Potential Enhancements to the MSCI Quality Indexes Methodology

PROPOSAL FOR CONSULTATION

June 2024

This consultation may or may not lead to the implementation of any or all of the proposed changes in the highlighted or any other MSCI 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 result of the consultation.

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Enhancing MSCI Single Factor Indexes - Roadmap

- Single factor indexes are constructed to achieve a high, stable level of exposure to a single target factor and low exposure to all other factors, but they can also benefit from new data and/or alternative portfolio construction techniques and rebalancing frequencies.

- We aim to consult on specific proposals in due course for other single factor index methodologies including MSCI Momentum Indexes, MSCI Enhanced Value Indexes, MSCI Minimum Volatility Indexes and MSCI High Dividend Yield Indexes. MSCI welcomes views and feedback on the existing methodologies from the investment community on these topics.

- This document focuses on potential enhancement to the MSCI Quality Indexes Methodology and seeks to encourage dialogue and feedback from relevant stakeholders.

Agenda

1. Quality Indexes: Background and Objective
2. Proposed Enhancements
   - i. Rebalance Frequency; Missing Data Handling
   - ii. Factor Selection; Factor Weighting
3. Discussion Points
4. Appendix

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MSCI Quality Indexes : Background

- The MSCI Quality Indexes aim to reflect the performance of companies that have relatively high exposure to the Quality factor. Constituents of MSCI Quality Indexes have historically exhibited positive active exposures to the Quality factors.

- Current methodology defines Quality factor based on individual fundamental ratios representing three pillars of Quality i.e., Profitability, Financial Leverage and Earnings Variability.

- Since the initial launch of MSCI Quality Indexes methodology, new research has identified additional descriptors for the original pillars as well as new dimensions to the definition of Quality e.g., Investment Quality and Earnings Quality etc.

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MSCI Quality Indexes : Consultation Objectives

Objective of the consultation is to seek feedback from the market participants on the following:

- More frequent (quarterly) rebalancing, i.e., align the rebalancing calendar with Quarterly Comprehensive Index Reviews of the underlying MSCI GIMI parent indexes allowing reflection of the most recent information

- Handling of input data to mitigate cases of potential reverse turnover due to a lag in availability of data

- Review the weighting of descriptors in the Quality factor definition taking into consideration the historical factor returns and information ratios i.e., align them with weighting in MSCI FaCS methodology*

- Review the choice of descriptors to represent different pillars of Quality factor

- Seek feedback on mitigation of potential concentration by capping exposure to Issuers, Sectors and Countries

MSCI

* For more details on MSCI FaCS methodology, please refer to MSCI FaCS methodology document at https://www.msci.com/documents/10199/275765e9-d631-4222-b4aa-520f7fa7d830

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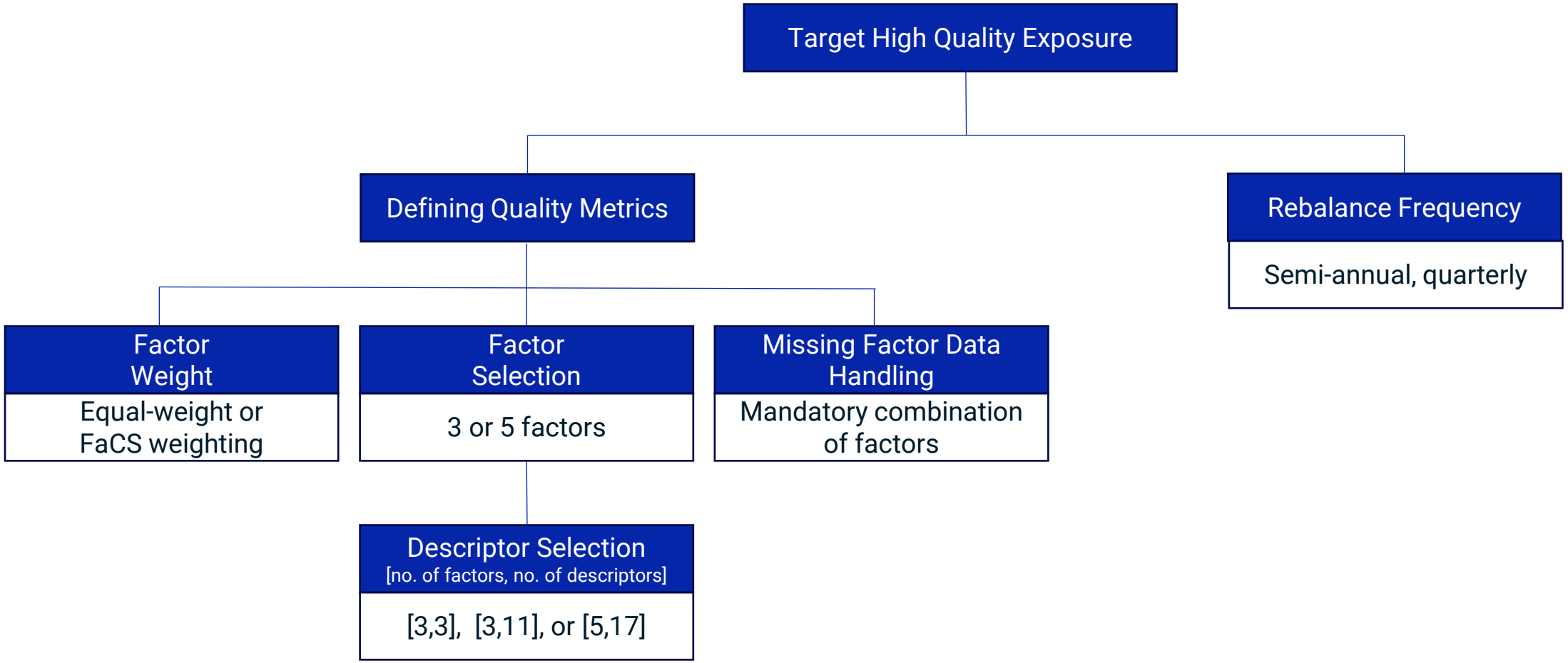
MSCI Quality Indexes : Considerations



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MSCI Quality Indexes : Considerations Rationale

Category	Description	Rationale	Current Methodology
Missing Factor Data Handling*	Availability of **Return-on-Equity** and **Debt-to-Equity** as a mandatory requirement for eligibility	Helps in mitigating cases of potential reverse turnover due to a lag in availability of data	Return-on-Equity is mandatory along with either Debt-to-Equity or Earnings Variability
Rebalance Frequency	**Quarterly** rebalancing	In line with MSCI GIMI Quarterly Comprehensive Index Review (QCIR) rebalance frequency and allows to reflect more recent information	Semi-annual rebalancing
Factor Weight	**MSCI FaCS Weighting** to compute Quality factor signal	Assigns weights to the descriptors of the Quality factor group, by emphasizing on historical factor returns and information ratios	Equal weighted
Factor & Descriptor Selection	Quality Score based on **3 factors,** or **5 factors** as represented in MSCI's **GEMLT** equity risk model	Enrich definition of the selected factors - For 3 pillars, total **11** descriptors: Profitability (#4), Leverage (#3) and Earnings Variability (#4) For 5 pillars, total **17** descriptors: Profitability (#4), Leverage (#3), Earnings Variability (#4), Investment Quality (#3) and Earnings Quality (#3)	Quality Score based on single fundamental ratios representing each pillar

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* Not applicable for Quality factor definition based on GEMLT descriptors

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GEMLT Quality Factors and MSCI FaCS Weighting

- MSCI FaCS methodology[#] is a classification standard and framework for analyzing and reporting style factors in equity portfolios.
- The standard is based on the factor structure in GEMLT Model.
- MSCI FaCS methodology assigns weights to factors in the quality factor group, by putting an emphasis on historical factor returns and information ratios (IRs).

Factor	Descriptors	Annual Return(%)*	Annual Volatility (%)*	IR*	Weight in Quality GEMLT 3 Factors	Weight in Quality GEMLT 5 Factors
Profitability	Asset Turnover (25%), Gross Profitability (25%), Gross Profit Margin (25%) and Return on Assets (25%)	0.98	0.97	**1.00**	50.0%	25.0%
Leverage	Market Leverage (30%), Book Leverage (30%) and Debt-to-Assets (40%)	-0.11	0.88	-0.12	25.0%	12.5%
Earnings Variability	Variability in Sales (20%), Variability in Earnings (25%), Variability in Cash-Flows (20%) and Standard Deviation of Analyst Predicted Earnings-to-Price (35%)	-0.76	0.93	-0.82	25.0%	12.5%
Earnings Quality	Accruals – Balance Sheet (40%), Accruals – Cash Flow (30%) and Cash Earnings to Earnings (30%)	0.71	0.71	**0.99**	--	25.0%
Investment Quality	Total Assets Growth Rate (40%), Issuance Growth (40%) and Capital Expenditure Growth (20%)	0.91	0.87	**1.05**	--	25.0%

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[#] MSCI FaCS methodology document at https://www.msci.com/documents/10199/275765e9-d631-4222-b4aa-520f7fa7d830
* Period: June 2014 to March 2024.

