Consultation on assessing and addressing the market impact of MSCI Index Reviews

August 2020

MSCI

Background

- Continued growth in index linked product AUM and index based investing over the last decade have led MSCI to conduct a focused examination around potential index methodology changes that may better address the overall market impact of Index Reviews

- MSCI opens a consultation around the following proposals which can potentially ease replication and related index review implementation challenges:

  - ‘Staggering’ the implementation of all Semi-Annual (SAIR) and Quarterly Index Reviews (QIR) for both Global Investable Market Indexes (GIMI) and Non-Market Cap Weighted Indexes

  - Switch a Semi-Annual Index Review to a “light” rebalancing scenario under conditions of market stress as introduced by the MSCI Market Monitoring Framework*

- MSCI may additionally launch a subsequent consultation on selected technical aspects of the topics covered herein

- MSCI welcomes feedback from the investment community on these topics until December 15, 2020. MSCI will announce the results of this consultation on or before January 31, 2021

*The MSCI Market Monitoring Framework aims to continually assess the potential impact of market conditions on regular Index Reviews along three key dimensions: Market Functioning, Market Liquidity and Data Availability.

Proposal Summary

Market Conditions	Proposal/Recommendation	Rationale
'Normal'	❑ Employ a staggered implementation* of rebalancing for GIMI and Non-Market cap weighted Indexes to ease potential market impact around index review implementation	▪ Increased market impact due the AUM growth ▪ Significant growth in Daily Traded Values on IR implementation dates ▪ Efficient way to manage the size of the IR 'trade' ▪ Market participant feedback
'Market Stress'	❑ Additionally opt for a "light" (QIR) rebalancing to replace a SAIR in times of extreme market volatility to reduce the rebalancing impact	▪ Material increase in market impact (bid/offer size) and transaction costs ▪ Potential increase in migrations due to extreme volatility

*A staggered implementation refers to an Index Review that will be implemented over a period of time leading into the effective date (i.e. approximately 33% of overall 'trade' each day for 3 days)

Index Review Implementation under Normal Market Conditions

Proposal

Proposal: Staggered Implementation as a More Efficient Way to Manage the Index Review

- In addition to the substantial growth in index linked product AUM and index based investing already noted, we have also observed significant growth in Daily Traded Values on Index Review implementation dates (T-1)
- Based on historical analysis, using a 'staggered' implementation approach may have been beneficial in managing overall transaction costs
- MSCI **proposes to implement a staggered approach** across the implementation of MSCI Index Reviews
  - Staggering an index review implementation involves the conversion from 'current' index to 'pro forma' index over an implementation period that would commence **3 days prior to the Index Review effective date**
  - MSCI proposes to apply a staggered implementation consistently across the MSCI Global Investable Market Indexes (GIMI) and all Non-Market Cap Weighted Indexes

Staggered Implementation: Illustration

- During an Index Review, the index changes are defined in terms of the 'number of shares changes in the index*' (NOS)
  - Staggering the NOS changes allows the index review implementation to be determined ahead and helps avoid potential reverse turnover in the staggering period
- With the current single day implementation, the NOS changes are expected to change as follows:

	Current	T-3	T-2	T-1	Effective Date
Company A - add	**0**	**0**	**0**	**7,500**	**7,500**
NOS Change				7,500	
Company B – delete	**5,100**	**5,100**	**5,100**	**0**	**0**
NOS Change				-5,100	
Company C – FIF/NOS	**6,000**	**6,000**	**6,000**	**6,300**	**6,300**
NOS Change				300	

- With the proposed staggered 3-day implementation, the NOS changes will be linearly spread across 3 days, thereby reducing the number of shares to be traded per day to replicate

	Current	Stagger day1	Stagger day2	Stagger day3	Effective
Company A - add	0	2,500	5,000	7,500	7,500
NOS Change		2,500	2,500	2,500	
Company B – delete	5,100	3,400	1,700	0	0
NOS Change		-1,700	-1,700	-1,700	
Company C – FIF/NOS	6,000	6,100	6,200	6,300	6,300
NOS Change		100	100	100	

MSCI

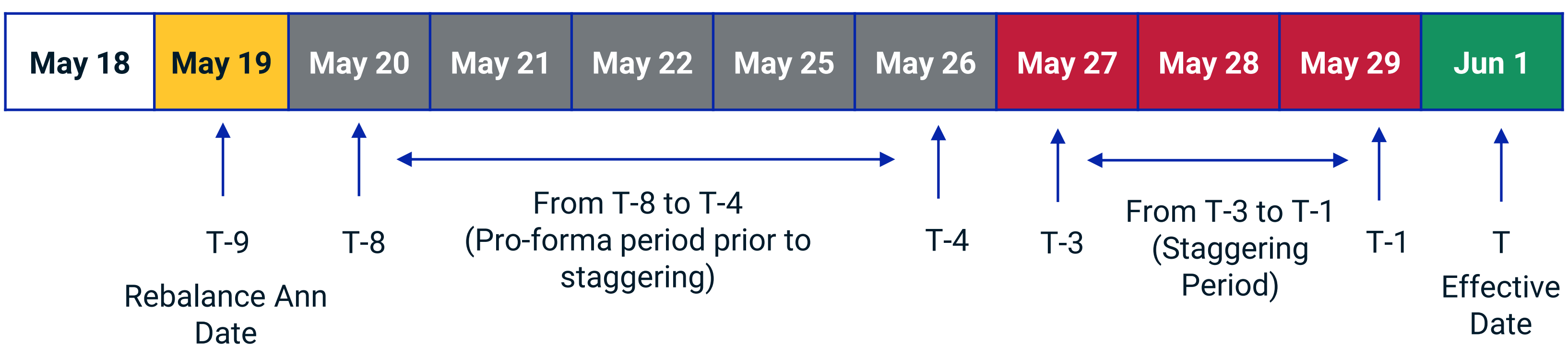
* Number of shares changes in the index for the MSCI GIMI is calculated as the index number of shares multiplied by the Foreign Inclusion Factor (FIF)

Impact of Staggered Implementation on Corporate Events

Various corporate events that impact MSCI Indexes around the implementation dates can be grouped into 3 broad categories:

	Event confirmation date	Event effective date	Impact
Case 1	Post Rebalance Ann Date	Before staggering period	No impact to staggered values
Case 2	Prior to Rebalance Ann Date	Within staggering period	No staggering until the effective date of the event, followed by relatively larger changes
Case 3	Post Rebalance Ann Date	Within staggering period	Maintain the NOS announced on t-9 until the effective date of the event, re-evaluate staggering post that

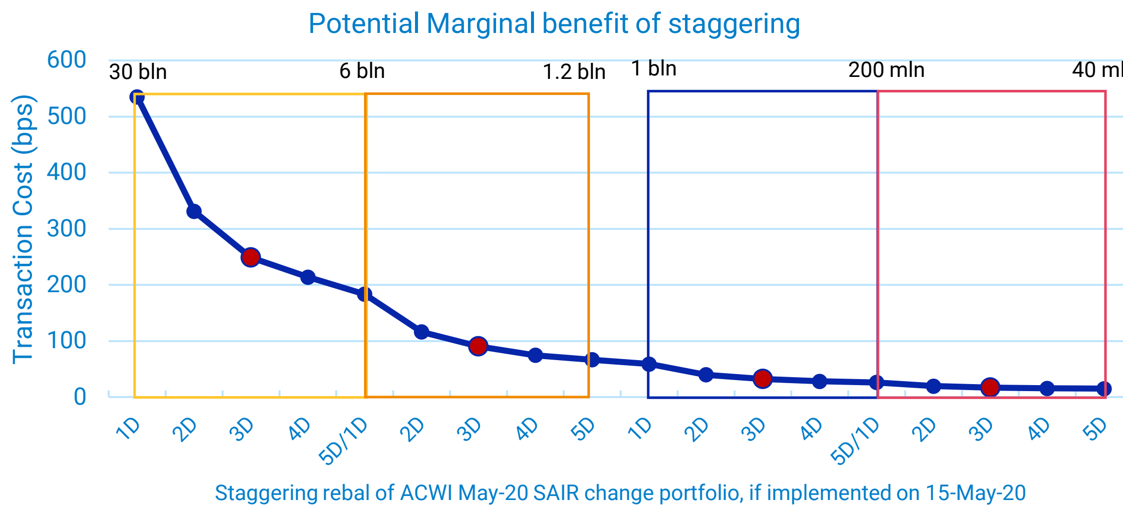
Timeline



Potential Impact of a Staggered Rebalancing

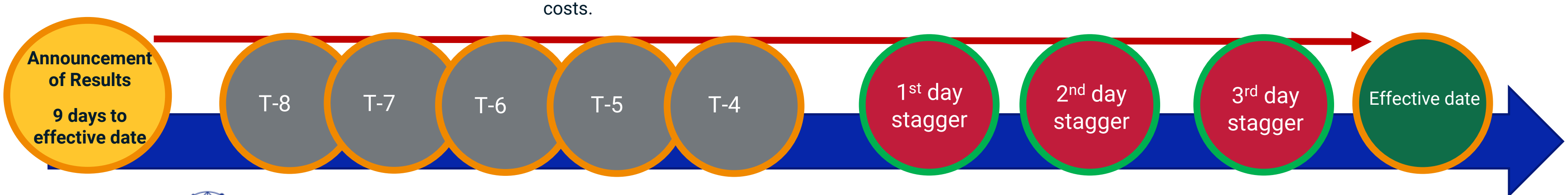
- A **staggered rebalancing** approach aims to split the implementation of rebalancing changes into several steps until it is fully implemented in the index
- **Three days** could provide a good balance between transaction cost reduction and sufficient time for implementation

