

Introducing the J.P. Morgan ESG Index suite (JESG)

ESG Platform for Global Fixed Income Indices

Introducing the J.P. Morgan ESG suite of indices (JESG), a global fixed income index family which integrates environmental, social, and governance factors in a composite benchmark.

The JESG applies a multidimensional approach to ESG investing for fixed income investors. It incorporates ESG score integration, positive screening (e.g. green bonds) as well as exclusions of controversial sectors and UN Global Compact violators.

- The initial JESG is available for the leading J.P. Morgan Emerging Markets suite of indices (EMBI Global Diversified, GBI-EM Global Diversified and CEMBI Broad Diversified) and is the first of its kind in emerging markets fixed income. The baseline for JESG indices offers the benefit of familiarity for benchmarked investors looking to gradually incorporate ESG and responsible investing in their overall investment strategies.
- There are 5 steps that comprise the JESG methodology once the baseline index is selected:
 1. Define the data inputs
 2. Establish JESG Index Scores
 3. Apply integration mechanics
 4. Consider ethical factors and exclusions
 5. Calculate new ESG weights
- JESG Index Scores for over 170 countries and 780+ issuers are calculated daily, using data from RepRisk, Sustainalytics and Climate Bonds Initiative (CBI) as inputs.
- The newly calculated JESG Index Scores will be systematically applied to determine the new ESG weights in the index. Issuers with better ESG scores will have higher weights relative to the baseline index weights.
- Notably, the methodology assigns an overweight to green bonds (as per CBI) to incentivize sustainable financing aligned with climate change solutions.
- Ethical screening is also applied for the following sectors: Thermal Coal, Tobacco, Weapons and any issuers that violate the United Nations Global Compact (UNGC) principles.
- In-line with the baseline indices, the JESG indices are rebalanced on the last business day of each month. The inception of the JESG suite is December 31, 2012. Returns and statistics will be available on Bloomberg (JPMX) and on DataQuery via J.P. Morgan Markets.

See page 26 for analyst certification and important disclosures.

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Global Index Research

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JESG key performance statistics

JESG indices have delivered comparable absolute returns to that of the baseline conventional indices, dispelling a popular industry notion that responsible investing involves giving up financial gains. This relative parity is achieved despite the modestly lower yields for JESG indices from the exclusion of issuers with the weakest ESG scores, which are typically also associated with a higher risk premium.

- **Currently, 98% of the issuers in the JPM EM bond indices have ESG input data available from either RepRisk or Sustainalytics (or both). Only 17 names which were predominantly debut issuers are not covered by either provider.**
- **Compared to the baseline EM bond indices, JESG indices exhibited considerably higher ESG scores (i.e. weighted average issuer scores), without compromising performance.** Specifically, the ESG scores for the JESG EMBI and JESG CEMBI saw the largest uplift of 18% and 11%, respectively. JESG GBI-EM score was modestly higher (5%) compared to the flagship GBI-EM Global Diversified.
- **The JESG methodology also increases the overall credit quality of the baseline EM indices, closing the gap for a credit rating upgrade.** For instance, a one notch upgrade of only 20% of the JESG EMBI is required for the index to become investment grade, whereas 80% of the baseline EMBIGD needs to be upgraded by one notch in order for the EMBIGD to become IG.
- **During periods of low or negative returns, the JESG indices exhibit better resilience compared to their counterpart baseline indices.** In fact, the maximum drawdown for JESG suite of indices over the past five years was lower than that of the baseline indices. For example, JESG EMBI maximum drawdown between 2013 to 2018 YTD (March 29th) was 46bps lower than the drawdown in the flagship EMBIGD.
- **Poland (+2.3%), Croatia (+1.4%), and Panama (+1.3%) exhibit the largest weight increases in the JESG EMBI versus the flagship EMBIG Diversified while Lebanon (-2.6%), Nigeria (-1.6%), and Sinopec (-1.1%) experienced the largest reductions versus the base index.** Lebanon and Nigeria were excluded from JESG EMBI due to JESG scores below minimum threshold, whereas Sinopec was excluded to UNGC violations.
- **The JESG methodology retains all 18 countries of the baseline GBI-EM Global Diversified. However, there are fairly significant weight changes in the JESG GBI-EM Global Diversified versus the baseline index where Czech Republic (+2.2%) has the largest increase while Thailand (-3%) weight is impacted the most on the downside.**
- **Within the CEMBI Broad Div. and the JESG variant, the most significant issuer change is the removal of Petrobras due to UNGC violations.**

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Figure 1: JESG index methodology at a glance

Base Index Criteria	EMBI Global Diversified	GBI-EM Global Diversified	CEMBI Broad Diversified
Country criteria	A country's GNI per capita must be below the JPMorgan defined Index Income Ceiling (IIC)* for 3 consecutive years	A country's GNI per capita must be below the JPMorgan defined Index Income Ceiling (IIC)* for 3 consecutive years	Based on region: Asia ex Japan, Latam, Eastern Europe, Middle East / Africa
Issuer criteria	Sovereign and Quasi-Sovereign bonds that are 100% owned or guaranteed by the government	Sovereign bonds ONLY	Headquartered in an EM country, OR 100% of issuer's asset are within EM economies, OR 100% guaranteed by an issuer within EM Economies (excludes Quasi-Sovereigns 100% owned or guaranteed by the government)
Min Issue Size	\$500 million	\$500 million for Global bonds \$1 billion for Local issued bonds	\$300 million
Currency	USD	Local currency of the issuer	USD
Min Maturity	Inclusion - 2 1/2 years Exclusion - 13 months	Exclusion - 13 months	Inclusion - 5 years Exclusion - 13 months
Issue type	All Fixed, Floaters, Amortizers, Capitalizers and loans	Fixed Rate and Zero-coupon bonds	All Fixed, Floaters, Amortizers, and Capitalizers. Defaulted Bonds are excluded
Rebalancing Schedule	Monthly	Monthly	Monthly
Issuer caps	Countries are capped at 10%	Countries are capped at 10%	Issuers and countries are capped at 3% and 10%, respectively
JESG Overlay	JESG EMBI	JESG GBI-EM	JESG CEMBI
ESG providers & green bond certification authorities	RepRisk (Quasi-Sov + Sov) Sustainalytics (Quasi-Sov + Sov) CBI (Green bonds)	RepRisk (Sovereigns) Sustainalytics (Sovereigns) CBI (Green bonds)	RepRisk (Corporates) Sustainalytics (Corporates) CBI (Green bonds)
JESG Scoring methodology	The absolute index scores are an amalgamation of RepRisk & Sustainalytics on an equal weight basis. The scores range from 0 - 100, with 100 classified as the best possible score.		
JESG Integration methodology	Issuers with better overall ESG scores are assigned larger weights compared to EMBI Global Diversified, GBI-EM Global Diversified and CEMBI Broad Diversified benchmarks.		
Green bond treatment	Increased weight allocation compared to a conventional bond from same issuer		
JESG Exclusionary Screening	Issuers with derived revenue from the following sectors are excluded: Thermal Coal, Tobacco, Weapons. In addition, issuers violating UNGC principles are also excluded. Lastly, issuers with JESG scores less than 20 are excluded and are not eligible for 12 months once excluded.		
JESG Index Scores	54 (+18% over benchmark)	57 (+5% over benchmark)	57 (+11% over benchmark)

Source: J.P. Morgan., as of March 29th 2018

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Figure 2: JESG key statistics

Statistics	JESG EMBI	JESG GBI-EM	JESG CEMBI
JESG Score improvement vs. baseline benchmark	18%	5%	11%
JESG Annualized Return	4.05%	-0.67%	3.92%
JESG Annualized Return delta vs. baseline benchmark	+4bps	-1bp	-22bps
JESG Index Yield	5.11%	5.83%	4.95%
JESG Index Yield loss w.r.t to baseline benchmark	-20bps	-18bps	-10bps
Top 3 issuer wgt. increases versus their baseline benchmark	Poland (+2.3%) Croatia (+1.4%) Panama (+1.3%)	Czech Republic (+2.2%) Malaysia (+1.4%) Hungary (+1.1%)	Turkey IS Bank (+0.5%) Anglogold (+0.4%) Peru BCP (+0.4%)
Top 3 issuer wgt. decreases versus their baseline benchmark	Lebanon (-2.6%) Nigeria (-1.6%) Sinopec (-1.1%)	Thailand (-3.0%) Mexico (-0.7%) Brazil (-0.7%)	Petrobras (-2.1%) First Quantum Minerals (-0.9%) Taqa Abu Dhabi (-0.8%)
Inception date	Dec. 31, 2012		