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Proposed Methodology Enhancements

Option 1 (Recommended):

- Rebalance frequency: Quarterly
- Definition of Quality factor based on GEMLT 3 factors (Profitability, Leverage and Earnings Variability)
- Quality score calculation: 50% Profitability, 25% Leverage and 25% Earnings Variability

Option 2:

- Rebalance frequency: Quarterly
- Definition of Quality factor unchanged based on Return-on-Equity (ROE), Debt-to-Equity (D/E), Earnings Variability but with both ROE and D/E as mandatory descriptors

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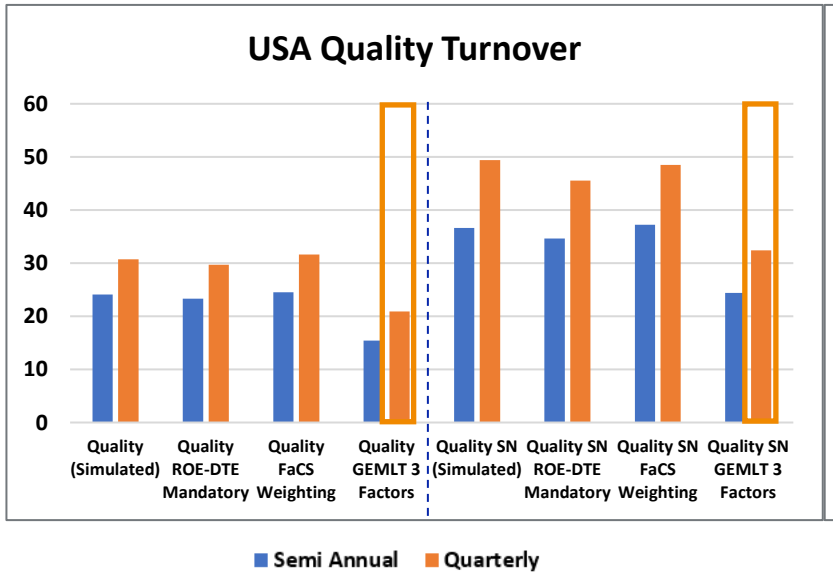
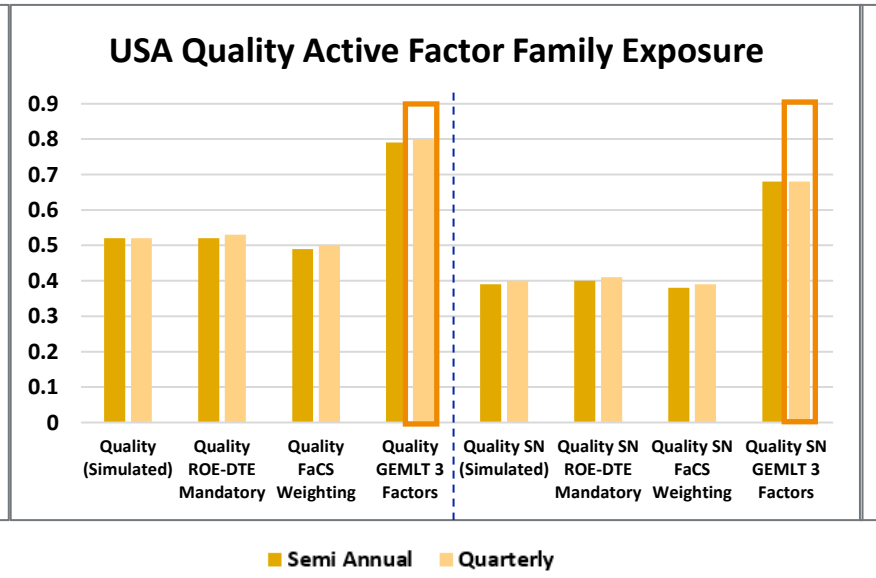
Rebalancing Frequency and Data handling

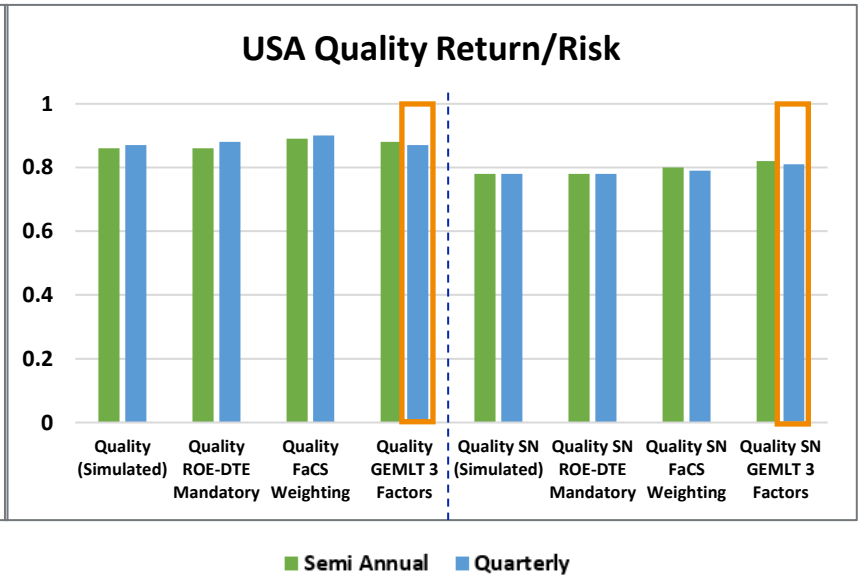
- Below plots exhibit historical turnover, exposure to Quality factor and performance of three simulated indexes compared with indexes using existing methodology:
  1. 'ROE-DTE Mandatory': Simulated variant with mandatory condition for availability of Return-on-Equity and Debt-to-Equity, and
  2. 'FaCS Weighting': Simulated variant where Quality factor signal is calculated using normalized MSCI FaCS weighting, along with Return-on-Equity and Debt-to-Equity being mandatory
  3. 'GEMLT 3 Factors': Simulated variant where Quality factor signal is computed with 3 GEMLT Factors with normalized MSCI FaCS weighting

The proposed simulation "GEMLT 3 Factors" has similar Quarterly turnover as that of the current semi-annual Quality Index but with an improvement in the factor exposure.

Making Return-on-Equity and Debt-to-Equity mandatory did not have an impact on the historical performance and other characteristics like Quality factor exposures, Turnover etc. but helped mitigate potential cases of reverse turnover







Period: May 30, 2003 to Mar 29, 2024. * Annualized one-way index turnover over index reviews ** Active exposures are w.r.t respective MSCI market cap benchmark indexes.
'Quality (Simulated)' and 'Quality SN (Simulated)' variants are the existing methodologies simulated for comparison with enhancement proposals.

