

# **S&P ESG Pan-Europe Developed Sovereign Bond Index** *Methodology*

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# Introduction

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The S&P ESG Pan-Europe Developed Sovereign Bond Index (the index) is an environment, social and governance (ESG) tilted version of the S&P Pan-Europe Developed Sovereign Bond Index (the underlying index). It is designed to track the performance of developed-market European sovereign debt, while taking into account each eligible country's sustainability performance, as assessed by RobecoSAM.

The index employs an ESG-tilted weighing scheme. Countries are over/underweighted, as compared to the underlying index, based on higher/lower ESG grades. Bonds within each country are market value weighted.

The rationale for such re-weighting is that specific sustainability opportunities and risks can play a key role in a country's long-term economic success. Overweighting those countries with a more sustainable profile ensures a greater sustainability profile for the index as a whole, while still maintaining relatively balanced country exposure.

The index is calculated and managed by S&P Dow Jones Indices. RobecoSAM, a specialist in sustainability investing, is the author of the country sustainability assessment methodology and provider of country ESG scores and grades.

*For information on the S&P Pan-Europe Developed Sovereign Bond Index, please refer to the S&P Global Developed Sovereign Bond Index Methodology available at [www.spdji.com](http://www.spdji.com).*

## **Highlights**

Country weights are set semi-annually based on grades received from RobecoSAM and the original market value weights of the countries in the underlying index. The index is rebalanced on a monthly basis to reflect the bonds in the underlying index.

The index is rules based, although the Index Committee reserves the right to exercise discretion, when necessary. The hallmark of a rules-based index is transparency and, broadly speaking, predictability. As an aide to transparency, this document sets out the rules by which the index is governed, index calculation and management procedures, and the various formulae used to calculate index returns and other statistics.

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

# Eligibility Criteria

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## **Index Eligibility**

The S&P ESG Pan-Europe Developed Sovereign Bond Index is based on the S&P Pan-Europe Developed Sovereign Bond Index. The index contains the same constituents as the underlying index except in cases where a new country is added to the underlying index.

If a new country is added to the underlying index, it is added to the S&P ESG Pan-Europe Developed Sovereign Bond Index only at the subsequent semi-annual country weight setting. Due to this timing difference, the index may not contain all of the constituents of the underlying index.

*For information on constituent eligibility criteria and index management rules of the S&P Pan-Europe Developed Sovereign Bond Index, please refer to the S&P Global Developed Sovereign Bond Index Methodology at [www.spdji.com](http://www.spdji.com).*

## **Monthly Rebalancing**

The index is rebalanced on a monthly basis to reflect the bonds in the S&P Pan-Europe Developed Sovereign Bond Index. Changes are effective after the close on the last business day of the month (the rebalancing date).

Additions, deletions and other changes to the index arising from the monthly rebalancing are published on a best efforts basis, after the close of business, three business days prior to the last business day of the month (the announcement date). Any market events after this date that affect the constituent membership are made on the next rebalancing date. Changes to the index that are published in the announcement are not normally subject to revision and are effective after the close on the last business day of the month (the rebalancing date).

# Index Construction

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## RobecoSAM ESG Scoring of Countries

The key factor in determining a country's weight in the index is RobecoSAM's country ESG grade. The ESG grading scale ranges from 1 to 10, with 10 being the highest grade and 1 the lowest. A country's ESG grade is derived from its RobecoSAM ESG score.

The country ESG score is a numerical expression of the relative sustainability profile of a country on a scale ranging from -3 to 3. It measures a country's strengths and weaknesses on three parameters – Environmental, Social and Governance. The RobecoSAM ESG scores are updated semi-annually.<sup>1</sup>

## ESG Grading of Countries

To convert a country score into a grade, first the country tilt score is calculated by assigning a 75% weight to the current score and a 25% weight to the change in score as follows:

$$Z_t = 0.75 \times Z_c + 0.25 \times (Z_c - Z_p)$$

where:

$Z_t$  = RobecoSAM's country tilt score.

