

Potential Enhancements to the MSCI Momentum Indexes and MSCI Minimum Volatility Indexes Methodologies

PROPOSAL FOR CONSULTATION

November 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.

MSCI Momentum Indexes Methodology

Agenda

- 1 Momentum Indexes: Background and Objective
- 2 Proposed Enhancements
 - i Rebalance Frequency; Turnover Mitigation Techniques
- 3 Discussion Points
- 4 Appendix

MSCI Momentum Indexes : Background and Objectives

Background:

- The MSCI Momentum Indexes aim to reflect the performance of companies that have relatively high exposure to the Momentum factor. Constituents of MSCI Momentum Indexes have historically exhibited positive active exposures to the Momentum factors.
- Currently, MSCI Momentum Indexes rebalance on a semi-annual basis with an additional conditional rebalance at the beginning of month if certain trigger criteria are met.

Objective:

- The objective of the consultation is to seek feedback from the market participants on the proposal of more frequent (quarterly) rebalancing in order to address the decay of the momentum factor while mitigating the incremental turnover during the Index Reviews.

MSCI Momentum Indexes : Considerations

Current Methodology & Challenges

- Current MSCI Momentum Indexes rebalances on a **semi-annual** frequency, along with an additional conditional rebalance at the beginning of month if certain trigger criteria are met.
- Challenge – Decay in Momentum factor between rebalances.
- More frequent rebalance can reduce the decay of the Momentum factor but this can result in higher turnover

Considerations

- **Quarterly rebalance**¹: Aligns with MSCI GIMI Quarterly Comprehensive Index Review (QCIR) rebalance frequency
- Quarterly rebalance with turnover control: Balances turnover increase with momentum factor exposure decay
 - **Half-way Turnover (Recommended Option)**: Move the weights only by half from the current weight to pro-forma weights (for weight changes and additions)
 - **Fixed Absolute Turnover**: Instead of moving weights by half, this option finds a value by which weights can be moved such that one-way turnover is restricted to 30%

Outcomes

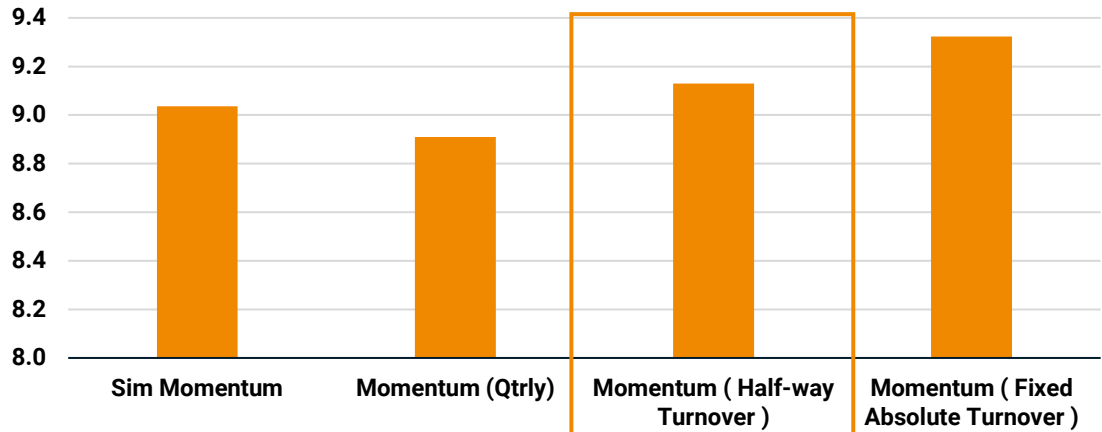
- Less decay of the Momentum factor
- Balance turnover increase due to more frequent (quarterly) rebalance:
 - Half-way Turnover option allows flexibility to reflect the underlying market conditions, especially in the period of high volatility.
 - Fixed Absolute Turnover option provides explicit control and predictability on the turnover value.
- Alignment with the rebalance frequency (quarterly) of the underlying Parent Indexes

¹ including conditional rebalancing.

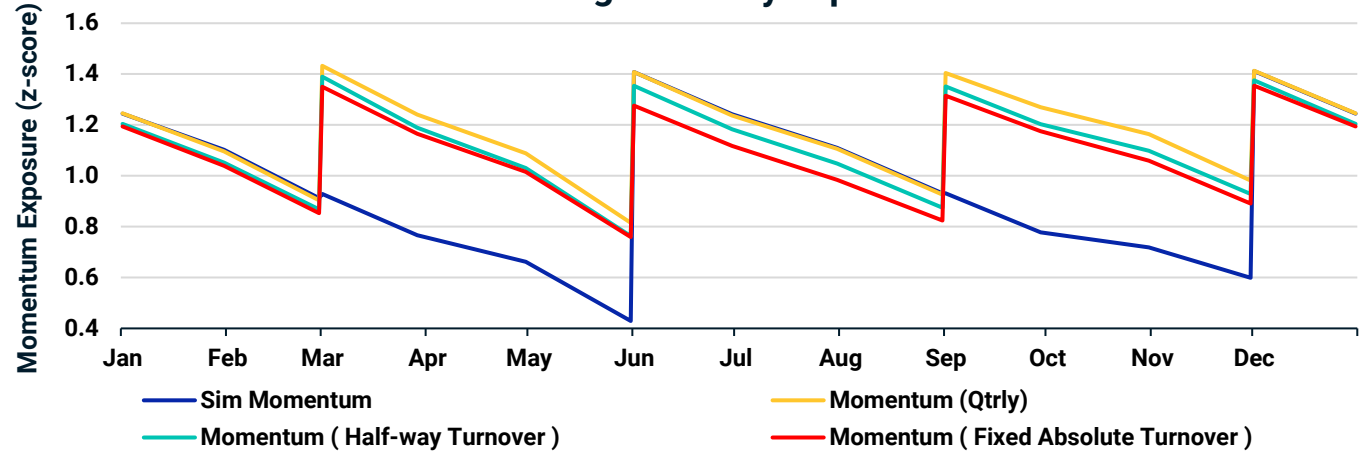
USA - Rebalancing Frequency

In our simulations, changing the rebalancing frequency from Semi Annual to Quarterly showed an increase in the Momentum factor exposure along with the increase in annual turnover to varying degrees.

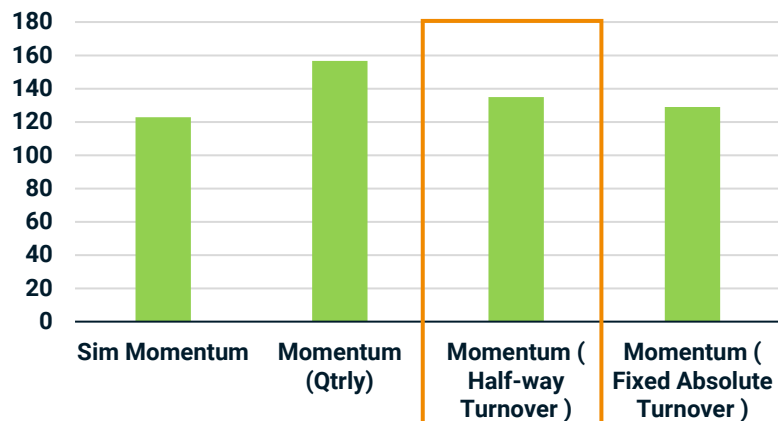
USA Momentum Total Return (in %)



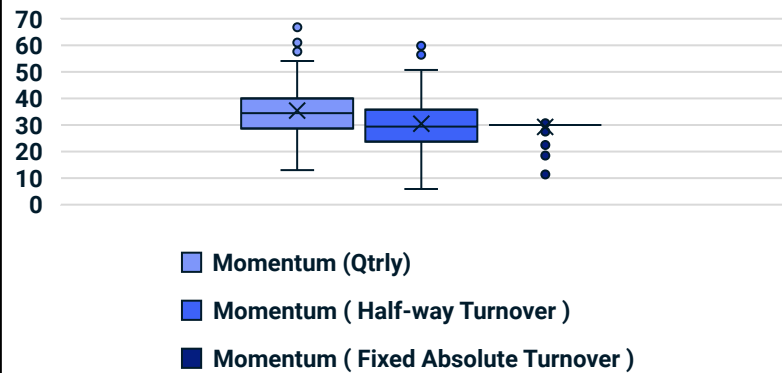
USA Average Monthly Exposures



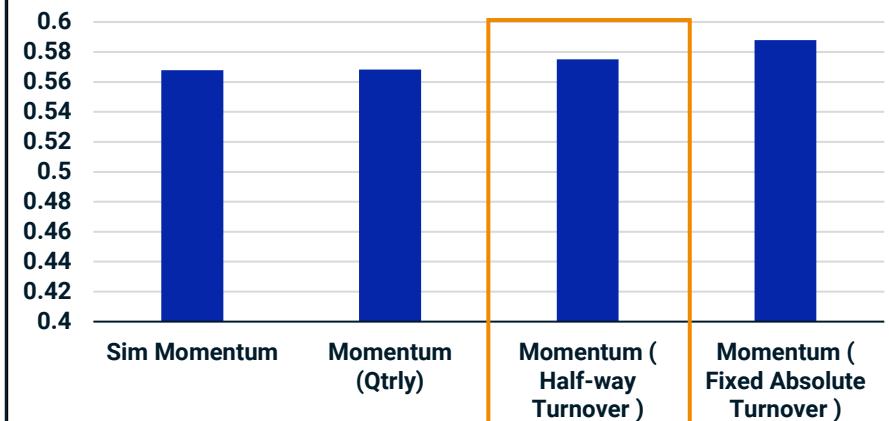
USA Momentum Turnover



USA Momentum Turnover at Index Reviews



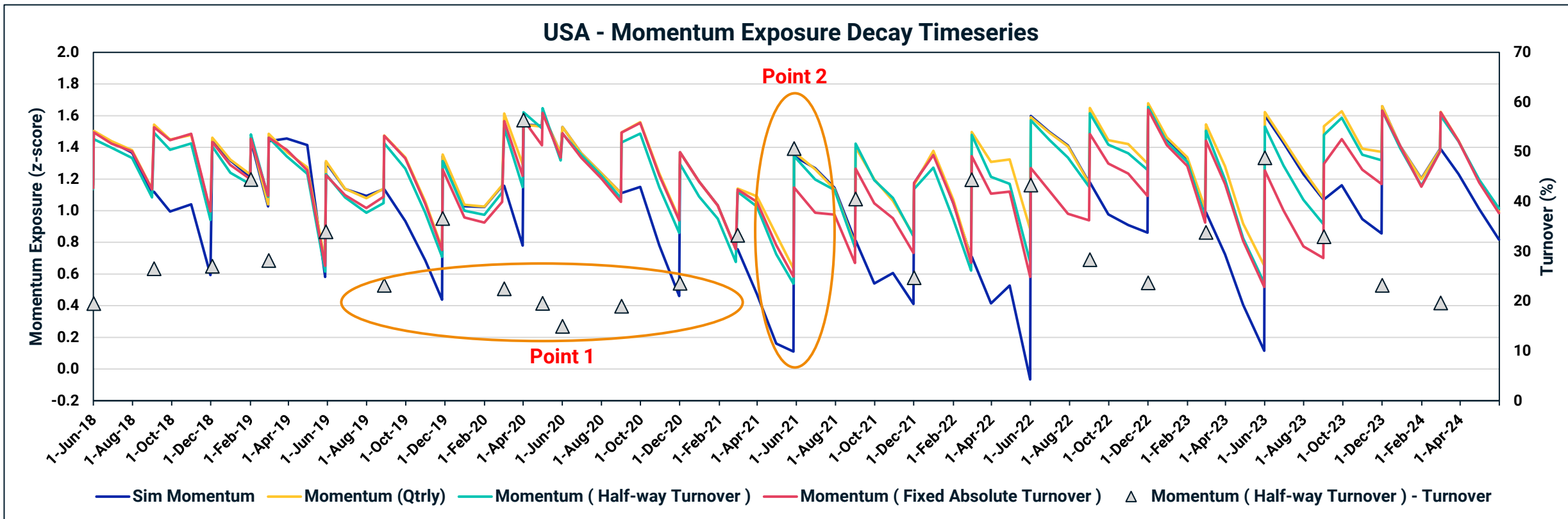
USA Momentum Return/Risk



Period: May 31, 2000 to July 31, 2024. * Annualized one-way index turnover over index reviews ** Active exposures are w.r.t respective MSCI market cap indexes *** x - Represent the mean value of active momentum exposure
 Sim Momentum (Semi Annual) variant is the existing methodology simulated for comparison with enhancement proposals.

This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

Simulation - Momentum Exposure Decay



Point 1 – There can be periods when in Half-way Turnover variant, the turnover consumed is significantly less than 30%. During these periods, the Fixed Absolute Turnover variant can move more towards the pro-forma portfolio.

Point 2 - During the period of high market volatility, the momentum exposure of the Fixed Absolute Turnover variant can be lower than the Half-way Turnover variant, since it won't be able to move much from the current portfolio to the pro-forma portfolio due to the turnover restricted to 30%.



Open weights at the effective date of Index Rebalancing are multiplied by Momentum z-score at different month end points to calculate decay.

This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

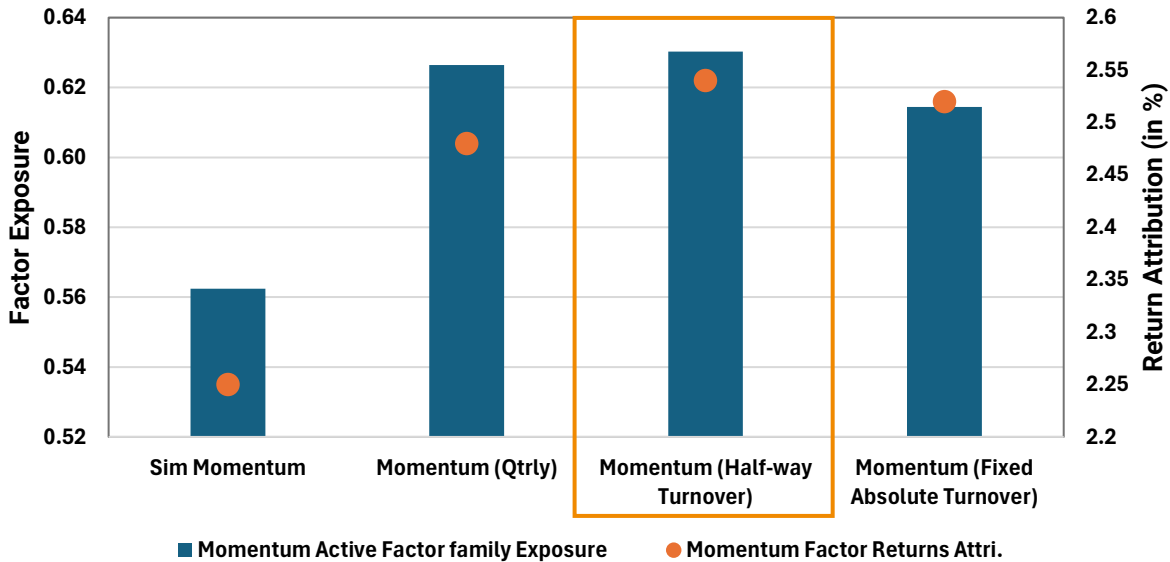
Information Classification: GENERAL

USA Factor Exposures and Return Attributions

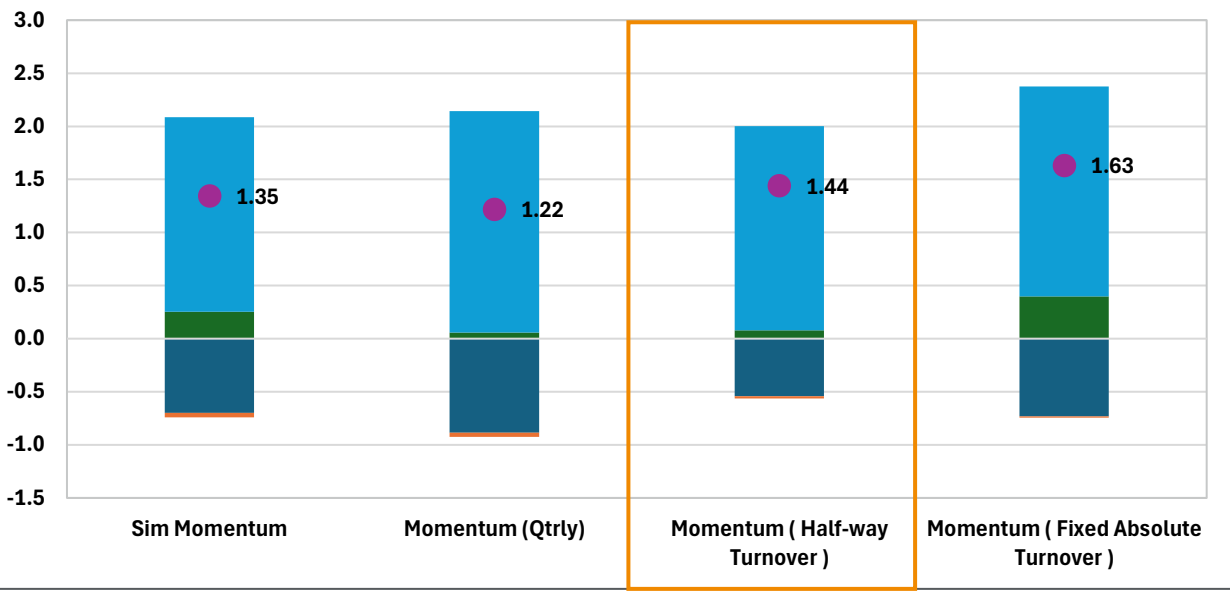
Momentum factor exposures was observed to be higher for all the quarterly simulations. Higher Momentum exposure contributed positively, at least 25 bps, from the Momentum factor in the active returns.

