

CONSULTATION ON IMPLEMENTATION OF 2018 GICS CHANGES IN THE MSCI EQUITY INDEXES

March 2018

This consultation may or may not lead to the implementation of any or all of the proposed changes in MSCI's indexes. Consultation feedback will remain confidential. MSCI may publicly disclose feedback if specifically requested by specific market participants. In that case, the relevant feedback would be published together with the final results of the consultation.

SUMMARY

- On November 15, 2017, MSCI and S&P Dow Jones announced the revisions to the Global Industry Classification Standard (GICS®) structure for 2018. The changes will be implemented in GICS Direct as of the close of September 28, 2018.
- MSCI proposes to implement the changes resulting from the 2018 GICS structure revisions in the MSCI Equity Indexes in one step as part of the November 2018 Semi-Annual Index Review (SAIR).
- MSCI proposes the following enhancements for the implementation of the 2018 GICS structure revisions in its equity indexes:
 - MSCI Cyclical and Defensive Sectors Indexes Methodology – Proposal to classify Communication Services as a Cyclical sector
 - MSCI Minimum Volatility and MSCI Diversified Multiple Factor Indexes Methodologies – Additional turnover budget for certain indexes at the November 2018 SAIR
 - No proposed changes for other MSCI Index Methodologies

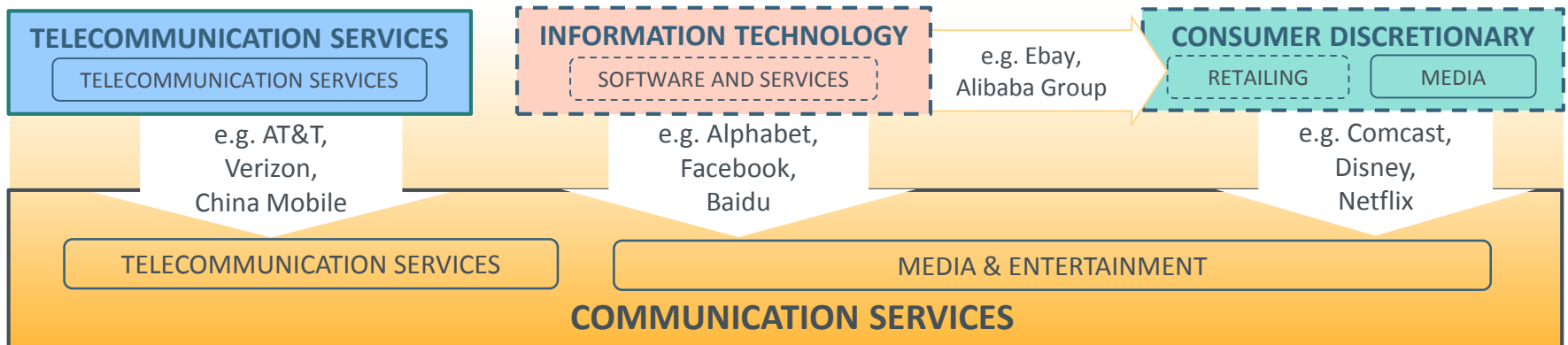
MSCI invites feedback from market participants on or before April 18, 2018.

OVERVIEW OF 2018 GICS CHANGES

The GICS structure will be revised to reflect the evolution in the mode in which people communicate and access entertainment content and other information. This evolution is a result of the integration between telecommunications, media and internet companies.

Highlights of changes to GICS in 2018

- Telecommunication Services will be broadened and renamed as Communication Services
- Media companies will move from Consumer Discretionary to Communication Services
- Internet services companies will move from Information Technology to Communication Services
- E-commerce companies will move from Information Technology to Consumer Discretionary



Examples based on select list of companies expected to be impacted as a result of the GICS revisions as released by MSCI and S&P on January 11, 2018

