

Index Methodology



FTSE Goldman Sachs Emerging Markets USD Government Bond Index

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The FTSE Goldman Sachs Emerging Markets USD Government Bond Index comprises US dollar denominated sovereign, sovereign guaranteed and government sponsored bonds providing a broad measure of sovereign and government related emerging markets¹ while excluding countries with relatively weak governance, high inflation growth and unfavorable import measures.

The index is created from the FTSE Emerging Markets Broad Bond Index (EMUSDBBI). The sovereign, sovereign guaranteed and government sponsored sectors of the index are used as the base universe of bonds. The base universe is then screened for larger issues based on amount outstanding, representing the more liquid portion of the emerging markets. This liquid universe of bonds is then divided into two maturity buckets, 1-7 years and 7+ years. The weights of the maturity buckets are adjusted to match the weighted average effective duration of the base. Within each maturity bucket, constituents are assigned weights in proportion to their market capitalization. A 5% market weight cap is applied to each country.

The bonds are then ranked by Worldwide Governance Indicators (WGI)². Bonds from the lowest ranked 10% of countries as measured by WGI are excluded. The resulting universe is then ranked again by a pair of equally weighted fundamental indicators provided by the International Monetary Fund (IMF). The IMF fundamental indicators include: (1) trade measured by the year over year difference of the import coverage ratio and (2) a cost of goods and services measured by the absolute change in inflation. The lowest 5% ranked countries as measured by the IMF fundamental indicators are excluded.

The remaining bonds from the emerging markets with favorable governance composite and fundamental composite rankings (i.e., higher import coverage growth and lower inflation volatility), are then capped again at 5% weight per country to help manage the concentration risk. This document details the index design, composition, and calculation methodology. FTSE Fixed Income LLC is the administrator of the index.

Composition and design criteria

Figure 1 details the design criteria and calculation assumptions for the FTSE Emerging Markets Broad Bond Index. Additional design criteria and calculation assumptions for the FTSE Goldman Sachs Emerging Markets USD Government Bond Index are outlined in Figure 2.

Figure 1. FTSE Emerging Markets Broad Bond Index — design criteria and calculation assumptions

Coupon	Fixed-rate and fixed-to-floating bonds
Currency	USD
Minimum maturity	At least one year Fixed-to-floating bonds are removed one year prior to the fixed-to-floating rate start date
Minimum Credit Quality	C by S&P and Ca by Moody's

¹ For more information on the methodology for classifying a country to be "emerging," please see the Emerging Markets Indices section of the *Index Guide* on the Web at <http://www.yieldbook.com/m/indices/>.

² For more information on Worldwide Governance Indicators see <http://info.worldbank.org/governance/wgi>.

Figure 1. FTSE Emerging Markets Broad Bond Index — design criteria and calculation assumptions – (continued)

Minimum Issue Size	Foreign Sovereign: USD 500 million Sovereign Guaranteed/Government Sponsored/Regional, Governments/Corporate: USD 250 million.
Weighting	Market capitalization
Accessibility	Limited to bonds and markets that foreign investors can fully access and whose returns they can easily replicate.
Rebalancing	Once a month at the end of the month
Composition	Securities included: Investment-grade and high-yield US Dollar-denominated debt issued by governments, regional governments, government-sponsored entities, and corporations domiciled in emerging markets. – unless otherwise stated in Figure 2. Securities excluded: Variable-rate, floating-rate, callable zero-coupon bonds, index-linked, retail directed, bills, stripped zero coupon, convertibles, savings, and private placements
Reinvestment of cash flow	At the daily average of the local currency one-month Eurodeposit rate calculated from the actual scheduled payment date of the cash flow through the end of the reporting period.
Calculation Frequency	Daily
Settlement date	Monthly: Last calendar day Daily: Same day settlement except if the last business day of the month is not the last calendar day of the month; then, settlement is on the last calendar day of the month
Fixing Date	Each month, the upcoming month's index constituents are "fixed" on the profile fixing date ³ . Each year's scheduled fixing dates are published on the Web at http://www.yieldbook.com/m/indices .

Figure 2. Additional design criteria and calculation assumptions for the FTSE Goldman Sachs Emerging Markets USD Government Bond Index

Minimum Issue Size	USD 500 million minimum outstanding per issue
Minimum Issuer Size	USD 1 billion minimum total qualifying outstanding debt
Minimum Credit Quality	B- by S&P and B3 by Moody's (excludes defaulted bonds)
Composition	Securities Included: bonds issued by Sovereign Government, Sovereign Government Sponsored Entities, and Sovereign Government Guaranteed Entities
Additional Requirements	Exclude Sukuk issues

³ Fixing dates provide a clear reference point for index users to know in advance of any changes to the composition of the index for the upcoming month. On each fixing date, publically available securities information is used to determine index eligibility and indicative values for the following month's index profile.