Source: J.P. Morgan., as of March 29th 2018

Figure 3: JESG return analysis vs. conventional indices

	EMBIGD	JESG EMBI	CEMBI BD	JESG CEMBI	GBI-EM GD*	JESG GBI-EM	EM Blend (1/3rd EMBI, GBI-EM, CEMBI)	JESG EM Blend	50 GBI-EM, 25 EMBIGD, 25 CEMBI BD	JESG 50 GBI-EM, 25 EMBIGD, 25 CEMBI BD	50-50 EMBIG GBI-EM	JESG 50-50 EMBIG GBI-EM	Mkt Cap EMBIGD CEMBI BD	JESG Mkt Cap EMBIGD CEMBI BD
TR 2013	-5.3%	-5.0%	-0.6%	-0.2%	-9.0%	-8.0%	-4.9%	-4.4%	-6.0%	-5.3%	-7.1%	-6.5%	-3.2%	-2.7%
TR 2014	7.4%	8.8%	5.0%	4.1%	-5.7%	-6.1%	2.1%	2.2%	0.1%	0.1%	0.7%	1.2%	6.3%	6.7%
TR 2015	1.2%	1.1%	1.3%	1.5%	-14.9%	-	-4.4%	-4.5%	-7.1%	-7.4%	-7.1%	-7.5%	1.2%	1.3%
TR 2016	10.2%	8.8%	9.7%	8.8%	9.9%	9.6%	10.0%	9.2%	10.1%	9.4%	10.2%	9.3%	9.9%	8.8%
TR 2017	10.3%	10.7%	8.0%	7.7%	15.2%	15.6%	11.1%	11.3%	12.1%	12.4%	12.7%	13.2%	9.2%	9.4%
YTD 2018 (Mar 29th)	-1.7%	-2.1%	-1.1%	-1.0%	4.4%	4.3%	0.5%	0.4%	1.5%	1.3%	1.3%	1.1%	-1.5%	-1.7%
Cum Return	22.9%	23.2%	23.7%	22.4%	-3.4%	-3.5%	14.1%	13.7%	9.6%	9.3%	9.3%	9.4%	23.2%	23.0%
Annualized Rtn%	4.0%	4.0%	4.1%	3.9%	-0.7%	-0.7%	2.5%	2.5%	1.8%	1.7%	1.7%	1.7%	4.0%	4.0%
Annualized Vol.	6.1%	6.0%	4.1%	4.0%	11.0%	11.0%	6.7%	6.5%	7.7%	7.6%	8.2%	8.0%	5.1%	5.0%
Sharpe Ratio	0.58	0.60	0.89	0.85	-0.10	-0.10	0.31	0.31	0.17	0.17	0.15	0.16	0.70	0.71

Source: J.P. Morgan., as of March 29th 2018

*JESG GBI-EM and GBI-EM GD returns unhedged in US\$

Note: Past performance is not indicative of future returns.

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Figure 4: Top and bottom 10 issuer level weight differences (JESG vs. flagship EM indices)

JESG EMBI				JESG GBI-EM				JESG CEMBI			
Issuer	JESG Index Weight (%)	Baseline Index Wgt (%)	Diff (in bps)	Ticker	JESG Index Weight (%)	Baseline Index Wgt (%)	Diff (in bps)	Issuer	JESG Index Weight (%)	Baseline Index Wgt (%)	Diff (in bps)
Poland	4.8	2.5	226	Czech Rep.	6.2	4.0	223	Turkey IS bank	1.4	0.8	54
Croatia	2.9	1.5	135	Malaysia	7.1	5.7	141	Anglogold	0.8	0.4	43
Panama	3.8	2.5	128	Hungary	5.8	4.6	114	PE BCP	1.1	0.6	41
Hungary	3.7	2.4	125	Poland	10.0	8.9	105	Ecopetrol	2.1	1.7	41
Uruguay	3.3	2.2	112	Romania	3.4	2.7	67	Qatar Raslaf	1.0	0.6	41
Lithuania	1.8	1.0	87	Chile	3.0	2.4	60	China Huarong AM	0.9	0.6	37
Romania	1.8	1.2	60	Uruguay	0.3	0.2	6	Bancolombia	0.9	0.6	36
Jamaica	1.6	1.1	54	Philippines	0.3	0.3	-2	Cable & Wireless PA	0.7	0.3	35
Argentina	3.8	3.3	46					Turkey Yapi	0.8	0.5	33
Turkey	3.6	3.1	43					Singapore Telecom	0.8	0.5	32
Dom. Rep.	1.9	2.4	-59	Argentina	0.8	0.8	-5	CNOOC Fin	-	0.5	-47
Venezuela	-	0.6	-60	Peru	2.5	2.7	-18	Hutchison	0.4	0.9	-52
Egypt	2.0	2.7	-65	Turkey	6.1	6.6	-43	ICBC China	0.1	0.6	-54
Ivory Coast	0.2	0.8	-66	Colombia	6.6	7.1	-47	Southern Copper	-	0.6	-56
Iraq	-	0.7	-67	Russia	7.3	7.8	-52	Vale Brazil	-	0.6	-62
Exim Bank India	-	0.9	-86	South Africa	8.3	8.9	-59	Gazprom	-	0.7	-66
Pakistan	-	1.1	-111	Indonesia	8.6	9.3	-61	MA Groupe Office	-	0.7	-67
Sinopec China	-	1.1	-114	Brazil	9.3	10.0	-66	Taqi Abu Dhabi	-	0.8	-80
Nigeria	-	1.6	-156	Mexico	9.3	10.0	-66	First Quant. Minerals	-	0.9	-92
Lebanon	-	2.6	-262	Thailand	4.9	7.9	-298	Petrobras Brazil	-	2.1	-208

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Figure 5: JESG vs. flagship EM indices sector level weight differences

	JESG EMBI				JESG GBI-EM				JESG CEMBI			
	JESG Weight (%)	Baseline Weight (%)	Diff (in bps)	JESG Score	JESG Weight (%)	Baseline Weight (%)	Diff (in bps)	JESG Score	JESG Weight (%)	Baseline Weight (%)	Diff (in bps)	JESG Score
Credit Bucket												
Investment Grade	58.03	50.21	782	58	68.16	65.91	224	60	55.93	55.21	72	56
Non Investment Grade	41.97	49.79	-782	50	31.84	34.09	-224	50	44.07	44.79	-72	57
Sub-Credit Bucket												
AAA	-	-	-	-	-	-	-		-	0.11	-11	
AA	-	-	-	-	-	-	-		2.60	2.48	12	53
A	14.19	11.98	221	69	28.9	23.79	511	57	16.99	17.53	-54	57
BBB	43.84	38.23	561	54	39.26	42.12	-287	62	36.34	35.08	126	57
BB	20.62	18.96	166	54	31.08	33.28	-219	53	21.99	22.35	-36	59
B	20.93	27.93	-700	46	0.76	0.81	-5	41	15.37	15.61	-24	55
C	0.33	2.30	-197	32	-	-	-		1.78	1.89	-11	55
NR	0.09	0.60	-51	45	-	-	-		4.93	4.94	-1	55
Maturity bucket												
1-3yrs	13.71	13.61	10	61	23.34	22.7	64	59	18.34	17.95	39	56
3-5yrs	17.63	17.63	-	58	22.67	22.76	-9	58	32.16	30.42	174	57
5-7yrs	15.46	15.65	-19	56	12.77	12.46	31	57	19.05	18.92	13	57
7-10yrs	22.33	23.42	-109	51	19.08	18.77	31	59	16.99	18.17	-118	57
10+ yrs	30.86	29.69	117	52	22.14	23.31	-117	51	13.47	14.54	-107	56
Region												
Africa	8.40	12.40	-400	44	8.31	8.89	-58	56	4.76	6.24	-148	59
Asia	14.90	19.06	-416	46	20.97	23.17	-220	48	32.60	36.06	-346	56
Europe	31.50	24.69	681	63	38.84	34.7	414	68	13.01	11.63	138	60
Latin America	41.57	37.44	413	53	31.89	33.25	-136	50	31.07	30.19	88	58
Middle East	3.63	6.41	-278	57	-	-	-	-	18.56	15.88	268	53
Sovereign/Quasi												
Sovereign	84.12	78.04	608	56	100	100	-					
Quasi-Sovereign	15.88	21.96	-608	47								
Sector												
Consumer									8.30	8.01	29	55
Diversified									1.74	2.51	-77	43
Financial									36.30	30.75	555	55
Industrial									4.98	5.03	-5	56
Infrastructure									1.75	1.83	-8	54
Metals & Mining									3.84	7.04	-320	67
Oil & Gas									12.82	15.02	-220	59
Pulp & Paper									1.00	0.93	7	62
Real Estate									6.05	5.46	59	61
TMT									13.06	12.45	61	56
Transport									1.08	0.89	19	58
Utilities									9.07	10.08	-101	57