$Z_c$  = RobecoSAM's current country score.

$Z_p$  = RobecoSAM's previous country score.

The country tilt score,  $Z_t$ , is converted into a country tilt grade,  $G_i$ , as follows:

$$G_i = 1 + [Z_t + 3] \times 1.5$$

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<sup>1</sup> For details on the Country ESG Scoring Methodology, please refer to RobecoSAM's *Country Sustainability Ranking Methodology* available at <http://www.robeco.com/images/country-sustainability-ranking-methodology-december%202014.pdf>.

## Country Weighting

The weights of the countries in the index are set semi-annually as part of the April and October monthly rebalancings (see *Index Maintenance*). They are based on the original market value weights of the countries in the underlying index, as of the last business day of March and September, and are tilted to reflect the latest RobecoSAM country ESG grades. Bonds within each country are market value weighted.

**ESG Titled Weighting Scheme.** In order to assign new weights to the countries based on their grades, a linear shift method is applied. This approach reduces the weights of countries whose grades are lower than the index average in proportion to the deviation of their grades from the average grade and to a minimum of 5% of the original weight. The aggregate deducted weights are then redistributed among those countries whose grades are above the index average, also in proportion to the deviation of their grades from the average.

For countries with grades below the simple index average, the following formula is used:

$$WCR_i = \{1 - \text{Min} [95\%, L * (1 - \frac{G_i}{\bar{G}})]\} * OMVW_i$$

For countries with grades above the simple index average, the following formulae are used:

$$WCR_i = [1 + ADJ * L * (\frac{G_i}{\bar{G}} - 1)] * OMVW_i$$

$$ADJ = \frac{\sum_{below} \text{Min} [95\%, L * (1 - \frac{G_i}{\bar{G}})] * OMVW_i}{\sum_{above} L * (\frac{G_i}{\bar{G}} - 1) * OMVW_i}$$

where:

- $WCR_i$  = New weight of the country.
- $OMVW_i$  = Original market value weight of the security in the underlying index.
- $G_i$  = ESG grade of the country  $i$ .
- $\bar{G}$  = Average ESG grade of the countries.
- $L$  = Scaling multiplier used to scale up the grade distributions, as detailed in *Scaling Multiplier*.

**Scaling Multiplier.** The idea of applying a scaling multiplier,  $L$ , is to increase the grade deviation from the index average and therefore, increase the ESG tilt in a bigger scale. This type of scaling does not change the approaches in principle. As a result of applying the  $L$  factor, the average sustainability tilt increases. The level of the multiplier is set to achieve a meaningful enough re-distribution of weights in relation to the size of the country weights in the market-value-weighted underlying index. The chosen multiplier delivers a meaningful and consistent improvement in the sustainability profile of the index.

At launch, the  $L$  factor of the index was set as 5 to achieve a minimum improvement of 2.5% in the weighted average ESG score of the index compared to the underlying index, as measured by the average improvement for the last three years. Should the three-year average improvement fall under 2.5% during the semi-annual country weight setting, the Index Committee may decide to change the  $L$  factor in order to sustain minimum improvement.

### **Index Calculations**

The index is ESG-tilted based on market-value-weighted data.

The total return is calculated by aggregating the interest return, reflecting the return due to paid and accrued interest, and price return, reflecting the gains or losses due to changes in the end-of-day price and principal repayments.

*For further details regarding index calculations please refer to the Appendix*

# Index Maintenance

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## **Rebalancing**

The index is normally reviewed and rebalanced on a monthly basis. The Index Committee, nevertheless, reserves the right to make adjustments to the index at any time that it believes appropriate.

Pro-forma additions, deletions and other changes to the index arising from the monthly rebalancing are published, after the close of business, no earlier than three business days prior to the last business day of the month. These may be subject to change. Final additions, deletions and other changes to the index arising from the monthly rebalancing are published one business day prior to the last business day of the month (the announcement dates).