Figure 2. Additional design criteria and calculation assumptions for the FTSE Goldman Sachs Emerging Markets USD Government Bond Index – (continued)

Pricing	<p>Thomson Reuters mid-market price. Americas: 3:00 p.m. New York</p> <p>Supplemental Europe, Middle East, and Africa: 6:00 p.m. London Asia Pacific: 6:00 p.m. Tokyo</p> <p>Secondary pricing source, FTSE Index price FTSE prices used for historical calculations (from February 28, 2007 to August 26, 2018)</p>
Reconstitution	<p>Each month, after filtering for minimum issue size, the bond universe is divided into two maturity buckets, 1-7 years and 7+ years. The weights of the maturity buckets are adjusted to match the weighted average effective duration to the base universe, defined as the sovereign, sovereign guaranteed and government sponsored sectors of the FTSE Emerging Markets Broad Bond Index. Within each maturity bucket, constituents are assigned weights in proportion to their market capitalization. A 5% market weight cap is applied to each country.</p> <p>The bonds are then screened by the average governance rank created from six Worldwide Governance Indicators. The countries with the lowest 10% composite rank are excluded. The remaining universe is screened by two fundamental indicators: (1) trade as measured by the year over year difference of the import coverage ratio and (2) cost of goods and services as measured by the absolute change in inflation, both determined annually in May⁴. The countries are ranked positively by import coverage ratio and negatively by inflation and, accounting for market capitalization. The percentile rankings of individual indicators are equally combined to calculate each country's composite rank and the countries with the lowest 5% composite rank are excluded.</p> <p>The remaining bonds from the emerging markets with favorable governance composite and fundamental composite rankings (i.e., higher import coverage growth and lower inflation volatility), are then capped again at 5% weight per country to help manage the concentration risk.</p> <p>In the event that the number of index eligible countries is twenty or less, no countries will be removed or reweighted using the fundamental indicators. Countries would be market value weighted subject to the 5% country weight cap. The rankings are recalculated quarterly at the end of February, May, August, and November to determine the countries for inclusion in the following quarter's index profile.</p>
Capping	5% on country weights
Index Base Date⁵	Feb 28, 2007

⁴ Inflation, balance of payments, and international reserves values for the previous calendar year are published each year, generally in April, by the International Monetary Fund (IMF) in its World Economic Outlook (WEO).

⁵ Back tested data from 2/28/2007 through 8/26/2018. Live data from 8/27/2018 through present.

Figure 3. Example of governance composite ranking, issuer reconstitution and index weighting

Description	Country Market Value (\$Bn)	Average of Governance Percentile Ranking*	Composite Decile Ranking	Inclusion	Index Market Value1 (After recapping \$Bn)	Market Capitalization Weight
Country A	97	1%	1	Included	100.1	3.3%
Country B	119	5%	2	Included	122.9	4.1%
Country C	99	8%	3	Included	102.2	3.4%
Country D	135	12%	4	Included	139.4	4.6%
Country E	127	16%	5	Included	131.1	4.4%
Country F	139	20%	6	Included	143.5	4.8%
Country G	160	24%	7	Included	150.0	5.0%
Country H	145	29%	8	Included	149.7	5.0%
Country I	131	33%	9	Included	135.3	4.5%
Country J	157	37%	10	Included	150.0	5.0%
Country K	117	41%	11	Included	120.8	4.0%
Country L	144	45%	12	Included	148.7	5.0%
Country M	139	50%	13	Included	143.5	4.8%
Country N	85	53%	14	Included	87.8	2.9%
Country O	138	56%	15	Included	142.5	4.7%
Country P	108	60%	16	Included	111.5	3.7%
Country Q	136	64%	17	Included	140.4	4.7%
Country R	160	68%	18	Included	150.0	5.0%
Country S	87	72%	19	Included	89.8	3.0%
Country T	165	76%	20	Included	150.0	5.0%
Country U	159	81%	21	Included	150.0	5.0%
Country V	165	86%	22	Included	150.0	5.0%
Country W	88	89%	23	Included	90.9	3.0%
Country X	40	92%	24	Excluded		
Country Y	165	95%	25	Excluded		
Country Z	95	99%	26	Excluded		
Total	3300				3000	100%

* Lower percentile rankings represent better governance rankings

Figure 4. Example of composite fundamental ranking, issuer reconstitution and index weighting

