

## JESG Score Expansion and Methodology Update

Enhancing our J.P. Morgan environmental, social and governance (JESG) scoring methodology for a global credit universe

We are updating our J.P. Morgan environmental, social and governance (JESG) scoring methodology for corporate and quasi-sovereign issuers as **we expand to a global credit universe covering over 4,000 issuers**. The enhancements will expand our ESG scoring to developed market issuers, beyond only emerging markets currently, while not changing our fundamental scoring approach. Our sovereign scoring, which already covers 172 countries, will not change.

- **We will implement the updated scoring methodology for emerging market issuers from February 1.** Given the rolling 3-month average used for calculating our JESG scores, the changes will take effect gradually and will not be fully switched over until May. Our JESG indices adjust an issuer's weight based on the one-month lagging JESG Band, therefore **the first month-end rebalance with the new scores will be March 31, 2019** (based on the Feb. 28 JESG Band). The June 30 rebalance will be the first fully using the new score.
- **Data normalization:** We will normalize vendor ESG raw scores into a 0-100 score by calculating the value's probability using a normal distribution function against our universe of developed and emerging market corporate and quasi-sovereign fixed income issuers, instead of a percent rank approach.
- **Waterfall scoring logic:** We will update our rules for calculating issuer scores where it is covered by only one of our ESG vendors. Instead of relying solely on the score from just the vendor offering coverage, now **we will apply the region-sector average score as the score from the vendor without coverage**, and take the average of the two. This approach should enhance score stability.
- **Region-sector average:** For applying a JESG score to issuers not covered by one or both of our ESG vendors, we will apply the average of the issuer's region-sector. We assign issuers to one of 14 industries and one of 8 regions.
- **RepRisk raw score calculation:** We will derive our RepRisk raw score, to be used for our data normalization, from a combination of the issuer RepRisk Index (RRI) and RepRisk Rating (RRR). This will emphasize an individual entity's performance based on its RRI, deemphasize reliance on the RRR and increase variability in issuer scoring.
- **Scoring change impacts:** The impact on the emerging market issuer scores is small. On average, the score from these issuers decreases 4.2 points (median score decline of 3.9 points). The distribution of JESG Bands shows a small change of around one percentage point for Bands 1, 3, 5; Band 2 has the largest move decreasing 7 percentage points and Band 4 increases 5.1 points.

Table 1: Issuer JESG Score availability

	All issuers	Auto-motive	Banks	Basic Industries	Cable/Media	Capital Goods	Consumer	Energy	Non-Bank Financials	Pharma/Healthcare	Real Estate	Tech-nology	Telecom
All regions	4181	98	409	393	151	405	629	438	379	191	280	173	126
DM	2613	84	132	261	132	291	499	310	220	179	106	145	59
EM	1568	14	277	132	19	114	130	128	159	12	174	28	67

Source: J.P. Morgan.

### Global Index Research

#### Gregory Elders <sup>AC</sup>

(1-212) 834-4077

gregory.elders@jpmorgan.com

J.P. Morgan Securities LLC

#### Jarrad K Linzie <sup>AC</sup>

(44-20) 7134-8717

jarrad.k.linzie@jpmorgan.com

J.P. Morgan Securities plc

#### Vincent Tao, CFA

(1-212) 834-4349

vincent.tao@jpmorgan.com

J.P. Morgan Securities LLC

See page 10 for analyst certification and important disclosures.

## Overview

We are expanding our J.P. Morgan ESG (JESG) scores to cover developed market fixed income issuers, increasing coverage to over 4,000 corporate, quasi-sovereign and sovereign issuers across developed and emerging markets. As part of this expansion, we are updating our JESG scoring methodology. We launched the first emerging market debt environmental, social and governance (ESG) indices and data suite in April 2018 (see [Introducing the J.P. Morgan ESG Index suite \(JESG\)](#)), and we plan to offer ESG variants for all of our benchmark indices.

## Score availability

JESG scores will now be available for over 4,000 issuers, up from around 1,200 previously, as we expand to developed markets. The scores cover investment grade and high yield issuers in developed and emerging markets, including complete coverage for the J.P. Morgan US Liquid Index (JULI) of investment grade dollar denominated corporate bonds and J.P. Morgan Global High Yield Index, as well as previous coverage for the EMBI Global and CEMBI Broad emerging market bond indices. JESG scores are available for 172 countries across developed and emerging markets.