ESTIMATED IMPACT ON SECTOR INDEXES AND PROPOSED IMPLEMENTATION TIMELINE

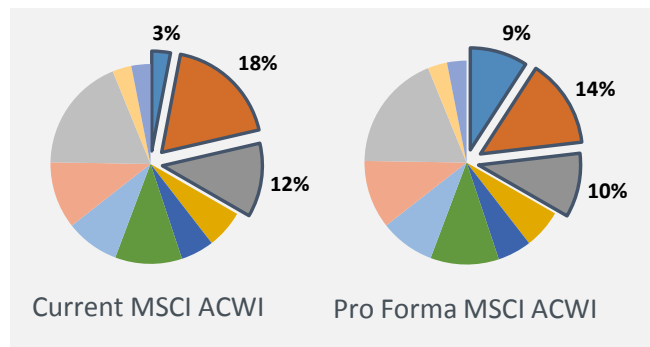
ESTIMATED IMPACT – SECTOR INDEXES

Sector indexes based on the MSCI Global Investable Market Indexes (GIMI) or the MSCI US Equity Indexes and covering the Communication Services, Information Technology and Consumer Discretionary Sectors will be impacted by the 2018 GICS changes.

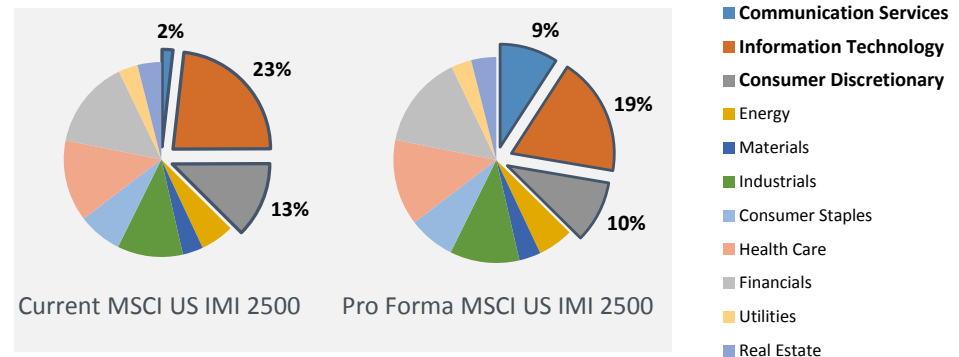
Simulated One-Way Index Turnover on Sector Indexes Based on the MSCI GIMI and MSCI US Equity Indexes*

	Communication Services Sector	Information Technology Sector	Consumer Discretionary Sector
ACWI	67%	24%	20%
World	66%	19%	19%
USA	80%	21%	26%
World ex USA	29%	9%	9%
EAFE	29%	9%	9%
Europe	31%	3%	14%
EM	70%	44%	34%
US Investable Market 2500	80%	20%	24%

Sector Weight Impact on MSCI ACWI*



Sector Weight Impact on MSCI US Inv. Market 2500*



PROPOSED IMPLEMENTATION TIMELINE

- MSCI proposes to implement the 2018 GICS changes in one step as part of the November 2018 Semi-Annual Index Review
- MSCI plans to launch MSCI Provisional Indexes for the three impacted GICS Sectors following the release of the final list of impacted companies (July 2, 2018)
 - The timeline for the launch of MSCI Provisional Indexes will be communicated in due course

Feedback Questions:

- Do you agree with the proposed implementation timeline?
- Should more time be given to market participants to prepare for the changes (e.g., implement the changes at the May 2019 Semi-Annual Index Review)?