Industries factor contributed positively to the active return for "Momentum (Fixed Absolute Turnover)" variant and decrease in negative specific return contributed positively to the active return for "Momentum (Half-way Turnover)" variant.

USA Active Factor Family Exposures



USA Return Attributions (in %)



Period: May 31, 2000 to July 31, 2024. Active measures are w.r.t respective MSCI market cap indexes. Active returns are Gross returns annualized in USD.

■ Specific Return Attribution (%) ■ Countries Return Attribution (%) ■ Industries Return Attribution (%)
 ■ Styles Return Attribution (%) ● Active Return (%)

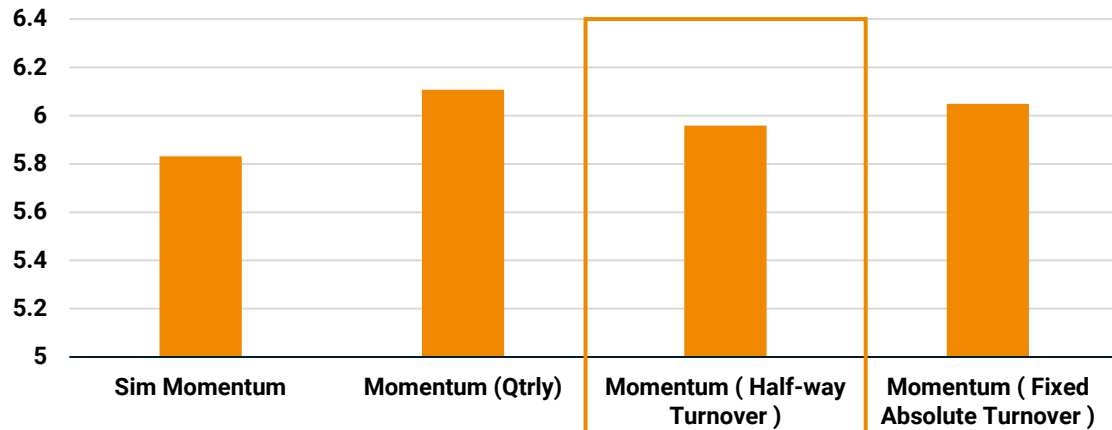


This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

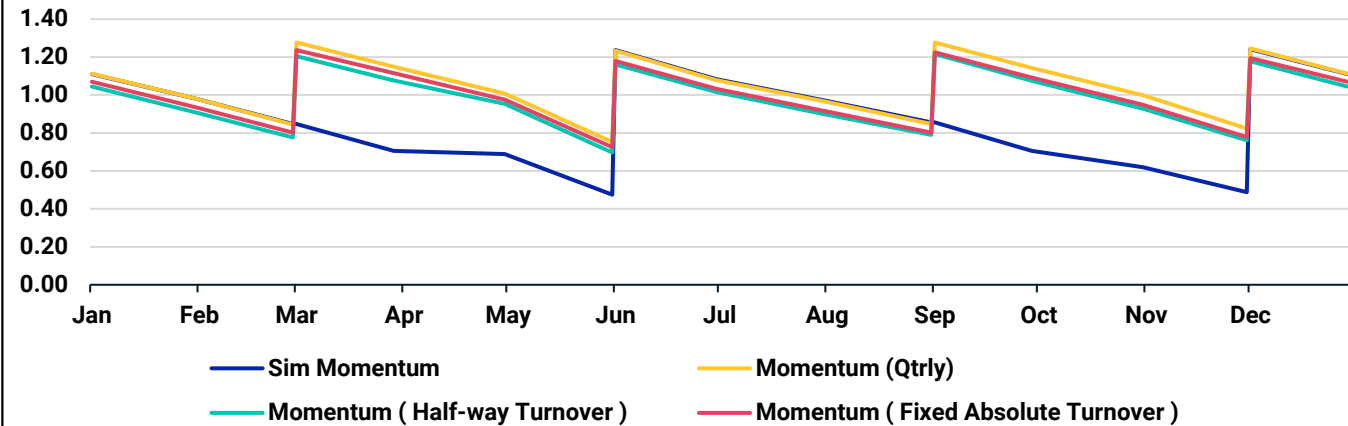
World ex USA - Rebalancing Frequency

In our simulations, changing the rebalancing frequency from Semi Annual to Quarterly showed an increase in the Momentum factor exposure along with the increase in annual turnover except for 'Half-way' variant.

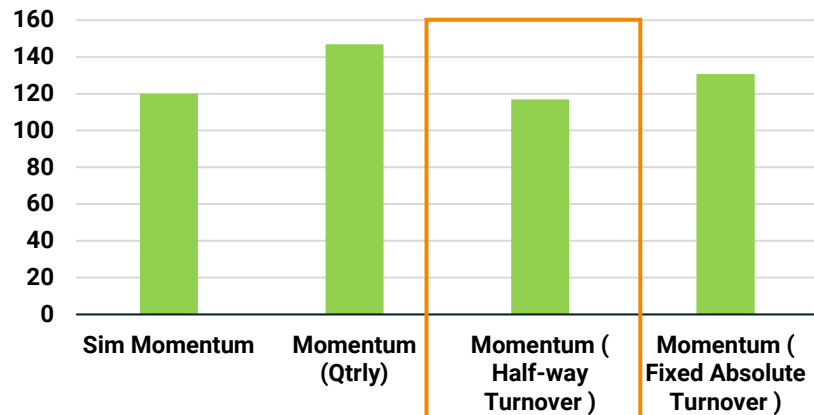
World ex USA Momentum Total Return (in %)



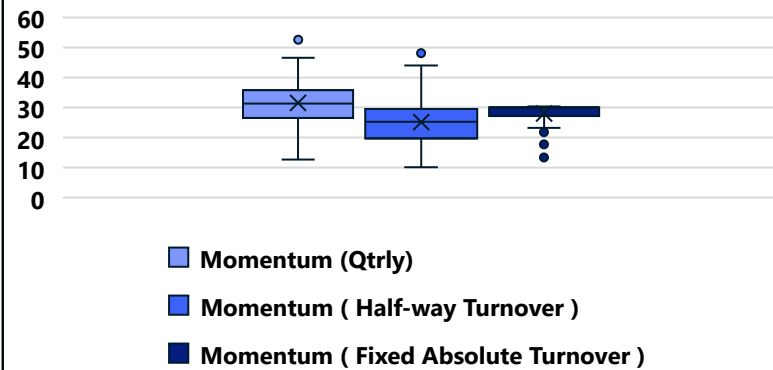
World ex USA Average Monthly Exposures



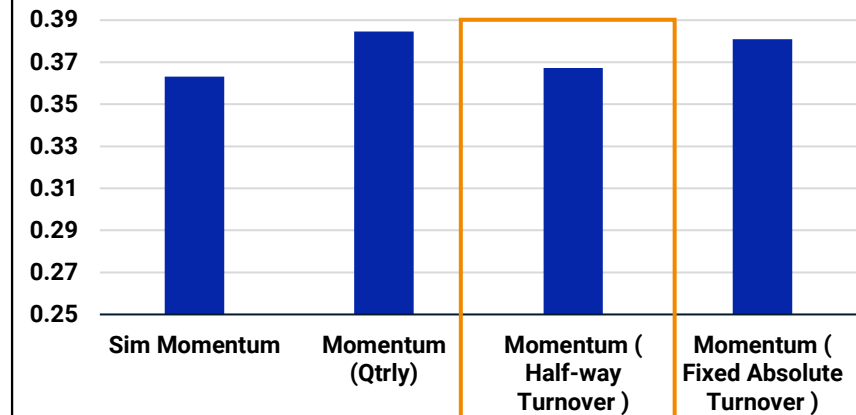
World ex USA Momentum Turnover



World ex USA Momentum Turnover at Index Reviews



World ex USA Momentum Return/Risk

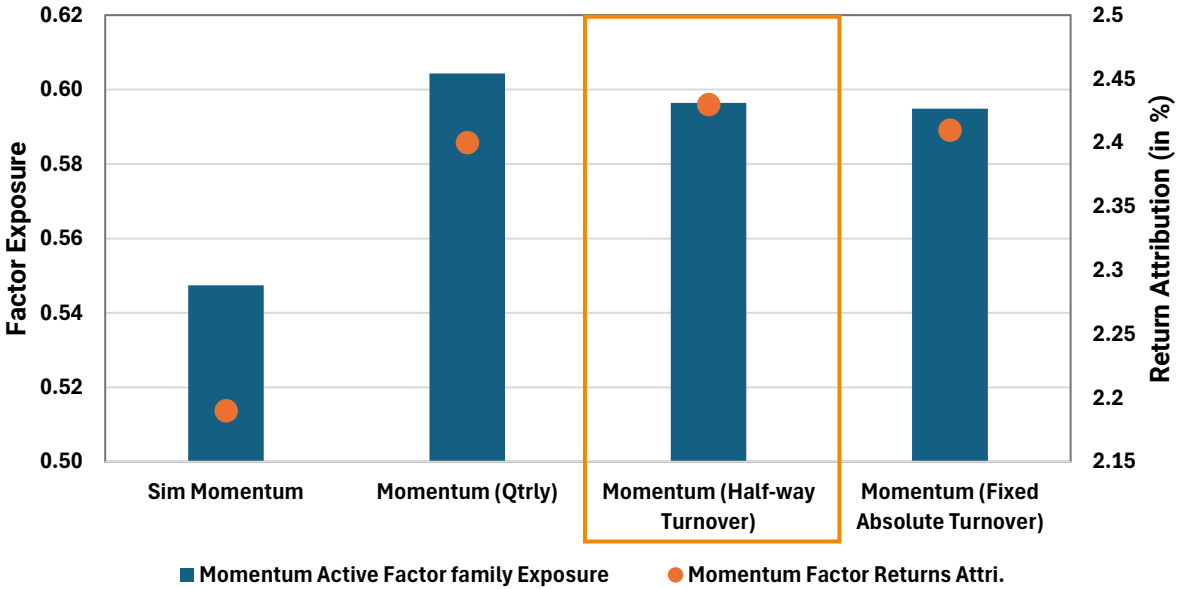


World ex USA Factor Exposures and Return Attributions

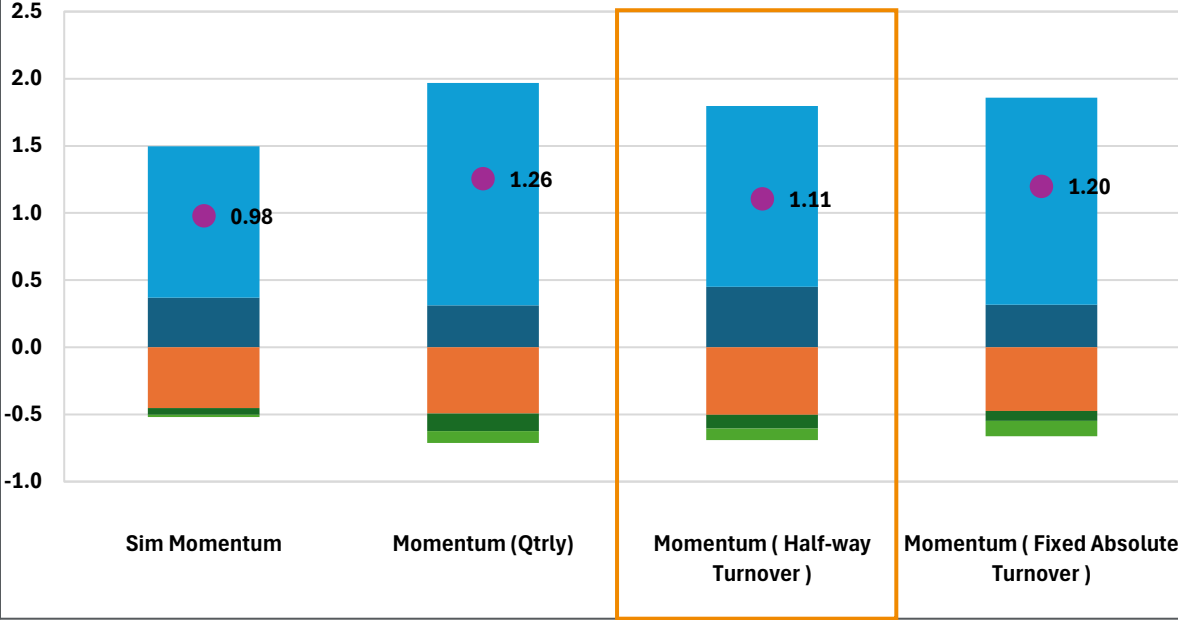
Momentum factor exposures was observed to be higher for all the quarterly simulations. Higher Momentum exposure contributed positively, at least 20 bps, from the Momentum factor in the active returns.

Style factor returns contributed positively to the active return for all the quarterly variants which mainly caused an increase in the active returns compared to the current Momentum Index.

World ex USA Active Factor Family Exposures



World ex USA Return Attributions (in %)



Period: May 31, 2000 to July 31, 2024. Active measures are w.r.t respective MSCI market cap indexes. Active returns are Gross returns annualized in USD.

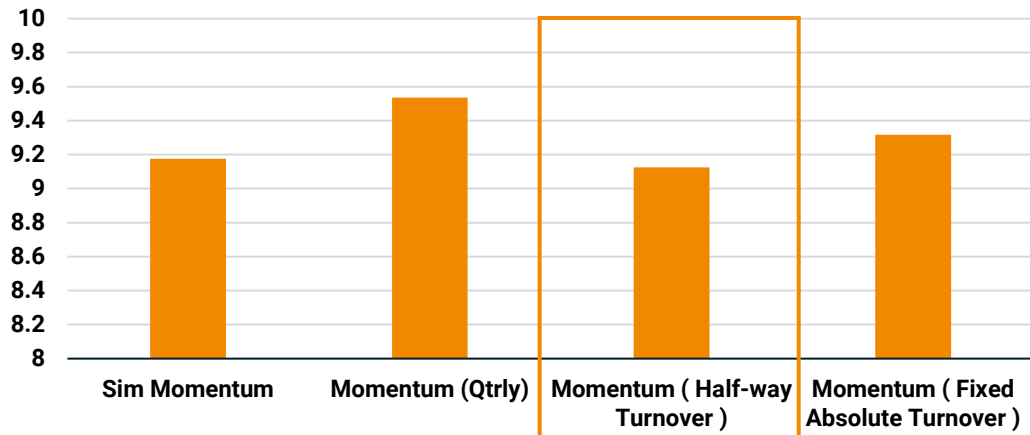
■ Specific Return Attribution (%) ■ Countries Return Attribution (%) ■ Industries Return Attribution (%)
 ■ Styles Return Attribution (%) ■ Currencies Return Attribution (%) ● Active Return (%)



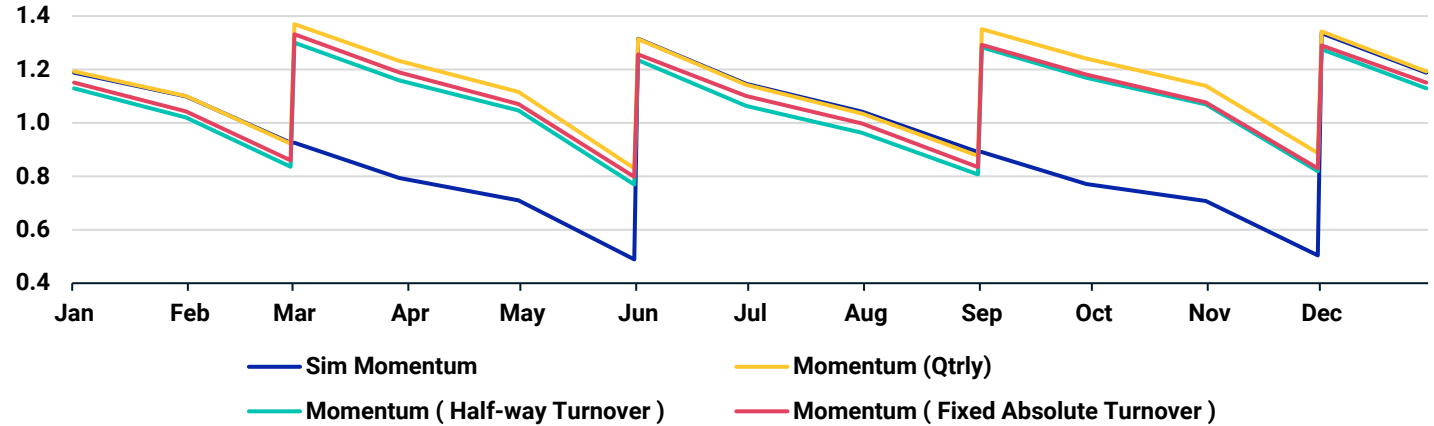
EM- Rebalancing Frequency

In our simulations, changing the rebalancing frequency from Semi Annual to Quarterly showed an increase in the Momentum factor exposure along with the increase in annual turnover to varying degrees.