While the marginal benefit may decrease with trade size, a staggered approach could allow for lower transaction costs



Source: MSCI, Virtu

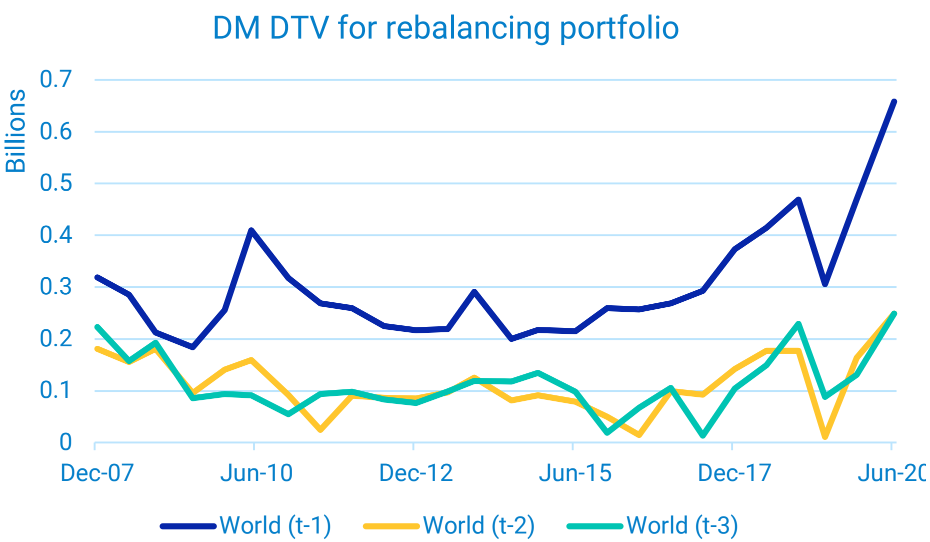
*For this analysis, a model (by Virtu) was used which measures trading costs using the difference between the average execution price and the prevailing price at the start of the order execution. This measure includes both the bid-ask spread as well as the price impact cost of the order. For market impact, Virtu uses a 60 business day historical volatility as main input to liquidity model. These historical examples are not indicative of future results or potential costs.

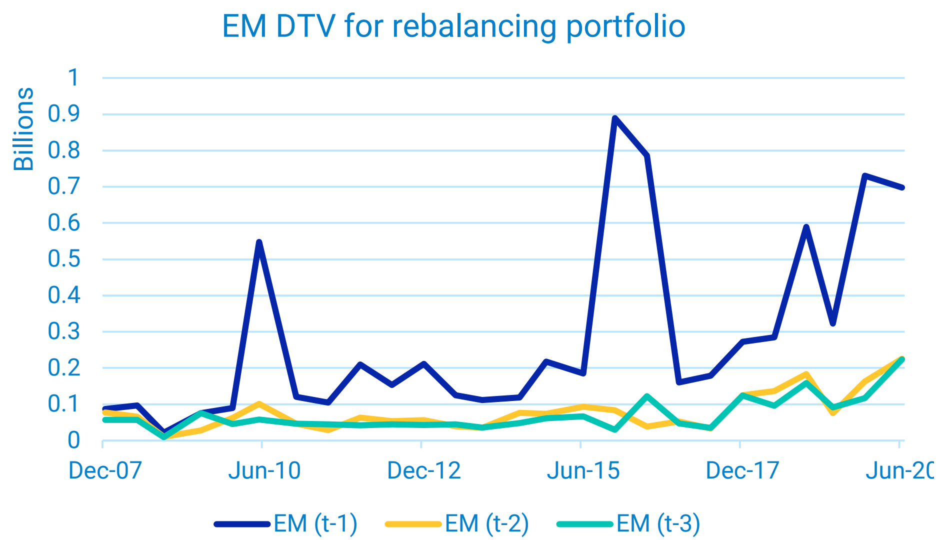


^Currently, MSCI calculates a variant of the MSCI USA Momentum Index that is staggered across three days

Daily Traded Values for rebalancing are on the rise

An increasing trend in terms of Daily Traded Value for the rebalancing portfolio* around the index review implementation date is observed





*Rebalancing portfolio can be defined as the portfolio (related to a given index) which reflect additions, deletions, and other maintenance changes required to fully replicate a given Index Review (effectively the full 'pro-forma' portfolio)

Consideration of Alternative Measures

- MSCI also considered and examined these alternatives related to mitigation of the impact of Index Reviews

Considered Alternatives	Reasons for Not Adopting
❑ Applying wider buffers	▪ Wider buffers may deteriorate index representativeness
❑ Applying SAIR rules in place of QIRs to spread the index review changes	▪ More frequent SAIRs could increase annual turnover
❑ Setting 'hard' IR turnover constraints	▪ Rebalancing turnover has been generally stable and within acceptable range ▪ No observed increase in bid/ask spreads or other illiquidity measures outside volatile periods
❑ Split GIMI and non-market cap weighted index implementation	▪ Disconnecting GIMI and non-market cap weighted indexes may result in unnecessary methodology complexities for investors

Discussion Points

- Does the increased market impact of MSCI index review implementations now warrant MSCI to address the rebalancing related issues as noted?
- Do you agree with the proposal to stagger the implementation of index reviews across the MSCI GIMI and Non-Market Cap Weighted Indexes?
  - Do you agree with the proposed 3 days to stagger such implementation?
  - Should MSCI employ consistency of the staggered approach to all indexes as proposed or only the MSCI GIMI?
  - Should MSCI consider moving the announcement date of the index review results to provide greater time to process the rebalancing?
- Should MSCI consider other alternatives which could potentially ease market impact and facilitate implementation of index reviews? (i.e. a combination of staggering approach with other alternatives)

Index Review Implementation under Market Stress

Proposal

MSCI

Proposal: Switch to a 'Light' Rebalancing during Market Stress conditions

- Historically, there have been noticeable spikes in liquidity and transaction cost metrics during times of market stress. While turnover and number of additions and deletions in 'normal' market conditions have generally been stable, increases are noticeably observed in periods where volatility is higher
- **In times of market stress, in addition to the staggered implementation, MSCI proposes to switch to a 'light' rebalancing**
  - A 'light' rebalancing generally focuses on replacing a scheduled SAIR with a QIR (if such QIR is defined by a methodology)
  - Employment of these measures would not be preceded by any public consultation
  - If the upcoming scheduled rebalance is already a QIR, then no change to the process would occur
- To determine market stress, MSCI would consider dimensions that are part of the MSCI Market Monitoring Framework as well as additional measures of market volatility

‘Light’ Rebalancing for Various Methodologies

- Differentiation of ‘normal’ rebalancing schedules are present across index methodologies
- As noted, under market stress conditions, a QIR rebalancing would *generally* be applied if defined by a methodology
- For methodologies which rebalance annually or where QIRs are not defined, MSCI would proceed as per the normal rebalancing schedule