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Figure 6: JESG vs. flagship EM indices: Country level weight differences

Country	JESG EMBI				JESG GBI-EM				JESG CEMBI			
	JESG Wgt (%)	Baseline Wgt (%)	Diff (in bps)	JESG Score	JESG Wgt (%)	Baseline Wgt (%)	Diff (in bps)	JESG Score	JESG Wgt (%)	Baseline Wgt (%)	Diff (in bps)	JESG Score
Angola	-	0.32	-32	-								
Argentina	3.78	3.32	45	52	0.76	0.81	-5	52	3.38	3.44	-7	46
Armenia	0.30	0.20	10	63								
Azerbaijan	0.61	1.13	-53	40								
Bahrain									0.39	0.29	10	60
Bangladesh									0.09	0.07	2	41
Barbados									0.16	0.08	8	85
Belarus	0.44	0.39	5	48					0.10	0.08	2	52
Belize	0.07	0.06	1	54								
Bolivia	0.42	0.37	5	40								
Brazil	3.12	3.30	-18	46	9.34	10.00	-66	46	3.72	6.57	-285	54
Cameroon	-	0.16	-16	-								
Chile	3.56	2.74	82	61	3.02	2.43	60	75	4.95	4.25	70	65
China	1.44	4.31	-286	46					6.09	8.22	-213	52
Colombia	3.35	2.94	40	41	6.62	7.09	-47	41	5.77	4.31	146	62
Costa Rica	1.59	1.12	47	67								
Cote D'Ivoire	0.17	0.83	-66	36								
Croatia	3.02	1.62	140	82								
Czech Republic					6.24	4.01	223	85	-	0.07	-7	-
Dominican Republic	1.85	2.44	-59	41					0.06	0.08	-1	26
Ecuador	3.06	2.69	37	41								
Egypt	2.02	2.67	-65	29					0.64	0.52	12	41
El Salvador	1.33	1.17	16	56					0.14	0.22	-8	82
Ethiopia	-	0.19	-19	-								
Gabon	0.31	0.41	-10	25								
Georgia	0.23	0.20	3	51					0.21	0.14	7	63
Ghana	0.64	0.56	8	59					0.36	0.22	14	70
Guatemala	0.37	0.49	-12	24					0.66	0.57	9	59
Honduras	0.26	0.34	-8	22								
Hong Kong									5.35	5.00	35	69
Hungary	4.00	2.66	134	80	5.77	4.63	114	81	0.19	0.12	8	79
India	-	0.95	-95	-					3.53	4.68	-115	50
Indonesia	4.37	4.22	15	42	8.65	9.26	-61	41	2.46	2.59	-13	53
Iraq	-	0.67	-67	-					0.27	0.16	10	67
Israel									4.10	3.97	14	44
Jamaica	1.60	1.06	54	71					0.84	1.01	-18	32
Jordan	0.63	0.56	8	56					0.19	0.11	7	78
Kazakhstan	3.02	2.76	26	46					0.90	0.75	15	54
Kenya	0.70	0.92	-22	40								
Korea									4.03	4.34	-31	49
Kuwait									2.18	1.60	58	52
Latvia	0.19	0.13	7	77					0.13	0.08	5	67

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Figure 6 continued - JESG vs. flagship EM indices: Country level weight differences

Country	JESG EMBI				JESG GBI-EM				JESG CEMBI			
	JESG Wgt (%)	Baseline Wgt (%)	Diff (in bps)	JESG Score	JESG Wgt (%)	Baseline Wgt (%)	Diff (in bps)	JESG Score	JESG Wgt (%)	Baseline Wgt (%)	Diff (in bps)	JESG Score
Lebanon	-	2.62	-262	-								
Lithuania	1.84	0.97	87	82								
Macau									0.65	0.97	-32	61
Malaysia	2.73	2.65	9	49	7.14	5.73	141	64	1.39	1.77	-38	57
Mexico	5.86	5.14	72	46	9.34	10.00	-66	50	5.52	5.10	42	55
Mongolia	0.72	0.67	5	53					-	0.09	-9	-
Morocco	0.49	0.43	6	52					-	0.67	-67	-
Mozambique	0.08	0.11	-3	29								
Namibia	0.36	0.24	12	70								
Nigeria	-	1.56	-156	-					0.75	1.13	-38	34
Oman	2.99	2.57	42	58					0.41	0.25	16	66
Pakistan	-	1.11	-111	-								
Panama	4.03	2.69	134	61					1.44	1.07	38	69
Paraguay	0.50	0.66	-16	34					0.11	0.07	5	64
Peru	2.82	2.89	-7	47	2.50	2.67	-18	48	4.31	3.42	89	59
Philippines	3.62	3.27	34	46	0.26	0.28	-2	47	1.97	2.12	-14	45
Poland	4.78	2.52	226	83	10.00	8.95	105	83	0.28	0.23	5	52
Qatar									4.07	3.40	67	53
Romania	1.76	1.16	60	68	3.39	2.72	67	68				
Russia	3.67	3.55	12	43	7.31	7.83	-52	42	3.98	5.18	-120	52
Saudi Arabia									1.98	1.60	38	57
Senegal	0.55	0.48	7	43								
Serbia	1.05	0.69	36	67								
Singapore									3.63	3.43	20	57
Slovakia	0.56	0.29	26	82								
South Africa	2.52	2.76	-24	55	8.30	8.89	-59	56	2.89	2.63	26	70
Sri Lanka	1.76	1.55	21	49								
Suriname	0.12	0.11	1	53								
Taiwan									0.35	0.43	-8	77
Tajikistan	0.06	0.09	-2	39								
Tanzania									0.12	0.14	-2	33
Thailand					4.92	7.90	-298	37	3.07	2.37	70	58
Trinidad And Tobago	0.58	0.57	2	51								
Tunisia	0.13	0.18	-4	35								
Turkey	4.08	3.64	44	46	6.13	6.56	-43	46	6.09	4.32	177	65
UAE									4.98	4.50	48	58
Ukraine	1.89	2.68	-80	33					1.12	0.66	46	71
Uruguay	3.30	2.18	112	79	0.31	0.25	6	79				
Venezuela	-	1.17	-117	-								
Vietnam	0.26	0.34	-8	32								
Zambia	0.44	0.58	-14	36					-	0.92	-92	-

Source: J.P. Morgan, as of March 29th 2018

Overview

The J.P. Morgan ESG suite of indices (JESG) is a global fixed income index family which integrates environmental, social and governance factors in a composite benchmark. JESG applies a multidimensional approach to ESG investing for fixed income investors.

The initial JESG is available for the leading J.P. Morgan Emerging Markets suite of indices (EMBI Global Diversified, GBI-EM Global Diversified and CEMBI Broad Diversified) and is the first of its kind in emerging markets fixed income. The baseline for JESG indices offers the benefit of familiarity for benchmarked investors looking to gradually incorporate ESG and responsible investing in their overall investment strategies.