Table 2: JESG Score availability

	All regions	DM	EM	DM-Asia	EM-Asia	Africa	Eastern Europe	Western Europe	North America	South America	Middle East
All issuers	4181	2613	1568	74	812	59	174	615	1924	404	119
Corporates	4061	2613	1448	74	753	53	150	615	1924	376	116
Quasi-sovereigns	120	0	120	0	59	6	24	0	0	28	3
Investment grade	1355	828	527	56	336	5	24	122	650	107	55
High yield	2250	1768	482	17	167	27	95	490	1261	172	21
Automotive	98	84	14	3	10	0	0	28	53	4	0
Banks	409	132	277	15	91	22	55	72	45	60	49
Basic Industries	393	261	132	15	57	9	24	62	184	37	5
Cable/Media	151	132	19	0	3	1	2	30	102	12	1
Capital Goods	405	291	114	9	89	1	1	68	214	20	3
Consumer	629	499	130	5	61	2	14	136	358	52	1
Energy	438	310	128	3	44	7	18	23	284	43	16
Non-Bank Financials	379	220	159	4	113	2	7	54	162	29	8
Pharma/Healthcare	191	179	12	1	5	0	0	32	146	5	2
Real Estate	280	106	174	5	141	1	6	12	89	12	14
Technology	173	145	28	0	24	2	0	14	131	2	0
Telecom	126	59	67	4	26	6	8	21	34	22	5
Transportation	171	87	84	5	40	0	10	32	50	28	6
Utilities	224	108	116	5	54	0	5	31	72	50	7

Source: J.P. Morgan.

## Scoring methodology changes

To accommodate our expansion, we are implementing four key changes as we move to a global universe:

1. **Data normalization:** Vendor ESG raw scores will be converted to 0-100 scale, based on a value's probability calculated on a normal distribution of our universe of expanded emerging market and developed market corporate and quasi-sovereign issuers.
2. **Waterfall scoring logic:** For issuers not covered by one of our ESG vendors, we will no longer rely solely on the score from the covering vendor to calculate our JESG score. Instead, we will average the issuer's score from the covering vendor with the region-sector average normalized score from the vendor that does not cover the issuer.
3. **Region-sector average:** For applying a JESG score to issuers not covered by one or both of our ESG vendors, we will apply the average of the issuer's region-sector. We assign issuers to one of 14 industries and one of 8 regions.
4. **RepRisk raw score calculation:** Our RepRisk raw score will be calculated as an average of the RepRisk Index and the RepRisk Rating (with the Rating letter grades converted to numerical values).

### Calculating the JESG Score

Our JESG score is calculated daily as an average of the normalized ESG score from each of our ESG data providers. The finalized JESG Score for each issuer incorporates a 3-month rolling average in order to smooth any noise in the input data. This process remains the same, but the steps to calculate the normalized inputs change.

### Implementing scoring methodology changes

We will implement the updated scoring methodology for emerging market issuers from February 1. Given the rolling 3-month average used for calculating our JESG scores, the changes will take effect gradually and will not be fully switched over until May. Our JESG indices adjust an issuer's weight based on the one-month lagging JESG Band, therefore **the first month-end rebalance with the new scores will be March 31, 2019** (based on the Feb. 28 JESG Band). The June 30 rebalance will be the first fully using the new score, after the 3-month rolling average has completely switched over to being based on the new methodology.

## ESG Data Provider Raw Scores

Our proprietary JESG scores are calculated based on data from two industry-leading data providers: RepRisk and Sustainalytics. These inputs include event-driven signals that leverage big data techniques as well as longer-term scores based on in-depth fundamental research. 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.

## RepRisk

RepRisk specializes in quantifying reputational risk exposures by leveraging big data techniques. This score is called the RepRisk Index (RRI). In addition, RepRisk also provides a letter rating (AAA to D) called the RepRisk Rating, which is based on both an issuer's RRI and the country-sector average RRI for where the company operates.

### RepRisk raw score calculation update

To calculate an issuer's RepRisk raw score, we are updating our methodology to be an average of the inverse-RRI and RRR. Our previous methodology relied largely on the RRR, which resulted in issuer scores grouping around the numerical-value equivalent for the letter grades. The new scoring adds greater emphasis on an issuer's individual performance (RRI), and provides greater differentiation between issuers. Because RepRisk calculates the RRI as 0 being best to 100 being worst, we take the inverse of the score ( $100 - \text{RRI}$ ) to give us a score where higher values are better, and lower worse.