Proposed Rebalancing schedules for various methodologies

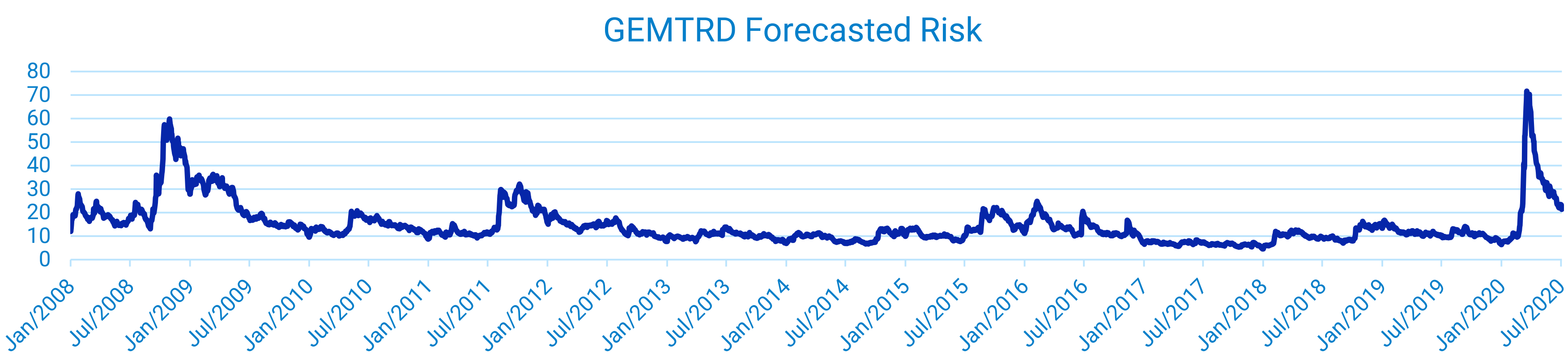
‘Normal’ Rebalancing Schedule	Proposed Rebalancing schedule during market stress	Index Methodology Example
Semi Annual + QIR	QIR	MSCI Global Investable Market Indexes; MSCI ESG Universal Indexes
Annual only	Annual	MSCI GDP Weighted Indexes
Annual + QIR	Annual	MSCI Top 50 Dividend Indexes
Semi-Annual only	Semi-Annual	MSCI Minimum Volatility Indexes
QIR only	QIR	MSCI Equal Weighted Indexes
Monthly	Monthly	MSCI Hedged Indexes

How should Market Stress be determined?

- The primary means to determine market stress will focus on the MSCI Market Monitoring Framework which looks at:
  - Market Functioning
  - Market Liquidity
  - Data Availability

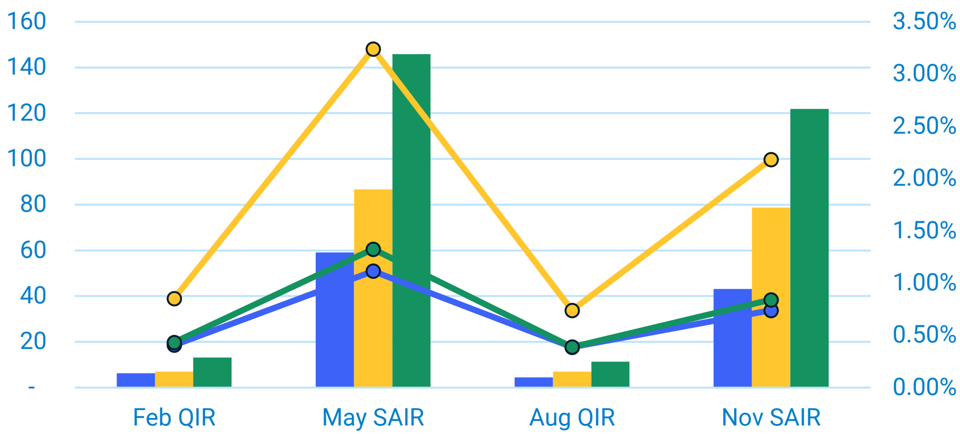
- MSCI may also consider other measures which:
  - Appropriately capture market risk
  - Are sufficiently reactive to allow for prompt and timely decisions
  - Provide enough stability to consistently capture only ‘extreme’ events

As example, the Global Total Market Trading (GEMTRD) risk model could be considered as a measure of market stress/volatility. Note the peaks which show the 2008 GFC and COVID-19 crises



Applying QIR thresholds led to a reduced number of index changes

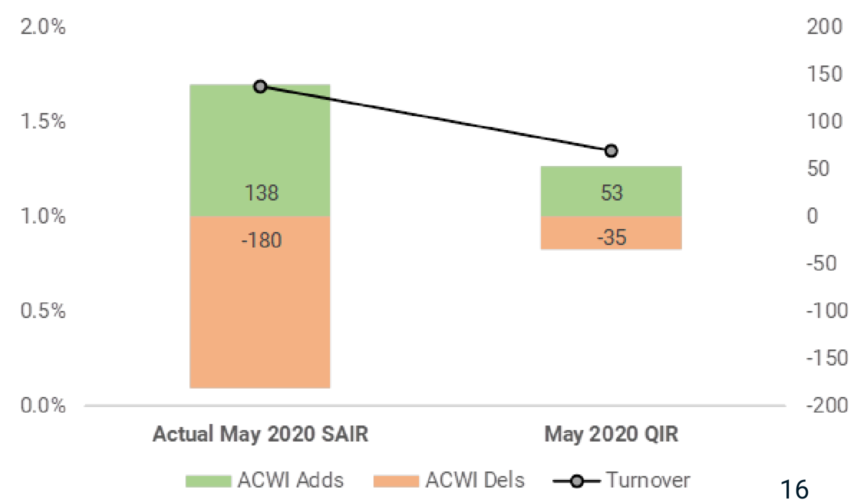
Historical Average of Index Review Changes (2007-2020)



Historically, QIRs had significantly lower number of changes and turnover than SAIRs

Simulated May 2020 SAIR for ACWI using QIR thresholds

Turnover	1.687%	1.344%

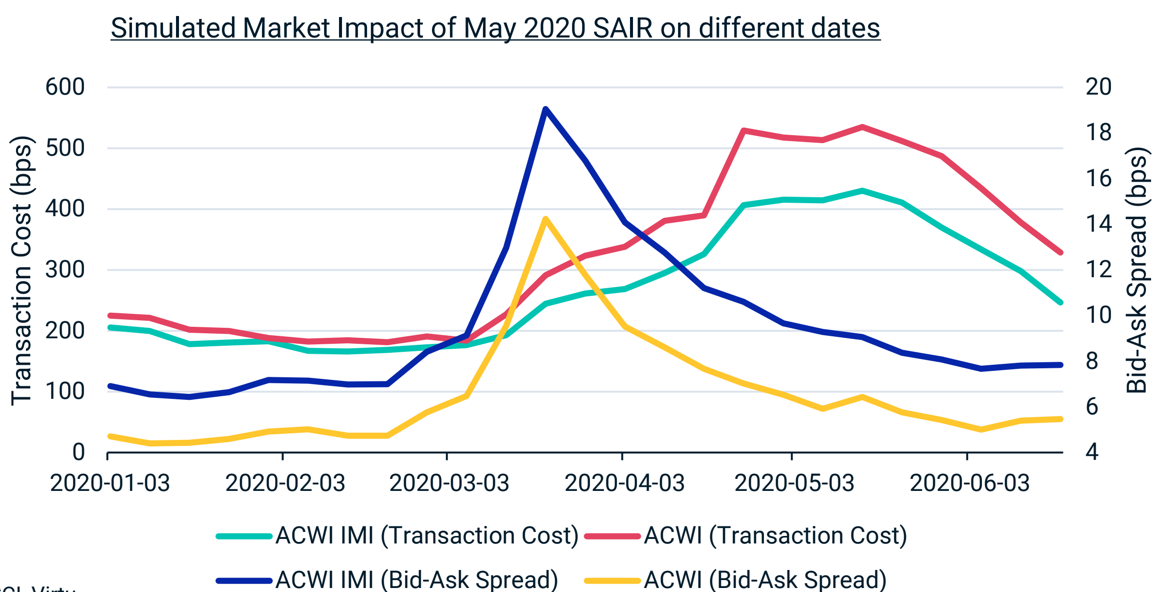


Based on simulation of the May 2020 SAIR, applying QIR thresholds led to lower number of index review changes and turnover

Based on simulation of May 2020 SAIR using QIR thresholds, if FIF/NOS changes are not considered, turnover would be approximately 0.66%

MSCI

Impact Substantially Rose during Market Stress



*Source: MSCI, Virtu

While we do not see a substantial dislocation in terms of turnover and numbers of additions and deletions during 'normal' times, there are noticeable spikes in liquidity and transaction cost* metrics observed during times of market stress

*Transaction costs are based on a model (Virtu) which measures trading costs using the difference between the average execution price and the prevailing price at the start of the order execution. This measure includes both the bid-ask spread as well as the price impact cost of the order. For market impact, Virtu uses a 60 business day historical volatility as main input to liquidity model.