JESG uses a proprietary ESG construction method. Normalized JESG Index Scores for over 170 countries and 780+ issuers are calculated daily, using data from RepRisk, Sustainalytics, and Climate Bonds Initiative (CBI) as inputs. JESG construction takes into account the environmental and socio-ethical factors by excluding issuers operating in certain sectors, namely thermal coal, tobacco and weapons. The exclusion criteria also encompass a corporate sustainability aspect by filtering issuers in violation of the UN Global Compact principles. Notably, the methodology assigns an overweight to green bonds (as per CBI) to incentivize sustainable financing aligned with climate change solutions.

Sustainable and Responsible Investing (SRI) most commonly refers to incorporating Environmental, Social and Governance (ESG) factors in investment decision-making process alongside traditional investment decisions. ESG investing approaches vary from strictly excluding potential investments due to moral/ethical considerations, to having only an ESG integration skew without any negative screening. JESG utilizes the best of both approaches by following an integration methodology in combination with positive and negative screening.

ESG landscape

ESG - Environmental, Social and Governance (also known as Sustainable and Responsible Investing, SRI) is becoming a mainstream topic in the investment community as investors increasingly look to ascertain the impact of their investment decisions beyond financial returns.

Previous J.P. Morgan publications have highlighted the growth and trends in ESG investing ([link](#)). An estimated \$23 trillion in assets are managed in mandates integrating SRI principles in their portfolio strategy. The majority of those assets are based in Europe (53%), with fixed income accounting for 64% of European SRI assets.

There is no single standards body that covers all Responsible Investing (RI) initiatives. We list the most commonly followed standards and advocacy initiatives in Appendix I. These include UN PRI (United Nations Principles for Responsible Investing), Climate Bonds Initiative (for green bonds), regional Sustainable Investment Forums (such as US SIF, Euro SIF etc.).

GSIA (Global Sustainable Investment Alliance) is a collaboration of several sustainable investment organizations around the world and sets out 7 categories of SRI investment

(refer to Appendix II). **JESG index construction uses ESG Integration, positive and negative screening which are the three main categories set out by GSIA.**

JESG Methodology

The JESG EM methodology will start with the baseline benchmark criteria of the EMBI Global Diversified, GBI-EM Global Diversified and CEMBI Broad Diversified. For detailed index criteria refer to Appendix V, VI and VII.

Once the baseline index is selected, the following 5-step approach is applied to determine the JESG Index Scores and constituent level weights:

1. Define the data inputs
2. Establish JESG Index Scores
3. Apply Integration mechanics
4. Consider ethical factors and exclusions
5. Calculate new ESG weights

1. Define the data inputs

ESG factor valuations for each issuer are sourced from two industry leading data providers. These inputs include event-driven signals that leverage big data techniques as well as longer-term scores based on rigorous fundamental research:

- **RepRisk:** A niche ESG research provider specializing in quantifying reputational risk exposures by leveraging big data techniques. RepRisk has over a decade of expertise in providing ESG event risk signals on a real-time basis. In addition to ESG input scores, RepRisk also provides a letter rating (AAA to D) which is a peer group and the sector average ranking enhanced by integration of ESG and business conduct risks into business processes.
- **Sustainalytics:** The largest pure-play investment research provider dedicated to responsible investing and ESG research with a 25 year track record and coverage of more than 7000 issuers.

Apart from providing a holistic view of both real-time and fundamental ESG factors, having multiple ESG contributors provides broad based coverage for the issuers in the JESG indices. All the sovereign issuers in the JESG GBI-EM and JESG EMBI series are covered and nearly 98% of the corporate issuers are covered by at least 1 provider.

Figure 7: JESG country/issuer coverage from input data providers

	Aggregate		RepRisk		Sustainalytics	
	# of Names Covered	% of Coverage	# of Names Covered	% of Coverage	# of Names Covered	% of Coverage
Sovereign	172	100%	172	100%	172	100%
Corp / Quasi	693	98%	685	96%	544	77%

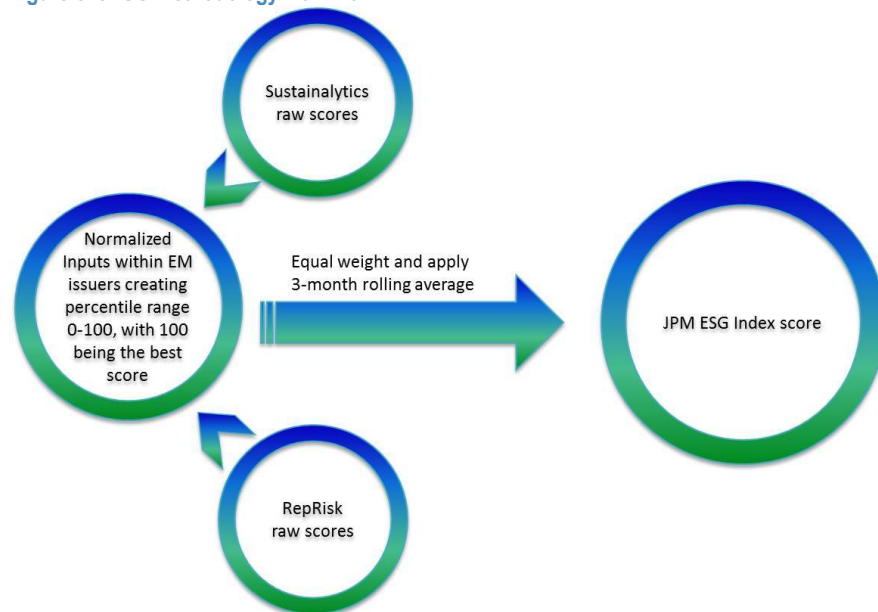
Source: J.P. Morgan.

2. Establish JESG Index Scores:

- a. **Normalizing the inputs:** ESG scores at the issuer level are sourced from each provider and transformed to a range of 0 – 100, with 100 being the best possible score.
- b. **Finalizing the JPM ESG Index Score:** once the scores are normalized for each issuer, a simple average of the individual provider scores are taken in order to produce one standardized metric. The finalized JPM ESG Index Score for the issuer incorporates a 3 month rolling average in order to smooth any noise in the input data (Figure 8). JPM ESG Index Scores are calculated daily for over 170 countries and 780+ issuers.

Waterfall scoring logic: All available issuer level scores are used in the JESG Score calculations. If a quasi-sovereign issuer in the EMBIGD is not covered by any of the input ESG score providers, the respective sovereign ESG score is assigned to the issuer. Similarly, if a corporate issuer in the CEMBI BD does not have any input ESG scores, then the industry sector average ESG score is utilized as a proxy.

Figure 8: JESG methodology work flow



Source: J.P. Morgan

3. *Apply Integration mechanics:*

- a. **Implementation of bands** – each issuer in the EMBI Global Diversified, GBI-EM Global Diversified and CEMBI Broad Diversified will be bucketed into bands 1 – 5.
 - i. Band 1 = JESG Score equal to or greater than 80
 - ii. Band 2 = JESG Score equal to or greater than 60, less than 80
 - iii. Band 3 = JESG Score equal to or greater than 40, less than 60
 - iv. Band 4 = JESG Score equal to or greater than 20, less than 40
 - v. Band 5 = JPM ESG Index Score less than 20
- b. **What do the bands represent** – each band functions as a scalar/multiplier which is utilized in the overall ESG integration approach.
 - i. Issuers in Band 1 will inherit 100% of their baseline index market value from the EMBI Global Diversified, GBI-EM Global Diversified and CEMBI Broad Diversified.
 - ii. Issuers in Band 2 will inherit 80% of the base index market value.
 - iii. Issuers in Band 3 will inherit 60% of the base index market value.
 - iv. Issuers in Band 4 will inherit 40% of the base index market value.
 - v. Issuers in Band 5 will be excluded and will not be eligible for the next 12 months.

For example, an instrument with market value of US\$1.25billion in the baseline index would potentially have the following new JESG market value:

$$JESG \text{ Market Value } (\$bn) = \begin{cases} 1.25 * 1.0 = 1.25, \text{ if Band 1} \\ 1.25 * 0.8 = 1.00, \text{ if Band 2} \\ 1.25 * 0.6 = 0.75, \text{ if Band 3} \\ 1.25 * 0.4 = 0.50, \text{ if Band 4} \\ \text{Or 0, if Band 5} \end{cases}$$

- c. **Treatment of green bonds – JESG methodology increases the weight of green bonds to incentivize sustainable financing aligned with climate change solutions.** If an instrument is categorized as “green” by the CBI (Climate Bond Initiative), the security will receive a one notch Band upgrade. For example, any green bond issued by an issuer in Band 3 will be promoted to Band 2, whereas conventional bonds issued by the same issuer will remain in Band 3. Green bonds by issuers already in Band 1 will not receive any further upgrade. This approach effectively provides positive screening benefits to green bond issuance by increasing their weights relative to conventional bonds issued by the same entity.

