

## J.P. Morgan Global Credit Index (GCI) ESG Investment Grade EUR Custom Maturity Index

### Methodology and Factsheet

#### Highlights

J.P. Morgan Global Credit Index (GCI) ESG Investment Grade EUR Custom Maturity Index tracks Euro-denominated investment grade corporate bonds by developed market issuers. The index applies an ESG scoring and screening methodology to tilt toward issuers ranked higher on ESG criteria and green bond issues, and to underweight and exclude issuers that rank lower. The returns and statistics are available since December 2012.

#### Index Criteria

<b>Instrument Type</b>	<b>Include:</b> fixed rate, floating rate, hybrid, step-up, PIK, toggle, amortizers, perpetuals, Sukuk bonds, and all subordinated financial bonds except AT1 <b>Exclude:</b> structured bonds and credit enhanced bonds including credit linked, collateral trust and equipment trust bonds, dual currency bonds and bonds with non-transparent cash flows or atypical indices used to reset coupons	
<b>Issuer Type</b>	<b>Include:</b> Corporate <b>Exclude:</b> sovereign and quasi-sovereign issuers <sup>1</sup>	
<b>Collateral</b>	<b>Exclude:</b> covered, mortgage backed, asset backed, bank guaranteed, government guaranteed	
<b>Maturity</b>	<b>Entry:</b> Minimum 24 months till maturity	<b>Exit:</b> Minimum 6 months till maturity
<b>Minimum Amount Outstanding</b>	<b>Bond level</b> €500mm	
<b>Holiday</b>	TARGET holiday calendar	
<b>Currency</b>	Euro-denominated bonds are allowed	
<b>Country of Risk</b>	Issuers must have country of risk as a developed country to be included.	
<b>Country Eligibility</b>	Developed country/economy is defined as a distinct list of countries in the following regions: North America, Western Europe, Japan, Australia, and New Zealand.	
<b>Credit Rating</b>	<b>Entry:</b> Only investment grade instruments are eligible. An instrument is classified as investment grade when the middle rating from S&P, Moody's, and Fitch is investment grade (i.e. BBB- equivalent or above). When a rating from only two agencies is available, the lower has to be investment grade; and when only one agency rates a bond, that single rating has to be investment grade. <b>Exit:</b> Bonds downgraded from IG to HY will be held in the index for an additional 6-month provided the credit rating is no worse than B-/B3 according to the J.P. Morgan index methodology.	
<b>Defaulted Issues</b>	Upon default, the issue is removed from the index at the month-end rebalancing following a grace period or bankruptcy filing, whichever comes sooner.	
<b>Registration Type</b>	SEC-registered Global, Domestic, MTN, and 144A with or without registration rights, Eurobonds, and EMTNs that trade in accordance with ISMA principals.	

Source: JPMorgan Chase & Co.

1 – Quasi-sovereign entities are defined as being 100% guaranteed or 100% owned by the national government.

## JESG Overlay Criteria

<b>ESG providers &amp; Green Bond certification authorities</b>	Sustainalytics RepRisk Climate Bonds Initiative
<b>JESG Scoring methodology</b>	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. See <i>Appendix: ESG Methodology</i> for more details.
<b>JESG Integration methodology</b>	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. See <i>Appendix: ESG Methodology</i> for more details.
<b>Green bond treatment</b>	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. See <i>Appendix: ESG Methodology</i> for more details.
<b>JESG Ethical exclusions &amp; Negative Screening</b>	<p>Issuers are excluded based on the below criteria</p> <ul style="list-style-type: none"> <li>• Issuers with revenue from the following sectors: <ul style="list-style-type: none"> <li>○ Thermal Coal</li> <li>○ Tobacco</li> <li>○ Weapons</li> </ul> </li> <li>• Issuers not in compliance with UN Global Compact principles as identified by both RepRisk and Sustainalytics</li> <li>• Issuers with JESG scores less than 20 are not eligible for index re-inclusion for 12 months</li> </ul>

Source: JPMorgan Chase & Co.

## Index Characteristics and Methodology

<b>Pricing</b>	Mid prices are taken from a third party pricing source, PricingDirect
<b>Aggregate Return</b>	Index level total return is calculated as a market-weighted average of bond returns using mid prices
<b>Rebalancing</b>	Rebalances on the last weekday of the month
<b>Coupon Treatment</b>	All coupons received are immediately reinvested into the index
<b>FX Rates</b>	All FX rates used for hedged/unhedged returns are as of 4pm London time provided by WM/Reuters
<b>Hedging Strategy</b>	Assume a 1-month currency forward position that begins on rebalance day and ends on next rebalance day
<b>Weighting</b>	Market capitalization based weighting, renormalized based on JESG Band scalar
<b>Bloomberg Ticker</b>	JPEIIECM

Source: JPMorgan Chase & Co.

## Defining the 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 announced prior to rebalance with an estimated schedule to provide full transparency to the investor base.

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 its first settlement date falls five business days before the rebalancing date. If its settlement date falls on or after five business days prior to the month-end rebalancing date, it is not eligible for inclusion until the following month-end rebalancing.

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.

## Fallen angels

Bonds that have been downgraded from investment grade to high yield while included in the index will be eligible for an additional 6-month provided their credit ratings are no worse than B-/B3 according to the J.P. Morgan index methodology. Securities that have been downgraded to a credit rating below B-/B3 will be removed at the next month-end rebalancing.

## ESG Methodology

The index applies J.P. Morgan ESG (JESG) issuer scores to adjust the market value of index constituents from the baseline Global Credit Index (GCI) Investment Grade EUR custom maturity index. 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 2: 40 < Score <= 60	0.60
Band 2: 20 < Score <= 40	0.40
Band 2: 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.

## 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:

1. Using the clean and coupon returns:

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

2. Or, alternatively, using the treasury and excess returns:

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

Analytic	Field Name in DataQuery	Description
<b>Return Analytics</b>		
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)
<b>ESG Analytics</b>		
ESG JPM Rank	ESGScore	Proprietary J.P. Morgan computed ESG score
ESG Band	ESGBand	ESG band designation
<b>To Worst Analytics</b>		
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)	YTMModDurToWrstMid	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.
<b>Base Analytics</b>		
Index Dirty Price (mid)	StatValStlOrgAmtMid	Dirty mid price including adjustments for amortization and capitalization
Market Value (ESG adj.)	MktCap	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

Source: J.P. Morgan

For any questions or for additional information, please contact [index.research@jpmorgan.com](mailto:index.research@jpmorgan.com).

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