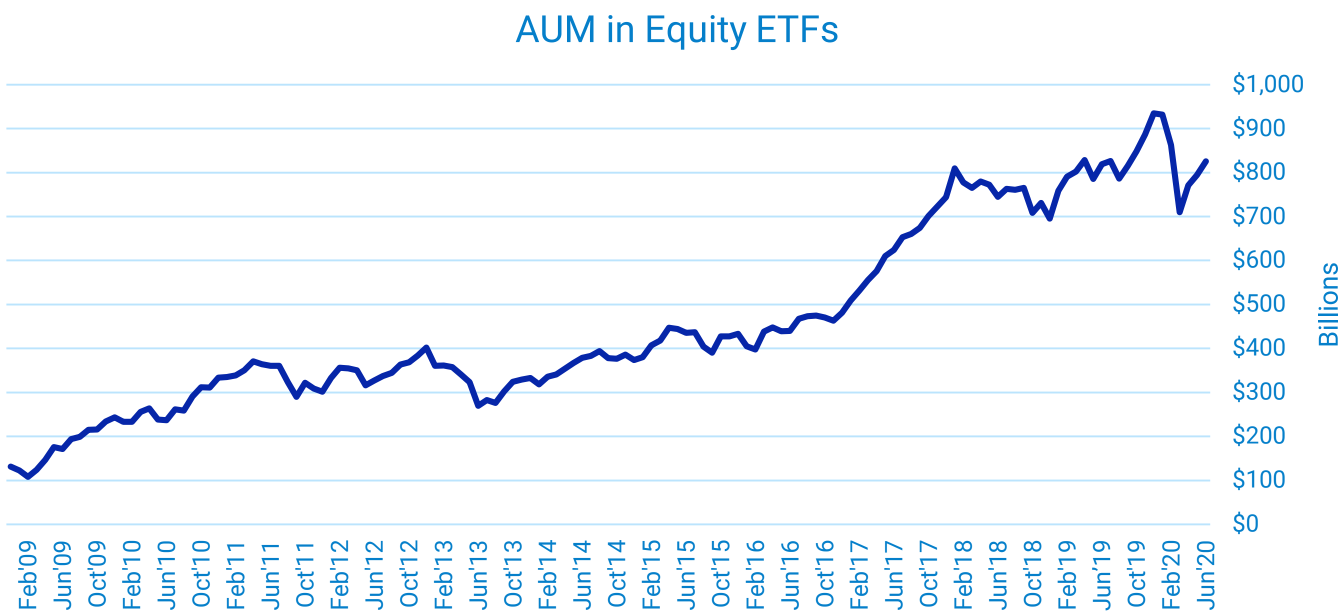
Discussion Points

- Do you agree with the proposal to implement a ‘light’ rebalancing in times of significant market stress?
  - Is it appropriate to apply QIR thresholds in place of SAIR rules for the MSCI GIMI in times of defined market stress?
  - Do you agree with the proposal to apply ‘light’ rebalancing for the Non-Market Cap Weighted Indexes, if QIR is defined by the relevant index methodologies?
  - Is it appropriate to proceed with the normal rebalancing schedule for the Non-Market Cap Weighted Indexes, if a QIR is not defined by the relevant index methodology (i.e. Semi-Annual only)?
  - What is the appropriate advance notice period to inform market participants of moving to a ‘light’ rebalancing?
  - Is the evaluation of market stress through the three dimensions of the MSCI Market Monitoring Framework sufficient ? What other/different measures should potentially be employed?

Appendix

MSCI

AUM in Equity ETFs linked to MSCI



- AUMs have increased over the past decade

SOURCE https://ir.msci.com/aum-etfs-linked-msci-indexes

[1] For periods prior to April 2019, estimates were based on data from Bloomberg and MSCI.

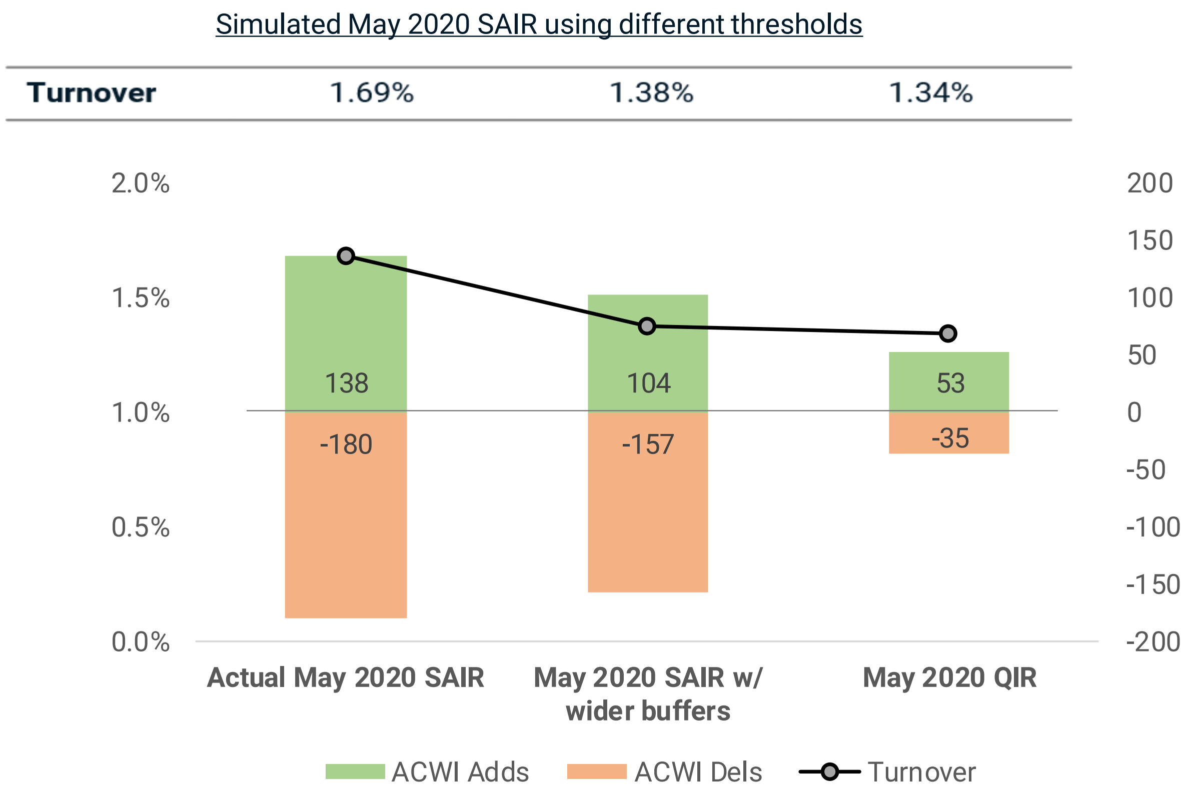
[2] For April 2019, a) the Month-End Balance is an estimate based on data from Refinitiv and MSCI, b) the Monthly Average Balance is an estimate based on data from Bloomberg and MSCI for the period from April 1 through April 25 and on data from Refinitiv and MSCI for the period from April 26 through April 30; provided that de minimis amounts of AUM for the Month-End Balance and Monthly Average Balance were based on data as of April 25, 2019 from Bloomberg.

[3] For May 2019 and later months, the Month-End Balance and the Monthly Average Balance are estimates based on data from Refinitiv and MSCI, which may include de minimis amounts of delayed data.

The AUM in Equity ETFs also includes AUM in Exchange Traded Notes, the value of which is less than 1.0% of AUM amounts presented.

MSCI

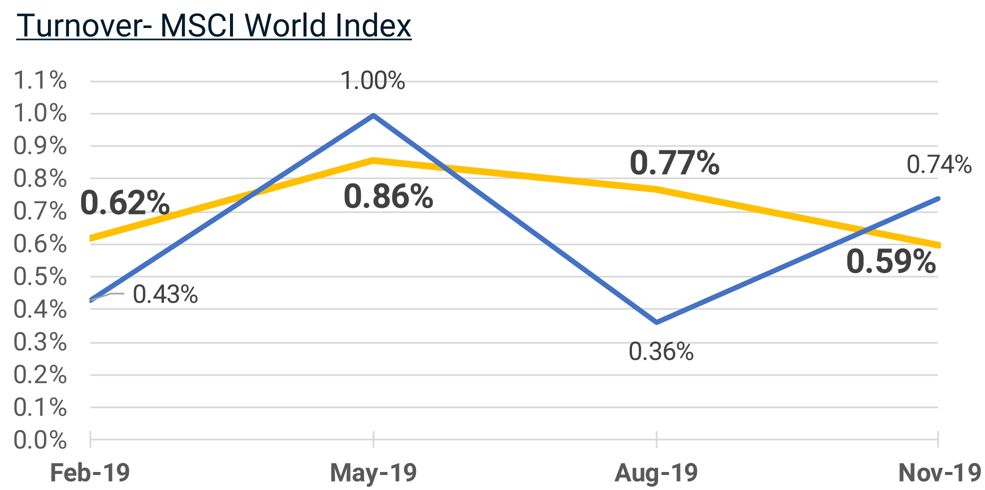
Simulated May 2020 SAIR using different thresholds



