

J.P. Morgan ESG GBI-EM Global Diversified

Methodology and Factsheet

Highlights

The J.P. Morgan ESG GBI-EM Global Diversified (JESG GBI-EM) tracks the performance of bonds issued by emerging market governments and denominated in the local currency of the issuer. The index applies an Environmental, Social and Governance (ESG) scoring and screening methodology to tilt toward issuers ranked higher on ESG criteria and green bond issues, and to underweight or remove issuers that rank lower. The JESG GBI-EM is based on the established flagship J.P. Morgan GBI-EM Global Diversified Index. The returns and statistics are available since December 2012.

Index Criteria

Instrument Type:	Local Currency denominated fixed coupon instruments
Remaining Maturity:	Only bonds with greater than 13 months to maturity are included in the GBI-EM Indices. Bonds with less than 13 months to maturity, adjusted for settlement, are removed from the indices at rebalance date
Amount Outstanding:	Local issues with a current face amount outstanding of \$1 billion or more, as well as Global issues with \$500 million or more are considered for inclusion
Currency:	All eligible currencies are available within the set of eligible countries
Country Eligibility:	Index Entry: A country's GNI per capita must be below the JPMorgan defined Index Income Ceiling (IIC) ¹ for 3 consecutive years, or the Index PPP Ratio (IPR) ² is below the emerging market threshold for 3 consecutive years Index Exit: A country's GNI per capita is above the Index Income Ceiling (IIC) for three consecutive years; the country's long term local Currency sovereign credit rating (the available ratings from all three agencies: S&P, Moody's & Fitch) is A-/A3/A- (inclusive) or above for three consecutive years; and its IPR is above the emerging market threshold for 3 consecutive years
Capital controls:	The JESG GBI-EM Index excludes countries with explicit capital controls, but does not factor in regulatory/tax hurdles in assessing eligibility, unless such regulatory or tax hurdles significantly hinder investors' ability to replicate the index

Index Characteristics and Methodology

Pricing:	Bid and Ask prices are taken from a third party pricing source ³
Aggregate Return:	Index/Country level total return is calculated as a market-weighted average of bond returns using bid prices
Rebalancing:	Rebalances on the last US business day of the month
Coupon Treatment:	All coupons received are immediately reinvested into the index
FX Rates:	All FX rates used for hedged/unhedged returns are as of 4pm London time provided by WM/Reuters
Hedging Strategy:	Assume a 1-month currency forward position that begins on rebalance day and ends on next rebalance day
Credit Rating:	Rating-based statistics published using middle rating of the S&P, Moody's and Fitch ratings. Index rating is Ba1/BB+/BB+ as of September 30, 2018
Weighting:	Diversified, market capitalization based weighting subject to maximum weight of 10% (cap) per country
Holiday Calendar:	Follows US bond market calendar set by Emerging Markets Trader Association (EMTA)

Source: JPMorgan Chase & Co.

For any questions or for additional information, please contact index.research@jpmorgan.com

¹ J.P. Morgan defines the Index Income Ceiling (IIC) as the GNI per capita level that is adjusted every year by the growth rate of the World GNI per capita, Atlas method (current US\$), provided by the World Bank annually.

² J.P. Morgan defines the Index Purchasing Power Parity Ratio (IPR) as GDP (current prices, USD) / GDP (current prices, PPP dollars), from the one-year lagged GDP data available in the IMF World Economic Outlook.

³ PricingDirect Inc., a market-based professional valuation service and a wholly owned subsidiary of JP Morgan Chase & Co, is utilized as the primary source for instrument level pricing ensuring transparency around pricing sourcing and consistency/accuracy of index constituent valuations.

Appendix

Defining the universe of eligible countries

The J.P. Morgan ESG GBI-EM Global Diversified (JESG GBI-EM) consists of regularly traded, fixed-rate, domestic currency government bonds which international investors can readily access. The index excludes countries where local market investing is subject to explicit capital controls, but eligibility consideration does not factor in regulatory/tax hurdles.

Eligibility for local currency issues is determined using the following criteria:

Instrument type

The JESG GBI-EM indices only include fixed coupon instruments. Floating-rate and capitalizing/amortizing bonds are not eligible for index inclusion. Additionally, bonds with callable, puttable or convertible features are not part of the indices.