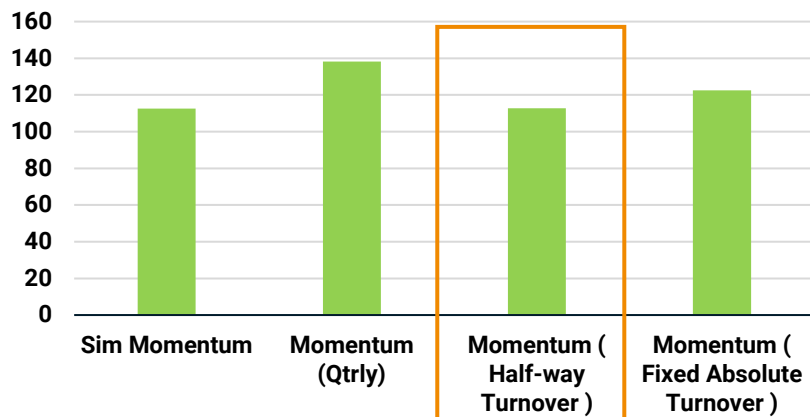
EM Momentum Total Return (in %)



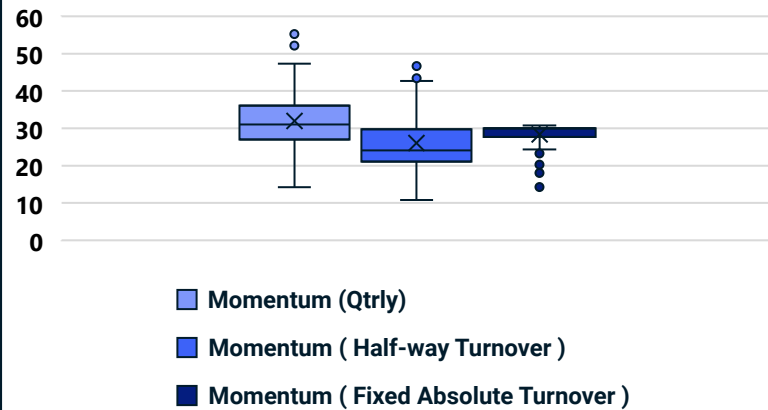
EM Average Monthly Exposures



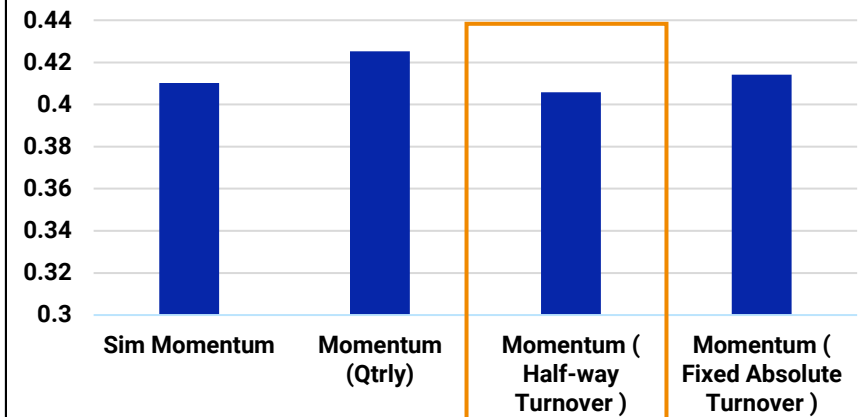
EM Momentum Turnover



EM Momentum Turnover at Index Reviews



EM Momentum Return/Risk



Period: May 31, 2000 to July 31, 2024. * Annualized one-way index turnover over index reviews ** Active exposures are w.r.t respective MSCI market cap indexes *** x - Represent the mean value of active momentum exposure
 Sim Momentum (Semi Annual) variant is the existing methodology simulated for comparison with enhancement proposals.

This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

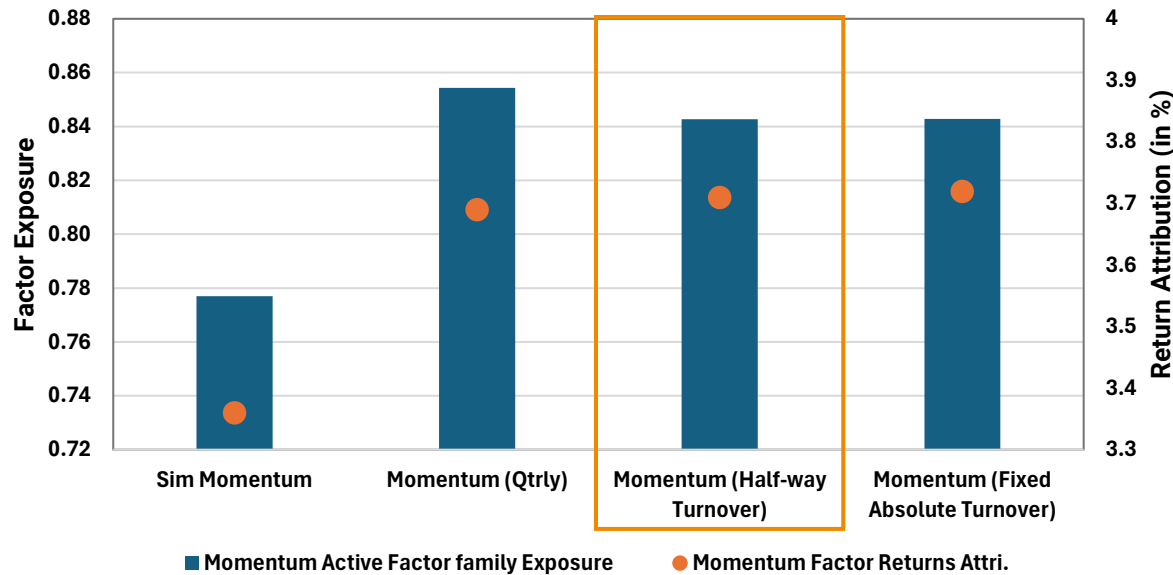
Information Classification: GENERAL

EM Factor Exposures and Return Attributions

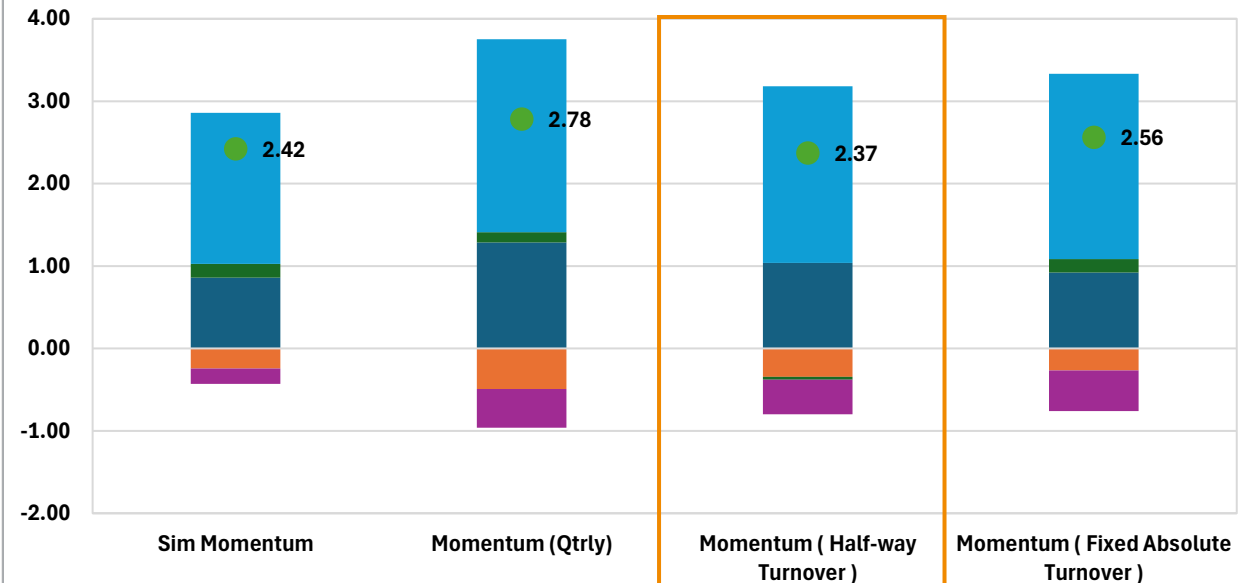
Momentum factor exposures were observed to be higher for all the quarterly simulations. Higher Momentum exposure contributed positively, at least 35 bps, from the Momentum factor in the active returns.

Style factor returns contributed positively to the active return for all the quarterly variants which mainly caused an increase in the active returns compared to the current Momentum Index.

EM Active Factor Family Exposures



EM Return Attributions (in %)

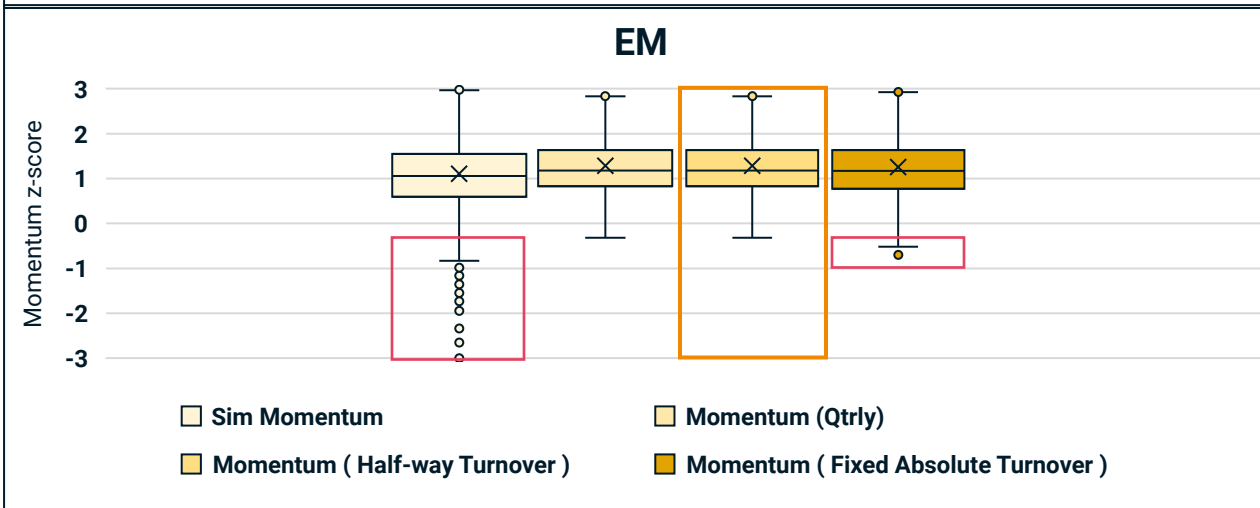
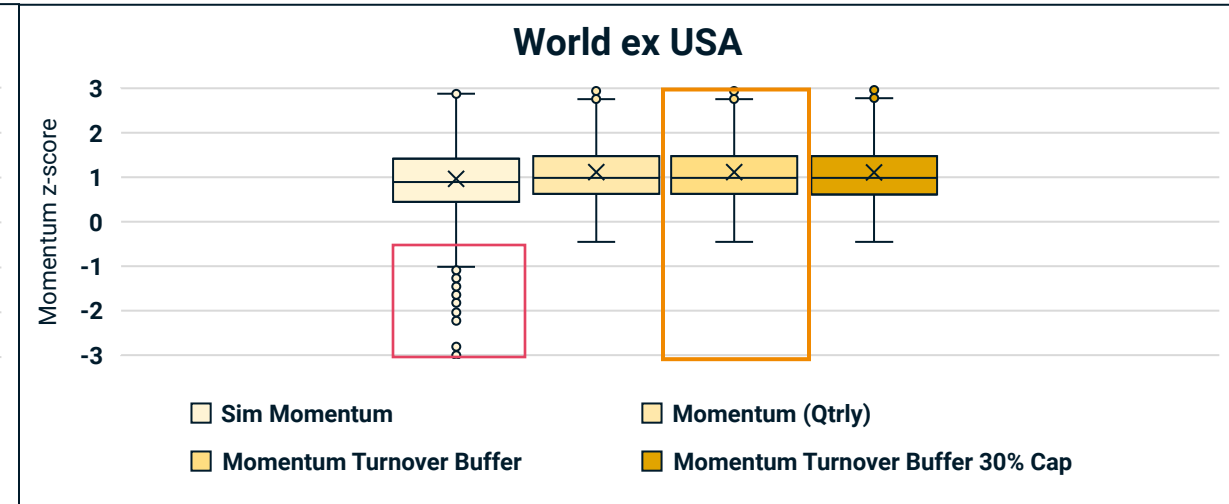
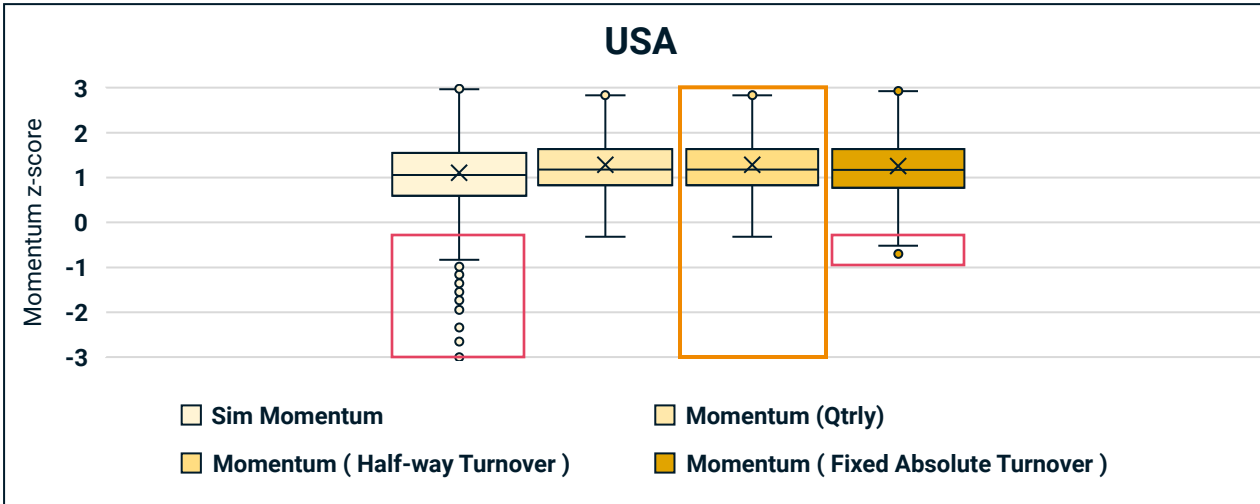


Period: May 31, 2000 to July 31, 2024. Active measures are w.r.t respective MSCI market cap indexes. Active returns are Gross returns annualized in USD.

