

J.P. Morgan Green, Social and Sustainability Bond Indices (GESSIE)

Methodology and Factsheet

Highlights

The J.P. Morgan Green, Social and Sustainability Bond Index (GESSIE) is designed to track labelled bonds issued with proceeds dedicated to green and/or social activities, assets, projects, or expenditures. The index provides a comprehensive measure of the global labelled bond market across various asset classes and credit sectors. The GESSIE introduces four variants:

1. The Green, Social and Sustainability Bond Index, the global aggregate benchmark (GESSIE).
2. The EM Credit Green, Social and Sustainability Bond Diversified Index, the hard currency only emerging markets benchmark (GESSIE EM CREDIT DIV).
- 3, 4. The JESG Green, Social and Sustainability Bond Index (JESG GESSIE) and JESG EM Credit Green, Social and Sustainability Bond Diversified Index (JESG GESSIE EM CREDIT DIV), ESG-aligned variants of both benchmarks incorporating the J.P. Morgan ESG methodology for fixed income indices.

Index Criteria

	Hard Currency Bonds	Local Currency Government Bonds
Eligible currencies	USD, EUR & GBP	Currencies where local government bonds are liquid, investible and accessible by international investors. Table below mentions the current list of eligible currencies
Minimum Amount Outstanding	USD: \$300MM; EUR: €300MM; GBP: £150MM	Local currency bonds: USD \$1 billion
Minimum Maturity	For inclusion: Bonds should have minimum 2 years remaining to maturity Remain in the index: A bond remains eligible for the index as long as it has 6 months remaining to maturity	
Issuer	GESSIE: Sovereign, Quasi-sovereign (100% government owned or guaranteed), Corporate or Supranational	Sovereign only
	GESSIE EM CREDIT DIV: Sovereign, Quasi-sovereign (100% government owned or guaranteed), Corporate or Supranational	-
Country	All countries are eligible	Countries where local government bonds are liquid, investible and accessible by international investors. Table below mentions the current list of eligible countries
Instrument Type	Self-labeled green bonds, screened and verified by Climate Bonds Initiative are eligible. Self-labelled social & sustainability bonds, captured within the Climate Bonds Initiative's Social & Sustainability Bond Database, are eligible. Sustainability-linked bonds will not be included, except when also labelled as green, social or sustainability bonds.	
	Include: fixed rate, floating rate, hybrid, step-up, PIK, amortizers, perpetuals, Sukuk bonds, etc. Exclude: securitized bonds, municipal bonds, structured bonds, collateral trust and equipment trust bonds, bonds with non-transparent cash flows or atypical indices used to reset coupons, etc.	Bullet, fixed-rate or zero coupon bonds
Collateral	Exclude: covered, mortgage backed, asset backed, bank guaranteed	-

Source: JP Morgan Chase & Co.

JESG Overlay Criteria

JESG Overlay	JESG Green, Social and Sustainability Bond Index
ESG Data Provider	Sustainalytics, RepRisk, CBI
JESG Scoring methodology	The absolute index scores of RepRisk & Sustainalytics are normalized and then blended on an equal weighted basis. The scores range from 0 - 100, with 100 classified as the best possible score.
JESG Integration methodology	Issuers are assigned into quintiles (bands) based on their scores. Those with better ESG scores are assigned overweighed compared to the baseline benchmark
Treatment for Certified Climate Bonds	Certified Climate Bonds will receive one band upgrade (unless they are already in Band 1)
Ethical screening	Green, Social and Sustainability bonds by issuers directly earning revenue from tobacco, weapons, or not in adherence with UNGC principles will not be eligible. Issuers with revenue exposure to thermal coal and oil sands are excluded with the exception of green bonds, which are eligible.

Source: JP Morgan Chase & Co.