PROPOSED CHANGES TO MSCI CYCLICAL & DEFENSIVE INDEXES

MSCI CYCLICAL & DEFENSIVE INDEXES

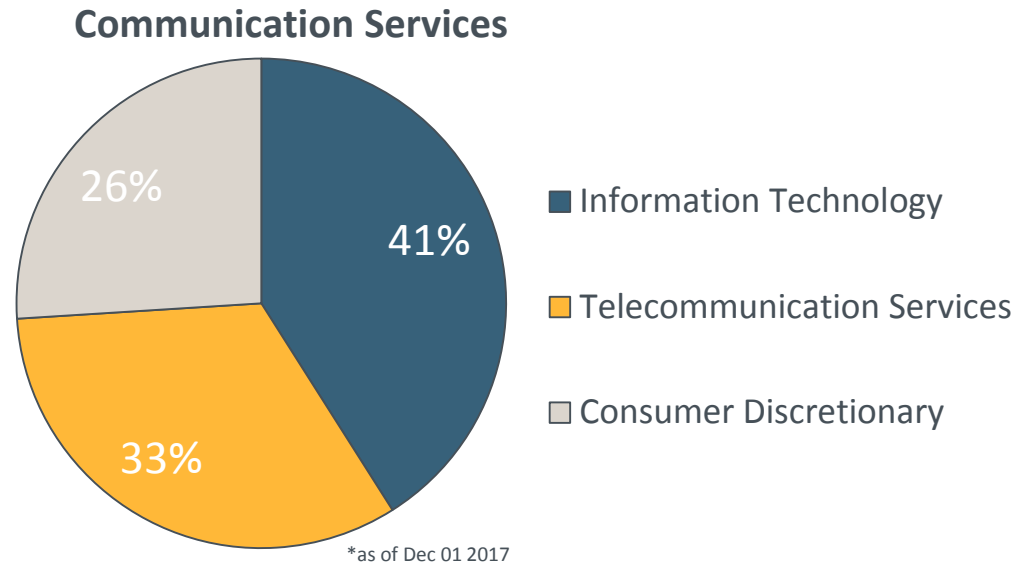
- MSCI Cyclical and Defensive Indexes methodology are based on classification of 11 GICS sectors as either Cyclical or Defensive
- MSCI proposes to classify Communication Services sector as **Cyclical** in the new GICS hierarchy

GICS Sector	Current Classification	New Classification	Correlation (Old GICS)	Correlation (New GICS)	Beta (Old GICS)	Beta (New GICS)
Financials	Cyclical	Cyclical	0.29	0.29	1.27	1.27
Information Technology	Cyclical	Cyclical	0.28	0.29	1.34	1.35
Industrials	Cyclical	Cyclical	0.26	0.26	1.08	1.08
Consumer Discretionary	Cyclical	Cyclical	0.22	0.13	1.06	1.02
Materials	Cyclical	Cyclical	0.19	0.19	1.26	1.26
Real Estate	Cyclical	Cyclical	0.16	0.16	1.02	1.02
<i>Telecommunication Services/Communication Services (New)</i>	<i>Defensive</i>	<i>Cyclical</i>	<i>-0.11</i>	<i>0.02</i>	<i>0.88</i>	<i>0.99</i>
Energy	Defensive	Defensive	-0.3	-0.3	0.98	0.98
Utilities	Defensive	Defensive	-0.61	-0.61	0.63	0.63
Consumer Staples	Defensive	Defensive	-0.63	-0.63	0.59	0.59
Healthcare	Defensive	Defensive	-0.73	-0.73	0.64	0.64

*Correlations w.r.t CLI and beta against MSCI World Index were calculated using returns of sector indexes in MSCI World for periods between 1998-2017

MSCI CYCLICAL & DEFENSIVE INDEXES

- Large inflows from Information Technology and Consumer Discretionary sectors strengthen the proposed cyclical nature of the Communication Services sector



Feedback Question : Do you agree with the proposed classification of Communication Services?

ONE-TIME TRANSITION PROPOSAL FOR MSCI MINVOL INDEXES AND MSCI DMF INDEXES

ONE-TIME TRANSITION PROPOSAL

- MSCI Minimum Volatility Index Methodology and MSCI Diversified Multiple-Factor Index Methodology use active sector weight-based constraints as part of their index construction methodology
- Simulations using the new GICS structure did not indicate any significant impact in terms of risk reduction for the MSCI Minimum Volatility Indexes or the factor exposures for the MSCI Diversified Multiple-Factor Indexes for a majority of the indexes*
- Simulations using the new GICS structure indicated that the changes in parent sector weights for the below indexes mandate additional turnover to bring impacted sectors within active sector limits. Please note that no other indexes need additional turnover budget

Index Name	Standard Turnover	Proposed Additional Turnover	Total Turnover
MSCI South Africa Minimum Volatility (USD) Index [#]	10%	5%	15%
MSCI South Korea Minimum Volatility (USD) Index [#]	10%	5%	15%
MSCI USA Consumer Discretionary Diversified Multiple Factor Index	20%	15%	35%

Simulations as of Dec 01, 2017; [#]Proposed TO relaxations also apply to the respective local currency optimized minimum volatility indexes