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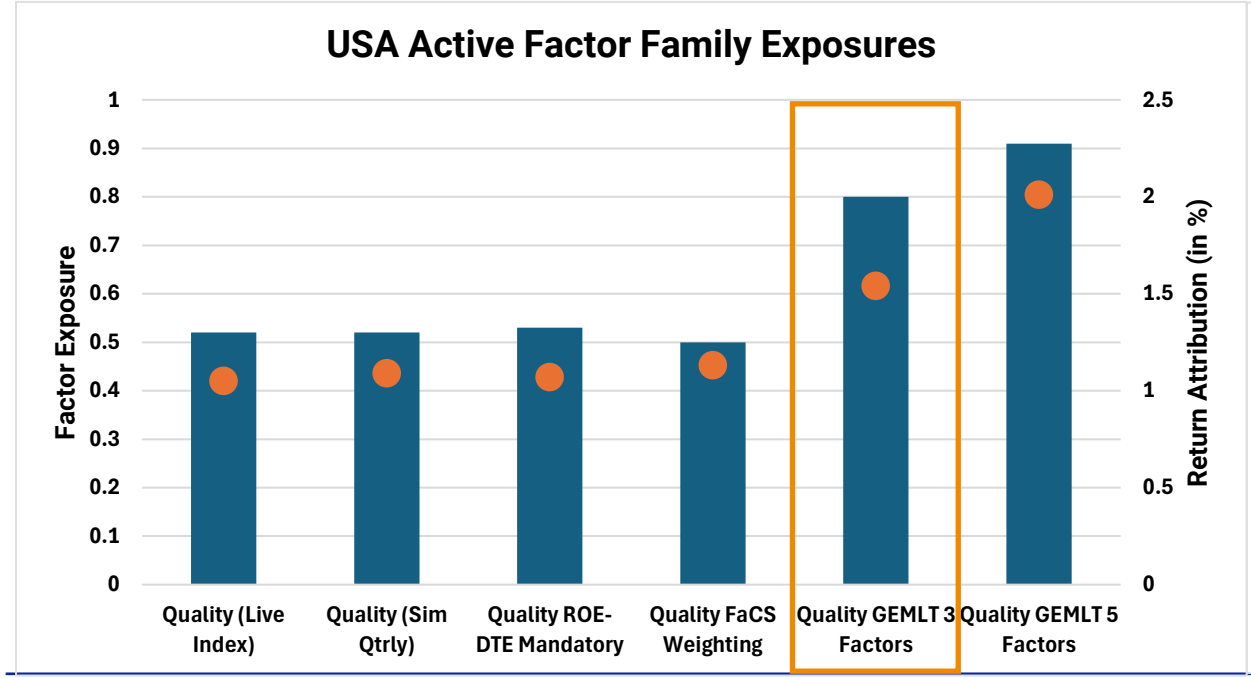
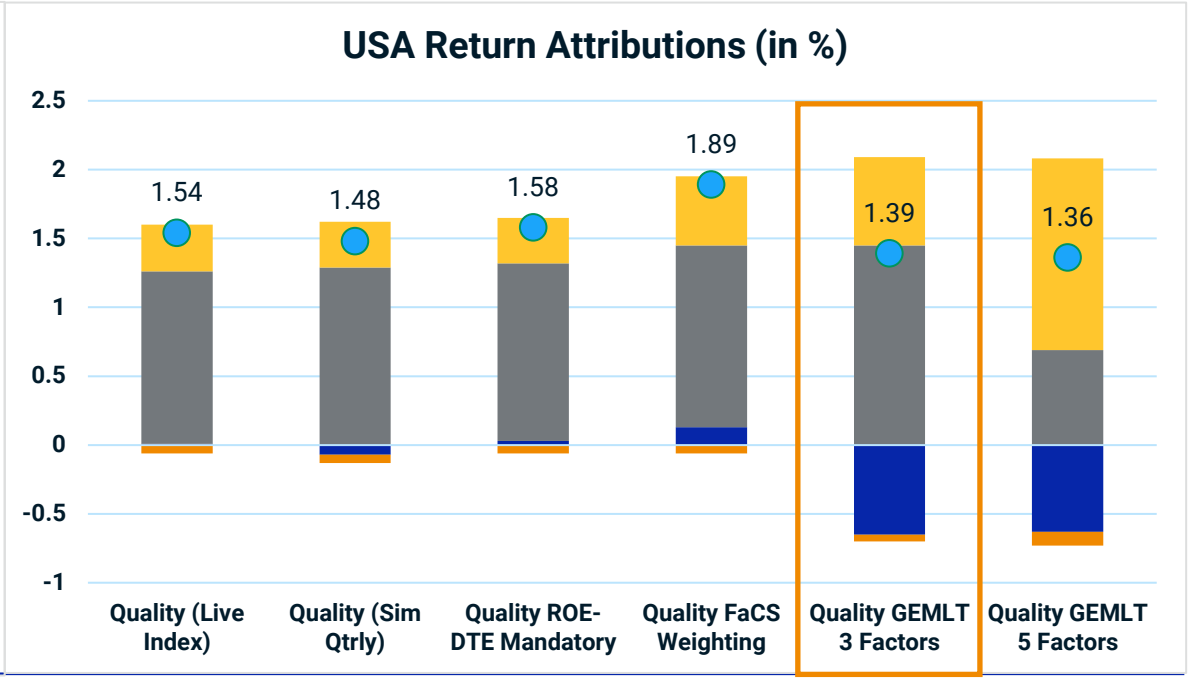
FaCS weighting and GEMLT factors

Quality factor exposure and active return attribution to Quality factor increased significantly in the "Quality GEMLT 3 Factors" compared to the current Quality index.

The style factor active returns increased in the "Quality GEMLT 3 Factors" compared to the current Quality index. This increase was offset by negative active returns from the specific component.





Period: May 30, 2003 to Mar 29, 2024. Active measures are w.r.t respective MSCI market cap benchmark indexes. Active returns are Gross returns annualized in USD.

Note: The Factor Family exposures are calculated using the GEMLT Model. This includes 25% weightage to Profitability, Investment Quality and Earnings Quality each, while 12.5% weightage to Earnings Variability and Leverage each. These weightages align to the simulations of 'Quality GEMLT 5 Factors' and 'Quality GEMLT SN 5 Factors'.
Quality (Live Index) is an existing live Index (semi-annual rebalance frequency). Quality (Sim Qtrly) is an existing methodology simulated for comparison but with quarterly rebalance frequency.
All other, simulated Indexes follow quarterly rebalance frequency.

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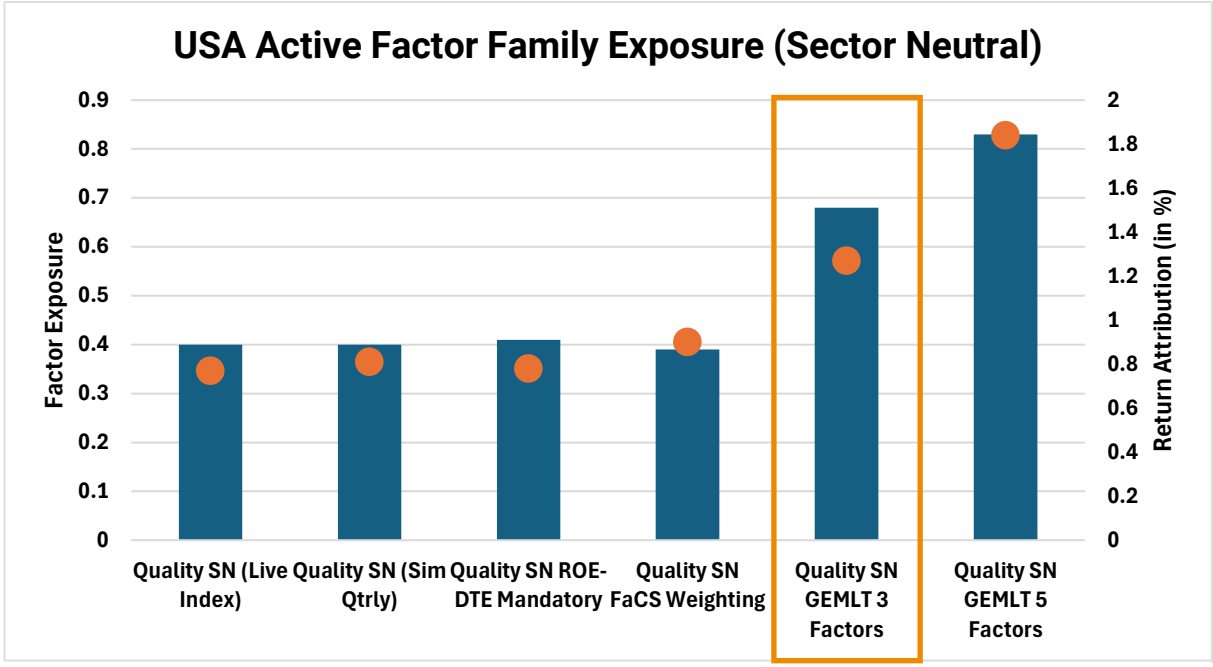
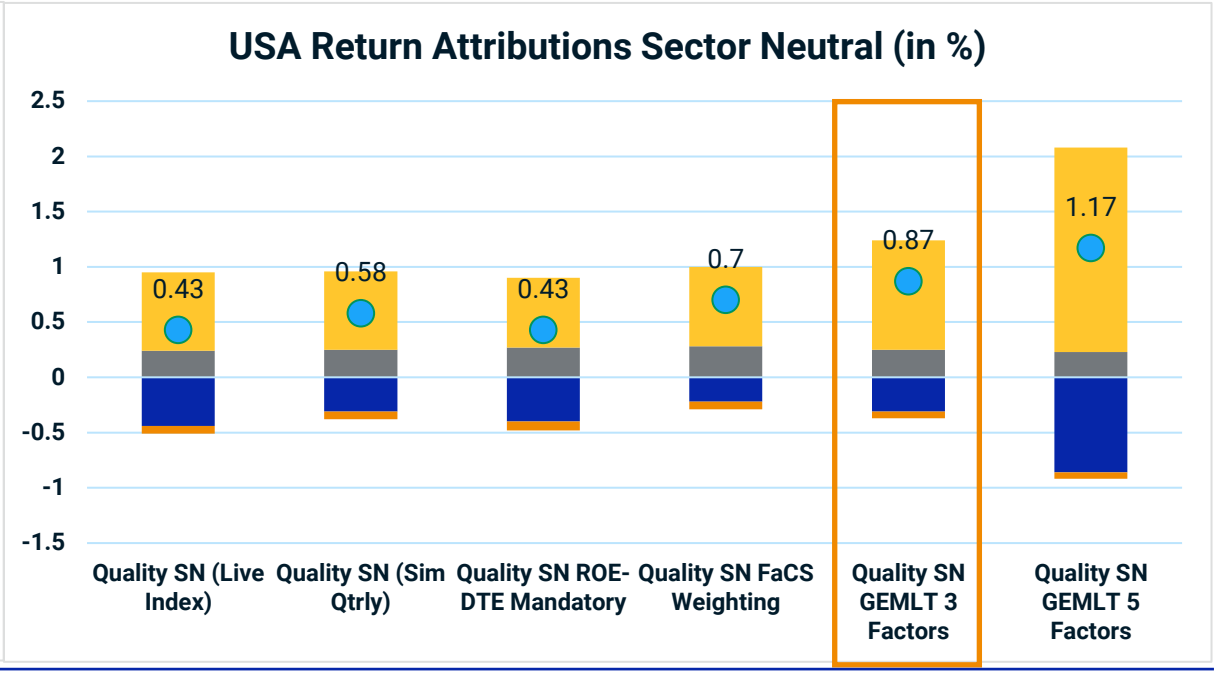
Similar characteristics observed for the Sector Neutral variant