Index Characteristics and Methodology

Characteristics	J.P. Morgan Green, Social and Sustainability Bond Index
Inception Date	December 31 st , 2014
Prices	Mid prices from Pricing Direct
Weighting Scheme	<u>Baseline</u> : Market Cap Weighted JESG: JESG overlay with 5 bands and a one band upgrade for Certified Climate Bonds
FX Rates	All FX rates used, including for hedged/unhedged returns, are as of 4pm London time provided by WM/Reuters
Rebalance	Rebalanced on last weekday of every month
Holiday Calendar	Index levels will be available on all weekdays Bond analytics (e.g. accruals) will follow the respective currency holiday calendar (USD: SIFMA & EMTA, EUR/GBP: SIFMA)
Treatment for Defaulted/Called Securities	<u>Defaulted</u> securities will be removed at the subsequent rebalance <u>Called</u> securities will be removed at a month end before the called date if the call is announced before the month end & if not, will be removed at the subsequent rebalance
Credit Rating	Instrument rating will be assigned using middle rating of S&P, Moody's and Fitch. If only two ratings are available the lower rating will be used. The index does not have a minimum rating threshold
Coupon Treatment	All coupons received are immediately reinvested into the index
Hedging Strategy	Assumes a 1-month currency forward position that begins on rebalance day and ends on next rebalance day

Source: JP Morgan Chase & Co.

Local Currency Government Bonds – Eligible countries/ currencies

Country	Currency	Country	Currency	Country	Currency	Country	Currency
Australia	AUD	Egypt	EGP	Malaysia	MYR	South Africa	ZAR
Austria	EUR	Finland	EUR	Mexico	MXN	Spain	EUR
Belgium	EUR	France	EUR	Netherlands	EUR	Sweden	SEK
Brazil	BRL	Germany	EUR	New Zealand	NZD	Thailand	THB
Canada	CAD	Hungary	HUF	Peru	PEN	Turkey	TRY
Chile	CLP	Indonesia	IDR	Philippines (Global)	PHP	United Kingdom	GBP
China	CNY	Ireland	EUR	Poland	PLN	United States	USD
Colombia	COP	Israel	ILS	Portugal	EUR	Uruguay (Global)	UYU
Czech Republic	CZK	Italy	EUR	Romania	RON		
Denmark	DKK	Japan	JPY	Serbia	RSD		
Dominican Republic (Global)	DOP	Korea	KRW	Singapore	SGD		

Source: JP Morgan Chase & Co., as of 30th September 2022

Defining Index Universe

Eligibility for the index will be determined on a continuous basis by monitoring the index criteria. Any changes to the composition or eligibility will be notified prior to rebalance with an estimated schedule. Only those labelled bonds that meet the criteria for Climate Bonds Initiative's (CBI) labelled database will be eligible for inclusion into the index.

Countries of risk for the instruments in the index will be determined based upon the below considerations:

1. The country with the largest source of revenue. Guarantees by other entities including subsidiaries or holding companies in other countries will also be considered.
2. The headquarters or the location of the issuer's majority assets will also be considered.

New Issue Timing

A new issue that meets the index criteria is added at the month-end rebalancing provided it is present in CBI's labelled database by the 15th of the month. Bonds entering the database after the 15th of the month will enter the index during the subsequent month-end rebalance.

Instruments issued purely in reliance on Regulation S or "Reg-S" (without an accompanying 144A or registered tranche) or private placements (not registered instruments) are eligible for inclusion after a 40 calendar day seasoning period provided they meet other index criteria. The date at which the seasoning restriction is lifted will effectively be the new "settlement" date. This applies to only USD-denominated bonds.

ESG Methodology

The index applies J.P. Morgan ESG (JESG) issuer scores to adjust the market value of index constituents from the baseline J.P. Morgan Green, Social and Sustainability Bond Index (GESSIE). 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. Corporate issuers with no coverage by either third-party research provider default to their region sector JESG score. 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	0.20

If an instrument is categorized as a 'Certified Climate Bond' by the Climate Bonds Initiative, the security will receive a one-band upgrade. Certified bonds by issuers already in Band 1 will not receive any further upgrades. Instruments in Band 5 will not receive any further downgrades. Issuers with direct revenue exposure to weapons, tobacco, or failing the UN Global Compact (UNGC) principles are excluded from the JESG variants. Issuers with direct revenue exposure to thermal coal or oil sands are also excluded, with the exception of labelled green bonds, which are eligible.

Appendix

The following is a description of our methodology for calculating aggregate returns at the index level. The returns calculated are total return, price (clean) return, interest (coupon) return, treasury return, spread (excess) return, and spot return.