Liquidity

A key feature that distinguishes our indices from other index products is the strict enforcement of liquidity criteria in the selection of instruments. Yet, while the notion of liquidity differs from market to market, J.P. Morgan indices include only securities, subject to several considerations including but not limited to:

- *Pricing:* Bonds must trade with enough frequency to prevent stale price quotations.
- *Availability:* Bonds must be regularly traded in size at acceptable bid-offer spreads and readily redeemable for cash. A reasonable two-way market must exist for the instrument to be included in the index portfolio.
- *Replication costs:* Investors should be able to replicate the index without incurring excessive transaction costs.

ESG Methodology

The J.P. Morgan ESG GBI-EM Global Diversified applies J.P. Morgan ESG (JESG) issuer scores to adjust the market value of index constituents from the baseline J.P. Morgan GBI-EM Global Diversified. JESG issuer scores are a 0-100 percentile rank calculated based on normalized raw ESG scores from third-party research providers Sustainalytics and RepRisk. An issuer's finalized JESG score incorporates a 3-month rolling average. The JESG scores are divided into five bands that are used to scale each issue's baseline index market value, with the band rebalance occurring with a one-month lag.

JESG Score Bands	Scalar
Band 1: Score > 80	1.00
Band 2: 60 < Score <= 80	0.80
Band 3: 40 < Score <= 60	0.60
Band 4: 20 < Score <= 40	0.40
Band 5: Score <= 20	0.00

Issuers in Band 5 will be excluded from the index and will not be eligible for twelve months. If an instrument is categorized as a "green bond" by the Climate Bonds Initiative, the security will receive a one-band upgrade. Green bonds by issuers already in Band 1 will not receive any further upgrades, while those in Band 5 will still be excluded.

Weighting Methodology

The J.P. Morgan ESG GBI-EM Global Diversified limits the weights of those index countries with larger debt stocks by only including a specified portion of these countries' eligible current face amounts of debt outstanding. The index is geared toward managers who want maximum diversification or those who face limitations on the amount of portfolio exposure they can take to individual issuers. Once these instrument allocations are derived for each country, the current settlement price for each instrument is applied to its index allocation to calculate the market capitalization of each issue in the index. The weight of each instrument in the index is then determined by dividing its market capitalization by the total market capitalization for all of the index's instrument allocations. The result represents the weight of each issue expressed as a percentage of the index. By allocating their portfolios according to these exact instrument weights, and accounting for coupon reinvestments and instrument allocation changes, investors can replicate the performance of the J.P. Morgan ESG GBI-EM Global Diversified.

The underlying J.P. Morgan GBI-EM Global Diversified diversification methodology anchors on the average size of the countries in the index and the debt stock size of the largest country in the index.

We define **Index Country Average (ICA)** = $\Sigma(\text{Ctry Face Amount}) / (\text{No. of Countries in the index})$

Based on the ICA, the diversified face amount for any country in the index is derived according to the following rules:

1. The largest country based on face amount will be capped at double the average country debt stock in the index (ICA*2). This is the maximum threshold and sets the scale to determine the diversified face amounts of other countries in the index.
2. If a country's debt stock is below the index country average (ICA), the entire amount will be eligible for inclusion.
3. Countries whose debt stock falls between the index country average (ICA) and double the average (ICA * 2) will be linearly interpolated.

Subsequently, the diversified (adjusted) face amount determined using the above step is then converted to a market value (based on dirty price), which is then converted to an index weight percentage based on the proportion of the total index market capitalization that the country represents. Any excess weight above the cap will be redistributed to smaller countries that are below the cap to limit concentration risk.

Diversified Country Face Amount=

$$\begin{cases} ICA * 2 & , \text{if } FA_{max} \\ ICA + \frac{ICA}{FA_{max} - ICA} * (Ctry FA - ICA) & , \text{if } Ctry FA > ICA \\ Ctry FA & , \text{if } Ctry FA \leq ICA \end{cases}$$

where Ctry FA represents the non-diversified country face amount and FA_{max} represent the Face Amount of the Largest Country.

Global Index Research

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