, the production of waste, greenhouse gas emissions, or impact on biodiversity); social indicators (such as, inequality and investment in human capital); governance indicators (such as sound management structures, employee relations, remuneration of staff, tax compliance, respect for human rights, anti-corruption and anti-bribery matters), specific sustainability or values-related company involvement indicators (for example, production/distribution of controversial weapons, tobacco products, or thermal coal), or controversies monitoring (including research of media outlets to identify companies involved in ESG-related incidents).

S&P DJI ESG indices use ESG metrics and scores in the selection and/or weighting of index constituents. ESG scores or ratings seek to measure or evaluate a company's, or an asset's, performance with respect to environmental, social and corporate governance issues.

The ESG scores, ratings, and other data used in S&P DJI ESG indices is supplied directly or indirectly by third parties (note these parties can be independent affiliates of S&P Global or unaffiliated entities) so an S&P DJI ESG index's ability to reflect ESG factors depends on these third parties' data accuracy and availability.

ESG scores, ratings, and other data may be reported (meaning that the data is provided as disclosed by companies, or an asset, or as made publicly available), modelled (meaning that the data is derived using a proprietary modelling process with only proxies used in the creation of the data), or reported and modelled (meaning that the data is either a mix of reported and modelled data or is derived from the vendor using reported data /information in a proprietary scoring or determination process).

ESG scores, ratings, and other data, whether from an external and/or internal source, is based on a qualitative and judgmental assessment, especially in the absence of well-defined market standards, and due to the existence of multiple approaches and methodologies to assess ESG factors and considerations. An element of subjectivity and discretion is therefore inherent in any ESG score, rating, or other data and different ESG scoring, rating, and/or data sources may use different ESG assessment or estimation methodologies. Different persons (including ESG data ratings, or scoring providers, index administrators or users) may arrive at different conclusions regarding the sustainability or impact of a particular company, asset, or index.

Where an index uses ESG scores, ratings or other data supplied directly or indirectly by third parties, S&P DJI does not accept responsibility for the accuracy or completeness of such ESG scores, ratings, or data. No single clear, definitive test or framework (legal, regulatory, or otherwise) exists to determine 'ESG', 'sustainable', 'good governance', 'no adverse environmental, social and/or other impacts', or other equivalently labelled objectives. In the absence of well-defined market standards and due to the existence of multitude approaches, the exercise of judgment is necessary. Accordingly, different persons may classify the same investment, product and/or strategy differently regarding 'ESG', 'sustainable', 'good governance', 'no adverse environmental, social and/or other impacts', or other equivalently labelled objectives. Furthermore, the legal and/or market position on what constitutes an 'ESG', 'sustainable', 'good governance', 'no adverse environmental, social and/or other impacts', or other equivalently labelled objectives may change over time, especially as further regulatory or industry rules and guidance are issued and the ESG sustainable finance framework becomes more sophisticated.

Prospective users of an S&P DJI ESG Index are encouraged to read the relevant index methodology and related disclosures carefully to determine whether the index is suitable for their potential use case or investment objective.