Applying QIR thresholds leads to significantly lower number of index review changes and turnover, including SAIR with widened buffers

Simulated 2019 Index Reviews using SAIR thresholds

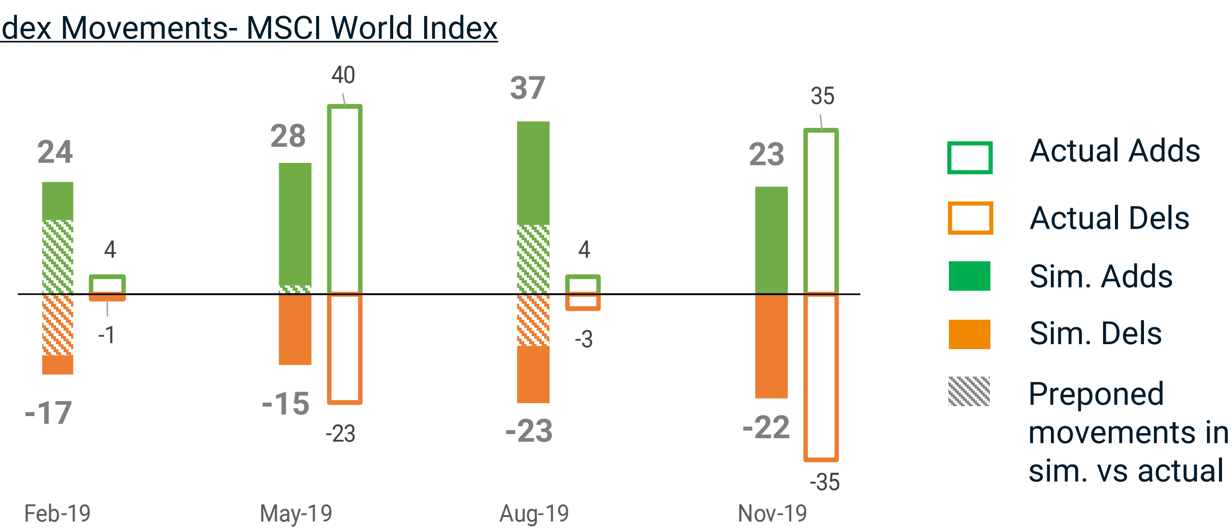
- Rebalancing using SAIR rules at each review would even out the quarterly turnovers, but would result in a **slightly higher total annual turnover**



Annual Actual Turnover: **2.52%**

Annual Sim. Turnover: **2.84%**

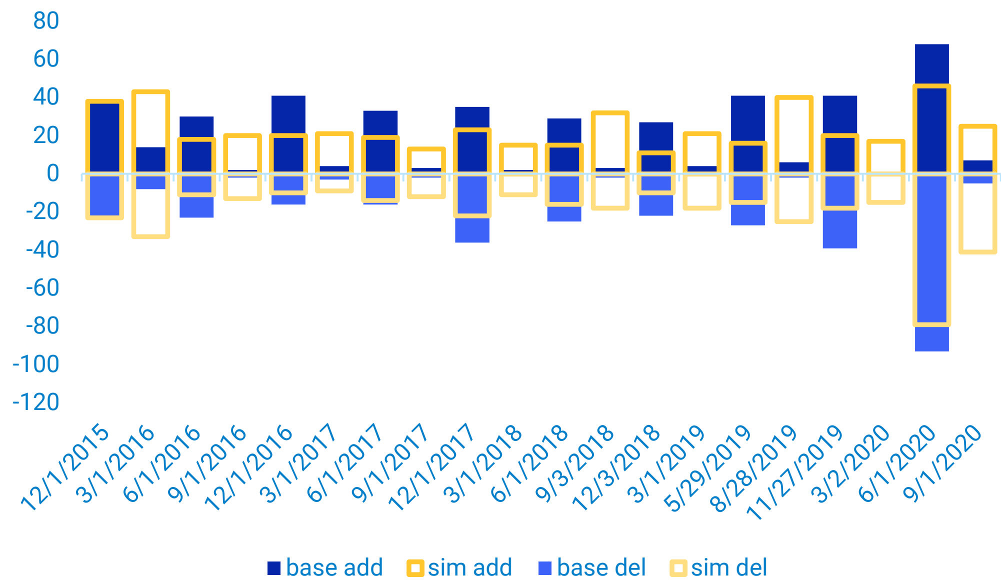
- This would result in preponing some SAIR movements to the previous QIR (i.e. **more timely market representation**)
- The full-year 2019 simulation did not result in reverse turnovers

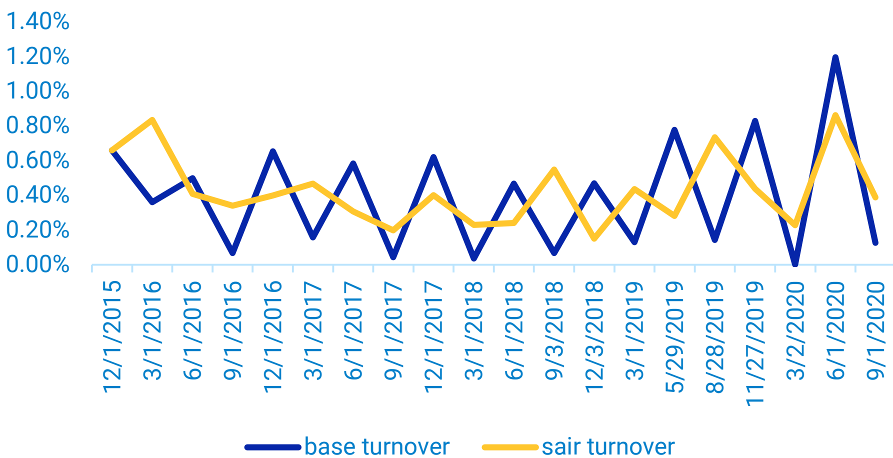


MSCI

Extended Simulation of Applying SAIR Thresholds (DM)

- MSCI simulated the impact of applying SAIR rules across each index review (referred to as sim) and compared this with the current methodology, which alternates between SAIR and QIR rules (referred to as base)
- This alternative resulted in “smoother” historical turnover, by increasing the number of changes in February and August and, as a consequence, decreasing the “accumulated” number of changes needed in May and November





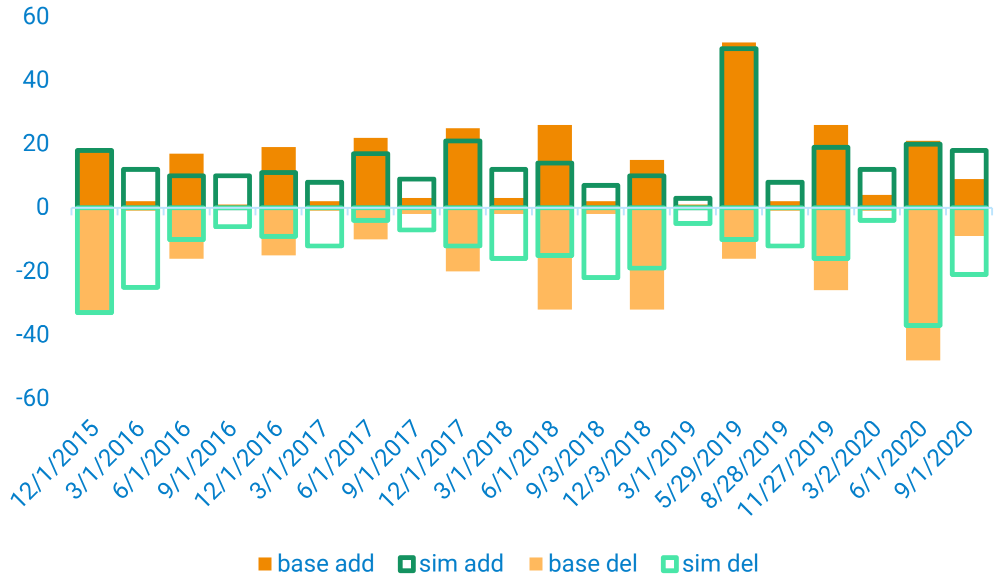
- *(ABOVE)* On average, applying SAIR rules at each review for DM resulted in an average of 23.7 additions and 20.7 deletions compared to 21.4 and 17.3 respectively for the current methodology
- *(LEFT)* Turnover increased from 0.39% to 0.43% on average per rebalancing