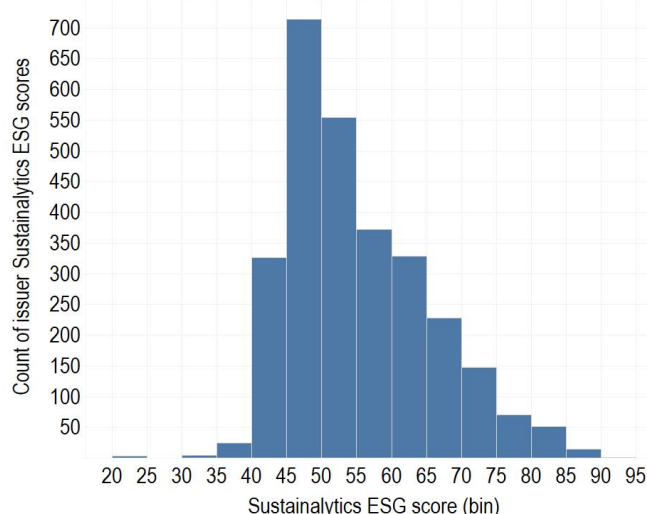
## Sustainalytics

Sustainalytics is 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 10,000 issuers. Sustainalytics provides a 0-100 numerical score, with 100 being the best, which we use as our raw score input. There is no change to how we treat Sustainalytics' scores.

## Data normalization

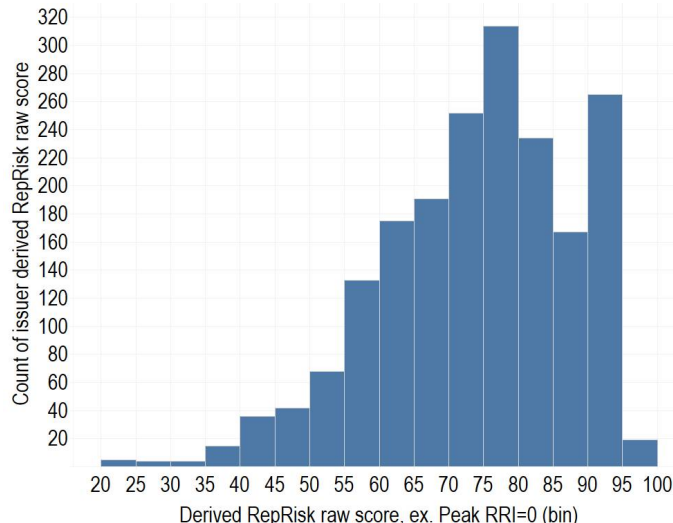
We normalize each issuer's raw score into a 0-100 score (with 100 again being the best) to allow for comparability. To normalize the raw score, we are updating our methodology to be based on a normal distribution. We observe that the raw scores from each provider are approximately normally distributed. By calculating the respective mean and standard deviation for each data provider, we can then calculate a raw score's probability on a 0-100 scale. Previously, we relied on a percent rank approach to normalize scores. Using a normal distribution will generate less dispersion in our normalized scores for the bulk of issuers that cluster around the mean, and better reflect the raw score grouping from each data provider.

Figure 1: Sustainalytics' raw ESG score distribution



Source: Sustainalytics, J.P. Morgan.

Figure 2: Derived RepRisk raw score distribution (ex. Peak RRI = 0)



Source: RepRisk, J.P. Morgan.

We observe that the Sustainalytics' raw scores skew low, which is likely due to the large number of companies with little or no ESG policy and data disclosure. In time, as more companies engage and report on their ESG impacts, we expect the distribution to even more closely reflect a normal distribution as there is more distinction among ESG laggards. For our derived RepRisk raw score, we notice the opposite where the scores bias higher. This is due to the fact that many companies have little or no bad news (note that in the chart we exclude companies with a Peak RRI equal to 0, which means the entity has never had any negative news stories).

## Waterfall scoring logic

In order to ensure every issuer has a JESG score, we apply a waterfall logic based on an issuer's region and sector. If a quasi-sovereign issuer is not covered by either of our two ESG score providers, the respective sovereign JESG score is assigned to the issuer. Similarly, if a corporate issuer is not covered by our ESG providers, then the region-sector average JESG score is utilized as a proxy.