Changes are made and become effective after the close on the last business day of the month (the rebalancing date).

**Country Weight Setting.** ESG scores and country weightings are updated and applied semi-annually, based on RobecoSAM's research.

As part of the April and October monthly rebalancings, country weights are updated and set based on the process described in *Index Construction*. For all other monthly rebalancings, country weights remain static.

At all times, bonds within the countries are market value weighted.

**Country Additions.** If a new country is added to the underlying index, it is added to the S&P ESG Pan-Europe Developed Sovereign Bond Index only at the subsequent semi-annual country weight setting. Due to this timing difference, the index may not contain all of the constituents of the underlying index.

**Country Deletions.** If a country is deleted from the underlying index, it is also deleted from the S&P ESG Pan-Europe Developed Sovereign Bond Index simultaneously. The weight of the deleted country is redistributed proportionally amongst the remaining countries.

## **Currency of Calculation**

The index is calculated in euros and U.S. dollars.

### **Exchange Rate**

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

### **Base Date and History Availability**

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

<b>Index</b>	<b>Launch Date</b>	<b>First Value Date</b>	<b>Base Date</b>	<b>Base Value</b>
S&P ESG Pan-Europe Developed Sovereign Bond Index	03/26/2015	04/30/2008	04/30/2008	100

# Index Governance

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## **Index Committee**

S&P Dow Jones Indices' Fixed Income Index Committee maintains the index. All committee members are full-time professionals at S&P Dow Jones Indices. Meetings are held quarterly and whenever deemed appropriate.

The Index Committee oversees the management of the index, including determinations of intra-rebalancing changes, maintenance and inclusion policies, and other matters affecting the maintenance and calculation of the index.

In fulfilling its responsibilities, the Committee has full and complete discretion to (i) amend, apply, or exempt the application of index rules and policies as circumstances may require and (ii) add, remove, or by-pass any bond in determining the composition of the index.

The Committee may rely on any information or documentation submitted to it or gathered by it that the Committee believes to be accurate. The Committee reserves the right to reinterpret publicly available information and to make changes to the index based on a new interpretation of that information at its sole discretion. All Index Committee discussions are confidential.

*For information on [Quality Assurance and Internal Reviews of Methodology](#), please refer to [S&P Dow Jones Indices' Fixed Income Policies & Practices](#) document located on our Web site, [www.spdji.com](http://www.spdji.com).*

# Index Policy

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## **Announcements**

Announcements of any relevant information pertaining to the index are made at approximately 06:00 PM New York Time. Press releases are posted on S&P Dow Jones Indices' Web site at [www.spdji.com](http://www.spdji.com).

## **Holiday Schedule**

The index is calculated on all business days of the year (Monday through Friday) except the following holidays:

- New Year's Day (January 1<sup>st</sup>)
- Christmas (December 25<sup>th</sup>)

*A complete holiday schedule for the year is available on S&P Dow Jones Indices' Web site at [www.spdji.com](http://www.spdji.com).*

## **End-of-Day Calculation**

Index levels are calculated at the end of each business day, at approximately 06:00 PM New York Time, via S&P Dow Jones Indices' Web site. This may be subject to change.

## **Index Releases**

Releases are issued by S&P Dow Jones Indices at the end of the business day. The release time is generally 06:00 PM New York Time.

## **Recalculation Policy**

S&P Dow Jones Indices reserves the right to recalculate an index under certain limited circumstances. S&P Dow Jones Indices may choose to recalculate and republish an index if it is found to be incorrect or inconsistent within two trading days of the publication of the index level in question for one of the following reasons:

1. Index methodology event
2. Late announcement
3. Revised source data

Any other restatement or recalculation of an index is only done under extraordinary circumstances to reduce or avoid possible market impact or disruption as solely determined by the Index Committee.