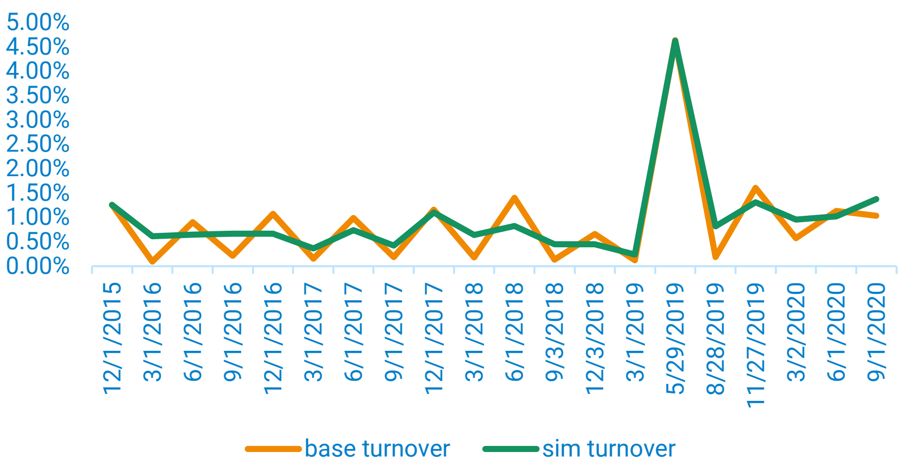
MSCI

Simulation is for Nov 2015 SAIR to Aug 2020 QIR. The turnover calculation does not consider changes in Number of Shares (NOS) and Foreign Inclusion Factors (FIF).

Extended Simulation of Applying SAIR Thresholds (EM ex CN)

- Similarly to Developed Markets, the simulated turnover, generated by applying current Semi-Annual Index Review rules four times a year, is also “smoother”.
- The increase in turnover in May 2019 is primarily resulting from Argentina and Saudi Arabia reclassification to Emerging Markets
- For the purpose of this simulation China market is excluded to remove impact resulting from China A inclusion

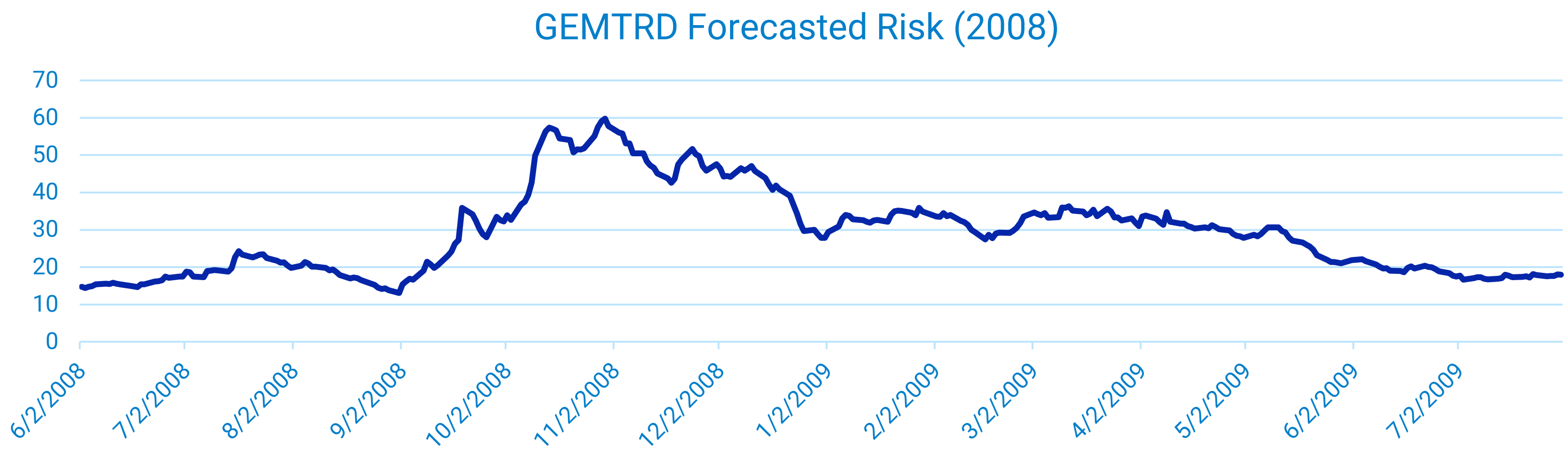


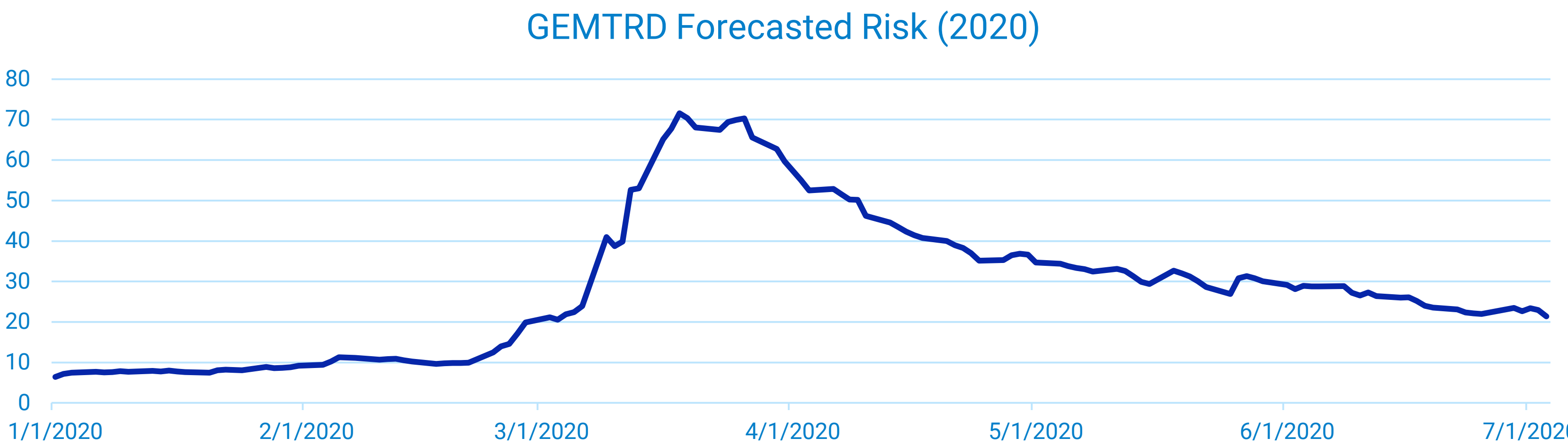


- *(ABOVE)* On average, applying SAIR rules at each review for EM ex CN resulted in an average of 14.5 additions and 14.8 deletions compared to 13.5 and 13.4 respectively for the current methodology
- *(LEFT)* Turnover increased from 0.89% to 0.96% on average per rebalancing

Simulation is for Nov 2015 SAIR to Aug 2020 QIR. The turnover calculation does not consider changes in Number of Shares (NOS) and Foreign Inclusion Factors (FIF).