■ Specific Return Attribution (%)
 ■ Countries Return Attribution (%)
 ■ Industries Return Attribution (%)
 ■ Styles Return Attribution (%)
 ■ Currencies Return Attribution (%)
 ● Active Return Attribution (%)



Momentum score dispersion



- Momentum score range for the Half-way Turnover variant was observed to be similar to the Quarterly variant
- For Fixed Absolute Turnover variant, there were marginally more names with negative momentum score, compared to the Half-way Turnover variant

Summary and proposed methodology

	USA Momentum				World ex USA Momentum				EM Momentum			
	Sim Momentum	Momentum (Qtrly)	Momentum (Half-way Turnover)	Momentum (Fixed Absolute Turnover)	Sim Momentum	Momentum (Qtrly)	Momentum (Half-way Turnover)	Momentum (Fixed Absolute Turnover)	Sim Momentum	Momentum (Qtrly)	Momentum (Half-way Turnover)	Momentum (Fixed Absolute Turnover)
Return / Risk	0.57	0.57	0.58	0.59	0.36	0.38	0.37	0.38	0.41	0.43	0.41	0.41
Momentum Active Factor Family Exposure***	0.56	0.63	0.63	0.61	0.55	0.60	0.60	0.59	0.78	0.85	0.84	0.84
Turnover** (%)	122.8	156.6	134.6	129.0	120.2	146.8	117.0	130.6	112.5	138.3	112.7	122.5
Difference of Momentum Z-Score with Semi-Annual Index												
Third month after Semi-Annual rebalance	-	0.48	0.42	0.40	-	0.44	0.37	0.40	-	0.45	0.38	0.40
Fourth month after Semi-Annual rebalance	-	0.44	0.37	0.35	-	0.35	0.29	0.31	-	0.42	0.35	0.36
Fifth month after Semi-Annual rebalance	-	0.38	0.33	0.31	-	0.31	0.25	0.27	-	0.36	0.30	0.32

Period: May 31, 2000 to July 31, 2024. ** Annualized one-way index turnover over index reviews *** Monthly Averages of Momentum Active Factor Family Exposures

- **Summary:**
 - With more frequent rebalancing and turnover mitigation techniques, it was observed that momentum z-score increases by ~35 bps (on an average) in the second quarter post semi-annual rebalance frequency, and hence reduces decay of the momentum signal.
 - Simply moving from semi-annual to quarterly rebalance frequency increases one-way turnover by ~30% (on an average) but turnover mitigation techniques restrict this increase in turnover to less than 10%.
 - Half-way Turnover option allows flexibility to reflect the underlying market conditions, especially in the period of high volatility.
 - Fixed Absolute Turnover option provides explicit control and predictability on the turnover value.
- **Proposed methodology:**
 - **Option 1** : Quarterly rebalancing frequency with Half-way Turnover
 - **Option 2** : Quarterly rebalancing frequency with Fixed Absolute Turnover



This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

Information Classification: GENERAL

Discussion Points

Rebalancing frequency –

- Should Quarterly rebalancing be implemented given the trade-off between higher momentum exposure and incremental turnover?

Turnover mitigation techniques –

- Do you think the turnover mitigation techniques should be applied while moving to Quarterly rebalance frequency given the trade-off between turnover and momentum exposure?
 - If yes, then what would be the preferable approach?
 - Half-way turnover or
 - Fixed absolute turnover
 - If Fixed absolute turnover, then do you agree on one-way turnover upper limit of 30% per Index Review for all regions?

MSCI Minimum Volatility Indexes Methodology

Agenda

- 1 Minimum Volatility Indexes: Background and Objective
- 2 Proposed Enhancements
 - i Most Recent Risk Model Data
 - ii Rebalance Frequency
- 3 Discussion Points
- 4 Appendix

MSCI Minimum Volatility Indexes : Background and Objectives

Background:

- The MSCI Minimum Volatility Indexes are constructed using the Barra[®] Optimizer in combination with the relevant Barra[®] Equity Model with the objective of arriving at an optimal portfolio with the lowest total risk, using an estimated security co-variance matrix under applicable constraints. The Index serves as a transparent and relevant benchmark for managing volatility equity strategies.
- The MSCI Minimum Volatility Indexes historically demonstrate the following characteristics:
 - a) Low Beta relative to the Parent Index
 - b) Lower Volatility than the Parent Index
 - c) Bias towards securities with low idiosyncratic risk

Objective:

- The objective of the consultation is to seek feedback from the market participants on the proposal of more frequent (quarterly) rebalancing while balancing the turnover during the Index Reviews.

Proposed Methodology Enhancements

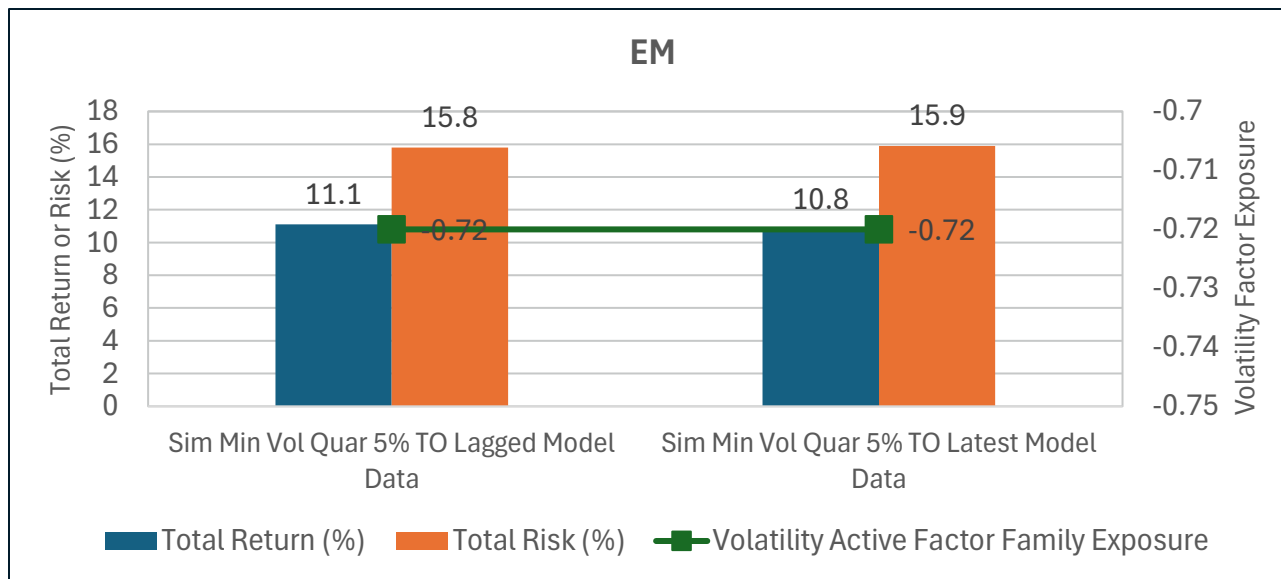
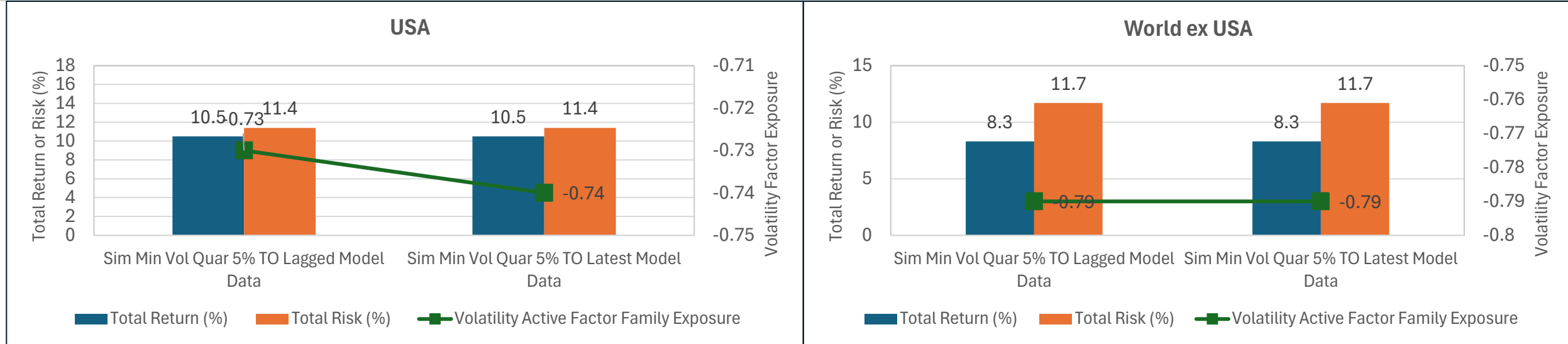
Proposed Option	Rationale	Current Methodology
Use the most recent risk model data	<ul style="list-style-type: none"> Index construction benefits from the most recent available risk exposures and factor co-variance data 	<ul style="list-style-type: none"> Previous end-of-month risk model data
Quarterly rebalance frequency with 5% one-way turnover per Index Review Use the most recent risk model data (Recommended Option)	<ul style="list-style-type: none"> Allows to reflect more recent information in a timely manner and aligned with MSCI GIMI Quarterly Comprehensive Index Review (QCIR) rebalance frequency and This option maintains current annual one-way turnover budget of 20% 	<ul style="list-style-type: none"> Semi-annual rebalance frequency 10% one-way turnover per Index Review (annual one-way turnover budget of 20%)
Quarterly rebalance frequency with 7.5% one-way turnover per Index Review Use the most recent risk model data	<ul style="list-style-type: none"> Additional turnover budget might help optimizer find a better solution (with lower total risk), specifically during the periods of higher market volatility Leads to annual one-way turnover budget of 30% 	

Along with the above proposed enhancements, the optimizer relaxation steps ordering is also proposed to be updated from the current, **sequential** relaxation of below two steps to **alternative** relaxation for each step:

- Turnover relaxation in steps of 2.5% up to a maximum of 15% (current relaxation is in steps of 5% up to a maximum of 30%)
- Parings constraint relaxation in steps of 0.01% from minimum asset weight of 0.05% to 0.01%

More Recent Risk Model Data

In our simulations, using the most recent model data showed a marginal improvement in the Low Volatility exposure with similar return and risk characteristics.



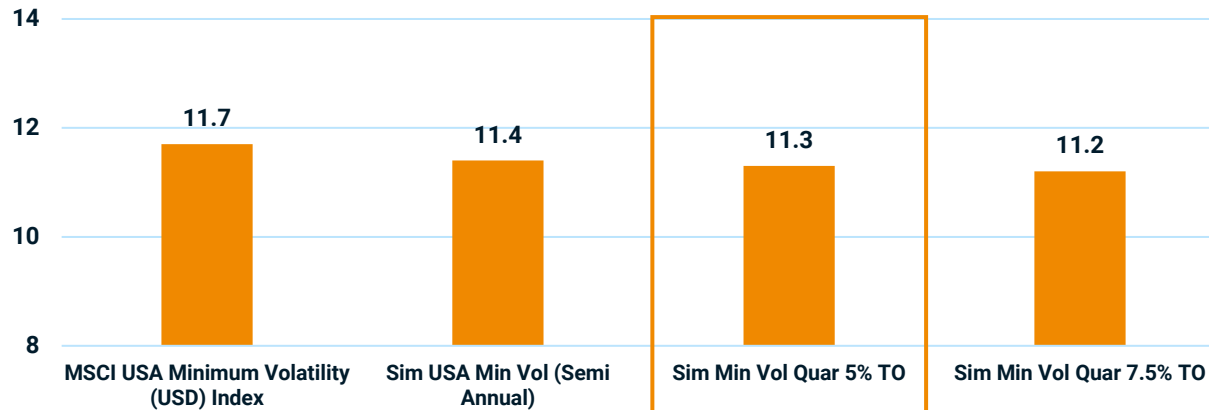
- **'Lagged Model Data'** is the simulation with risk model data as of previous end of month, prior to the rebalancing date.
- **'Latest Model Data'** is the simulation with risk model data as of previous day (T-10), prior to the rebalancing date.



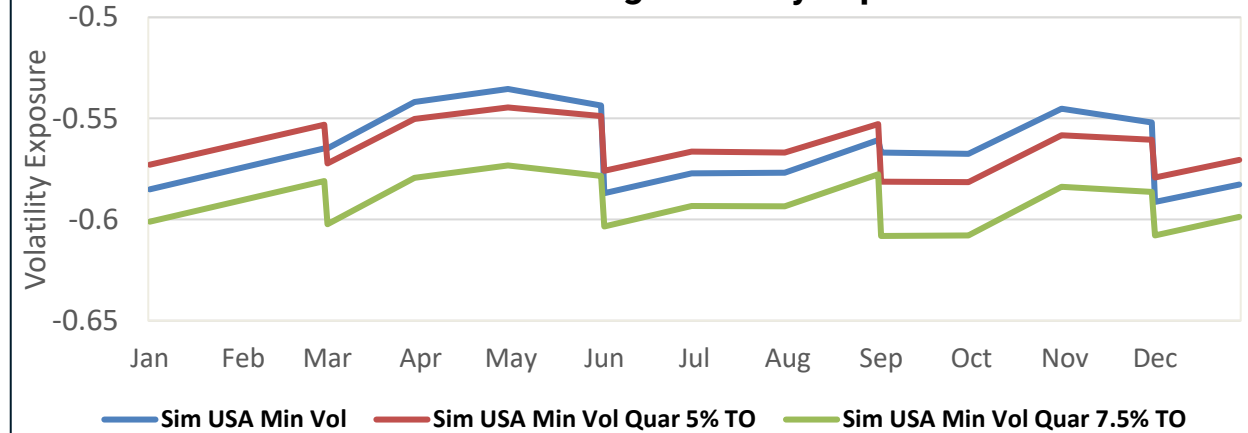
USA - Rebalancing Frequency

In our simulations, changing the rebalance frequency from Semi Annual to Quarterly showed a marginal lower Total Risk along with similar turnover with respect to the current MSCI Minimum Volatility Index.

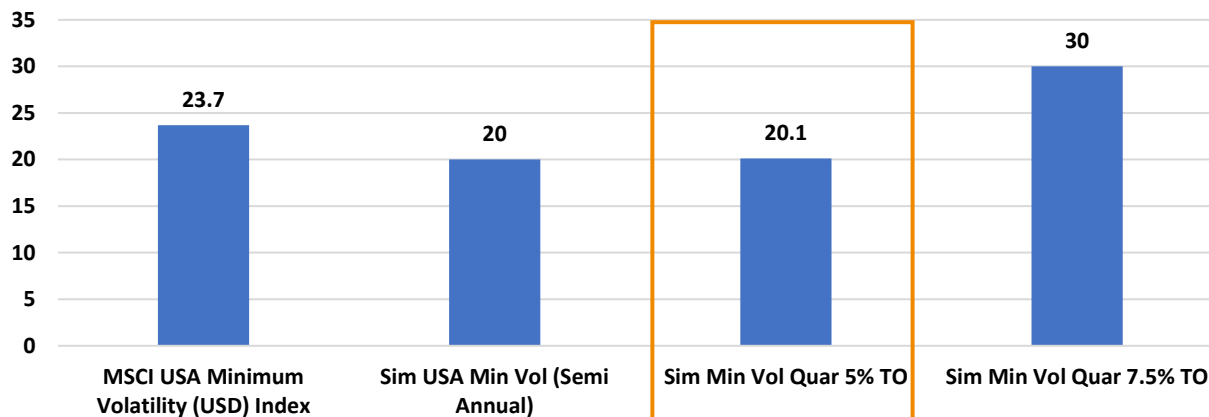
USA Minimum Volatility Total Risk



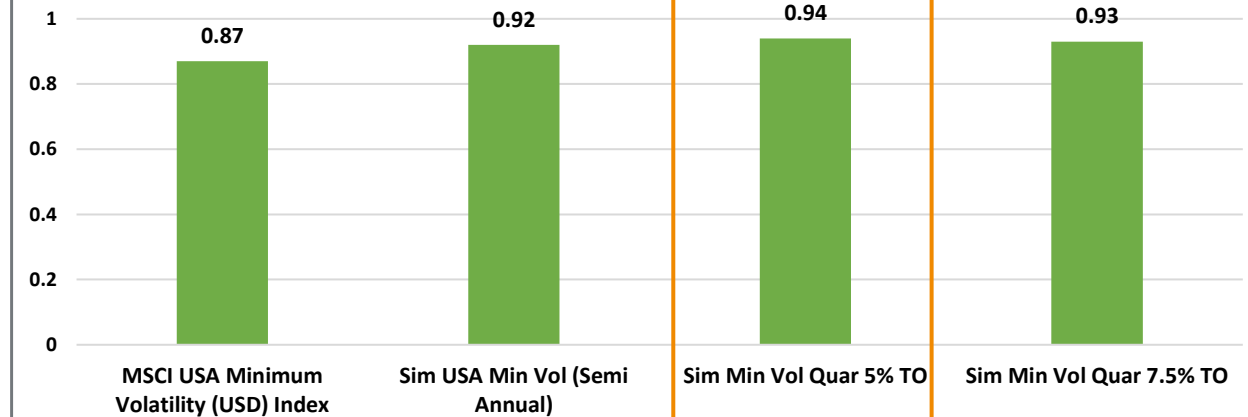
USA – Average Monthly Exposures



USA Minimum Volatility Turnover



USA Minimum Volatility Return/Risk



Period: May 30, 2003 to Jun 28, 2024. * Annualized one-way index turnover over index reviews ** Active exposures are w.r.t respective MSCI market cap indexes.
 *Sim USA Min Vol (Semi Annual) variants is the existing methodology simulated for comparison with enhancement proposals.