Figure 9: Distribution of JESG index weights by bands

Bands	JESG EMBI		JESG GBI-EM		JESG CEMBI	
	JESG Index Wgt (%)	# of Issuers	JESG Index Wgt (%)	# of Countries	JESG Index Wgt (%)	# of Issuers
Band 1	10.2	5	16.2	2	6.7	34
Band 2	21.7	25	19.6	6	36.3	151
Band 3	56.4	54	59.2	12	43.3	247
Band 4	11.7	37	4.9	1	13.7	90
Band 5	-	-	-	-	-	-
Green bonds	0.7	4	-	-	1.5	19

Source: J.P. Morgan., as of March 29th 2018

4. Consider ethical factors and exclusions:

- Corporate or quasi-sovereign issuers with any involvement (based on revenues) in the following sectors will be removed from the benchmark: Thermal Coal, Tobacco and Weapons. In addition, any issuer that is flagged for violating UNGC principles will also be excluded from JESG indices (**as per RepRisk & Sustainalytics**). The UNGC principles are widely accepted corporate sustainability principles that cover areas like anti-corruption, human rights, labor, and the environment (**UNGC principles detailed in Appendix IV**).
- Issuers with JESG Index Scores of less than 20 will also be removed from the respective ESG benchmarks. Once an issuer is removed due to scoring, the issuer is no longer eligible for inclusion for 12 months. **Green bonds from excluded issuers are also not eligible for inclusion.**

Figure 10: Top 20 largest issuer exclusions from the JESG CEMBI

Ticker	Issuer	Exclusion Reason	Wgt (%) in CEMBI BD
PETBRA	BR Petrobras	UN Global Compact Violator	2.08
FMCN	ZM First Quantum Minerals	Sector exclusion: Thermal Coal	0.92
TAQAUH	AE Taqa Abu Dhabi	Sector exclusion: Thermal Coal	0.80
OCPMR	MA Groupe Office	UN Global Compact Violator	0.67
GAZPRU	RU Gazprom	Sector exclusion: Thermal Coal	0.66
VALEBZ	BR Vale Overseas	UN Global Compact Violator and Thermal Coal	0.62
CKHH	HK Hutchison	JESG Score below 20	0.59
SCCO	MX Southern Copper	UN Global Compact Violator and Thermal Coal	0.56
ICBCAS	CN ICBC	JESG Score below 20	0.53
CNOOC	CN CNOOC Fin	JESG Score below 20	0.47
BABA	CN Alibaba Group	JESG Score below 20	0.46
BCHINA	CN Bank of China	JESG Score below 20	0.46
ICICI	IN ICICI Bank	JESG Score below 20	0.40
MTNSJ	ZA MTN Mauritius	UN Global Compact Violator	0.39
FLEX	SG Flextronics Ltd	Sector exclusion: Weapon	0.37
GENTMK	MY Genting Bhd	Sector exclusion: Thermal Coal	0.33
VEDLN	IN Vedanta	Sector exclusion: Thermal Coal	0.32
ONGCIN	IN ONGC	UN Global Compact Violator	0.29
KOHNPW	KR Hydro & Nuclear	UN Global Compact Violator	0.29
NWDEVL	HK New World	Sector exclusion: Thermal Coal	0.28

Source: J.P. Morgan., as of March 29th 2018

Figure 11: Top 20 largest issuer exclusions from the JESG EMBI

Ticker	Issuer	Exclusion Reason	Wgt (%) in EMBIGD
LEBAN	Lebanon	JESG Score below 20	2.62
NGERIA	Nigeria	JESG Score below 20	1.56
SINOPE	Sinopec China	UN Global Compact Violator	1.14
PKSTAN	Pakistan	JESG Score below 20	1.11
EXIMBK	IN Exim Bank of India	JESG Score below 20	0.86
IRAQ	Iraq	JESG Score below 20	0.67
IVYCST	Ivory Coast	JESG Score below 20	0.61
VENZ	Venezuela	JESG Score below 20	0.60
PDVSA	VE PDVSA	UN Global Compact Violator	0.57
EXIMCH	CN Export Import Bank	JESG Score below 20	0.52
ESKOM	ZA Eskom	Sector exclusion: Thermal Coal	0.51
SDBC	CN China Dvlp Bk Corp	JESG Score below 20	0.46
OGIMK	MY 1MDB Global Investments	UN Global Compact Violator	0.44
PLNIJ	ID PLNII	Sector exclusion: Thermal Coal	0.39
BNDES	BR BNDES	JESG Score below 20	0.37
PETRPE	PE Petro Peru	JESG Score below 20	0.37
SOIAZ	AZ Socar	JESG Score below 20	0.33
ANGOL	Angola	JESG Score below 20	0.32
RURAIL	RU Russian Railways	JESG Score below 20	0.20
OSCHAD	UA Oschadbank	JESG Score below 20	0.19

Source: J.P. Morgan, as of March 29th 2018

5. Calculate new benchmark weights based on the JESG methodology:

- Once the final constituent list has been determined, instrument level weights are assigned pro rata to market capitalization (assigned in Step 3).
- Countries in the JESG EMBI, JESG GBI-EM and JESG CEMBI will be capped at 10%. Individual issuers in the JESG CEMBI will be capped at 3%.

JESG Rebalancing

The JESG indices will leverage the main standards of the monthly rebalance actions of the base EMBI Global Diversified, GBI-EM Global Diversified and CEMBI Broad Diversified indices. The JESG month-end rebalancing will focus on:

- Promotion/Demotion into/out of ESG Bands:** If an issuer is eligible for a different band than the one it is currently in, it will be moved to the new band on the monthly rebalance date, following a one month lag. As per index rules, the promotion/demotion into/out of ESG bands will also impact green bonds issued by the respective issuer.
- Inclusion/Exclusion of Issuer:** Based on developments related to ethical factors, if an issuer is eligible for inclusion into or exclusion from the JESG indices, the action will take place on the monthly rebalancing date, following a one-month lag.

JESG EM Bespoke Capabilities

While JESG EM suite of indices can help provide standardization to Emerging Markets fixed income community on ESG investing, we also acknowledge there will be demand for bespoke ESG indices. Figure 12 illustrates the various opportunity sets which can be used for customization. Some examples of bespoke indices are listed below.

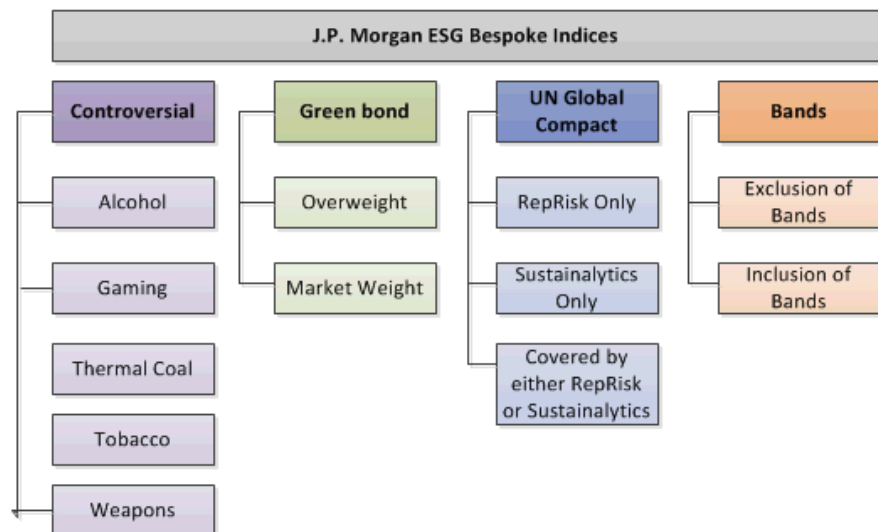
Controversial sectors: Standard JESG EM indices exclude issuers associated with Thermal Coal, Tobacco and Weapons industries. Bespoke indices that ignore these exclusions (i.e. retain the issuers in these sectors) can be produced. Additional sector exclusions are available on issuers related to alcohol and gaming industries.