Quality factor exposure and active return attribution from Quality factor increased significantly in the "Quality SN GEMLT 3 Factors" compared to the current Quality index.

The style factor active returns increased in the "Quality SN GEMLT 3 Factors" compared to the current Quality index.





Period: May 30, 2003 to Mar 29, 2024. Active measures are w.r.t respective MSCI market cap benchmark indexes. Active returns are Gross returns annualized in USD.

Note: The Factor Family exposures are calculated using the GEMLT Model. This includes 25% weightage to Profitability, Investment Quality and Earnings Quality each, while 12.5% weightage to Earnings Variability and Leverage each. These weightages align to the simulations of 'Quality GEMLT 5 Factors' and 'Quality GEMLT SN 5 Factors'.
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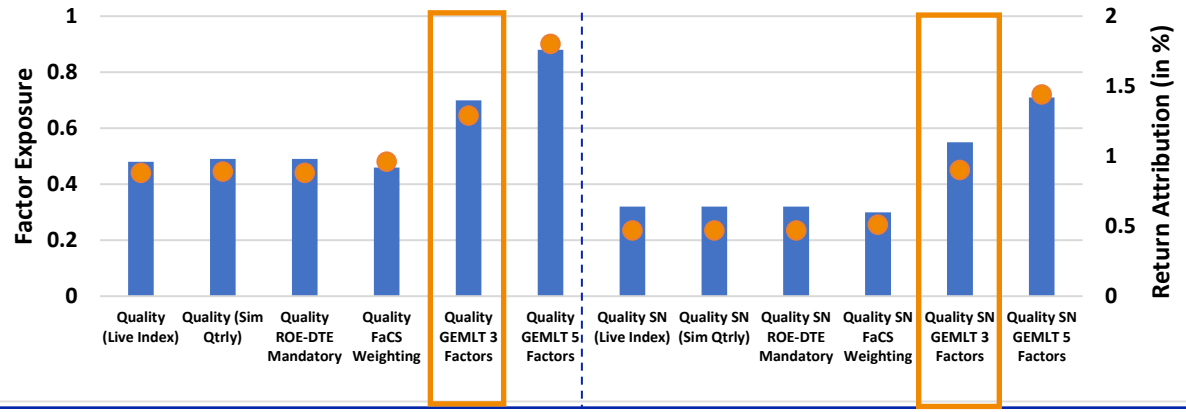
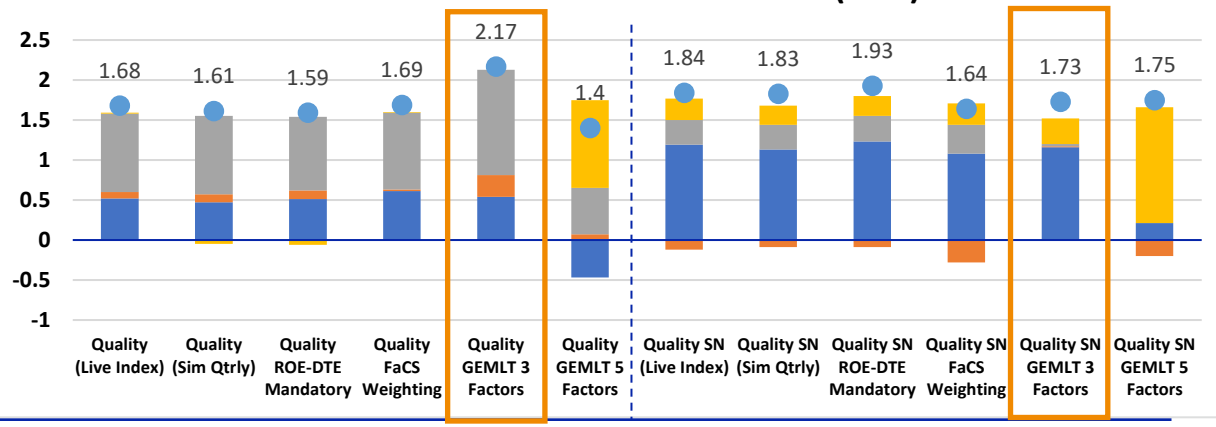
Summary – World ex USA

Increased Quality factor exposure, increased active return attribution from Quality factors and similar turnover to current Quality Index were observed for 'GEMLT 3 Factors' variant

World ex USA Active Factor Family Exposure



World ex USA Return Attributions (in %)

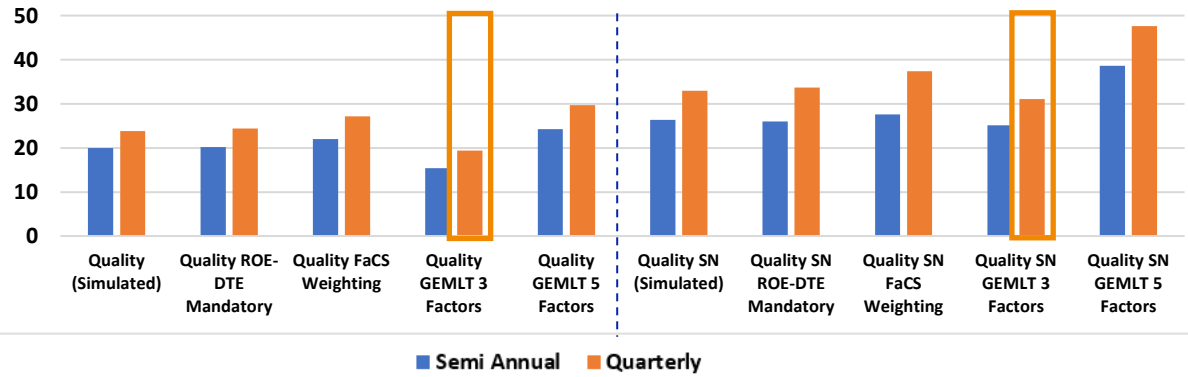


Period: May 30, 2003 to Mar 29, 2024. Active measures are w.r.t respective MSCI market cap benchmark indexes. Active returns are Gross returns annualized in USD.