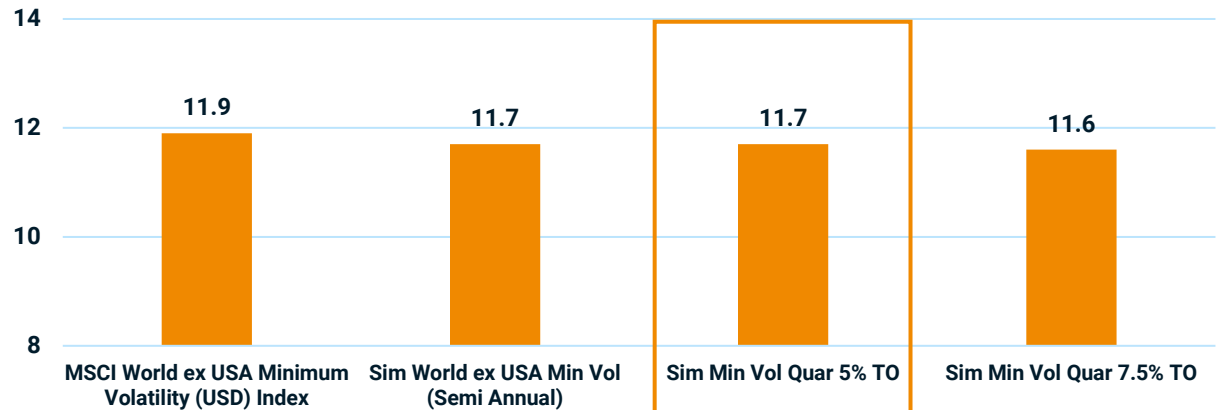
This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.



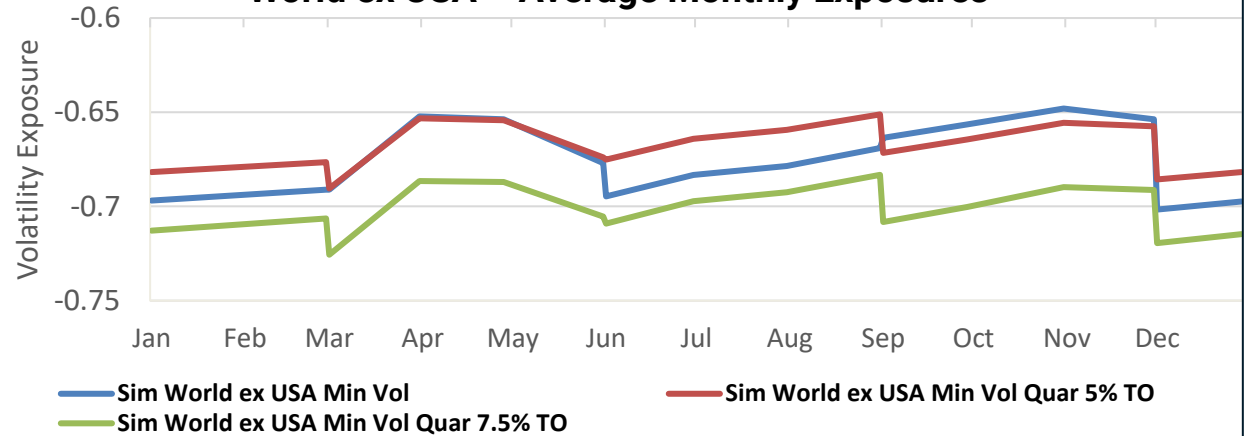
World ex USA - Rebalancing Frequency

In our simulations, transitioning to Quarterly rebalancing showed a marginal increase in Return/Risk ratio along with similar Low Volatility exposures with respect to the current MSCI Minimum Volatility Index.

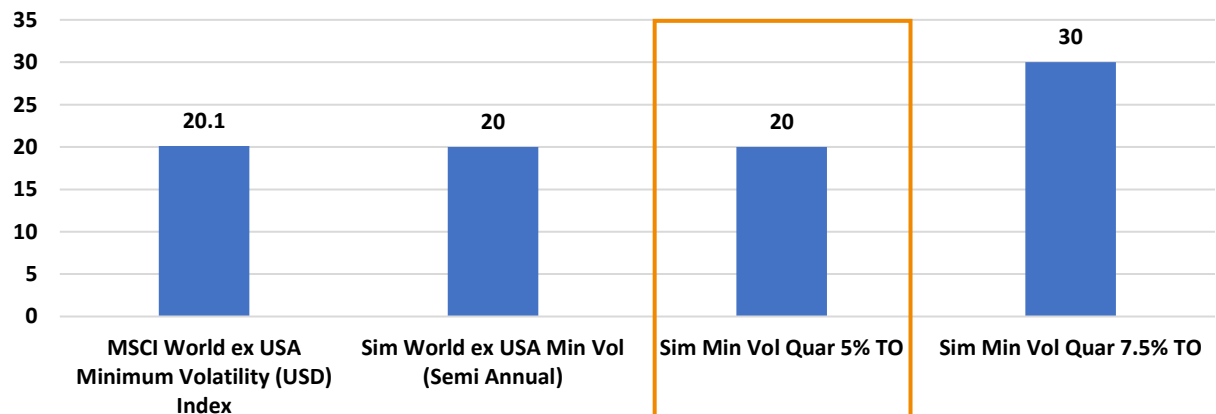
World ex USA Minimum Volatility Total Risk



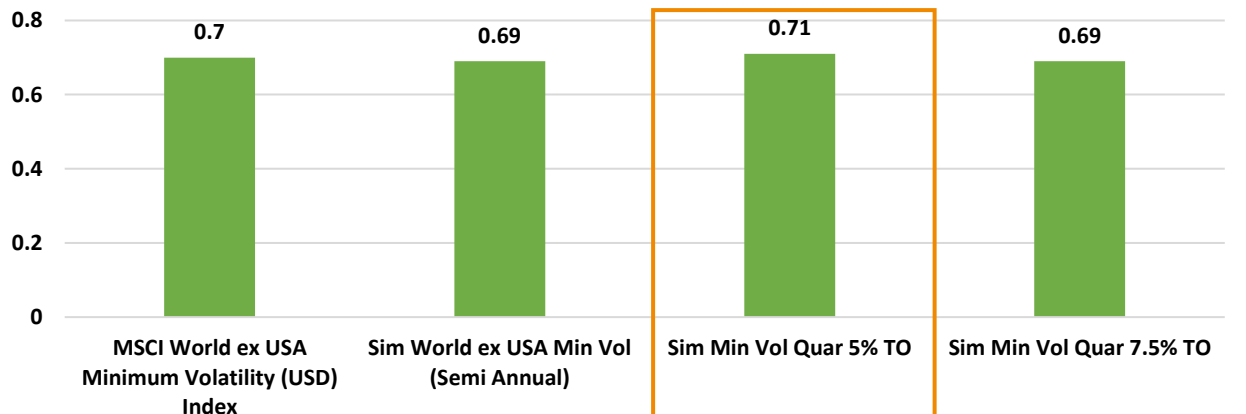
World ex USA – Average Monthly Exposures



World ex USA Minimum Volatility Turnover



World ex USA Minimum Volatility Return/Risk



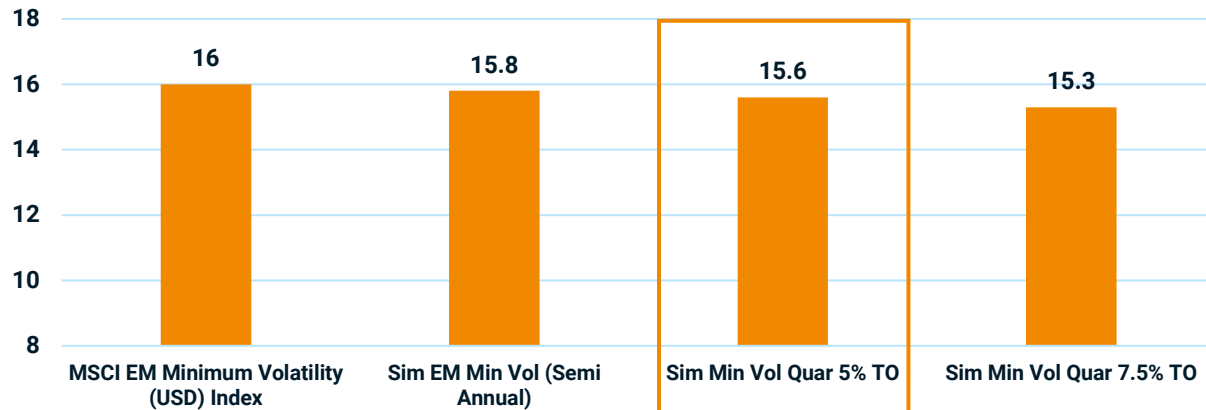
Period: May 30, 2003 to Jun 28, 2024. * Annualized one-way index turnover over index reviews ** Active exposures are w.r.t respective MSCI market cap indexes.
 *Sim World ex USA Min Vol (Semi Annual) variants is the existing methodology simulated for comparison with enhancement proposals.

This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

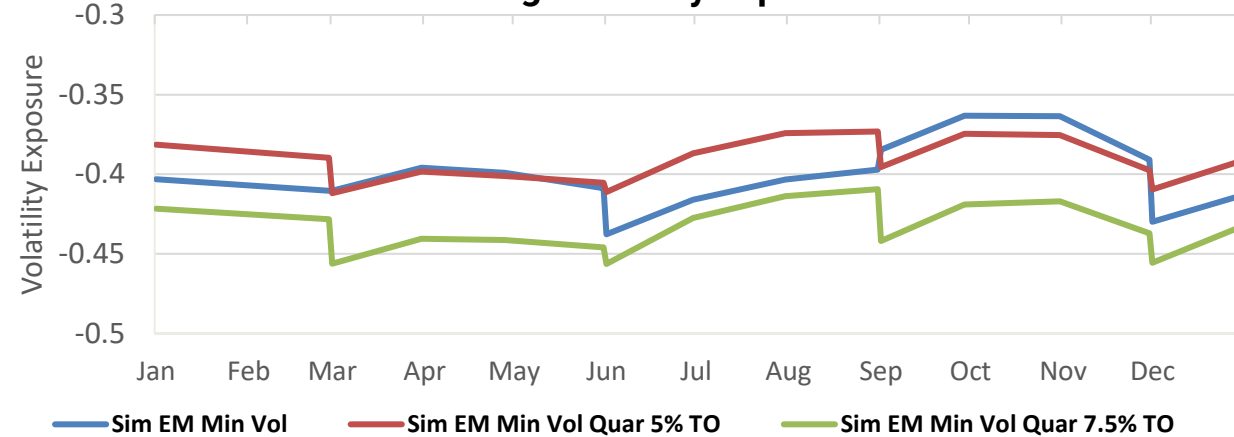
EM - Rebalancing Frequency

In our simulations, transitioning to Quarterly rebalancing in EM showed a marginal increase in turnover due to relaxations, along with an improvement in the Return/Risk ratio

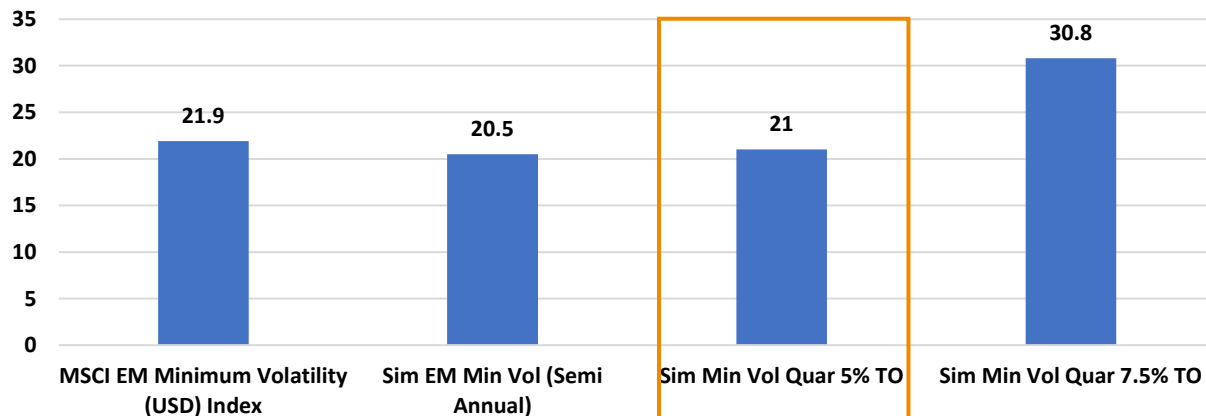
EM Minimum Volatility Total Risk



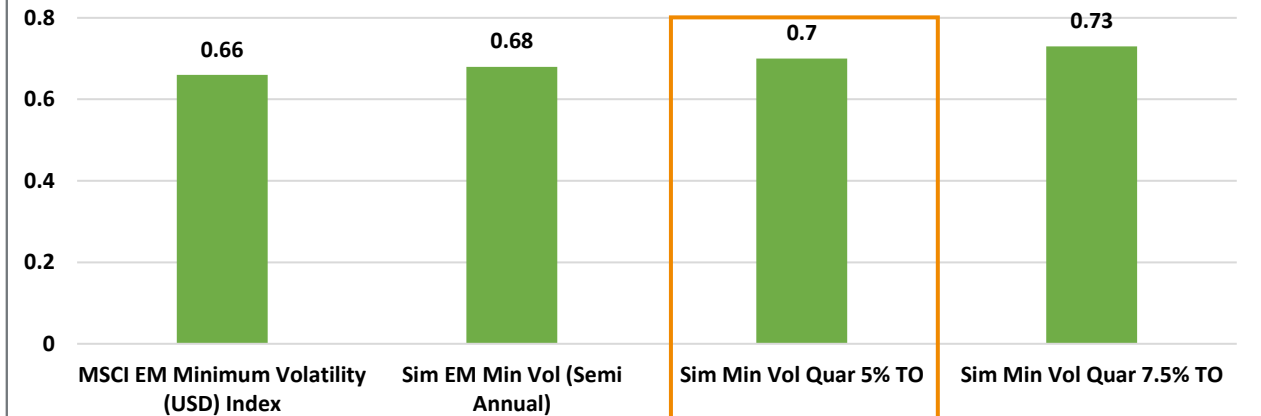
EM – Average Monthly Exposures



EM Minimum Volatility Turnover



EM Minimum Volatility Return/Risk



Period: May 30, 2003 to Jun 28, 2024. * Annualized one-way index turnover over index reviews ** Active exposures are w.r.t respective MSCI market cap indexes.
 *Sim EM (Semi Annual) variants is the existing methodology simulated for comparison with enhancement proposals.

This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.



Discussion Points

More recent risk model data -

- Do you agree to use more recent model data that reflects the latest information available?

Rebalancing Frequency –

- Should Quarterly rebalancing be implemented given the timely reflection of more recent information?

Turnover Constraint Value –

- Do you think turnover budget of 5% is sufficient for the Quarterly rebalancing frequency?