In an update to our methodology, if an issuer is covered by only one ESG data provider, we will no longer apply just the normalized score from that provider. Instead, if an issuer is a quasi-sovereign, we will average the normalized score from the data provider that covers it with the normalized sovereign score of the data provider that does not cover the issuer. For corporates, we will average the normalized score from the covering data provider with the normalized region-sector average value from the other provider. This should provide better comparability and greater stability to an issuer's JESG score, while still ensuring every issuer has a score.

## Region-sector average

**Table 3: Sectors and regions**

Industries	Regions
Automotive	DM-Asia
Banks	EM-Asia
Basic Industries	Africa
Cable/Media	Eastern Europe
Capital Goods	Western Europe
Consumer	North America
Energy	South America
Non-Bank Financials	Middle East
Pharma/Healthcare	
Real Estate	
Technology	
Telecom	
Transportation	
Utilities	

Source: J.P. Morgan.

In order to have JESG scores for all issuers, including debut issuers, we assign an entity not covered by our ESG data vendor its region-sector average score. We assign issuers to one of 14 industries and one of 8 regions. This will allow us to generate scores for all issuers, and reflect the differences in ESG scores we tend to observe between issuers in different sectors and geographies.

## Score change impacts

The result of our methodology update is that the average emerging market index issuer score decreases 4.2 points (5.9 point average absolute score change), with a median change slightly lower at -3.9 points (median absolute score difference of 4.6 points). Emerging market companies generally perform less well compared to developed market issuers given generally lower engagement and disclosure on ESG topics.

**Table 4: Emerging market index issuer JESG Band distribution**

<u>Current Methodology</u>			<u>Updated Methodology</u>		<u>Percentage point chg</u>
Count	%	Count	%		
Bands based on issuer JESG Scores					
1	31	4.2	25	3.4	-0.8
2	195	26.7	137	18.8	-7.9
3	310	42.5	318	43.6	1.1
4	172	23.6	190	26.0	2.5
5	22	3.0	60	8.2	5.2
Bands based on issuer JESG scores & controversial issuers in Band 5					
1	24	3.3	18	2.5	-0.8
2	172	23.6	121	16.6	-7.0
3	276	37.8	286	39.2	1.4
4	114	15.6	151	20.7	5.1
5	144	19.7	154	21.1	1.4

Source: J.P. Morgan, as of Dec. 20, 2018.

### CEMBI Broad

**Table 5: CEMBI Broad issuer JESG Band distribution**

	Current Methodology			Updated Methodology		
	Count	%	mkt cap %	Count	%	mkt cap %
<b>Bands based on issuer JESG Scores</b>						
1	31	4.8	5.05	25	3.9	3.56
2	189	29.3	28.24	132	20.5	19.74
3	276	42.8	47.91	295	45.7	50.64
4	139	21.6	17.58	155	24.0	19.83
5	10	1.6	1.21	38	5.9	6.23
<b>Bands based on issuer JESG scores &amp; controversial issuers in Band 5</b>						
1	24	3.7	4.05	18	2.8	1.88
2	168	26.0	24.45	117	18.1	17.60
3	252	39.1	38.67	271	42.0	41.91
4	131	20.3	11.88	141	21.9	17.78
5	70	10.9	20.95	98	15.2	20.83

Source: J.P. Morgan, as of Dec. 20, 2018.

### EMBI Global

**Table 6: EMBI Global issuer JESG Band distribution**

	Current Methodology			Updated Methodology		
	Count	%	mkt cap %	Count	%	mkt cap %
<b>Bands based on issuer JESG Scores</b>						
1	5	3.2	6.11	5	3.2	6.11
2	18	11.6	13.02	17	11.0	13.11
3	60	38.7	38.46	49	31.6	34.56
4	52	33.5	34.59	54	34.8	36.50
5	20	12.9	7.82	30	19.4	9.71
<b>Bands based on issuer JESG scores &amp; controversial issuers in Band 5</b>						
1	5	3.2	6.11	5	3.2	6.11
2	18	11.6	14.06	17	11.0	13.11
3	59	38.1	36.99	48	31.0	34.16
4	49	31.6	28.62	52	33.5	35.78
5	24	15.5	14.21	33	21.3	10.83

Source: J.P. Morgan, as of Dec. 20, 2018.