Quality Active Factor Family Exposure | Quality Factors Return Attri. (%)

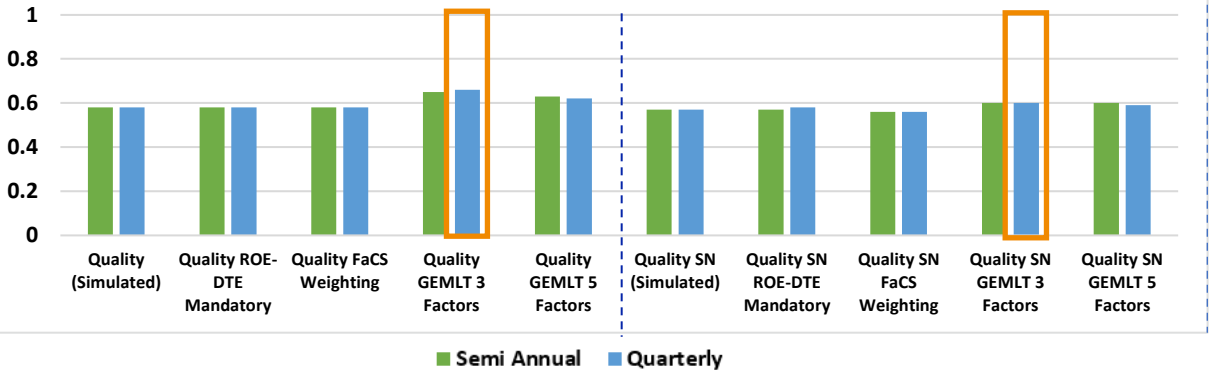
Specific Ret. Attr. (%) | Countries Ret. Attr. (%) | Industries Ret. Attr. (%) | Styles Ret. Attr. (%) | Active Return (%)

World ex USA Quality Turnover



Semi Annual | Quarterly

World ex USA Quality Return/Risk



Semi Annual | Quarterly

Note: The Factor Family exposures are calculated using the GEMLT Model. This includes 25% weightage to Profitability, Investment Quality and Earnings Quality each, while 12.5% weightage to Earnings Variability and Leverage each. These weightages align to the simulations of 'Quality GEMLT 5 Factors' and 'Quality GEMLT SN 5 Factors'.
Quality (Live Index) and Quality SN (Live Index) are existing live Indexes (semi-annual rebalance frequency). Quality (Sim Qtrly) and Quality SN (Sim Qtrly) are existing methodology simulated for comparison with quarterly rebalance frequency.
All other, simulated Indexes in Factor Family and Return Attributions plots follow quarterly rebalance frequency.

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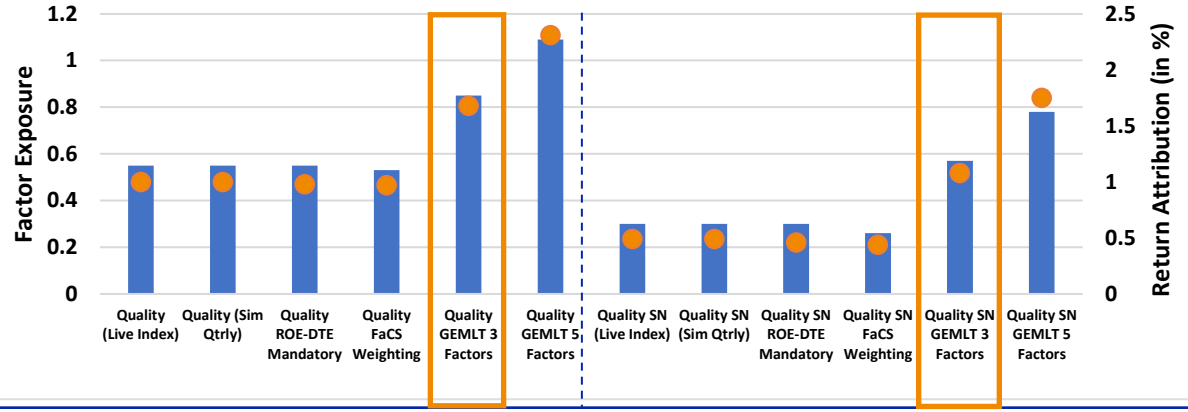
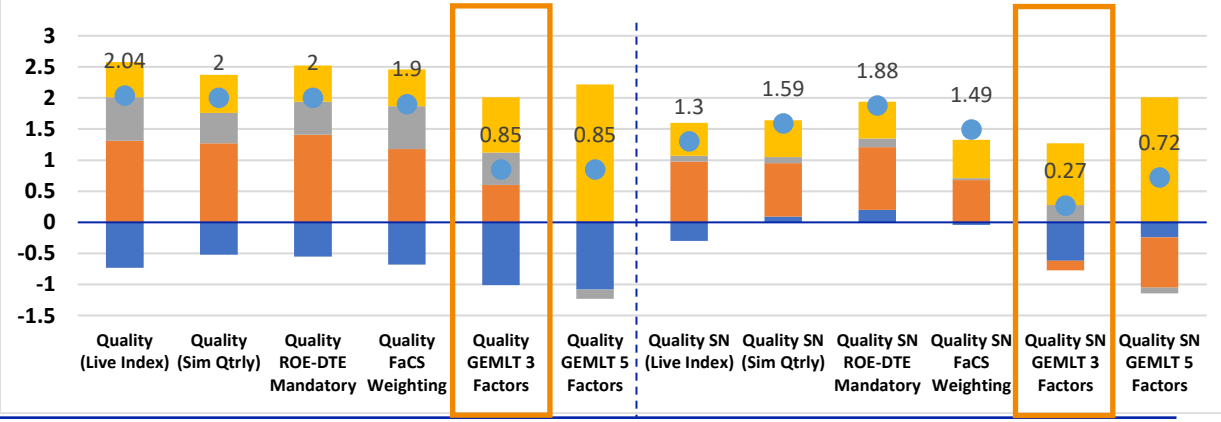
Summary – Emerging Markets (EM)

Increased Quality factor exposure, increased active return attribution from Quality factors, marginally higher turnover to current Quality Index and marginally lower risk adjusted performance were observed for 'GEMLT 3 Factors' variant

EM Active Factor Family Exposure



EM Return Attributions (in %)

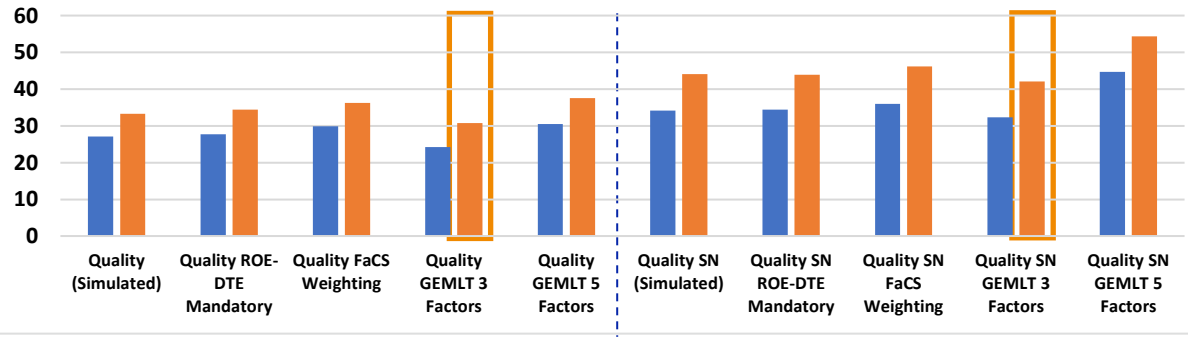


Period: May 30, 2003 to Mar 29, 2024. Active measures are w.r.t respective MSCI market cap benchmark indexes. Active returns are Gross returns annualized in USD.

Quality Active Factor Family Exposure | Quality Factors Return Attri. (%)

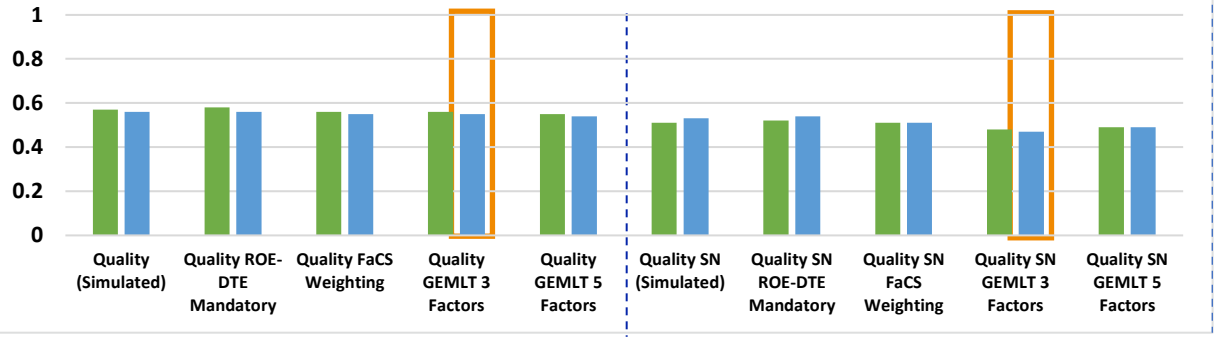
Specific Ret. Attr. (%) | Countries Ret. Attr. (%) | Industries Ret. Attr. (%) | Styles Ret. Attr. (%) | Active Return (%)

EM Quality Turnover



Semi Annual | Quarterly

EM Quality Return/Risk



Semi Annual | Quarterly

Note: The Factor Family exposures are calculated using the GEMLT Model. This includes 25% weightage to Profitability, Investment Quality and Earnings Quality each, while 12.5% weightage to Earnings Variability and Leverage each. These weightages align to the simulations of 'Quality GEMLT 5 Factors' and 'Quality GEMLT SN 5 Factors'.
Quality (Live Index) and Quality SN (Live Index) are existing live Indexes (semi-annual rebalance frequency). Quality (Sim Qtrly) and Quality SN (Sim Qtrly) are existing methodology simulated for comparison with quarterly rebalance frequency.
All other, simulated Indexes in Factor Family and Return Attributions plots follow quarterly rebalance frequency.