Green bonds: The current JESG methodology increases the weight of green bonds by implementing a one notch band upgrade. In bespoke JESG indices, green bonds can be adjusted to market weight treatment (i.e. not implementing the one band upgrade).

UN Global Compact violators: Option to ignore UNGC violators flagged by one or more providers in bespoke indices. Currently, UNGC flags are sourced from both RepRisk and Sustainalytics.

ESG Bands: Issuers that fall in Band 5 are ineligible for inclusion in the JESG indices and remain ineligible for at least 12 months. In a bespoke index, the inclusion or exclusion of issues from ESG bands can be customized.

Figure 12: Customization capabilities



Source: J.P. Morgan.

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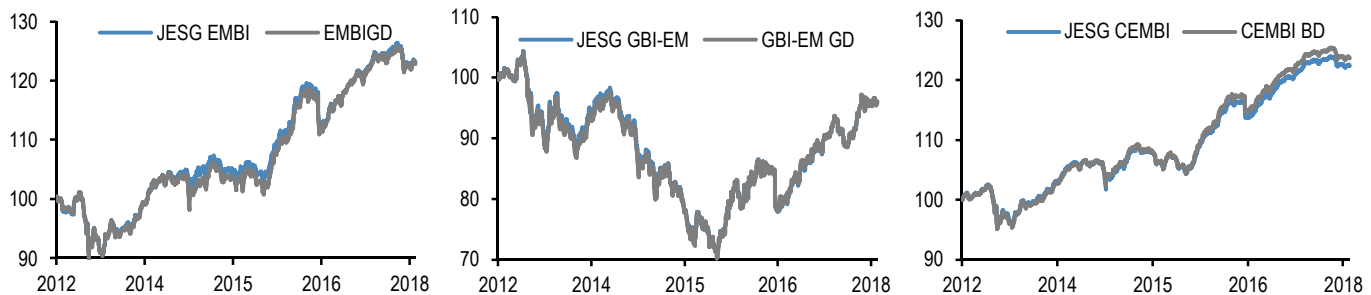
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Performance attribution for JESG EM

Figure 13: JESG indices have track record of comparable absolute returns

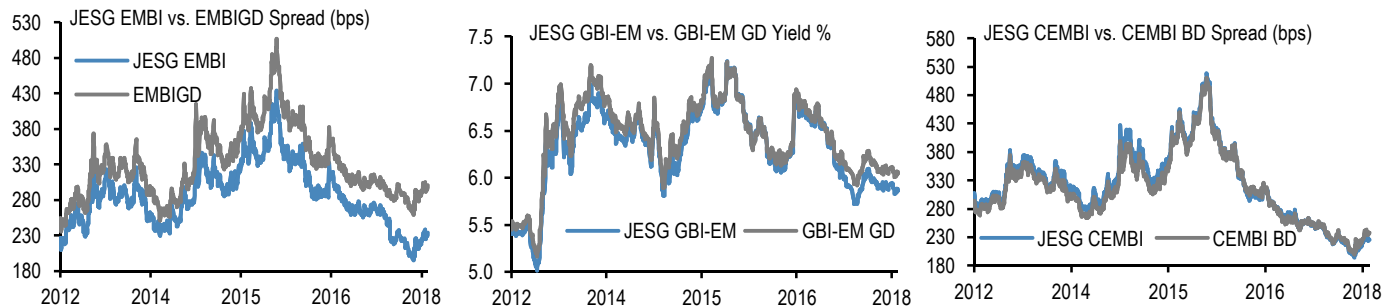
Total return %, Dec 31st 2012 – Apr 16th 2018



Source: J.P. Morgan.

Figure 14: JESG indices have modestly lower risk premia compared to baseline EM indices.

STW (Trsy) in bps and Yield (%), Dec 31st 2012 – Apr 16th 2018

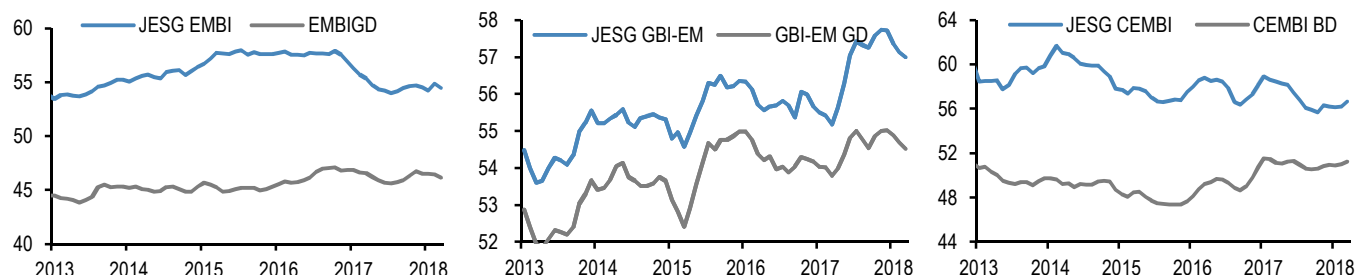


Source: J.P. Morgan.

Figure 15: JESG methodology delivers significant ESG enhancement in terms of overall ESG score improvement

JESG EMBI (+18% vs. EMBIGD), JESG CEMBI BD (+10% vs. CEMBI BD) and JESG GBI-EM (+5% vs. GBI-EM GD)

Based on JESG scores for baseline and JESG indices, Dec 31st 2012 – Apr 16th 2018



Source: J.P. Morgan.

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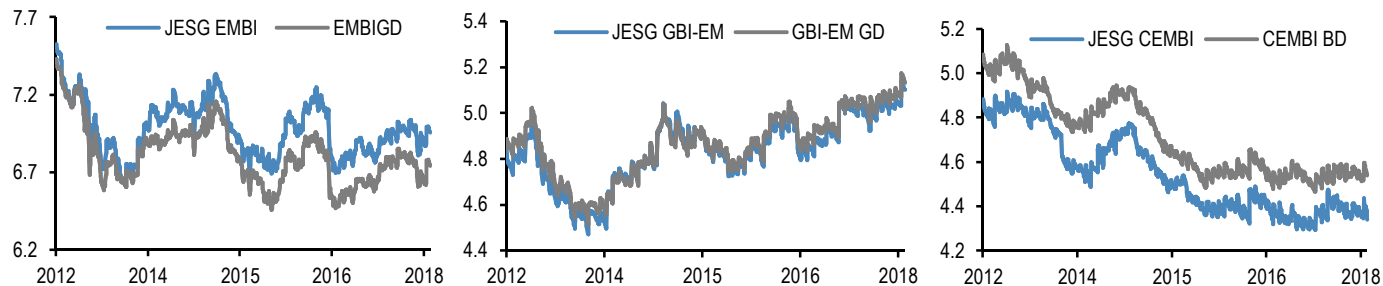
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Figure 16: JESG CEMBI and JESG GBI-EM have lower interest rate sensitivity compared to their base line indices. Whereas the JESG EMBI has modestly longer duration than the EMBIGD

EIR Duration To-worst for EMBI/CEMBI indices and Modified duration for JESG GBI-EM and GBI-EM GD



Source: J.P. Morgan.

Figure 17: Watch list of issuers at risk of removal (ESG scores close to 20) from JESG CEMBI and JESG EMBI

JESG EMBI			JESG CEMBI		
Ticker	ESG Score	Market Cap %	Ticker	ESG Score	Market Cap %
China Power Construction Corp	15.58	0.02	Africa Finance Corp	21.93	0.23
Georgia Railway	16.76	0.08	PT APL Realty	21.87	0.05
Guatemala Republic	24.48	0.37	Banco General SA	22.75	0.10
Honduras Republic	22.03	0.26	Beijing Gas Group	20.50	0.01
SCF Capital	22.40	0.05	China Auto Rental	23.47	0.02
			Global Bank	20.24	0.24
			Halkbank	24.40	0.25
			Industrial and Commercial Bank of China	21.49	0.07
			Industrial Bank of Korea	23.71	0.11
			Shanghai Pudong Bank	15.72	0.01
			Syndicate Bank	21.17	0.03
			Tencent	23.65	0.25
			Union Life Insurance	21.69	0.01
			Total		1.38
		0.78			

Source: J.P. Morgan., as of March 29th 2018.