- MSCI proposes to evaluate the above indexes again post the May 2018 SAIR to determine the appropriate turnover relaxations

*Please refer to Appendix for comparison

OTHER MSCI INDEXES WITH POTENTIAL IMPACT

MSCI ESG INDEXES

- The following list of methodologies have sector dependencies and will reflect GICS 2018 structure changes starting from November 2018 SAIR
- These methodologies were reviewed and MSCI is not proposing any enhancements to the methodology or their implementation at November 2018 SAIR

Methodology Name	Sector Constraint in Optimization	Inclusion / Exclusion based on sector	Cap on sector weights	Strict Sector Neutrality
MSCI ESG Leaders Methodology	No	<u>Yes</u>	No	No
MSCI SRI Methodology	No	<u>Yes</u>	No	No
MSCI Low Carbon Target Methodology	<u>Yes</u>	No	No	No
MSCI Low Carbon Leaders Methodology	<u>Yes</u>	<u>Yes</u>	No	No
MSCI KLD 400 Social Methodology	No	<u>Yes</u>	No	No
MSCI Catholic Values Methodology	No	<u>Yes</u>	No	No
MSCI ACWI Sustainable Impact Methodology	No	No	<u>Yes</u>	No
MSCI USA ESG Select Methodology	<u>Yes</u>	No	No	No
MSCI ESG Focus Methodology	<u>Yes</u>	No	No	No
MSCI Women's Leadership Methodology	No	No	No	<u>Yes</u>
MSCI Empowering Women Methodology	No	<u>Yes</u>	No	No
MSCI Japan Human and Physical Investment Methodology	No	<u>Yes</u>	No	No

- The simulated turnover due to the 2018 GICS changes for selected indexes based on these ESG methodologies is available in the Appendix

MSCI FACTOR AND THEMATIC INDEXES

- The following list of methodologies have sector dependencies and will reflect GICS 2018 structure changes starting from November 2018 SAIR
- These methodologies were reviewed and MSCI is not proposing any enhancements to the methodology or their implementation at November 2018 SAIR

Methodology Name	Sector Constraint in Optimization	Inclusion / Exclusion based on sector	Sector Specific Scores / Ranking	Cap on sector weights
MSCI Agriculture & Food Chain Indexes Methodology	No	<u>Yes</u>	No	No
MSCI Commodity Producers Indexes Methodology	No	<u>Yes</u>	No	No
MSCI Infrastructure Indexes Methodology	No	<u>Yes</u>	No	No
MSCI Dividend Masters Indexes Methodology	No	No	No	<u>Yes</u>
MSCI Enhanced Value Indexes Methodology	No	No	<u>Yes</u>	No
MSCI High Dividend Yield Indexes Methodology	No	<u>Yes</u>	No	No
MSCI Prime Value Indexes Methodology	No	<u>Yes</u>	No	No
MSCI Quality Indexes Methodology (Sector Neutral Quality)	No	No	<u>Yes</u>	No
MSCI ACWI Emerging Market Consumer Growth Indexes Methodology	No	<u>Yes</u>	No	No
MSCI Barra Factor Indexes Methodology	<u>Yes</u>	No	No	No
MSCI Equal Weighted Indexes Methodology	No	No	No	<u>Yes</u>
MSCI Market Neutral Barra Factor Indexes Methodology	<u>Yes</u>	No	No	No
MSCI Risk Weighted indexes Methodology	No	No	<u>Yes</u>	No
MSCI Volatility Tilt Indexes Methodology	No	No	<u>Yes</u>	No
MSCI Consumer Demand Indexes Methodology	No	<u>Yes</u>	No	No
MSCI Factor ESG Target Indexes Methodology	<u>Yes</u>	No	No	No

APPENDIX

ESTIMATED IMPACT - MSCI MINIMUM VOLATILITY INDEXES (1/2)

- MSCI Minimum Volatility indexes were simulated using the new GICS structure to assess for any additional turnover requirement and many of these indexes did not need any additional turnover
- Also, there was no significant improvement in utility if optimizer was provided with additional turnover and the results indicated similar Risk Reduction and Number of Constituents for Old GICS and New GICS structure