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Discussion Points

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Discussion Points

Data Handling –

- Do you agree that the below technical enhancement helps in mitigating cases of potential reverse turnover without significantly impacting other index characteristics?
    - Making both Return-on-Equity (ROE) and Debt-to-Equity(D/E) as mandatory descriptors for the eligibility of selection

Rebalancing Frequency –

- Should Quarterly rebalancing be implemented given the trade-off between timely reflection of changing company attributes and incremental turnover?

FaCS Weighting –

- Do you think the change in weights of the descriptors in quality score to align with MSCI FaCS Methodology reflect balanced weight allocation to the pillars of Quality factor?
    - For 3 factor quality score definition, this adjustment will increase the weight of ROE / Profitability measure to 50% and reduce the weight of D/E (Leverage) and Earnings Variability measures to 25% each, from the current equal weighting of all the 3 factors.

Factor Definition –

- Do you think the Quality factor definition based on 3 pillars could be enriched by incorporating descriptors from the GEMLT model?

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Additional Discussion Points

- Should MSCI consider enhancing the Quality factor definition further by adding Investment Quality and Earnings Quality to the current definition based on three pillars?

- Should MSCI consider applying bounds on sector weights and country weights?
  - If yes, does +/-5% active weight to Sectors and Countries seem reasonable?

- Should MSCI enhance the current issuer cap bound of 5% to max(5%, issuer weight in the Parent index) to be in sync with the relative constituent weights in the underlying parent index?

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Appendix

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Applicability of Consultation Proposals to Standard MSCI Index Methodologies

Index Methodologies
MSCI Quality Indexes
MSCI Quality Tilt Indexes
MSCI Sector Neutral Quality Indexes
MSCI High Dividend Yield Indexes
MSCI Governance Quality Indexes
MSCI Japan Human and Physical Investment Index
MSCI Prime Value Indexes

In addition, index methodologies that use MSCI Quality Indexes as one of the component index or use existing MSCI Quality Index as an underlying index are also applicable for consultation proposal. For e.g., MSCI Diversified Factor Mix Indexes, MSCI Factor Mix-A Series Indexes, MSCI Adaptive Multiple-Factor Indexes, MSCI Hedged Indexes.

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Transition Analysis

	USA Quality				USA Sector Neutral Quality			
	Quality (Live Index)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality (Live Index)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors
One-way Turnover	9.3%	9.3%	17.6%	23.6%	13.8%	12.0%	22.1%	32.9%

	World ex USA Quality				World ex USA Sector Neutral Quality			
	Quality (Live Index)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality (Live Index)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors
One-way Turnover	11.9%	10.6%	14.4%	28.3%	12.7%	12.6%	17.0%	35.8%

Transition simulation during Dec-23 Index Review
One-way Turnover includes changes from Index Review and transition turnover from current (Live) Quality Index

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Different Pillars of Quality : How are they correlated?

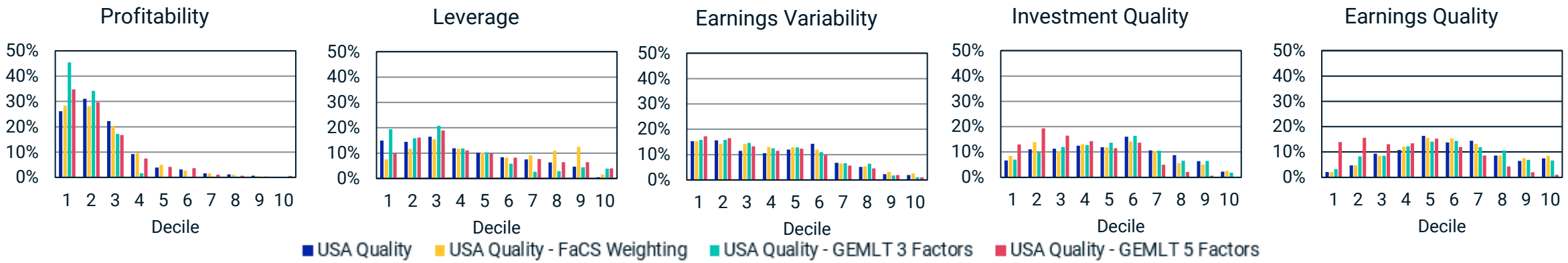
- Correlation among GEMLT 5 quality factors was observed to be less than 30% with other quality factors, including additional factors - Investment Quality and Earnings Quality factors.

Factor Correlation for MSCI USA Index

	Investment Quality	Profitability	Earnings Quality	Earnings Variability	Leverage	Momentum	Value	Growth
Investment Quality	1.00							
Profitability	**0.13**	1.00						
Earnings Quality	**-0.04**	**0.01**	1.00					
Earnings Variability	**0.29**	**0.20**	**-0.23**	1.00				
Leverage	**-0.09**	**0.20**	**-0.23**	**0.04**	1.00			
Momentum	**0.03**	**0.12**	**-0.04**	**0.08**	**0.06**	1.00		
Value	**0.18**	**-0.21**	**-0.11**	**0.03**	**0.02**	**-0.23**	1.00	
Growth	**-0.24**	**0.26**	**-0.03**	**-0.21**	**0.20**	**0.18**	**-0.30**	1.00

Median values calculated over simulated period from Jun 2003 to Mar 2024

- Weights distribution across deciles:



- Most of the stock selection was observed to be done from top deciles of the Profitability factor
- For 'Quality GEMLT 5 Factors', securities were observed to be selected from top deciles of the Earnings Quality and Investment Quality as well, as these are also targeted factors in the Quality Score calculation

Note: The decile calculation is based on the GEMLT Z-Scores of all constituents of the MSCI USA Index. Top decile (#1) has the highest factor scores i.e., highest Profitability, lowest Leverage, lowest Earnings Variability, highest Investment Quality and highest Earnings Quality. The plot compares the weight distribution of selected securities across these deciles of USA Quality, USA Quality FaCS Weighting, USA Quality GEMLT 3 Factors and USA Quality GEMLT 5 Factors.
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Data Handling Example

Background

- During the May 2023 Index Review, Home Depot was deleted from the MSCI USA Quality Index and MSCI USA Sector Neutral Quality Index even when it had higher index weight and was added only in the previous rebalance.
  - Home Depot was added in November 2022 due to an extreme high ROE value; it had Debt-to-Equity (D/E) value as Null. Under the current methodology, the Quality score was calculated using Return-on-Equity (ROE) and Earnings Variability only (excluding the Null D/E).
  - For the May 2023 Index Review, Home Depot's D/E value was populated with a value of 32.2, offsetting a still higher ROE figure and hence significantly dropping the overall Quality score and consequently dropping from the Index.

Reason

- There is inconsistent timing of fundamental data inputs to the Quality score for the MSCI Quality Indexes Methodology since Debt-to-Equity uses latest fiscal year while Return-on-Equity uses latest quarter filing. This causes unwanted additions and subsequent in case book value of equity moves between positive and negative values.

- Making both **Return on Equity and Debt-to-Equity mandatory** would make the data handling in sync and mitigate potential cases of reverse turnover.