Appendix

Appendix – MSCI Momentum Indexes Methodology

USA Simulation Summary

		USA Momentum			
	MSCI USA Index	Sim Momentum	Momentum (Qtrly)	Momentum (Half-way Turnover)	Momentum (Fixed Absolute Turnover)
Total Return* (%)	7.7	9.0	8.9	9.1	9.3
Total Risk (%)	15.5	15.9	15.7	15.9	15.9
Return / Risk	0.50	0.57	0.57	0.58	0.59
Tracking Error (%)	--	8.0	7.9	8.0	7.8
Turnover** (%)	--	122.8	156.6	134.6	129.0
Momentum Active Factor Family Exposure***	--	0.56	0.63	0.63	0.61
Specific Active Return Attribution (%)	--	-0.7	-0.89	-0.54	-0.73
Countries Active Return Attribution (%)	--	-0.04	-0.04	-0.02	-0.01
Industries Active Return Attribution (%)	--	0.25	0.06	0.08	0.4
Styles Active Return Attribution (%)	--	1.83	2.09	1.92	1.98

Period: May 31, 2000 to July 31, 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	Sim Momentum	Momentum (Qtrly)	Momentum (Half-way Turnover)	Momentum (Fixed Absolute Turnover)
1 Yr	22.0	32.8	34.8	36.5	35.3
3 Yr	8.7	5.0	8.8	7.7	5.8
5 Yr	14.9	11.3	13.6	13.2	12.5
10 Yr	13.1	13.6	13.5	13.9	14.0

Gross returns for the period ending July 31, 2024. Returns are annualized for periods longer than a year



This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

World ex USA Simulation Summary

		World ex USA Momentum			
	MSCI World Ex USA Index	Sim Momentum	Momentum (Qtrly)	Momentum (Half-way Turnover)	Momentum (Fixed Absolute Turnover)
Total Return* (%)	4.9	5.8	6.1	6.0	6.0
Total Risk (%)	16.7	16.1	15.9	16.2	15.9
Return / Risk	0.29	0.36	0.38	0.37	0.38
Tracking Error (%)	--	6.6	6.4	6.6	6.4
Turnover** (%)	--	120.2	146.8	117.0	130.6
Momentum Active Factor Family Exposure***	--	0.55	0.60	0.60	0.59
Specific Active Return Attribution (%)	--	0.37	0.31	0.45	0.32
Countries Active Return Attribution (%)	--	-0.45	-0.49	-0.50	-0.47
Industries Active Return Attribution (%)	--	-0.05	-0.13	-0.10	-0.07
Styles Active Return Attribution (%)	--	1.13	1.66	1.35	1.54

Period: May 31, 2000 to July 31, 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	Sim Momentum	Momentum (Qtrly)	Momentum (Half-way Turnover)	Momentum (Fixed Absolute Turnover)
1 Yr	11.7	20.8	19.9	21.4	20.2
3 Yr	4.2	4.8	5.4	5.8	5.8
5 Yr	8.0	9.6	9.8	10.2	10.1
10 Yr	5.3	7.1	6.6	6.7	6.7

Gross returns for the period ending July 31, 2024. Returns are annualized for periods longer than a year



This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

EM Simulation Summary

		EM Momentum			
	MSCI EM (Emerging Markets) Index	Sim Momentum	Momentum (Qtrly)	Momentum (Half-way Turnover)	Momentum (Fixed Absolute Turnover)
Total Return* (%)	6.8	9.2	9.5	9.1	9.3
Total Risk (%)	20.9	22.4	22.4	22.5	22.5
Return / Risk	0.32	0.41	0.43	0.41	0.41
Tracking Error (%)	--	8.0	8.3	8.4	8.4
Turnover** (%)	--	112.5	138.3	112.7	122.5
Momentum Active Factor Family Exposure***	--	0.78	0.85	0.84	0.84
Specific Active Return Attribution (%)	--	0.86	1.29	1.04	0.92
Countries Active Return Attribution (%)	--	-0.24	-0.49	-0.34	-0.27
Industries Active Return Attribution (%)	--	0.17	0.12	-0.03	0.16
Styles Active Return Attribution (%)	--	1.83	2.34	2.14	2.25

Period: May 31, 2000 to July 31, 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.

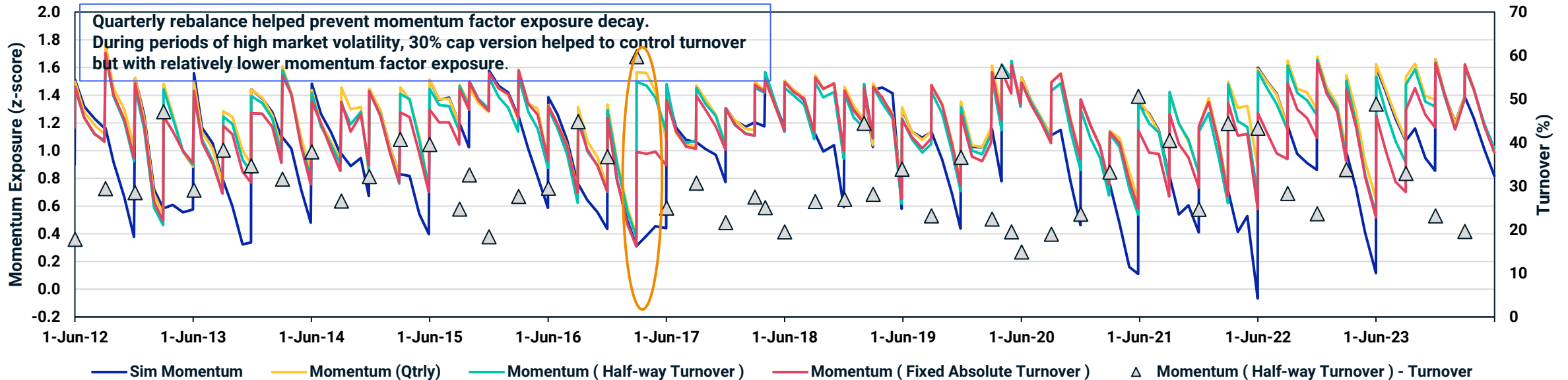
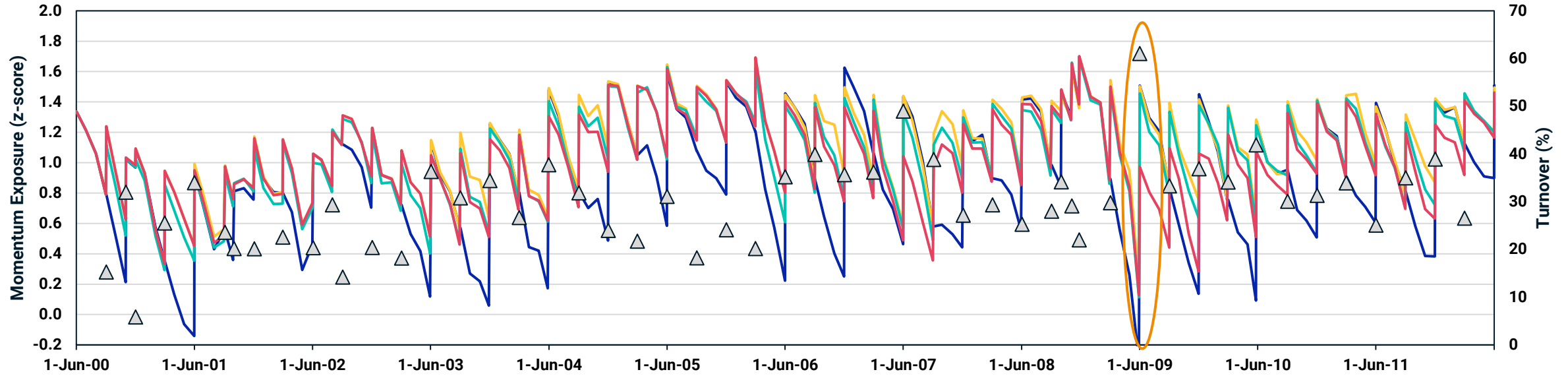
Performance (%)	MSCI EM (Emerging Markets) Index	Sim Momentum	Momentum (Qtrly)	Momentum (Half-way Turnover)	Momentum (Fixed Absolute Turnover)
1 Yr	6.7	9.0	13.7	16.5	21.2
3 Yr	-2.3	-4.9	-2.8	-3.0	-3.6
5 Yr	3.8	6.4	7.5	7.3	7.1
10 Yr	3.0	5.1	5.4	5.0	5.2

Gross returns for the period ending July 31, 2024. Returns are annualized for periods longer than a year

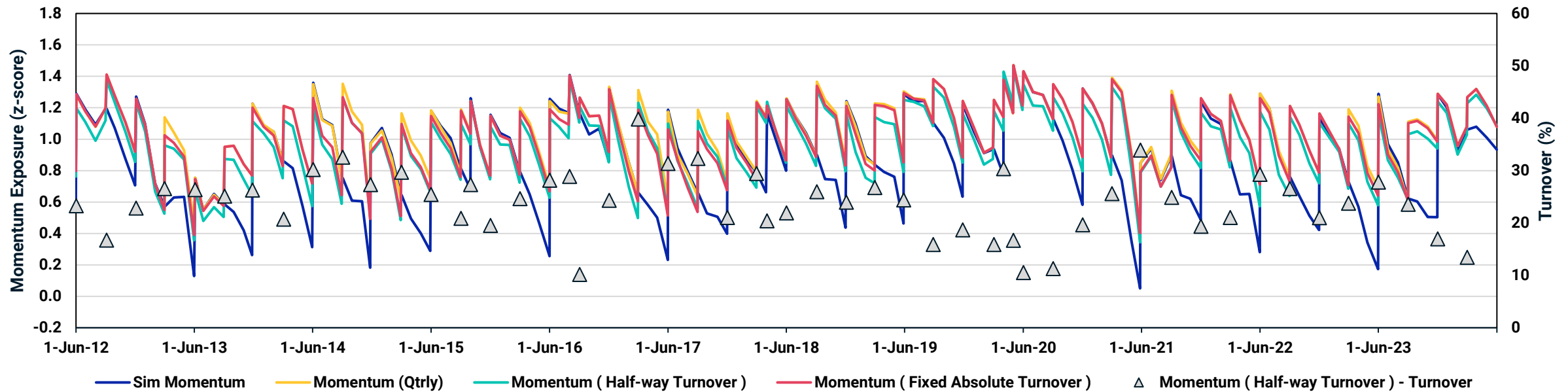
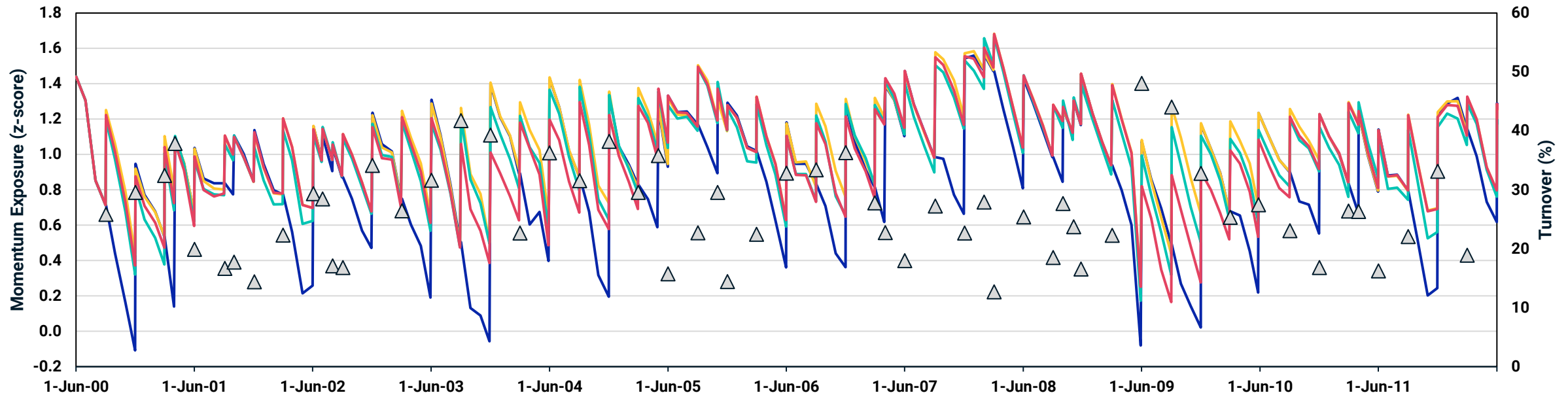


This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

USA - Momentum Exposure Timeseries

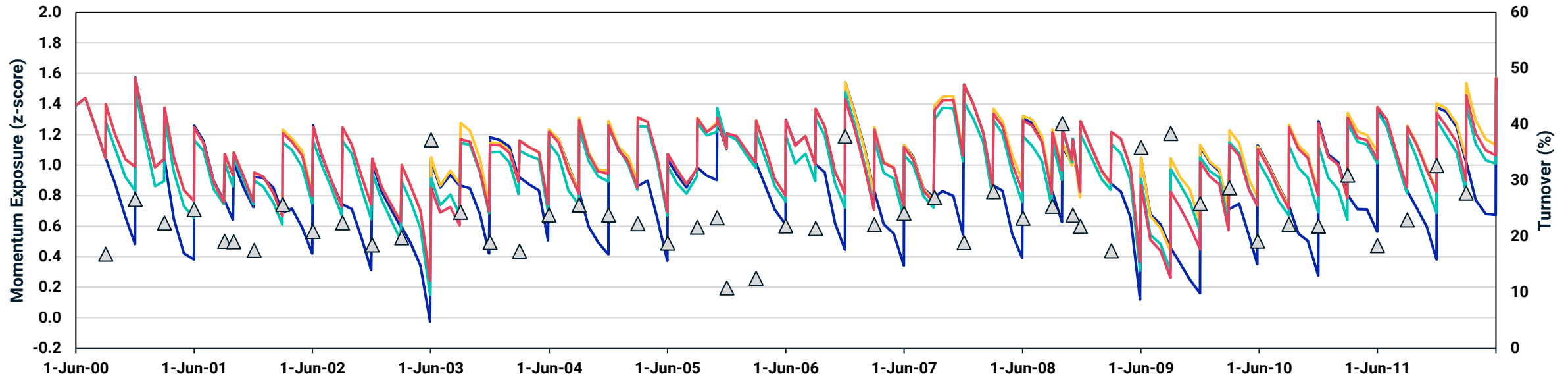
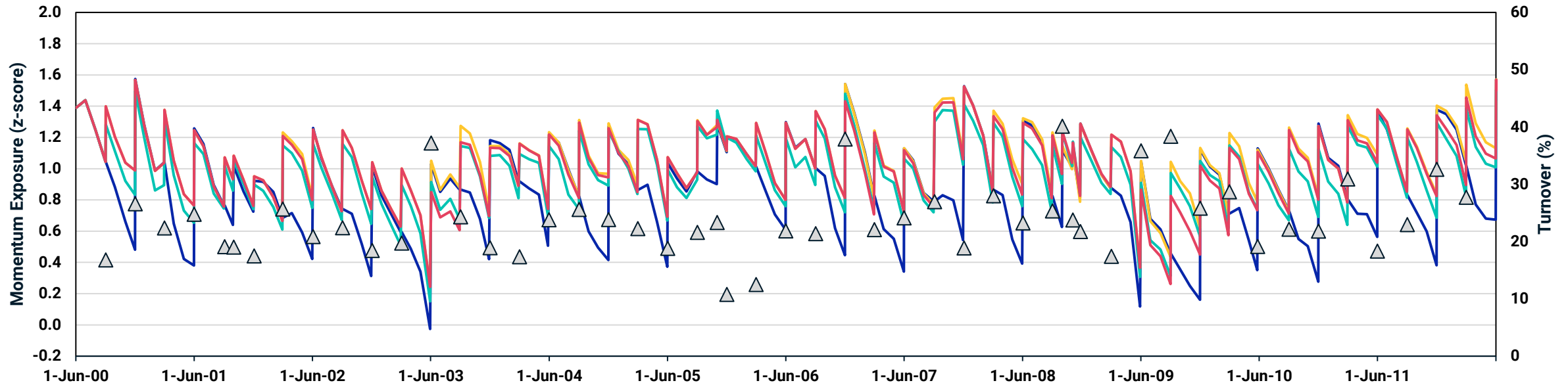


World ex USA - Momentum Exposure Decay Timeseries



Open weights at the effective date of Index Rebalancing are multiplied by Momentum z-score at different month end points to calculate decay. This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.
Information Classification: GENERAL

EM - Momentum Exposure Decay Timeseries

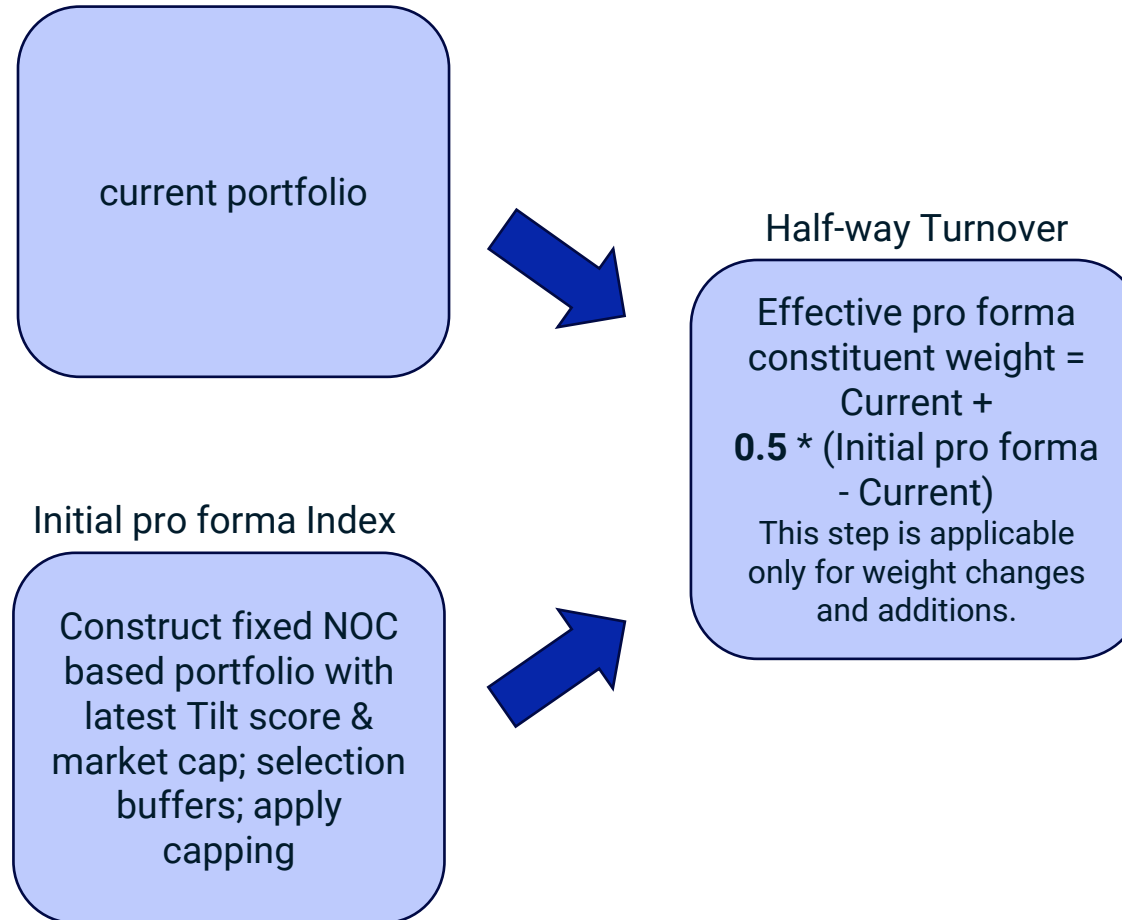


— Sim Momentum — Momentum (Qtrly) — Momentum (Half-way Turnover) — Momentum (Fixed Absolute Turnover) Δ Momentum (Half-way Turnover) - Turnover