Gregory Elders  
(1-212) 834-4077  
gregory.elders@jpmorgan.com

Jarrad K Linzie  
(44-20) 7134-8717  
jarrad.k.linzie@jpmorgan.com

Vincent Tao, CFA  
(1-212) 834-4349  
vincent.tao@jpmorgan.com

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## Band 5 Changes

Table 7: Issuers that would move into JESG Band 5

Ticker	Type	Current JESG Score	Updated JESG Score	Current JESG Band	Updated JESG Band
ICBCAS	C	25.14	17.83	4	5
TENCNT	C	26.29	18.82	4	5
YPFDAR	C	24.55	16.64	4	5
BIDU	C	23.54	15.11	4	5
CGCSA	C	28.20	16.13	4	5
SAFTRA	Q	30.86	18.56	4	5
IDBI	C	31.20	18.25	4	5
BCHINA	C	31.65	17.68	4	5
SAWSST	C	32.83	17.62	4	5
BCOPAN	C	33.28	18.03	4	5
HUANEN	Q	35.14	19.19	4	5
POWINV	Q	34.73	17.01	4	5

Source: J.P. Morgan, as of Dec. 20, 2018.

Table 8: Issuers that would move out of JESG Band 5

Ticker	Type	Current JESG Score	Updated JESG Score	Current JESG Band	Updated JESG Band
PETRPE	Q	12.69	37.19	5	4
POWINV	Q	14.68	30.97	5	4

Source: J.P. Morgan, as of Dec. 20, 2018.



## Largest emerging market index issuer JESG score changes

Table 9: Top 20 largest score increases / decreases

Ticker	Type	Current JESG Score	Updated JESG Score	Current JESG Band	Updated JESG Band	Score Chg	Band Chg
<b>20 largest score increases</b>							
PETRPE	Q	12.69	37.19	5	4	24.50	1
STSP	C	48.37	68.14	3	2	19.77	1
HTGLOB	C	14.68	30.97	5	4	16.29	1
NEXEN	C	45.23	59.46	3	3	14.22	0
ALPHSA	C	22.07	35.26	4	4	13.18	0
SHNHAN	C	52.90	64.18	3	2	11.28	1
MINASG	Q	44.95	56.08	3	3	11.13	0
AITOCU	Q	55.70	66.41	3	2	10.70	1
DAEGUB	C	46.85	57.30	3	3	10.45	0
LIQTEL	C	37.41	47.38	4	3	9.97	1
MIICF	C	59.69	69.50	3	2	9.81	1
MEXCAT	Q	54.90	64.38	3	2	9.48	1
HIKLN	C	49.56	58.90	3	3	9.34	0
SOPOWZ	Q	46.54	55.59	3	3	9.05	0
PANAMT	Q	64.95	72.44	2	2	7.50	0
REITDU	C	35.24	42.50	4	3	7.26	1
MAFUA	C	33.20	40.36	4	3	7.16	1
GNLQCI	C	45.53	52.48	3	3	6.95	0
GSCCOR	C	48.24	55.08	3	3	6.84	0
NANFUN	C	39.59	46.34	4	3	6.75	1
<b>20 largest score decreases</b>							
SMPM	C	54.70	38.57	3	4	-16.13	-1
BHARTI	C	46.16	29.94	3	4	-16.22	-1
TGPERU	C	49.92	33.67	3	4	-16.25	-1
SGCAZE	Q	40.13	23.66	3	4	-16.47	-1
SOIAZ	Q	54.43	37.86	3	4	-16.58	-1
FIDBAN	C	34.87	18.13	4	5	-16.74	-1
SIBNEF	C	43.56	26.79	3	4	-16.77	-1
SHENGY	C	51.51	34.67	3	4	-16.84	-1
NOORBK	C	68.82	51.96	2	3	-16.86	-1
CHGRID	Q	51.14	34.02	3	4	-17.12	-1
SINOC	Q	44.38	27.17	3	4	-17.21	-1
HAIERG	C	51.88	34.19	3	4	-17.68	-1
POWINV	Q	34.73	17.01	4	5	-17.72	-1
CHIMIN	C	40.71	22.91	3	4	-17.80	-1
HONAIR	C	86.51	68.21	1	2	-18.30	-1
HCDNDA	C	90.50	69.29	1	2	-21.21	-1
REGH	C	79.82	58.60	2	3	-21.22	-1
OPRORU	C	84.29	62.98	1	2	-21.31	-1
RGYAST	C	87.92	63.84	1	2	-24.08	-1
SDIC	Q	54.68	30.54	3	4	-24.14	-1

Source: J.P. Morgan, as of Dec. 20, 2018.