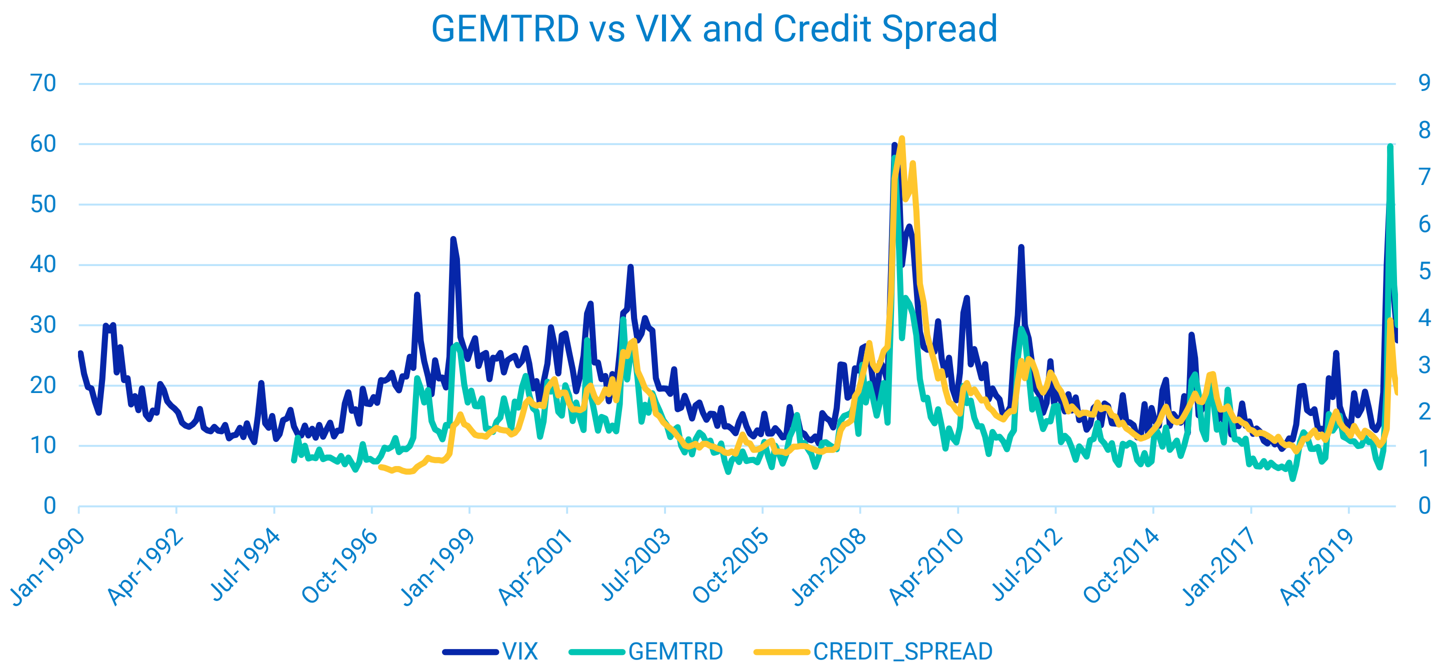
GEMTRD Forecasted Risk





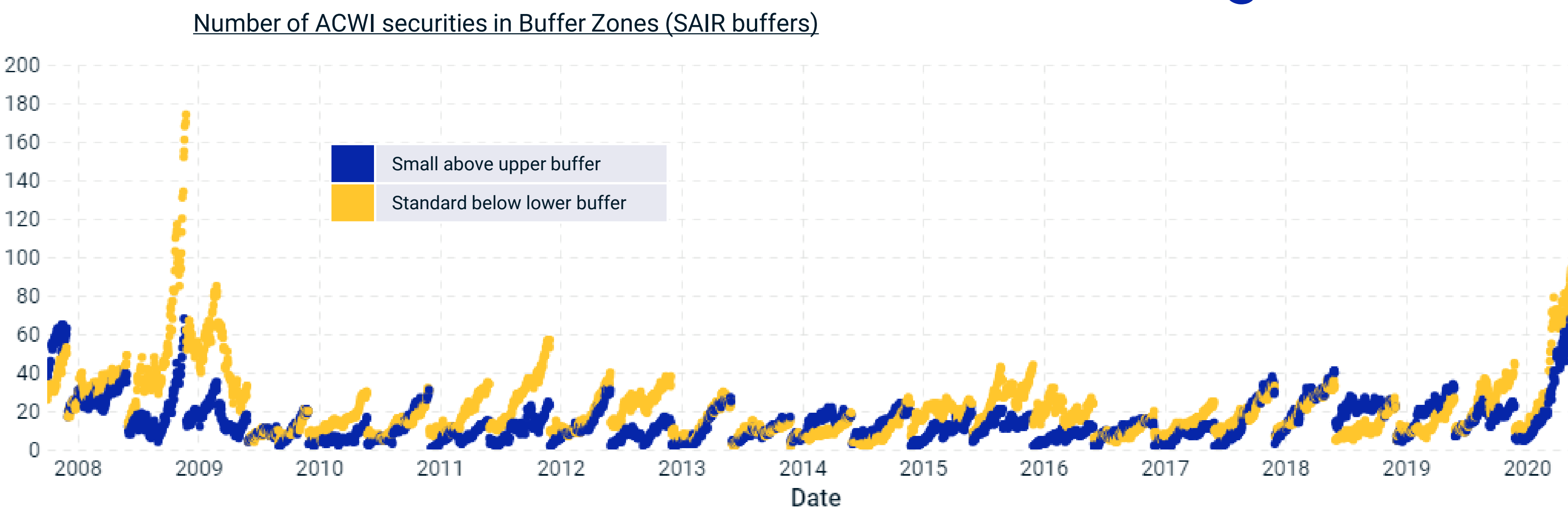
GEMTRD Forecasted Risk

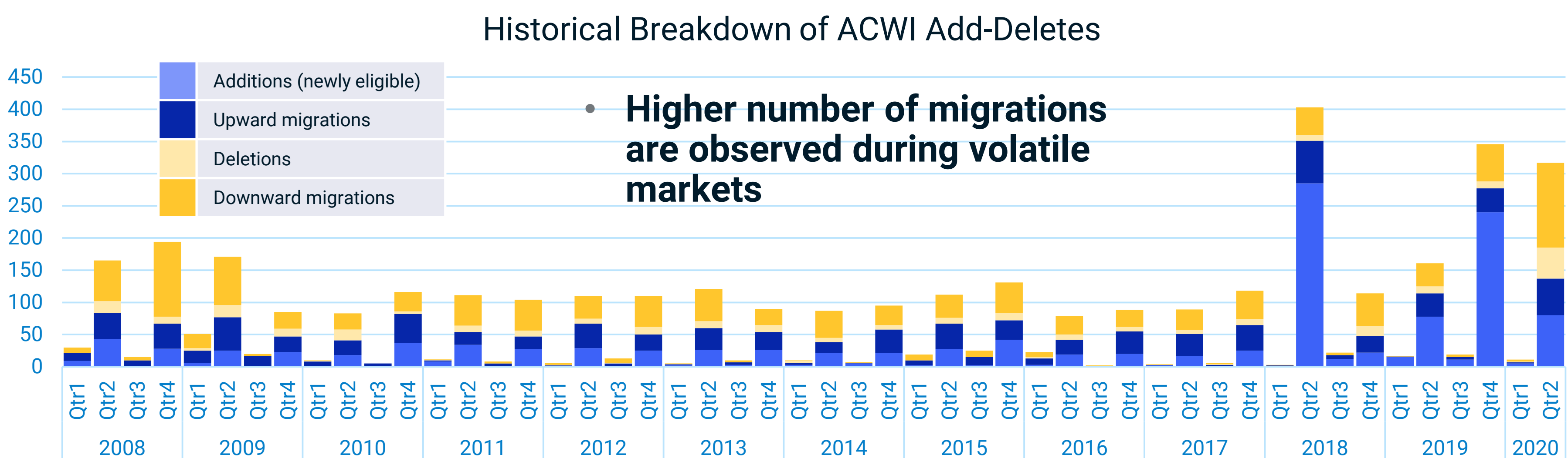
- The GEMTRD Forecasted Risk exhibit high correlation with other indicators such as VIX (0.88) and Credit Spread (0.72)



*Source: MSCI, Chicago Board Options Exchange (CBOE) Volatility Index, ICE BofAML Fixed Income indices

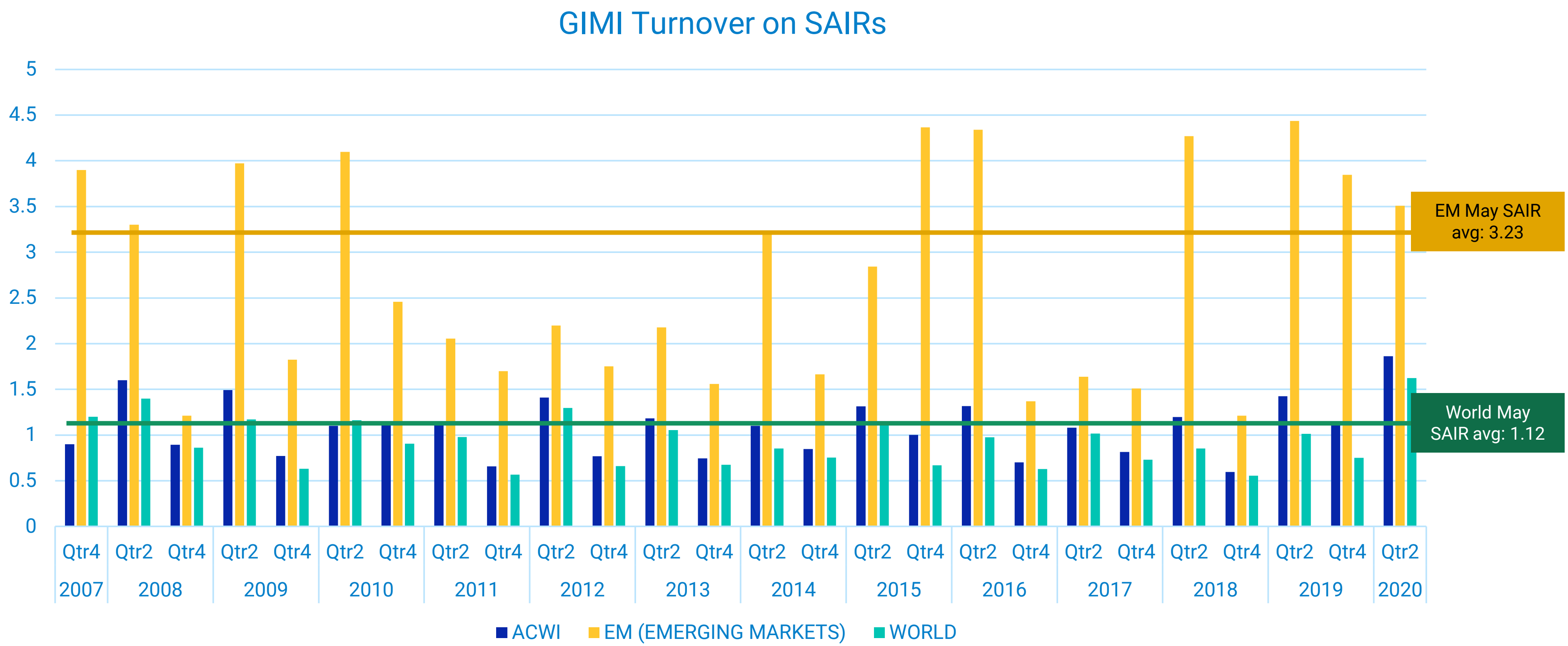
Historical number of index review changes