+There are no countries in the GBI-EM currently at risk of exclusion (i.e. JESG Score close to 20)

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Where to find the JESG Indices

Daily JESG index returns and statistics can be access via the following channels:

1. **MorganMarkets (www.jpmm.com):** Contains downloadable files of daily and historical country and instrument returns, statistics and compositions.
2. **Dataquery on J.P. Morgan Markets (JPMM):** Allows clients to view, manipulate and download user-specific queries. Access DataQuery via MorganMarkets website from “Research > Analytics > Data Query” and the JESG indices can be found under “Indices -> Emerging Markets -> JPM ESG Index (JESG)”.
3. **Bloomberg: JPMX <GO>** is the directory page for all J.P. Morgan Indices and their closing levels; The JESG suite of indices can be found at JPMX <go> followed by ‘ESG’.

Appendix I: ESG Standards bodies

We list commonly followed standards organizations for RI globally. This list is not exhaustive but does cover most of the bodies that investors, asset owners and national and supra-national entities subscribe to.

- **UN-Backed Principles for Responsible Investment (PRI):** The PRI outlines six Principles for Responsible Investment. These are voluntary and aspirational set of investment principles that offer a menu of possible actions for incorporating ESG issues into investment practice. As of March 31st 2017, the PRI has more than 1800 signatories, from over 50 countries, representing approximately US\$70 trillion in assets.
- **Regional SIFs:** Sustainable Investment forums committed to growing sustainable and RI practices in their respective regions such as US SIF, Eurosif, UKSIF, AfricaSIF, RIRA (India), SIF-Japan. Several of these SIFs have come together to form **GSIA**¹, a collaboration of membership-based sustainable investment organizations around the world. GSIA members extend beyond these regional SIF bodies to include organizations such as RIA (Canada), VBDO (Netherlands), and RIAA (Australasia).
- **Climate Bonds Initiative (CBI)**²: CBI is an investor focused, international organization developing standards and certification for bonds to be classified “green”. Their Taxonomy defines investments that are part of the low carbon economy.
- **TCFD:** The FSB Task Force on Climate-related Financial Disclosures (TCFD) develops voluntary, consistent climate-related financial risk disclosures. Their work helps companies understand what financial markets want from disclosure in order to respond to climate change risks.
- **Asset Owner Disclosure Project (AODP) and ShareAction:** AODP rank the climate related financial disclosures of largest pension funds, SWFs and endowments. Since June ‘17, ShareAction has taken on the reins of AODP.
- **Carbon Disclosure Project (CDP):** A not-for-profit entity that runs the global disclosure system to manage environmental impacts.
- **Carbon Disclosure Standards Board (CDSB):** An international consortium committed to advancing and aligning the global mainstream corporate reporting model to equate natural capital with financial capital.
- **Sustainability Accounting Standards Board (SASB):** The SASB develops and maintains sustainability accounting standards—for 79 industries in 11 sectors—that help public corporations disclose financially material information to investors in a cost-effective and decision-useful format.

Besides these bodies, there are several others such as Ceres/Investor Network on Climate Risk (INCR), Focusing Capital on the Long-term (FCLT), Global Climate 100, Aiming for A, Institutional Investors Group On Climate Change (IIGCC), GRESB (Global ESG Benchmark for Real Assets), Institute & Faculty of Actuaries (UK), Portfolio Decarbonisation Coalition (PDC), Transition Pathway Initiative (TPI), United Nations Environment Programme Finance Initiative (UNEP FI).

¹ <http://www.gsi-alliance.org/aboutus/>

² <https://www.climatebonds.net/about>

Appendix II: Seven Categories of Sustainable Investment

Global Sustainable Investment Alliance (GSIA) defines 7 categories of sustainable investment³, and these are generally seen as a global standard of classification:

1. **Negative/exclusionary screening:** the exclusion from a fund or portfolio of certain sectors, companies or practices based on specific ESG criteria;
2. **Positive/best-in-class screening:** investment in sectors, companies or projects selected for positive ESG performance relative to industry peers;
3. **Norms-based screening:** screening of investments against minimum standards of business practice based on international norms;
4. **ESG Integration:** the systematic and explicit inclusion by investment managers of environmental, social and governance factors into financial analysis;
5. **Sustainability themed investing:** investment in themes or assets specifically related to sustainability (e.g. clean energy, green technology or sustainable agriculture);
6. **Impact/community investing:** targeted investments, typically made in private markets, aimed at solving social or environmental problems, and including community investing, where capital is specifically directed to traditionally underserved individuals or communities, as well as financing that is provided to businesses with a clear social or environmental purpose; and
7. **Corporate engagement and shareholder action:** the use of shareholder power to influence corporate behavior, including through direct corporate engagement (i.e., communicating with senior management and/or boards of companies), filing or co-filing shareholder proposals, and proxy voting that is guided by comprehensive ESG guidelines

Sustainable investing takes many forms and practitioners may go about observing RI principles through more than a single channel. For instance, Impact Investing⁴ is gaining traction as a means for investors to generate social and environmental impact, without foregoing the financial returns. This is growing across frontier, emerging, and developed markets and stretches across asset classes. Sustainable Development Goals⁵ (SDGs) from United Nations identifies 17 goals with 169 associated targets for stakeholders to commit to.

The SDG bond framework is expected to be aligned within the Green Bond principles. Similar social and environmental instruments exist; such as Blue Bonds (targeting sustainable ocean industries), Vaccine bonds (funds for immunization programs in developing countries), and Social & Development impact bonds (impact investors financing for social or development interventions)⁶.

³ Global Sustainable Investment Review, 2012

⁴ Global Impact Investing Network, <https://thegiin.org/>

⁵ <https://sustainabledevelopment.un.org/sdinaction>

⁶ <http://www.undp.org/content/undp/en/home/blog/2017/9/12/The-pros-and-cons-of-ethical-debt-instruments.html>

Appendix III: UN PRI – The 6 principles

In 2006, the United Nations launched its six principles for responsible investment. The signatories to UN-PRI commit to these 6 principles⁷.

PRINCIPLE 1: We will incorporate ESG issues into investment analysis and decision-making processes.

PRINCIPLE 2: We will be active owners and incorporate ESG issues into our ownership policies and practices.

PRINCIPLE 3: We will seek appropriate disclosure on ESG issues by the entities in which we invest.

PRINCIPLE 4: We will promote acceptance and implementation of the principles within the investment industry.

PRINCIPLE 5: We will work together to enhance our effectiveness in implementing the principles.

PRINCIPLE 6: We will each report on our activities and progress towards implementing the principles.

⁷ <https://www.unpri.org/about/the-six-principles>

Appendix IV: UN Global Compact Principles

The UNGC principles are widely accepted corporate sustainability principles that meet fundamental responsibilities in the areas of anti-corruption, human rights, labor and the environment.

The Ten Principles of the United Nations Global Compact are derived from: the Universal Declaration of Human Rights, the International Labor Organization's Declaration on Fundamental Principles and Rights at Work, the Rio Declaration on Environment and Development, and the United Nations Convention Against Corruption.