*For more information on the recalculation policy please refer to S&P Dow Jones Indices' Fixed Income Policies & Practices document located on our Web site, [www.spdji.com](http://www.spdji.com).*

*For information on Calculations and Pricing Disruptions, Expert Judgment and Data Hierarchy, please refer to S&P Dow Jones Indices' Fixed Income Policies & Practices document located on our Web site, [www.spdji.com](http://www.spdji.com).*

# Index Dissemination

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

## **Tickers**

<b>Index (Total Return Index)</b>	<b>Ticker</b>
S&P ESG Pan-Europe Developed Sovereign Bond Index (EUR)	SPESPEE
S&P ESG Pan-Europe Developed Sovereign Bond Index (USD)	SPESPEU

## **FTP**

Daily index levels and index data are available via FTP subscription.

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

## **Web site**

*For further information, please refer to S&P Dow Jones Indices' Web site at  
[www.spdji.com](http://www.spdji.com).*

# Appendix

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## Calculation of Market Values and Weights

### Market Value

A market value is calculated for each security in the index as of the close on each day, as follows:

$$MV_t = PAR_t \times \frac{(P_t + AI_t)}{100} * FX_t \quad (1)$$

where:

- $MV_t$  = Market value of the security on day  $t$ .
- $PAR_t$  = Par amount of the security on day  $t$ .
- $P_t$  = Price of the security on day  $t$ .
- $AI_t$  = Accrued interest<sup>2</sup> on the security up to and including day  $t$ .
- $FX_t$  = Foreign exchange rate on day  $t$ .

If the valuation date is not a trading day, the market value is based on the price as of the immediate prior trading day, plus interest accrued to the valuation date.

### Index Market Value

The index market value of a security used for calculation of the index is defined as follows:

$$IMV_t = MV_t \times AWF_t \quad (2)$$

where:

- $IMV_t$  = Index market value of the security on day  $t$ .
- $MV_t$  = Market value of the security on day  $t$ .
- $AWF_t$  = Adjustable weight factor of the security on day  $t$ .

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<sup>2</sup>  $AI_t$  in (1) is calculated on a calendar date basis and uses the conventions for settlement date appropriate to the asset class. Accordingly, accrued interest is zero on a coupon payment date.

## Adjustable Weight Factor

The Adjustable Weight Factor (AWF) is used to tilt the original market value weight of a security within the index. It is calculated on the monthly rebalancing date and remains static until the subsequent monthly rebalancing.

When the monthly rebalancing coincides with the semi-annual country weight setting, the individual security weights are tilted as per the country weights calculated using the RobecoSAM grades. In such cases, the AWF is calculated after the market close as follows:

$$AWF_i = W_{cr} * \frac{\sum_k MV_k}{\sum_c MV_c} \quad (3)$$

where:

- $AWF_i$  = Adjustable weight factor of security  $i$ .
- $W_{cr}$  = Intended weight of the country calculated using the RobecoSAM grades to which security  $i$  belongs.
- $\sum_k MV_k$  = Aggregate market value of all the securities in the underlying index.
- $\sum_c MV_c$  = Aggregate market value of all the securities in the underlying index, issued by country to which the security  $i$  belongs.

When the monthly rebalancing falls outside of the semi-annual country weight setting, the weights of the bonds of a country in the index are redistributed within the country itself. In such cases, the AWF is calculated after the market close as follows:

$$AWF_i = Close IW_c * \frac{\sum_k NDO MV_k}{\sum_c NDO MV_c} \quad (4)$$

where:

- $AWF_i$  = Adjustable weight factor of security  $i$ .
- $Close IW_c$  = Close index weight of the country to which security  $I$  belongs.
- $\sum_k NDO MV_k$  = Aggregate next day open market value of all the securities in the underlying index
- $\sum_c NDO MV_c$  = Aggregate next day open market value of all the securities in the underlying index, issued by country to which security  $i$  belongs.