- **Higher number of migrations are observed during volatile markets**

Historical Index Turnover



- The turnover at the ACWI level generally remained stable since the inception of the GIMI
  - Some increase was observed as part of the May 2008 and May 2020 SAIRs, where volatility is higher

*Turnover for Q4 2007 and Q2 2008 are based on the turnovers calculated for provisional indexes at the time of the methodology transition MSCI Standard Indexes Methodology to MSCI GIMI Methodology

MSCI

About MSCI

MSCI is a leading provider of critical decision support tools and services for the global investment community. With over 45 years of expertise in research, data and technology, we power better investment decisions by enabling clients to understand and analyze key drivers of risk and return and confidently build more effective portfolios. We create industry-leading research-enhanced solutions that clients use to gain insight into and improve transparency across the investment process. To learn more, please visit www.msci.com.

Contact us

AMERICAS		EUROPE, MIDDLE EAST & AFRICA		ASIA PACIFIC	
Americas	+1 888 588 4567 *	Cape Town	+ 27 21 673 0100	China North	10800 852 1032 *
Atlanta	+ 1 404 551 3212	Frankfurt	+ 49 69 133 859 00	China South	10800 152 1032 *
Boston	+ 1 617 532 0920	Geneva	+ 41 22 817 9777	Hong Kong	+ 852 2844 9333
Chicago	+ 1 312 675 0545	London	+ 44 20 7618 2222	Mumbai	+ 91 22 6784 9160
Monterrey	+ 52 81 1253 4020	Milan	+ 39 02 5849 0415	Seoul	00798 8521 3392 *
New York	+ 1 212 804 3901	Paris	0800 91 59 17 *	Singapore	800 852 3749 *
San Francisco	+ 1 415 836 8800			Sydney	+ 61 2 9033 9333
São Paulo	+ 55 11 3706 1360			Taipei	008 0112 7513 *
Toronto	+ 1 416 628 1007			Thailand	0018 0015 6207 7181 *
				Tokyo	+81 3 5290 1555

* = toll free

msci.com
clientservice@msci.com

The process for submitting a formal index complaint can be found on the index regulation page of MSCI's website at: https://www.msci.com/index-regulation.

Notice & disclaimer

This document and all of the information contained in it, including without limitation all text, data, graphs, charts (collectively, the "Information") is the property of MSCI Inc. or its subsidiaries (collectively, "MSCI"), or MSCI's licensors, direct or indirect suppliers or any third party involved in making or compiling any Information (collectively, with MSCI, the "Information Providers") and is provided for informational purposes only. The Information may not be modified, reverse-engineered, reproduced or redisseminated in whole or in part without prior written permission from MSCI.

The Information may not be used to create derivative works or to verify or correct other data or information. For example (but without limitation), the Information may not be used to create indexes, databases, risk models, analytics, software, or in connection with the issuing, offering, sponsoring, managing or marketing of any securities, portfolios, financial products or other investment vehicles utilizing or based on, linked to, tracking or otherwise derived from the Information or any other MSCI data, information, products or services.

The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. NONE OF THE INFORMATION PROVIDERS MAKES ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EACH INFORMATION PROVIDER EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.

Without limiting any of the foregoing and to the maximum extent permitted by applicable law, in no event shall any Information Provider have any liability regarding any of the Information for any direct, indirect, special, punitive, consequential (including lost profits) or any other damages even if notified of the possibility of such damages. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited, including without limitation (as applicable), any liability for death or personal injury to the extent that such injury results from the negligence or willful default of itself, its servants, agents or sub-contractors.

Information containing any historical information, data or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. Past performance does not guarantee future results.

The Information should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or clients when making investment and other business decisions. All Information is impersonal and not tailored to the needs of any person, entity or group of persons.

None of the Information constitutes an offer to sell (or a solicitation of an offer to buy), any security, financial product or other investment vehicle or any trading strategy.

It is not possible to invest directly in an index. Exposure to an asset class or trading strategy or other category represented by an index is only available through third party investable instruments (if any) based on that index. MSCI does not issue, sponsor, endorse, market, offer, review or otherwise express any opinion regarding any fund, ETF, derivative or other security, investment, financial product or trading strategy that is based on, linked to or seeks to provide an investment return related to the performance of any MSCI index (collectively, "Index Linked Investments"). MSCI makes no assurance that any Index Linked Investments will accurately track index performance or provide positive investment returns. MSCI Inc. is not an investment adviser or fiduciary and MSCI makes no representation regarding the advisability of investing in any Index Linked Investments.

Index returns do not represent the results of actual trading of investible assets/securities. MSCI maintains and calculates indexes, but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the index or Index Linked Investments. The imposition of these fees and charges would cause the performance of an Index Linked Investment to be different than the MSCI index performance.

The Information may contain back tested data. Back-tested performance is not actual performance, but is hypothetical. There are frequently material differences between back tested performance results and actual results subsequently achieved by any investment strategy.

Constituents of MSCI equity indexes are listed companies, which are included in or excluded from the indexes according to the application of the relevant index methodologies. Accordingly, constituents in MSCI equity indexes may include MSCI Inc., clients of MSCI or suppliers to MSCI. Inclusion of a security within an MSCI index is not a recommendation by MSCI to buy, sell, or hold such security, nor is it considered to be investment advice.

Data and information produced by various affiliates of MSCI Inc., including MSCI ESG Research LLC and Barra LLC, may be used in calculating certain MSCI indexes. More information can be found in the relevant index methodologies on www.msci.com.

MSCI receives compensation in connection with licensing its indexes to third parties. MSCI Inc.'s revenue includes fees based on assets in Index Linked Investments. Information can be found in MSCI Inc.'s company filings on the Investor Relations section of www.msci.com.

MSCI ESG Research LLC is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc. Except with respect to any applicable products or services from MSCI ESG Research, neither MSCI nor any of its products or services recommends, endorses, approves or otherwise expresses any opinion regarding any issuer, securities, financial products or instruments or trading strategies and MSCI's products or services are not intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such. Issuers mentioned or included in any MSCI ESG Research materials may include MSCI Inc., clients of MSCI or suppliers to MSCI, and may also purchase research or other products or services from MSCI ESG Research. MSCI ESG Research materials, including materials utilized in any MSCI ESG Indexes or other products, have not been submitted to, nor received approval from, the United States Securities and Exchange Commission or any other regulatory body.

Any use of or access to products, services or information of MSCI requires a license from MSCI. MSCI, Barra, RiskMetrics, IPD and other MSCI brands and product names are the trademarks, service marks, or registered trademarks of MSCI or its subsidiaries in the United States and other jurisdictions. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and Standard & Poor's. "Global Industry Classification Standard (GICS)" is a service mark of MSCI and Standard & Poor's.

MIFID2/MIFIR notice: MSCI ESG Research LLC does not distribute or act as an intermediary for financial instruments or structured deposits, nor does it deal on its own account, provide execution services for others or manage client accounts. No MSCI ESG Research product or service supports, promotes or is intended to support or promote any such activity. MSCI ESG Research is an independent provider of ESG data, reports and ratings based on published methodologies and available to clients on a subscription basis. We do not provide custom or one-off ratings or recommendations of securities or other financial instruments upon request.

Privacy notice: For information about how MSCI ESG Research LLC collects and uses personal data concerning officers and directors, please refer to our Privacy Notice at https://www.msci.com/privacy-pledge.

- ***This consultation may or may not lead to any changes in MSCI's indexes. Consultation feedback will remain confidential unless a participant requests that its feedback be disclosed. In that case, the relevant feedback would be published at the same time as the final results of the consultation.***