Human Rights

Principle 1: Businesses should support and respect the protection of internationally proclaimed human rights

Principle 2: make sure that they are not complicit in human rights abuses

Labor

Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining

Principle 4: the elimination of all forms of forced and compulsory labor

Principle 5: the effective abolition of child labor

Principle 6: the elimination of discrimination in respect of employment and occupation

Environment

Principle 7: Businesses should support a precautionary approach to environmental challenges

Principle 8: undertake initiatives to promote greater environmental responsibility

Principle 9: encourage the development and diffusion of environmentally friendly technologies

Anti-Corruption

Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery

Appendix V: EMBI Global Diversified: Index Criteria and Methodology

Criteria

Instrument Type	Fixed and floating rate securities along with capitalizing/amortizing bonds. Excludes convertibles, inflation-linked instruments ¹
Issuer Type	Only sovereign and quasi-sovereign entities are eligible. Quasi sovereign entities are defined as being 100% guaranteed or 100% owned by the government.
Remaining Maturity	Only those instruments with at least 2.5 years are considered for inclusion. At each month-end, instruments that will mature within the next 13 months, will be excluded from the Index
Amount Outstanding	Only issues with a current face amount outstanding of \$500 million or more are considered for Inclusion ²
Currency	Only USD denominated bonds are included. Instruments where the amount of coupon or redemption payment is linked to an exchange rate are not eligible for inclusion
Country	Inclusion is limited to countries whose country's GNI per capita is below the JPMorgan Index Income Ceiling (IIC) for three consecutive years. Current IIC level is \$18,769. Countries are removed from the index if the IIC level AND the country's sovereign credit rating is A-/A3 or above for three consecutive years
Law	Local law instruments are not eligible
Settlement	Instruments must be able to settle internationally

Methodology

Inception Date	Dec 1993
Return	Index/Country level total return is calculated as a market-weighted average of bond returns using bid prices
Holiday Calendar	Follows US bond market calendar set by Emerging Markets Trader Association (EMTA)
Rebalancing	Rebalances on the last US business day of the month
Inclusion	New instrument that meets the index criteria is added to the index if settlement date falls before 15 th of the month. If it settles on or after the 15 th of the month, the instrument is included during next month's rebalancing. Exceptions include debt exchanges (reflected in the index during same month-end) and Reg S only securities (end of seasoning period considered as new settlement date, and 15 th of the month rule is applied)
Coupons	All coupons received are immediately reinvested into the index
Weighting	Diversified, market capitalization based weighting subject to maximum weight of 10% (cap) per country. For diversified weighting, only a certain portion of the instrument's current face amount outstanding is used.
Pricing	Bid and Ask prices are taken from a third party pricing source ³
FX Rates	All FX rates used for hedged/unhedged returns are as of 4pm London time provided by WM/Reuters as of 16:00 London time
Defaults	Defaulted securities remain eligible for the index as long as the liquidity criteria is met
Credit Rating	No minimum rating required for eligibility. Rating-based statistics use middle rating of the S&P, Moody's and Fitch ratings
Bloomberg Ticker	JPGCCOMP Index

Source: JPMorgan Chase & Co.

1- Bonds with embedded options and warrants are eligible for inclusion if the options/warrants are attached to the instruments that would otherwise be included in the index and the prices are quoted cum options or warrants. 2 - A bond is removed from the index when its current outstanding amount falls below \$0.5 billion. 3 - Currently use an independent pricing vendor, PricingDirect.

Appendix VI: GBI-EM Global Diversified: Index Criteria and Methodology

Criteria

Instrument Type	Local Currency denominated fixed coupon instruments issued by Emerging Market governments. Global Depository Notes are not eligible for the index.
Remaining Maturity	Only those instruments with at least 2.5 years are considered for inclusion. At each month-end, instruments that will mature within the next 13 months, will be excluded from the Index
Amount Outstanding	Minimum issue size of \$1 billion for local bonds and \$500 million for Global bonds
Currency	Local currency denominated debt of eligible countries.
Country	Inclusion is limited to countries whose country's GNI per capita is below the JPMorgan Index Income Ceiling (IIC) for three consecutive years. Current IIC level is \$18,769. Countries are removed from the index if the IIC level AND the country's sovereign credit rating is A-/A3 or above for three consecutive years
Capital Controls	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
Liquidity	Considerations include, but are 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. Replication Costs : Investors should be able to replicate the index without incurring excessive transaction costs.

Methodology

Inception Date	Dec 2001
Return	Index/Country level total return is calculated as a market-weighted average of bond returns using mid prices
Market Conventions	All calculations including accrued interest, duration, yield, etc., are done according to local market convention using parameters (ex-dividend rules, settlement conventions, etc.)
Holiday Calendar	Index is produced every weekday of the year
Rebalancing	Rebalances on the last weekday of each month. If FX rates from WM Reuters are unavailable on the last weekday of the month (i.e. Good Friday), indices are rebalanced on the previous business day
Country addition/removal	10/10 Rule : Inclusion, exclusion, or re-categorization of a country (or instrument type) holding a 10% or larger weight in any of the GBI-EM indices will be staggered over at least a 10-month period. Issuers less than 10% will be phased in/out at approximately 1% a month. 15th of the month rule : If a country's inclusion/exclusion event timing occurs before the 15th of the current month, the staggered rebalancing will begin on the second rebalancing month from the time of event. If the event occurs on or after the 15th of the current month, the staggered inclusion will begin on the third rebalancing month from the time of event
Coupons	All coupons received are immediately reinvested into the index
Weighting	Diversified, market capitalization based weighting subject to maximum weight of 10% (cap) per country. For diversified weighting, only a certain portion of the instrument's current face amount outstanding is used.
Pricing	Bid and Ask prices are taken from a third party pricing source ²
FX Rates	All FX rates used for hedged/unhedged returns are as of 4pm London time provided by WM/Reuters as of 16:00 London time
Credit Rating	No minimum rating required for eligibility. Rating-based statistics use lowest rating of the S&P, Moody's and Fitch ratings
Bloomberg Ticker	JGENVLLG Index (Local Returns), JGENVUUG Index (USD Returns)

Source: JPMorgan Chase & Co.

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 – Currently use an independent pricing vendor, PricingDirect.

Appendix VII: CEMBI Broad Diversified: Index Criteria and Methodology

Criteria

Instrument Type	Includes both fixed and floating rate securities along with capitalizing/amortizing bonds or loans. Excludes convertibles, inflation-linked instruments, and defaulted bonds ¹
Issuer Type	EM Corporate entities satisfying one of the following: (1) headquartered in an EM country or (2) 100% of the issuer's assets are within EM economies, or (3) issuer must have a 100% guarantee from an entity within an EM economy. Quasi-sovereigns that are 100% owned or guaranteed by the government are not eligible for the CEMBI series
Remaining Maturity	Only those instruments with at least 5 years are considered for inclusion. At each month-end, instruments that will mature within the next 13 months, will be excluded from the Index
Amount Outstanding	Only issues with a current face amount outstanding of \$300 million or more are considered for Inclusion ²
Currency	Only USD denominated bonds are included. Instruments where the amount of coupon or redemption payment is linked to an exchange rate are not eligible for inclusion
Country	Countries in Africa, Asia ex Japan, Latin America, Eastern Europe, and Middle East are eligible
Liquidity	Daily available pricing from a third party valuation vendor
Law	Local law instruments are not eligible
Settlement	Instruments must be able to settle internationally

Methodology

Inception Date	Dec 2001
Return	Index/Country level total return is calculated as a market-weighted average of bond returns using bid prices
Holiday Calendar	Follows US bond market calendar set by Emerging Markets Trader Association (EMTA)
Rebalancing	Rebalances on the last US business day of the month
Inclusion	New instrument that meets the index criteria is added to the index if settlement date falls before 15 th of the month. If it settles on or after the 15 th of the month, the instrument is included during next month's rebalancing. Exceptions include debt exchanges (reflected in the index during same month-end) and Reg S only securities (end of seasoning period considered as new settlement date, and 15th of the month rule is applied)
Coupons	All coupons received are immediately reinvested into the index
Weighting	Diversified, market capitalization based weighting subject to maximum weight of 10% (cap) per country and 3% cap per issuer. For diversified weighting, only a certain portion of the instrument's current face amount outstanding is used.
Pricing	Bid and Ask prices are taken from a third party pricing source ³
FX Rates	All FX rates used for hedged/unhedged returns are as of 4pm London time provided by WM/Reuters as of 16:00 London time
Defaults	Defaulted securities are excluded from the index during month-end rebalance
Credit Rating	No minimum rating required for eligibility. Rating-based statistics use middle rating of the S&P, Moody's and Fitch ratings
Bloomberg Ticker	JBCDCOMP Index

Source: JPMorgan Chase & Co.

1- Bonds or Loans with embedded options and warrants are eligible for inclusion if the options/warrants are attached to the instruments that would otherwise be included in the index and the prices are quoted cum options or warrants. 2 - A bond is removed from the index when its current outstanding amount falls below \$300 million. 3 - Currently use an independent pricing vendor, PricingDirect.

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