Table 10: Top 5 / Bottom 5 JESG score issuers by sector

	Top-5 Issuers by sector					Top-5 Issuers by sector			
	Ticker	JESG Score	JESG Band	Region		Ticker	JESG Score	JESG Band	Region
Automotive	LEA	92.58	1	DM-NORTH AMERICA		F	36.10	4	DM-NORTH AMERICA
	KOANO	92.33	1	DM-EUROPE		TSLA	34.75	4	DM-NORTH AMERICA
	GESTSM	87.99	1	DM-EUROPE		KIAMTR	32.65	4	EM-ASIA
	BWA	87.95	1	DM-NORTH AMERICA		VW	31.87	4	DM-EUROPE
	CPS	83.58	1	DM-NORTH AMERICA		NSANY	28.10	4	DM-ASIA
Banks	ASBBNK	96.64	1	DM-ASIA		ICICI	12.39	5	EM-ASIA
	ANZNZ	95.72	1	DM-ASIA		BTAS	11.74	5	EM-EUROPE
	ERSTBK	93.15	1	DM-EUROPE		BTASKZ	11.74	5	EM-EUROPE
	BAC	91.13	1	DM-NORTH AMERICA		BANSAF	10.99	5	EM-LATIN AMERICA
	FUBON	90.98	1	EM-ASIA		SNDBIN	8.73	5	EM-ASIA
Basic Industries	METSA	97.11	1	DM-EUROPE		VMETAL	18.57	5	EM-LATIN AMERICA
	FMGAU	96.28	1	DM-ASIA		METINR	17.81	5	EM-EUROPE
	SASOL	95.89	1	EM-AFRICA		GGBRBZ	17.30	5	EM-LATIN AMERICA
	CASCN	95.20	1	DM-NORTH AMERICA		HONGQI	17.00	5	EM-ASIA
	AMCAU	94.23	1	DM-ASIA		CC	11.17	5	DM-NORTH AMERICA
Cable/Media	UNITY	93.01	1	DM-EUROPE		ATCNA	32.43	4	DM-EUROPE
	TRICN	88.85	1	DM-NORTH AMERICA		CBSR	27.94	4	DM-NORTH AMERICA
	ITVLN	88.20	1	DM-EUROPE		FOXA	25.50	4	DM-NORTH AMERICA
	TNETBB	84.20	1	DM-EUROPE		NFLX	25.04	4	DM-NORTH AMERICA
	CCACN	82.86	1	DM-NORTH AMERICA		GLOPAR	15.58	5	EM-LATIN AMERICA
Capital Goods	XYL	95.11	1	DM-NORTH AMERICA		CHCOMU	14.46	5	EM-ASIA
	CRHID	93.71	1	DM-EUROPE		VOTORA	13.52	5	EM-LATIN AMERICA
	OC	92.31	1	DM-NORTH AMERICA		ODBR	11.52	5	EM-LATIN AMERICA
	ITW	91.89	1	DM-NORTH AMERICA		RLCONS	10.61	5	EM-ASIA
	TCLAU	91.48	1	DM-ASIA		SMCPM	8.53	5	EM-ASIA
Consumer	BXBAU	97.61	1	DM-ASIA		LYV	21.72	4	DM-NORTH AMERICA
	CCE	95.06	1	DM-NORTH AMERICA		LOTTES	21.57	4	EM-ASIA
	KYGID	89.13	1	DM-EUROPE		CHALUM	20.56	4	EM-ASIA
	WRNGLR	88.20	1	DM-NORTH AMERICA		WYNNLV	18.89	5	DM-NORTH AMERICA
	LIFUNG	87.64	1	EM-ASIA		SAWSST	17.62	5	EM-ASIA
Energy	SPMIM	94.76	1	DM-EUROPE		CGCSA	16.13	5	EM-LATIN AMERICA
	GTE	94.58	1	EM-LATIN AMERICA		TNEFT	15.70	5	EM-EUROPE
	WFT	90.07	1	DM-NORTH AMERICA		CITHOL	11.07	5	DM-NORTH AMERICA
	APAAU	88.93	1	DM-ASIA		PETROZ	10.42	5	EM-LATIN AMERICA
	DRC	88.64	1	DM-NORTH AMERICA		CNPCC	6.01	5	EM-ASIA
Non-Bank Financials	JACLIF	94.58	1	DM-NORTH AMERICA		CCAMCL	20.74	4	EM-ASIA
	RUSB	92.80	1	EM-EUROPE		ORSECH	16.79	5	EM-ASIA