Index Name	Proforma Parent		Old GICS Structure			New GICS Structure		
	Risk	Number of Securities	Risk	Turnover	Number of Securities	Risk	Turnover	Number of Securities
ACWI Min Vol	9.85%	2501	6.63%	10%	403	6.60%	10%	422
USA Min Vol	9.34%	633	7.07%	10%	208	7.04%	10%	212
World Min Vol	9.80%	1654	6.69%	10%	332	6.67%	10%	332
EM Min Vol	12.66%	847	9.59%	10%	266	9.53%	10%	266
Europe Min Vol	13.81%	446	11.23%	10%	161	11.23%	10%	161
AC Asia Pacific ex Japan Min Vol	11.62%	723	9.32%	10%	239	9.21%	10%	239
Japan Min Vol	13.41%	321	11.42%	10%	181	11.42%	10%	181

ESTIMATED IMPACT - MSCI MINIMUM VOLATILITY INDEXES (2/2)

- List of MSCI Minimum Volatility Indexes that will require additional turnover, based on calculations as of Nov 2017 SAIR rebalancing
 - Example:** Active sector weights for Communication Services, Consumer Discretionary and Information Technology under new GICS structure are 10%, -6% and -4% respectively
 - Absolute deviation of active sector weights beyond the 5% sector bound, are 5%,1% and 0% respectively
 - Minimum Additional one-way TO related to GICS change = $\text{Sum}(\text{Over flow of 3 sectors})/2 = \text{Sum}(5\%, 1\%, 0\%)/2 = 3\%$
 - Total TO = Original TO + Additional TO = 10% + 3% = 15% (After rounding to nearest multiple of 5)

Simulated Sector Active Weights as of Dec 01, 2017

Index	Sector	Sector Constraint	Active Sector Weight (New GICS)	Weight Overflow	Proposed Min Additional one-way Turnover
SOUTH AFRICA MINIMUM VOLATILITY (USD)	Communication Services	10%	-19.94%	Yes	5%
	Consumer Discretionary		9.69%	No	
KOREA MINIMUM VOLATILITY (USD)	Communication Services	12.5%	10.82%	No	5%
	Consumer Discretionary		2.26%	No	
	Information Technology		-19.09%	Yes	

The additional turnovers are also applicable to the respective local currency optimized versions of the above indexes

- Please note that the proposed minimum additional turnover is unavoidable and its objective is only to include the GICS change and there might still be a need for additional relaxations due to the other factors when GICS changes are actually implemented

ESTIMATED IMPACT - MSCI DIVERSIFIED MULTI-FACTOR INDEXES (1/2)

- Simulated rebalance of the major MSCI DMF Indexes using new GICS hierarchy exhibits similar active factor exposures relative to the simulated rebalance under old GICS hierarchy at the November 2017 SAIR

Index	Active Factor Exposures under Old GICS Structure				Active Factor Exposures under New GICS Structure			
	Size	Momentum	Value	Quality	Size	Momentum	Value	Quality
ACWI DMF	-0.617	0.418	0.376	0.261	-0.625	0.394	0.382	0.260
USA DMF	-0.624	0.226	0.330	0.200	-0.649	0.220	0.332	0.187
World DMF	-0.656	0.350	0.342	0.237	-0.675	0.327	0.345	0.235
Emerging Markets DMF	-0.624	0.478	0.295	0.213	-0.625	0.428	0.306	0.215
Europe DMF	-0.691	0.352	0.278	0.216	-0.691	0.333	0.289	0.217
AC Asia Pacific DMF	-0.655	0.340	0.397	0.232	-0.643	0.329	0.420	0.229
Japan DMF	-0.647	0.303	0.196	0.152	-0.752	0.281	0.134	0.178

Simulated Impact Analysis & Rebalancing Statistics as of Dec 01, 2017 using GEMLT model
For the purpose of analysis transition from GEM2 to GEMLT was done in June 2017 SAIR

ESTIMATED IMPACT - MSCI DIVERSIFIED MULTIPLE FACTOR INDEXES (2/2)

- Based on simulations using new GICS as of November 2017 SAIR, among all the MSCI Diversified Multiple Factor Indexes, only the MSCI USA/Cons Disc DMF Index will need additional turnover relaxation
- Additional turnover is required due to high turnover in parent index because:
 - 25 securities get deleted with a cumulative market cap weight of 26%
 - 2 securities get added with cumulative pro-forma market cap weight of 3%
- Under the new GICS structure, the MSCI USA /Consumer Discretionary Index becomes more concentrated and an additional turnover of **5%** is required to maintain active stock constraints as well as to account for changes in the parent index