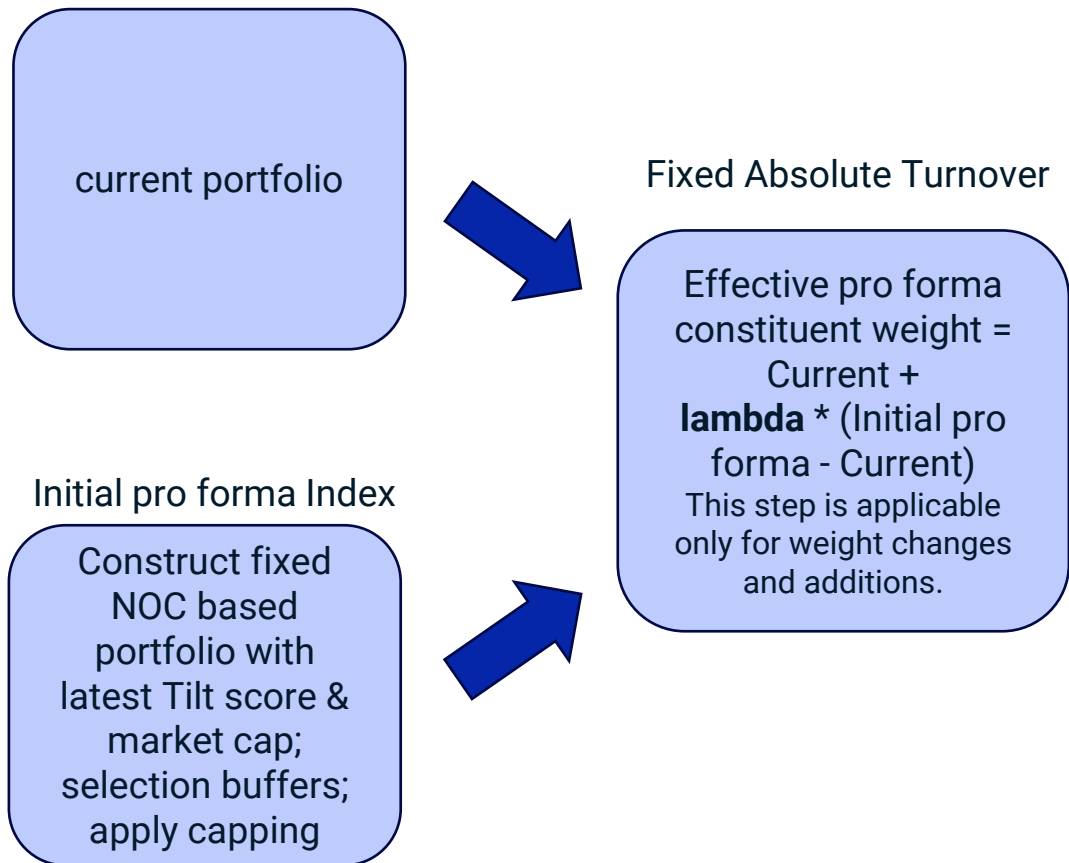


Open weights at the effective date of Index Rebalancing are multiplied by Momentum z-score at different month end points to calculate decay. This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.
Information Classification: GENERAL

Details of 'Half-way Turnover'

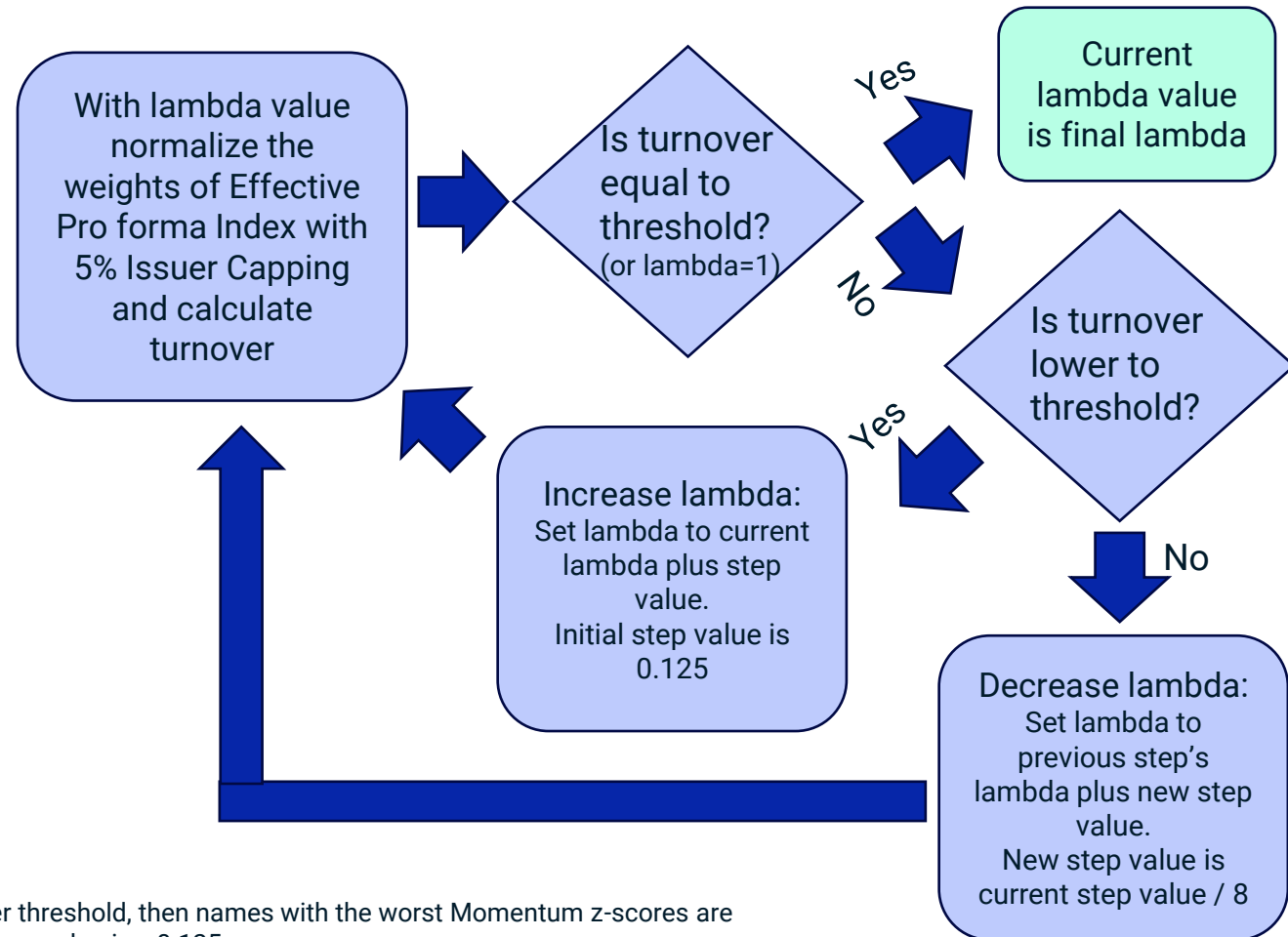


Details of 'Fixed Absolute Turnover'



Process to determine value of lambda

Initial value and Minimum value of lambda is 0.125



If the turnover incurred from deletions itself is more than the turnover threshold, then names with the worst Momentum z-scores are excluded till turnover threshold and lambda value is set at the minimum value i.e., 0.125.

Appendix – MSCI Minimum Volatility Indexes Methodology

Transition Analysis and Relaxation Details

USA Minimum Volatility			
	Minimum Volatility (Live Index)	Sim Min Vol Quar 5% TO	Sim Min Vol Quar 7.5% TO
One-way Turnover	10.0%	7.5% (Went into 1 step relaxation)	7.5% (No relaxation)
World ex USA Minimum Volatility			
	Minimum Volatility (Live Index)	Sim Min Vol Quar 5% TO	Sim Min Vol Quar 7.5% TO
One-way Turnover	10.0%	5.0% (No relaxation)	7.5% (No relaxation)
EM Minimum Volatility			
	Minimum Volatility (Live Index)	Sim Min Vol Quar 5% TO	Sim Min Vol Quar 7.5% TO
One-way Turnover	10.0%	5.0% (No relaxation)	7.5% (No relaxation)

Note: **Sim Min Vol Quar 5% TO** follows the below relaxation steps **alternatively (from current exhaustively)**:

- a) Turnover relaxation in steps of 2.5% up to a maximum of 15%.
- b) Paring constraint relaxation in steps of 0.01% from minimum asset weight of 0.05% to 0.01%.

Note: **Sim Min Vol Quar 7.5% TO** follows the below relaxation steps **alternatively (from current exhaustively)**:

- a) Turnover relaxation in steps of 2.5% up to a maximum of 15%.
- b) Paring constraint relaxation in steps of 0.01% from minimum asset weight of 0.05% to 0.01%.

Transition simulation during Jun-24 Index Review

One-way Turnover includes changes from Index Review and transition turnover from current (Live) Minimum Volatility Index

This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

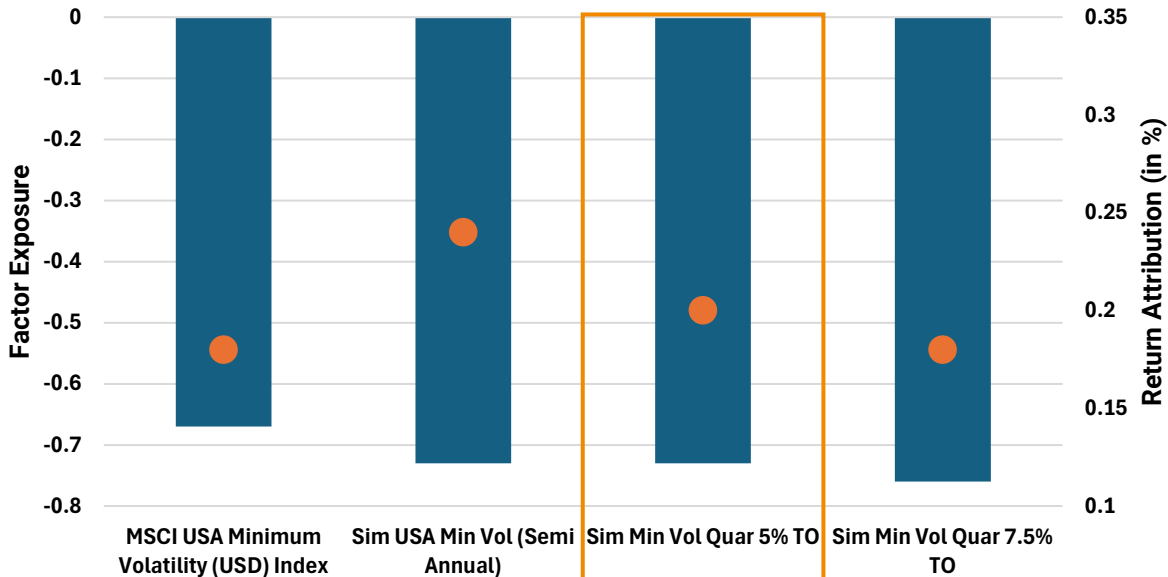


USA Factor Exposures and Return Attributions

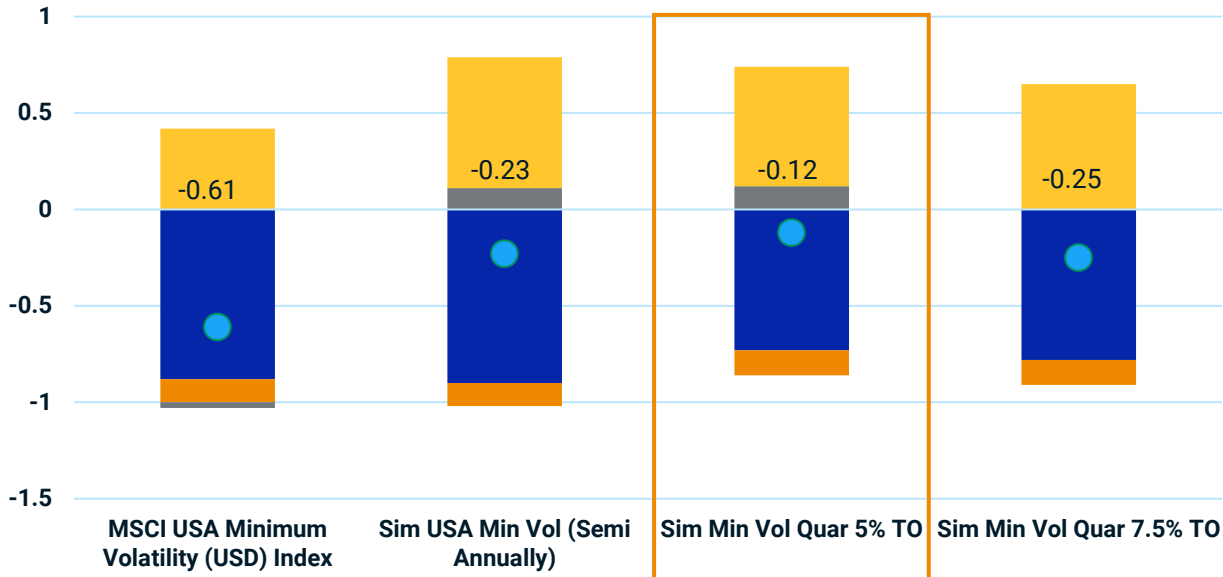
Volatility factor exposures are almost similar across all simulations (7.5% version has marginally better Low Vol exposure) with marginal change in the factor returns attributions. The Volatility factor returns was observed to be contributing positively to active return.

The specific factor active returns decreased in the “Sim Min Vol Quar 5% TO” compared to the current Live index. This increase was offset by marginal decrease in the styles factor active returns.