Security Name	Date	Weight in MSCI USA Index	Return on Equity Data	Debt-to-Equity Data	Weight in MSCI USA Quality Index	Weight in MSCI USA Sector Neutral Quality Index
Home Depot	June 1 2022	0.86%	--	--	--	--
	Dec 1 2022	0.92%	7172.44	--	5.01%	6.16%
	June 1 2023	0.78%	1092.06	32.24	--	--
	Dec 1 2023	0.78%	1209.51	32.24	--	--
	Jun 3 2024	0.72%	1445.05	50.04	--	--

The data used for Return on Equity and Debt-to-Equity is of April/October month end for the June/December rebalance respectively.
For more information about calculation of the data, please refer to MSCI Fundamental Data Methodology - www.msci.com/index/methodology/latest/FundData

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USA Simulation Summary – Quarterly & ROE/DTE Mandatory

		USA Quality					USA Sector Neutral Quality				
	MSCI USA Index	MSCI USA Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)	MSCI USA Sector Neutral Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)
Total Return* (%)	10.7	12.2	12.0	12.2	12.1	12.3	11.1	11.1	11.3	11.1	11.1
Total Risk (%)	14.8	14.0	14.0	14.0	14.0	14.0	14.3	14.3	14.3	14.2	14.3
Return / Risk	0.72	0.87	0.86	0.87	0.86	0.88	0.78	0.78	0.78	0.78	0.78
Tracking Error (%)	--	3.7	3.6	3.6	3.6	3.6	2.8	2.8	2.8	2.8	2.9
Turnover (%)**	3.1	25.2	24.1	30.7	23.3	29.7	37.8	36.6	49.4	34.6	45.5
Quality Active Factor Family Exposure***	--	0.52	0.52	0.52	0.52	0.53	0.40	0.39	0.40	0.40	0.41
Specific Active Return Attribution (%)	--	0.01	-0.16	-0.07	-0.13	0.03	-0.44	-0.46	-0.31	-0.40	-0.40
Countries Active Return Attribution (%)	--	-0.06	-0.07	-0.06	-0.07	-0.06	-0.07	-0.08	-0.07	-0.08	-0.08
Industries Active Return Attribution (%)	--	1.25	1.27	1.29	1.29	1.29	0.24	0.26	0.25	0.26	0.27
Styles Active Return Attribution (%)	--	0.34	0.31	0.33	0.29	0.33	0.71	0.67	0.71	0.65	0.63

Period: May 30, 2003 to Mar 29, 2024. * Gross returns annualized in USD ** Annualized one-way index turnover over index reviews *** Active values are w.r.t MSCI USA Index.

Performance (%)	MSCI USA Index	MSCI USA Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)	MSCI USA Sector Neutral Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)
1 Yr	32.9	42.1	42.2	42.8	42.5	43.0	37.0	37.8	37.9	37.0	38.0
3 Yr	10.9	13.5	13.4	14.8	13.8	14.9	12.1	12.2	13.0	12.2	12.9
5 Yr	15.0	17.3	17.3	17.9	17.5	18.0	15.1	15.1	15.2	15.2	15.1
10 Yr	13.0	15.3	15.1	15.3	15.3	15.4	13.2	13.1	13.4	13.3	13.4

Gross returns for the period ending Mar 29, 2024. Returns are annualized for periods longer than a year

All simulated Indexes with 'Qtrly' in name follow quarterly rebalance frequency, others follow semi-annual rebalance frequency.

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Information Classification: GENERAL

USA Simulation Summary – FaCS Weighting and GEMLT-based factor definition

		USA Quality					USA Sector Neutral Quality				
	MSCI USA Index	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors
Total Return* (%)	10.7	12.2	12.3	12.6	12.1	12.0	11.3	11.1	11.4	11.5	11.8
Total Risk (%)	14.8	14.0	14.0	13.9	13.8	13.3	14.3	14.3	14.4	14.3	13.8
Return / Risk	0.72	0.87	0.88	0.90	0.87	0.90	0.78	0.78	0.79	0.81	0.86
Tracking Error (%)	--	3.6	3.6	3.7	4.3	4.2	2.8	2.9	2.7	3.3	3.3
Turnover (%)**	3.1	30.7	29.7	31.6	20.9	35.1	49.4	45.5	48.5	32.4	51.2
Quality Active Factor Family Exposure***	--	0.52	0.53	0.50	0.80	0.91	0.40	0.41	0.39	0.68	0.83
Specific Active Return Attribution (%)	--	-0.07	0.03	0.13	-0.65	-0.63	-0.31	-0.40	-0.22	-0.31	-0.86
Countries Active Return Attribution (%)	--	-0.06	-0.06	-0.06	-0.05	-0.10	-0.07	-0.08	-0.07	-0.06	-0.06
Industries Active Return Attribution (%)	--	1.29	1.29	1.32	1.45	0.69	0.25	0.27	0.28	0.25	0.23
Styles Active Return Attribution (%)	--	0.33	0.33	0.50	0.64	1.39	0.71	0.63	0.72	0.99	1.85
Turnover (%) (Semi Annual)	--	24.1	23.3	24.5	15.4	26.9	36.6	34.6	37.2	24.4	39.5
Quality Active Factor Family Exposure (Semi Annual)	--	0.52	0.52	0.49	0.79	0.90	0.39	0.40	0.38	0.68	0.82
Return / Risk (Semi Annual)	--	0.86	0.86	0.89	0.88	0.90	0.78	0.78	0.80	0.82	0.86

Period: May 30, 2003 to Mar 29, 2024. * Gross returns annualized in USD ** Annualized one-way index turnover over index reviews *** Active values are w.r.t MSCI USA Index. Simulated Indexes use quarterly rebalance frequency.
The monthly average number of securities were 125 for all the variants.

Performance (%)	MSCI USA Index	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors
1 Yr	32.9	42.8	43.0	42.4	40.4	32.7	37.9	38.0	39.0	31.9	27.9
3 Yr	10.9	14.8	14.9	15.1	15.2	12.8	13.0	12.9	13.4	13.3	10.7
5 Yr	15.0	17.9	18.0	17.9	17.6	15.4	15.2	15.1	15.6	16.3	14.0
10 Yr	13.0	15.3	15.4	15.6	15.7	14.2	13.4	13.4	13.9	14.4	13.4

Gross returns for the period ending Mar 29, 2024. Returns are annualized for periods longer than a year

All simulated Indexes follow quarterly rebalance frequency.

World ex USA Simulation Summary – Quarterly & ROE/DTE Mandatory

		World ex USA Quality					World ex USA Sector Neutral Quality				
	MSCI World ex USA Index	MSCI World ex USA Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)	MSCI World ex USA Sector Neutral Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)
Total Return* (%)	7.6	9.2	9.2	9.2	9.1	9.2	9.4	9.3	9.4	9.4	9.5
Total Risk (%)	16.6	15.8	15.8	15.8	15.8	15.8	16.4	16.4	16.4	16.4	16.4
Return / Risk	0.46	0.58	0.58	0.58	0.58	0.58	0.57	0.57	0.57	0.57	0.58
Tracking Error (%)	--	4.3	4.4	4.4	4.4	4.4	2.7	2.8	2.7	2.8	2.7
Turnover (%)**	2.9	20.5	19.8	23.8	20.2	24.4	25.8	26.2	33.0	26.0	33.7
Quality Active Factor Family Exposure***	--	0.48	0.49	0.49	0.49	0.49	0.32	0.32	0.32	0.32	0.32
Specific Active Return Attribution (%)	--	0.52	0.56	0.47	0.55	0.51	1.19	1.22	1.13	1.24	1.23
Countries Active Return Attribution (%)	--	0.08	0.09	0.10	0.07	0.11	-0.12	-0.18	-0.09	-0.18	-0.09
Industries Active Return Attribution (%)	--	0.98	0.91	0.98	0.89	0.92	0.31	0.28	0.31	0.29	0.32
Styles Active Return Attribution (%)	--	0.01	-0.07	-0.05	-0.08	-0.06	0.27	0.22	0.24	0.23	0.25

Period: May 30, 2003 to Mar 29, 2024. * Gross returns annualized in USD ** Annualized one-way index turnover over index reviews *** Active values are w.r.t MSCI World ex USA Index.

Performance (%)	MSCI World ex USA Index	MSCI World ex USA Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)	MSCI World ex USA Sector Neutral Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)
1 Yr	17.9	16.2	16.6	15.7	16.5	16.3	18.0	18.2	18.6	17.9	18.4
3 Yr	5.4	5.3	4.8	4.6	4.8	4.9	6.1	6.2	6.2	6.3	6.4
5 Yr	8.0	9.9	9.5	9.4	9.5	9.6	9.6	9.5	9.4	9.5	9.6
10 Yr	5.4	7.0	6.8	6.9	6.8	6.9	7.1	6.9	6.9	6.9	7.0

Gross returns for the period ending Mar 29, 2024. Returns are annualized for periods longer than a year

All simulated Indexes with 'Qtrly' in name follow quarterly rebalance frequency, others follow semi-annual rebalance frequency.