Simulations as of Dec 01, 2017

Security Name	Weight under Old GICS Structure	Weight under New GICS Structure
AMAZON.COM	15.91%	20.95%
HOME DEPOT	6.95%	9.15%
MCDONALD'S CORP	4.68%	6.16%
PRICELINE GROUP (THE)	2.98%	3.92%
STARBUCKS CORP	2.84%	3.74%
NIKE B	2.69%	3.54%
LOWE'S COS	2.36%	3.11%
GENERAL MOTORS	2.04%	2.68%
TJX COMPANIES	1.57%	2.06%
FORD MOTOR CO	1.56%	2.05%

ESTIMATED IMPACT - MSCI ENHANCED VALUE INDEXES

METHODOLOGY

- Methodology uses sector specific score computation
- The below table compares the simulated index rebalance turnover if new GICS structure was implemented at the November 2017 SAIR against the actual November 2017 SAIR which used old GICS structure

Index	Turnover using Old GICS structure	Turnover using New GICS structure
EM Enhanced Value	7%	19%
AC Asia ex Japan Enhanced Value	10%	22%
USA Enhanced Value	7%	13%
World Enhanced Value	9%	14%
ACWI Enhanced Value	11%	15%
Japan Enhanced Value	6%	7%
Europe Enhanced Value	9%	10%

Simulations as of Dec 01, 2017

ESTIMATED IMPACT - MSCI SECTOR NEUTRAL QUALITY INDEXES

METHODOLOGY

- Methodology applies sector neutrality concept
- The below table compares the simulated index rebalance turnover if new GICS structure was implemented at the November 2017 SAIR against the actual November 2017 SAIR which used old GICS structure

Index	Turnover using Old GICS Structure	Turnover using New GICS Structure
World Sector Neutral Quality Index	11%	16%
USA Sector Neutral Quality Index	18%	21%
ACWI Sector Neutral Quality Index	9%	12%
EM Sector Neutral Quality Index	11%	14%
AC Asia ex Japan Sector Neutral Quality Index	13%	16%
Japan Sector Neutral Quality Index	11%	12%
Europe Sector Neutral Quality Index	14%	13%

Simulations as of Dec 01, 2017

ESTIMATED IMPACT ON ESG INDEXES

- Based on simulations, the implementation of the new GICS structure may generate some additional turnover for certain MSCI ESG Indexes:

Methodology	Example of Index	Nov 2017 Index Review		Nov 2017 Index Review (May Rules)**	
		Actual Turnover- Current GICS	Simulated Turnover- New GICS*	Simulated Turnover- Current GICS	Simulated Turnover- New GICS*
ESG Leaders	ACWI ESG Leaders	0.5%	2.1%	2.4%	3.9%
SRI	ACWI SRI	1.1%	1.5%	4.0%	6.0%
Low Carbon Target	ACWI Low Carbon Target	10.0%	10.0%		
Low Carbon Leaders	ACWI Low Carbon Leaders	4.2%	4.2%		
KLD 400 Social	KLD 400 Social	6.6%	7.6%		
Catholic Values	USA Catholic Values	1.1%	6.6%		
Sustainable Impact	ACWI Sustainable Impact	12.3%	12.3%		
ESG Select	USA ESG Select	4.7%	8.0%		
ESG Focus	EAFE ESG Focus	9.8%	10.0%		
Women's Leadership	World Women's Leadership	13.7%	13.7%		
Empowering Women	Japan Empowering Women	12.1%	12.1%		
HPI	Japan Human and Physical Investment	16.8%	16.8%		

ACWI ESG Leaders and ACWI SRI have simulated additional turnover of +1.5% and +2.1%, respectively, upon application of the May Annual Index Review methodology

*Simulated using Dec 1, 2017 data based on initial assessment of company-level GICS changes. Company-level GICS changes may be subject to change; final list of impacted companies will be released on July 2, 2018.

**Simulated using May Annual Index Review methodology.

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