## Index Weights

The weight of a security within the index is defined as the index market value of that security,  $i$ , expressed as a percentage of the aggregate index market value of all securities in the index, as follows:

$$IW_i = \frac{IMV_i}{\sum_i IMV_i} \quad (5)$$

where:

$IW_i$  = Index market value weight of security  $i$ .

$IMV_i$  = Index market value of security  $i$ .

## Calculation of Security Returns

### Total Return

The total return ( $TR$ ) of a security on day  $t$  is the sum of the market price return and the interest return on day  $t$ :

$$TR_t = IR_t + PR_t \quad (6)$$

where:

$IR_t$  = Interest return on day  $t$ .

$PR_t$  = Market price return on day  $t$ .

Price return measures the return due to the change in the market price of the security. Interest return (or coupon return) includes the return due to the interest earned on that security.

### Interest Return

The interest return on an individual security on day  $t$  is as follows:

$$IR_t = \frac{(AI_t - AI_{t-1}) + I_t}{P_{t-1} + AI_{t-1}} \quad (7)$$

where:

$IR_t$  = Interest return at time  $t$ .

$AI_t$  = Accrued interest, up to and including day  $t$ .

$AI_{t-1}$  = Accrued interest, up to and including day  $t-1$ .

$I_t$  = Interest payment on day  $t$ .

$P_{t-1}$  = Price the security on day  $t-1$ .

## Price Return

The formula for the price return for a security at time  $t$  is as follows:

$$PR_t = \frac{P_t - P_{t-1}}{P_{t-1} + AI_{t-1}} \quad (8)$$

where:

- $PR_t$  = Price return on day  $t$ .
- $P_t$  = Security price on day  $t$ .
- $P_{t-1}$  = Security price on day  $t-1$ .
- $AI_{t-1}$  = Accrued interest, up to and including day  $t-1$ .

## Calculation of Daily Index Returns and Levels

### Daily Index Returns

The individual security returns are aggregated to calculate returns for the index.

Specifically, on a given day  $t$ , the total return, interest return and price return for the index are equal to a weighted average of the returns of the securities that constitute the index. The weight of each index security used in the calculation is the relative weight of that security in the index as of the previous business day. The formulae are as follows:

$$ITR_t = \sum_i (TR_{i,t} \times IW_{i,t-1}) \quad (9)$$

$$IIR_t = \sum_i (IR_{i,t} \times IW_{i,t-1}) \quad (10)$$

$$IPR_t = \sum_i (PR_{i,t} \times IW_{i,t-1}) \quad (11)$$

where:

- $ITR_t$  = Index total return on day  $t$ .
- $IIR_t$  = Index interest return on day  $t$ .
- $IPR_t$  = Index price return on day  $t$ .
- $TR_{i,t}$  = Total return of security  $i$  on day  $t$ .
- $IR_{i,t}$  = Interest return of security  $i$  on day  $t$ .
- $PR_{i,t}$  = Price return of security  $i$  on day  $t$ .
- $IW_{i,t-1}$  = Index market value weight of security  $i$  on day  $t-1$ .

### **Daily Index Values**

Index values are calculated each day by applying the current day's index return to the previous day's index value, as follows:

$$TRIV_t = TRIV_{t-1} \times (1 + ITR_t) \quad (12)$$

$$IRIV_t = IRIV_{t-1} \times (1 + IIR_t) \quad (13)$$

$$PRIV_t = PRIV_{t-1} \times (1 + IPR_t) \quad (14)$$

where:

$TRIV_t$  = Total return index value on day  $t$ .

$IRIV_t$  = Interest return index value on day  $t$ .

$PRIV_t$  = Price return index value on day  $t$ .

### **Reinvestment Returns from Monthly Cash Flows**

The index is rebalanced on a monthly basis. All cash, including interest payments and principal prepayments, are kept in cash until the next rebalance date. In other words there is zero return on cash.

# S&P Dow Jones Indices' Contact Information

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## Index Management

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