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Information Classification: GENERAL

World ex USA Simulation Summary – FaCS Weighting and GEMLT-based factor definition

		World ex USA Quality					World ex USA Sector Neutral Quality				
	MSCI World ex USA Index	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors
Total Return* (%)	7.6	9.2	9.2	9.3	9.7	9.0	9.4	9.5	9.2	9.3	9.3
Total Risk (%)	16.6	15.8	15.8	16.0	14.7	14.6	16.4	16.4	16.5	15.6	15.7
Return / Risk	0.46	0.58	0.58	0.58	0.66	0.62	0.57	0.58	0.56	0.60	0.59
Tracking Error (%)	--	4.4	4.4	4.4	5.0	3.9	2.7	2.7	2.8	3.2	2.5
Turnover (%)**	2.9	23.8	24.4	27.2	19.4	29.7	33.0	33.7	37.4	31.1	47.6
Quality Active Factor Family Exposure***	--	0.49	0.49	0.46	0.70	0.88	0.32	0.32	0.30	0.55	0.71
Specific Active Return Attribution (%)	--	0.47	0.51	0.61	0.54	-0.47	1.13	1.23	1.08	1.16	0.21
Countries Active Return Attribution (%)	--	0.10	0.11	0.02	0.27	0.07	-0.09	-0.09	-0.28	0.01	-0.20
Industries Active Return Attribution (%)	--	0.98	0.92	0.96	1.32	0.58	0.31	0.32	0.36	0.03	0.00
Styles Active Return Attribution (%)	--	-0.05	-0.06	0.01	0.00	1.10	0.24	0.25	0.27	0.32	1.45
Turnover (%) (Semi Annual)	--	19.8	20.2	22.0	15.4	24.3	26.2	26.0	27.6	25.1	38.6
Quality Active Factor Family Exposure (Semi Annual)	--	0.49	0.49	0.46	0.70	0.87	0.32	0.32	0.30	0.54	0.71
Return / Risk (Semi Annual)	--	0.58	0.58	0.58	0.65	0.63	0.57	0.57	0.56	0.60	0.60

Period: May 30, 2003 to Mar 29, 2024. * Gross returns annualized in USD ** Annualized one-way index turnover over index reviews *** Active values are w.r.t MSCI World ex USA Index. Simulated Indexes use quarterly rebalance frequency.
The monthly average number of securities were 300 for all the variants.

Performance (%)	MSCI World ex USA Index	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors
1 Yr	17.9	15.7	16.3	17.1	17.4	17.9	18.6	18.4	18.8	16.4	17.2
3 Yr	5.4	4.6	4.9	5.5	5.6	6.8	6.2	6.4	6.0	5.0	6.2
5 Yr	8.0	9.4	9.6	9.7	10.4	8.4	9.4	9.6	9.1	8.8	8.6
10 Yr	5.4	6.9	6.9	6.8	7.9	6.2	6.9	7.0	6.6	7.4	6.9

Gross returns for the period ending Mar 29, 2024. Returns are annualized for periods longer than a year

All simulated Indexes follow quarterly rebalance frequency.

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Please refer to the disclosures at the end of this presentation for more information.

EM Simulation Summary – Quarterly & ROE/DTE Mandatory

		Emerging Markets Quality					Emerging Markets Sector Neutral Quality				
	MSCI EM Index	MSCI EM Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)	MSCI EM Sector Neutral Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)
Total Return* (%)	8.9	10.9	10.9	10.9	11.0	10.8	10.2	10.0	10.4	10.3	10.7
Total Risk (%)	20.7	19.4	19.2	19.2	19.1	19.2	19.8	19.8	19.8	19.8	19.8
Return / Risk	0.43	0.56	0.57	0.56	0.58	0.56	0.51	0.51	0.53	0.52	0.54
Tracking Error (%)	--	4.7	4.8	4.8	4.8	4.8	4.2	4.2	4.1	4.2	4.1
Turnover (%)**	7.7	27.1	27.1	33.3	27.7	34.4	35.6	34.2	44.1	34.4	43.9
Quality Active Factor Family Exposure***	--	0.55	0.55	0.55	0.55	0.55	0.30	0.29	0.30	0.29	0.30
Specific Active Return Attribution (%)	--	-0.73	-0.55	-0.52	-0.55	-0.55	-0.30	-0.45	0.09	-0.40	0.20
Countries Active Return Attribution (%)	--	1.31	1.30	1.27	1.45	1.41	0.98	0.94	0.86	1.09	1.01
Industries Active Return Attribution (%)	--	0.70	0.58	0.49	0.62	0.53	0.09	0.09	0.10	0.10	0.14
Styles Active Return Attribution (%)	--	0.57	0.58	0.61	0.56	0.58	0.53	0.60	0.59	0.62	0.59

Period: May 30, 2003 to Mar 29, 2024. * Gross returns annualized in USD ** Annualized one-way index turnover over index reviews *** Active values are w.r.t MSCI EM (Emerging Markets) Index.

Performance (%)	MSCI EM Index	MSCI EM Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)	MSCI EM Sector Neutral Quality Index	Quality (Simulated)	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality ROE-DTE Mandatory (Qtrly)
1 Yr	9.7	13.0	14.1	14.0	14.0	13.3	7.8	9.1	13.6	10.7	14.8
3 Yr	-4.5	-1.0	-0.6	-0.9	-0.6	-1.2	-2.9	-3.3	-2.6	-2.9	-1.7
5 Yr	2.6	5.3	5.5	5.2	5.5	5.0	2.9	2.7	2.9	3.0	3.5
10 Yr	3.4	4.5	4.5	4.3	4.6	4.2	3.7	3.8	4.1	4.0	4.5

Gross returns for the period ending Mar 29, 2024. Returns are annualized for periods longer than a year

All simulated Indexes with 'Qtrly' in name follow quarterly rebalance frequency, others follow semi-annual rebalance frequency.

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EM Simulation Summary – FaCS Weighting and GEMLT-based factor definition

		Emerging Markets Quality					Emerging Markets Sector Neutral Quality				
	MSCI EM Index	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors
Total Return* (%)	8.9	10.9	10.8	10.8	9.7	9.7	10.4	10.7	10.3	9.1	9.6
Total Risk (%)	20.7	19.2	19.2	19.5	17.7	17.9	19.8	19.8	20.2	19.5	19.5
Return / Risk	0.43	0.56	0.56	0.55	0.55	0.54	0.53	0.54	0.51	0.47	0.49
Tracking Error (%)	--	4.8	4.8	4.7	5.5	5.1	4.1	4.1	4.3	4.0	3.7
Turnover (%)**	7.7	33.3	34.4	36.3	30.8	37.6	44.1	43.9	46.2	42.1	54.4
Quality Active Factor Family Exposure***	--	0.55	0.55	0.53	0.85	1.09	0.30	0.30	0.26	0.57	0.78
Specific Active Return Attribution (%)	--	-0.52	-0.55	-0.68	-1.01	-1.08	0.09	0.20	-0.04	-0.62	-0.24
Countries Active Return Attribution (%)	--	1.27	1.41	1.18	0.60	0.02	0.86	1.01	0.68	-0.15	-0.81
Industries Active Return Attribution (%)	--	0.49	0.53	0.69	0.52	-0.15	0.10	0.14	0.03	0.28	-0.09
Styles Active Return Attribution (%)	--	0.61	0.58	0.59	0.89	2.20	0.59	0.59	0.62	0.99	2.01
Turnover (%) (Semi Annual)	--	27.1	27.7	29.9	24.2	30.5	34.2	34.4	36.0	32.3	44.7
Quality Active Factor Family Exposure (Semi Annual)	--	0.55	0.55	0.54	0.84	1.07	0.29	0.29	0.26	0.56	0.76
Return / Risk (Semi Annual)	--	0.57	0.58	0.56	0.56	0.55	0.51	0.52	0.51	0.48	0.49

Period: May 30, 2003 to Mar 29, 2024. * Gross returns annualized in USD ** Annualized one-way index turnover over index reviews *** Active values are w.r.t MSCI EM (Emerging Markets) Index. Simulated Indexes use quarterly rebalance frequency.
The monthly average number of securities were 200 across EM Quality variants and 225 across the EM Sector Neutral Quality Variants.

Performance (%)	MSCI EM Index	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors	Quality (Sim Qtrly)	Quality ROE-DTE Mandatory	Quality FaCS Weighting	Quality GEMLT 3 Factors	Quality GEMLT 5 Factors
1 Yr	9.7	14.0	13.3	13.6	-0.5	13.4	13.6	14.8	16.9	0.3	9.8
3 Yr	-4.5	-0.9	-1.2	-1.6	-6.1	1.6	-2.6	-1.7	-1.5	-6.1	1.7
5 Yr	2.6	5.2	5.0	4.6	1.8	5.7	2.9	3.5	4.3	0.2	4.5
10 Yr	3.4	4.3	4.2	4.3	3.0	5.0	4.1	4.5	4.4	2.4	4.5

Gross returns for the period ending Mar 29, 2024. Returns are annualized for periods longer than a year

All simulated Indexes follow quarterly rebalance frequency.

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Appendix

Risk and Return Metrics

	Definition
Total Return (%)	Annualized index return
Total Risk (%)	Annualized index risk (based on monthly returns)
Return / Risk	Ratio of annualized return and annualized risk
Active Return (%)	Difference of the annualized index return and the annualized benchmark return
Tracking Error (%)	Annualized standard deviation of active returns (based on monthly data)
Turnover (%)	Annualized Average one-way index turnover over rebalancing dates

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