	AIA	91.23	1	EM-ASIA		BTGPBZ	11.13	5	EM-LATIN AMERICA
	HIG	90.09	1	DM-NORTH AMERICA		KOFCOR	10.16	5	EM-ASIA
	EQH	89.89	1	DM-NORTH AMERICA		EFX	5.36	5	DM-NORTH AMERICA
Pharma/Healthcare	SHPLN	86.46	1	DM-EUROPE		ABC	27.53	4	DM-NORTH AMERICA
	PHARGR	84.62	1	DM-EUROPE		STER	21.55	4	DM-NORTH AMERICA
	AVNS	83.05	1	DM-NORTH AMERICA		BHCCN	20.79	4	DM-NORTH AMERICA
	JUBPSG	82.61	1	EM-ASIA		HYPEBZ	18.10	5	EM-LATIN AMERICA
	MRKGR	82.16	1	DM-EUROPE		ENDP	11.25	5	DM-NORTH AMERICA
Real Estate	MGRAU	97.38	1	DM-ASIA		COGARD	20.48	4	EM-ASIA
	ALATPF	96.01	1	DM-EUROPE		OCTOWN	19.62	5	EM-ASIA
	ULFP	95.10	1	DM-NORTH AMERICA		DALWAN	17.57	5	EM-ASIA
	PLD	95.02	1	DM-NORTH AMERICA		VLLPM	17.10	5	EM-ASIA
	CAPLSP	94.33	1	EM-ASIA		GRNCH	15.16	5	EM-ASIA
Technology	ADI	95.69	1	DM-NORTH AMERICA		PONTIS	15.68	5	EM-LATIN AMERICA
	KEYS	95.64	1	DM-NORTH AMERICA		BABA	15.46	5	EM-ASIA
	KLAC	92.45	1	DM-NORTH AMERICA		BIDU	15.11	5	EM-ASIA
	FLEX	92.18	1	EM-ASIA		JD	8.68	5	EM-ASIA
	LRCX	91.67	1	DM-NORTH AMERICA		AMZN	8.01	5	DM-NORTH AMERICA
Telecom	PACNET	93.80	1	EM-ASIA		SOFTBK	32.76	4	DM-ASIA
	HTOGA	93.72	1	DM-EUROPE		WINTRE	32.68	4	DM-EUROPE
	CTCACI	91.19	1	EM-LATIN AMERICA		RCOMIN	30.64	4	EM-ASIA
	S	88.70	1	DM-NORTH AMERICA		BHARTI	29.94	4	EM-ASIA
	TCN	87.20	1	DM-NORTH AMERICA		TELP	22.76	4	EM-ASIA
Transportation	SYDAU	90.43	1	DM-ASIA		PFAVTA	24.90	4	EM-LATIN AMERICA
	BRCORO	84.31	1	DM-EUROPE		CJRAIL	22.68	4	DM-ASIA
	GETFP	81.00	1	DM-EUROPE		GARUDA	18.01	5	EM-ASIA
	FLY	73.90	2	DM-EUROPE		GOL	11.84	5	EM-LATIN AMERICA
	TNTLOG	73.90	2	DM-EUROPE		GOLBZ	11.84	5	EM-LATIN AMERICA
Utilities	NTGYSM	95.04	1	DM-EUROPE		PAMPAR	28.44	4	EM-LATIN AMERICA
	DDPL	94.98	1	DM-EUROPE		NTPCIN	27.26	4	EM-ASIA
	AQUARN	94.46	1	DM-NORTH AMERICA		YUNAEN	23.89	4	EM-ASIA
	HKCGAS	89.87	1	EM-ASIA		SMCGL	22.77	4	EM-ASIA
	CHINLP	89.03	1	EM-ASIA		EGUATE	17.92	5	EM-LATIN AMERICA

Source: J.P. Morgan, as of Dec 20, 2018.

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Gregory Elders  
(1-212) 834-4077  
gregory.elders@jpmorgan.com

Vincent Tao, CFA  
(1-212) 834-4349  
vincent.tao@jpmorgan.com

Global Index Research  
JESG Score Expansion and Methodology Update  
23 January 2019

J.P.Morgan

Jarrad K Linzie  
(44-20) 7134-8717  
jarrad.k.linzie@jpmorgan.com

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