Total return is a means of representing the economic benefit of holding a security or portfolio position. In its simplest form, it is based on the “cash in/cash out” notion – i.e., what is paid for the security at the initial purchase versus what is received at its sale. The means of calculating the total return on a basket containing various instruments is an extension of the single instrument total return framework.

Index Total Return

The total return is a representative measure of the performance of the underlying instruments between day $t - 1$ and day t . At its most basic, the index total return of a multi-currency portfolio can be explained by five components: price return, interest return, treasury return, spread return, and spot return. Assume that the portfolio of securities is composed of bonds and markets in proportion to their respective total market value. Market value in this case is calculated using the amount outstanding, as well as the total price inclusive of accrued interest and principal payments. The rate of return for any day can be attributed in one of two ways:

- Using the clean and coupon returns:

$$\text{Total Rate of Return} = (1 + \text{Price Rtn})(1 + \text{Interest Rtn})(1 + \text{Spot Rtn}) - 1$$

- Or, alternatively, using the treasury and excess returns:

$$\text{Total Rate of Return} = (1 + \text{Treasury Rtn})(1 + \text{Interest Rtn})(1 + \text{Spot Rtn}) - 1$$

Analytic	Field Name in DataQuery	Description
Return Analytics		
Total Return	CumTotRet	(see above)
Price Return	StatClnRtnRateMid	(see above)
Interest Return	StatsIntRet	(see above)
Spread Return	StatExcessReturnMid	(see above)
Treasury Return	DailyTsyReturnMid	(see above)
ESG Analytics		
ESG JPM Rank	ESGScore	Proprietary J.P. Morgan computed ESG score
ESG Band	ESGBand	ESG band designation
To Worst Analytics		
Yield (to worst)	StatYldWrstRateMid	The lowest potential Yield on a callable security or the highest potential yield on a puttable security. The corresponding date at which this Yield is realized is referred to as the Worst Date, and is the driver for all other To Worst analytics.
Spread (to worst)	StatStpSprRateMid	The Spread Over the Treasury Zero Curve corresponding to the Worst Date. This is the basis point spread over the Treasury Zero Curve that will discount cash flows such that the Present Value will equal the Settlement Price, reflective of the Worst Date.
Modified Duration (to worst)	YTModDurToWrstMid	A measure of the change in settlement price for a 100 bps shift in the underlying government bond Cash Coupon Curve and reflective of all cash flows to the Worst Date. It is calculated by shifting the government bond Cash Coupon Curve by 100bps up and down and calculating settlement price under each scenario.
Spread Duration (to worst)	EffSpreadDuration_Wrst	A measure of the change in settlement price for a 100 bps shift in the underlying government bond Zero Coupon Curve and reflective of all cash flows to the Worst Date. It is calculated by shifting the government bond Zero Curves by 100bps up and down and calculating settlement price under each scenario.
Spread Convexity (to worst)	EffSpreadConvexity_Wrst	A measure of the sensitivity of Spread Duration to a 100 bps shift in the underlying government bond Zero Coupon Curve and reflective of all cash flows to the Worst Date. It is calculated by shifting the government bond Zero Curves by 100 bps up and down and calculating settlement price under each scenario.
Average Life (to worst)	Avg_Life_Wrst	Average length of remaining time before the bond's principal is repaid (or when optionality is executed) as measured at the To

Worst Date.		
Base Analytics		
Index Dirty Price (mid)	StatValStlOrgAmtMid	Dirty mid price including adjustments for amortization and capitalization
Market Value (ESG adj.)	Mkt Cap	Market Value (ESG methodology adjusted)
Face Amount	FaceAmtOS	Amount outstanding
Coupon	AM_ACT_PAY	Current coupon rate
Accrued interest	AM_INT_PRD	Accumulated interest since last payout
Amortization amount	AM_AMORT	Aggregated amortized principal amount
Remaining Maturity (days)	StatsDaysToMat	Number of business days from trade date to maturity date
Current Yield	StatClnRtnRateMid	Current yield
Number of bonds	Num_Bonds	Number of bonds in the index

Global Index Research

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