Description	Index Market Value1 (\$Bn)	Import Coverage Ratio Percentile Ranking*	Absolute Change Inflation Percentile Ranking*	Average Ranking*	Composite Decile Ranking	Inclusion	Final Index Market Value (After recapping, \$Bn)	Market Capitalization Weight
Country A	100.1	6%	2%	4%	1	Included	102.3	3.5%
Country B	122.9	2%	11%	7%	2	Included	125.5	4.3%
Country C	102.2	18%	5%	12%	3	Included	104.4	3.6%
Country D	139.4	14%	11%	13%	4	Included	142.4	4.9%
Country E	131.1	10%	18%	14%	5	Included	134.0	4.6%
Country F	143.5	22%	27%	25%	6	Included	145.5	5.0%
Country G	150.0	32%	22%	27%	7	Included	145.5	5.0%
Country H	149.7	37%	32%	34%	8	Included	145.5	5.0%
Country I	135.3	27%	44%	36%	9	Included	138.2	4.8%
Country J	150.0	46%	37%	41%	10	Included	145.5	5.0%
Country K	120.8	41%	53%	47%	11	Included	123.4	4.2%
Country L	148.7	60%	44%	52%	12	Included	145.5	5.0%
Country M	143.5	55%	58%	57%	13	Included	145.5	5.0%
Country N	87.8	62%	53%	58%	14	Included	89.7	3.1%
Country O	142.5	53%	63%	58%	15	Included	145.5	5.0%
Country P	111.5	75%	70%	73%	16	Included	113.9	3.9%
Country Q	140.4	69%	77%	73%	17	Included	143.5	4.9%
Country R	150.0	77%	70%	74%	18	Included	145.5	5.0%
Country S	89.8	68%	80%	74%	19	Included	91.8	3.2%
Country T	150.0	84%	84%	84%	20	Included	145.5	5.0%
Country U	150.0	89%	95%	92%	21	Included	145.5	5.0%
Country V	150.0	95%	90%	93%	22	Included	145.5	5.0%
Country W	90.9	98%	96%	97%	23	Excluded		
Total	3000.0						2909.1	100%

* Lower percentile rankings represent better fundamental rankings

Pricing

Source

The pricing source for the FTSE Goldman Sachs Emerging Markets USD Government Bond Index is outlined in Figure 2.

Timing

Indexes are calculated Monday through Friday except Christmas Day (observed) and New Year's Day (observed). When a market observes a holiday, the closing prices from the previous available day are used as the closing prices for index calculations on such holiday for that market.

Index quality

An index quality is assigned to each index bond as of profile fixing. The quality is first mapped to the Standard & Poor's Financial Services LLC ("S&P") rating. If a bond is not rated by S&P but it is rated by Moody's Investor Service, Inc. ("Moody's"), the S&P equivalent of the Moody's rating is assigned to the index quality. If a bond is rated by neither S&P nor Moody's, the bond is not assigned an index quality. If a bond is rated as investment-grade by one rating agency and high-yield by the other, the S&P equivalent of the investment-grade rating is assigned to the index quality. These ratings remain unchanged for the entire performance month.

Defaults

When an issuer defaults, or is assigned a D rating by S&P regardless of whether that issuer has filed for bankruptcy protection, or enters into Chapter 7 or Chapter 11 bankruptcy protection in the US (or equivalent in its local market), its bonds remain in the index until the end of the month. However, the bonds will not be included in the calculation of the current month's average profile statistics of the index. The returns are calculated without coupon payment or accrued interest, where applicable.

Return computation

Total returns are computed on the assumption that each security is purchased at the beginning of the period and sold at the end of the period. An issue's total rate of return is the percentage change in its total value over the measurement period. The components of total return for each security are price change, principal payments, coupon payments, accrued interest, and reinvestment income on intra-month cash flows. The total returns are market capitalization weighted using the security's beginning-of-period market value (see Figure 5).

Figure 5. Total rate of return calculation methodology

Beginning-of-Period Value

(Beginning Price + Beginning Accrued) x Beginning Par Amount Outstanding

End-of-Period Value

[(Ending Price + Ending Accrued) x (Beginning Par Amount Outstanding - Principal Payments)] + Coupon Payments + Principal Payments + Reinvestment Income

Total Rate of Return (%)

$$\left[\left(\frac{\text{End-of-Period Value}}{\text{Beginning-of-Period Value}} \right) - 1 \right] \times 100$$

A note on precision: Returns are computed to at least six decimal places but reported to a maximum of five. In addition, owing to rounding errors inherent in computer floating-point arithmetic, the last digit in any reported value may sometimes be off by one from its true value.

Data correction

FTSE Fixed Income LLC strives to produce error-free indices; however, there are occasions when erroneous data is published. These circumstances may be caused by, but not limited to, calculation or pricing errors, missing data, or incorrect indicative data. On rare occasions, and only in extreme cases, the FTSE Fixed Income LLC team may conclude that restatement is required. When determining if restatement is necessary, factors such as the magnitude of the error, the overall impact on the data, the sector affected, and whether the error affects daily and/or monthly results are taken into consideration.

Unless otherwise stated, the index follows the general methodology for FTSE Fixed Income LLC's indices. For details, please see the *Index Guide* on <http://www.yieldbook.com/m/indices/>.

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Data availability and accessibility

Figure 6. Ticker* FTSE Goldman Sachs Emerging Markets USD Government Bond Index

Ticker	Index
CFIIGEMD	FTSE Goldman Sachs Emerging Markets USD Government Bond Index, in USD terms

*Ticker can be used to access data on Bloomberg platform.

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