USA Active Factor Family Exposures



USA Return Attributions (in %)



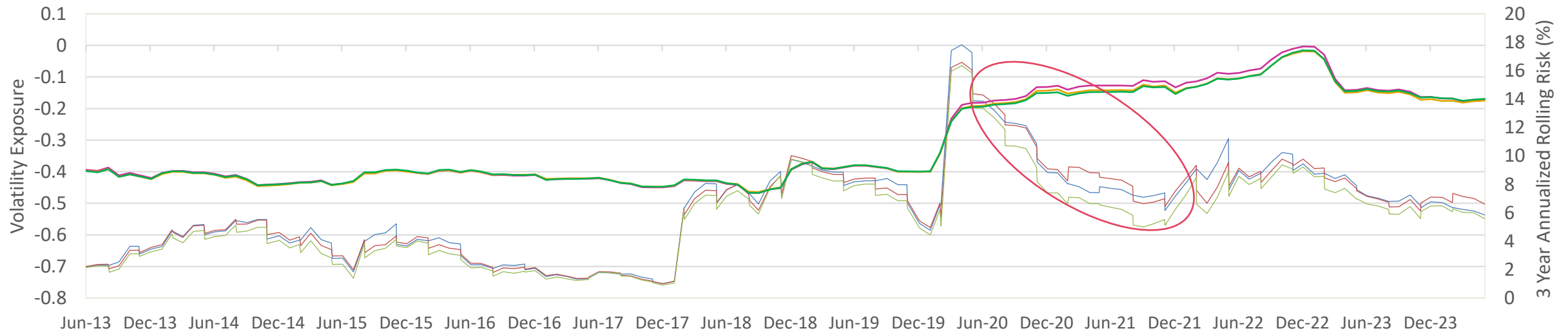
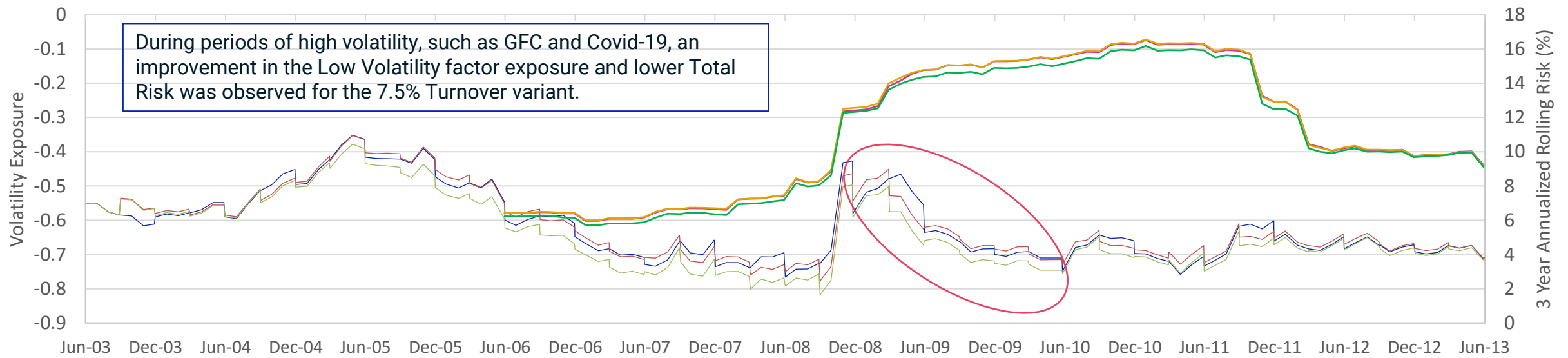
Period: May 30, 2003 to Jun 28, 2024. Active measures are w.r.t respective MSCI market cap indexes. Active returns are Gross returns annualized in USD.

■ Volatility Active Factor Family Exposure ● Volatility Factor Returns Attri.

■ Specific Return Attribution (%) ■ Countries Return Attribution (%) ■ Industries Return Attribution (%)
 ■ Styles Return Attribution (%) ● Active Return (%)



USA - Volatility Exposure Decay Timeseries



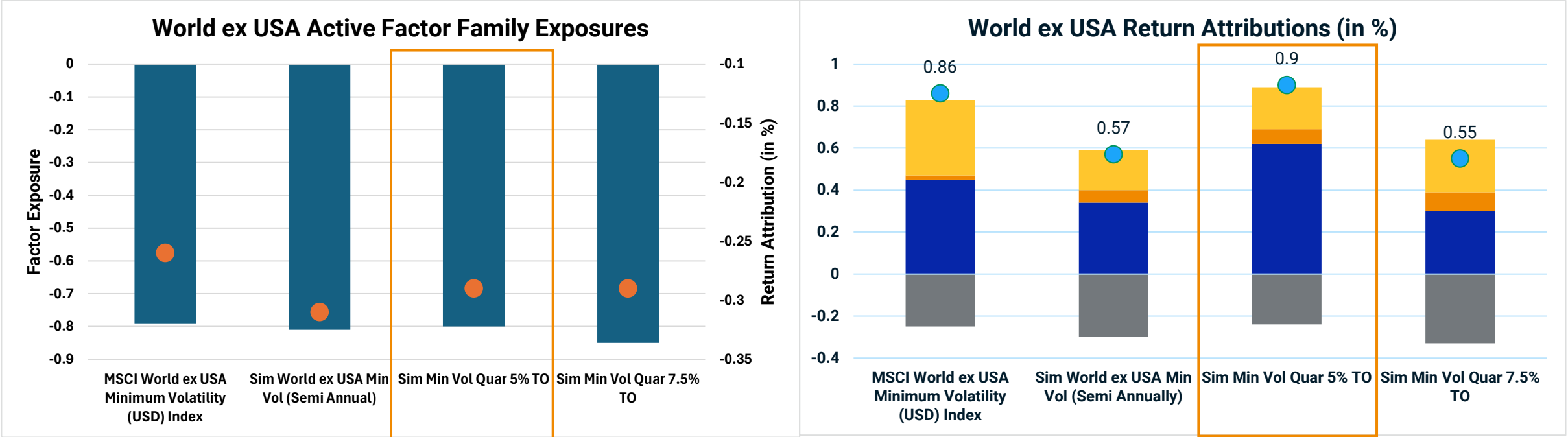
— Sim USA Min Vol
 — Sim Min Vol Quar 5% TO
 — Sim Min Vol Quar 7.5% TO
— Sim USA Min Vol 3 Yr Annualized Rolling Risk (RHS)
 — Sim Min Vol Quar 5% TO 3 Yr Annualized Rolling Risk (RHS)
 — Sim Min Vol Quar 7.5% TO 3 Yr Annualized Rolling Risk (RHS)



World ex USA Factor Exposures and Return Attributions

Volatility factor exposures are almost similar across all simulations (7.5% version has marginally better Low Vol exposure) with marginal change in the factor returns attributions. The Volatility factor returns was observed to be contributing negatively to active return.

The specific factor active returns increase in the “Sim Min Vol Quar 5% TO” compared to the current Live index. This increase caused higher active returns compared to the Simulated index.

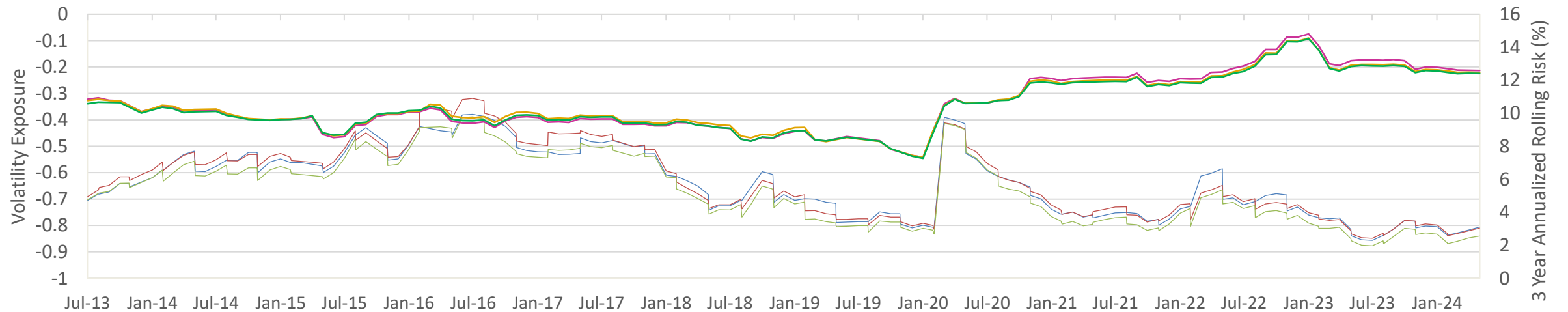
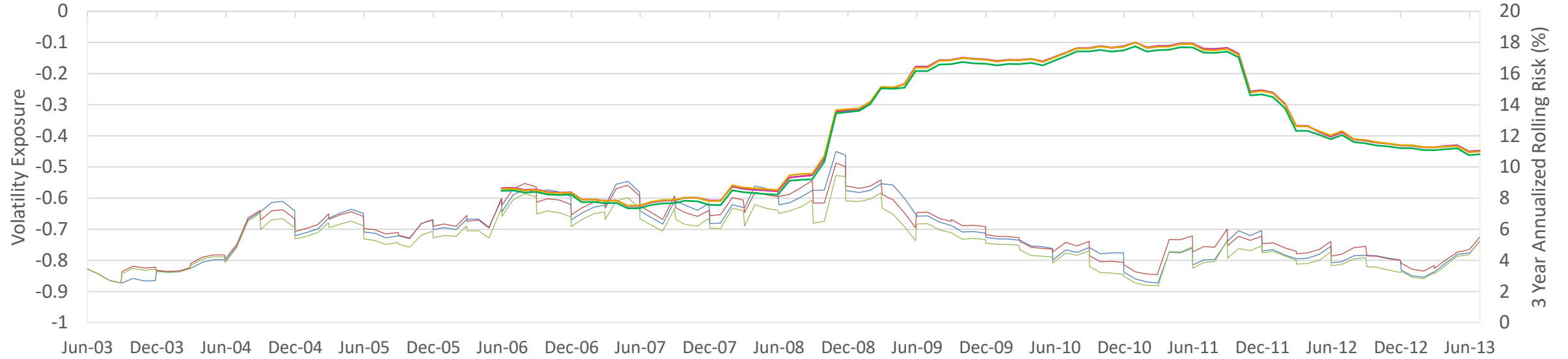


Period: May 30, 2003 to Jun 28, 2024. Active measures are w.r.t respective MSCI market cap indexes. Active returns are Gross returns annualized in USD.

■ Volatility Active Factor Family Exposure ● Volatility Factor Returns Attri.
 ■ Specific Return Attribution (%) ■ Countries Return Attribution (%) ■ Industries Return Attribution (%)
 ■ Styles Return Attribution (%) ● Active Return (%)



World ex USA - Volatility Exposure Decay Timeseries



— Sim World ex USA Min Vol — Sim Min Vol Quar 5% TO — Sim Min Vol Quar 7.5% TO
 — Sim World ex USA Min Vol 3 Yr Annualized Rolling Risk (RHS) — Sim Min Vol Quar 5% TO Risk 3 Yr Annualized Rolling Risk (RHS) — Sim Min Vol Quar 7.5% TO Risk 3 Yr Annualized Rolling Risk (RHS)

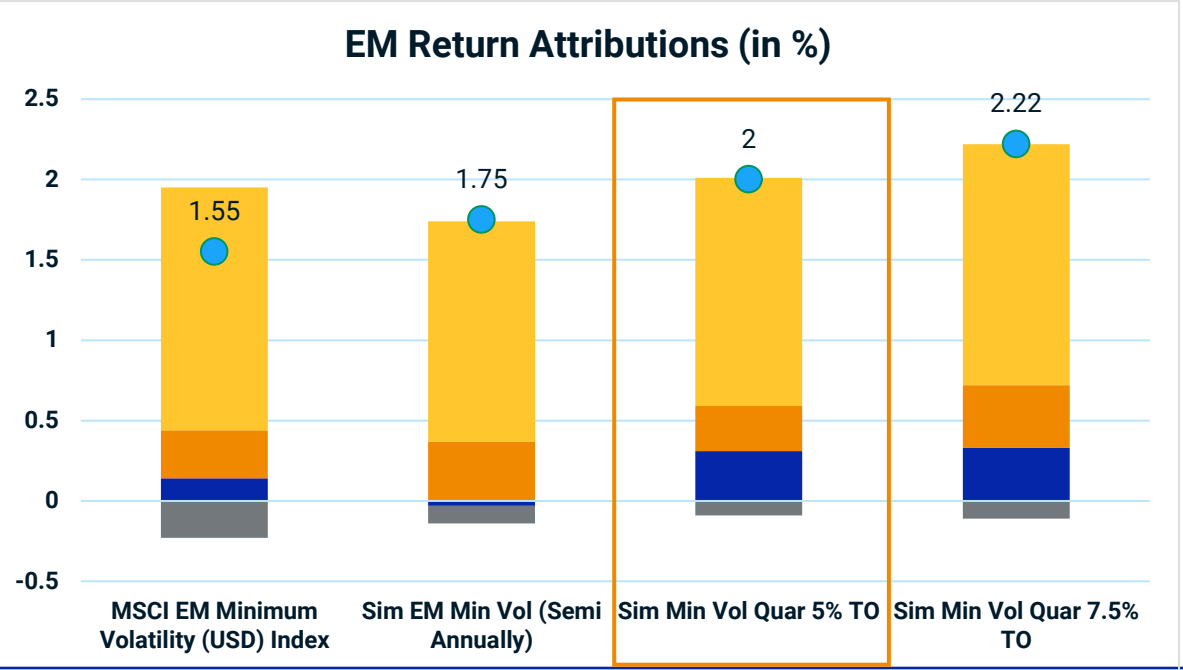
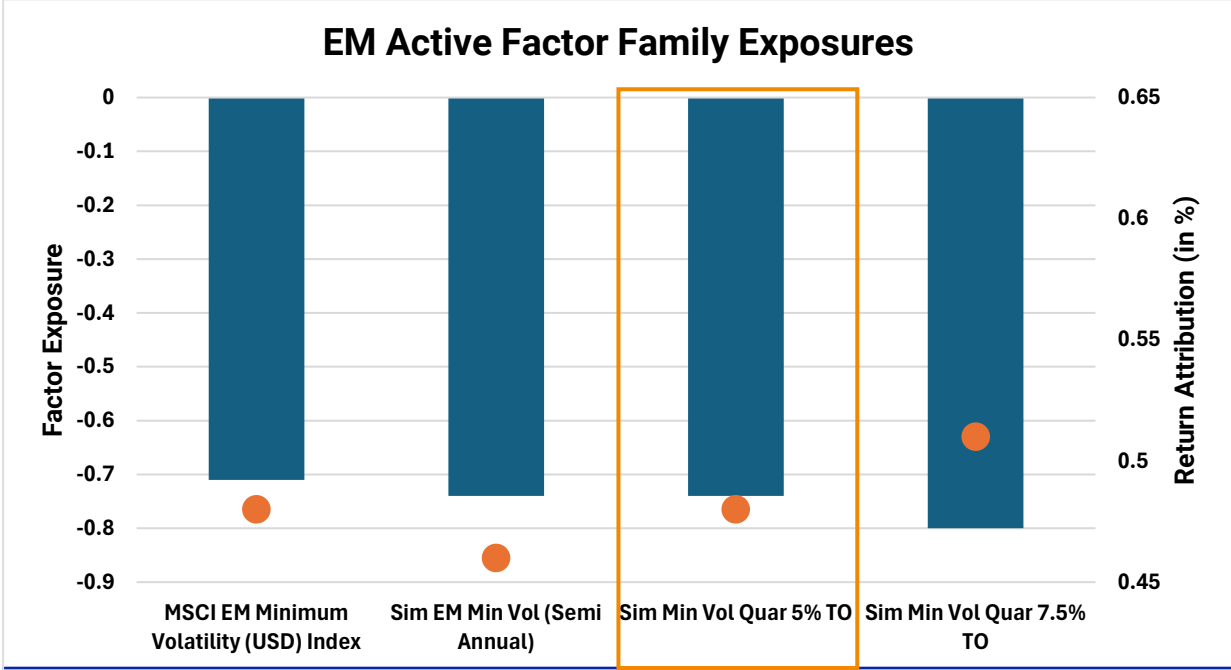


Open weights at the effective date of Index Rebalancing are multiplied by Volatility Exposures at different month end points to calculate decay. This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.
 Information Classification: GENERAL

EM Factor Exposures and Return Attributions

Volatility factor exposures are almost similar across all simulations (7.5% version has marginally better Low Vol exposure) with marginal change in the factor returns attributions. The Volatility factor returns was observed to be contributing positively to active return.

The specific factor active returns increase in the “Sim Min Vol Quar 5% TO” compared to the current Live index. This increase caused higher active returns compared to the Simulated index.



Period: May 30, 2003 to Jun 28, 2024. Active measures are w.r.t respective MSCI market cap indexes. Active returns are Gross returns annualized in USD.

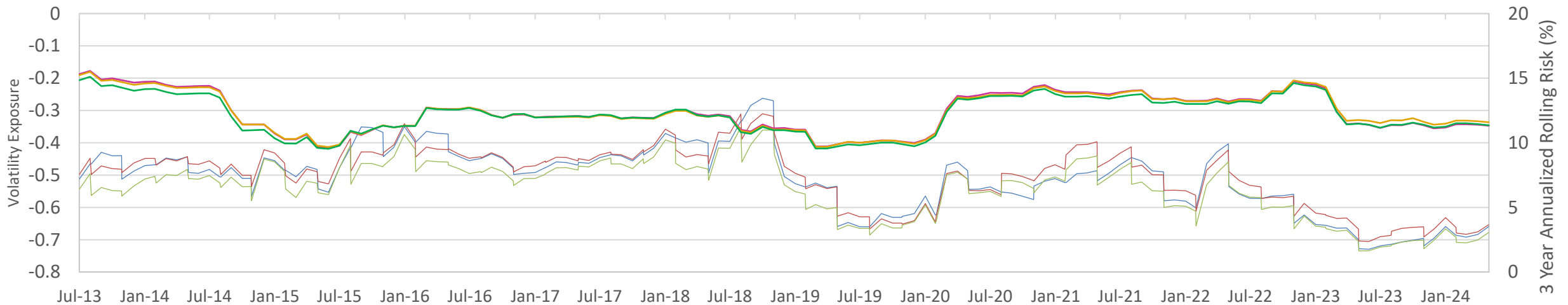
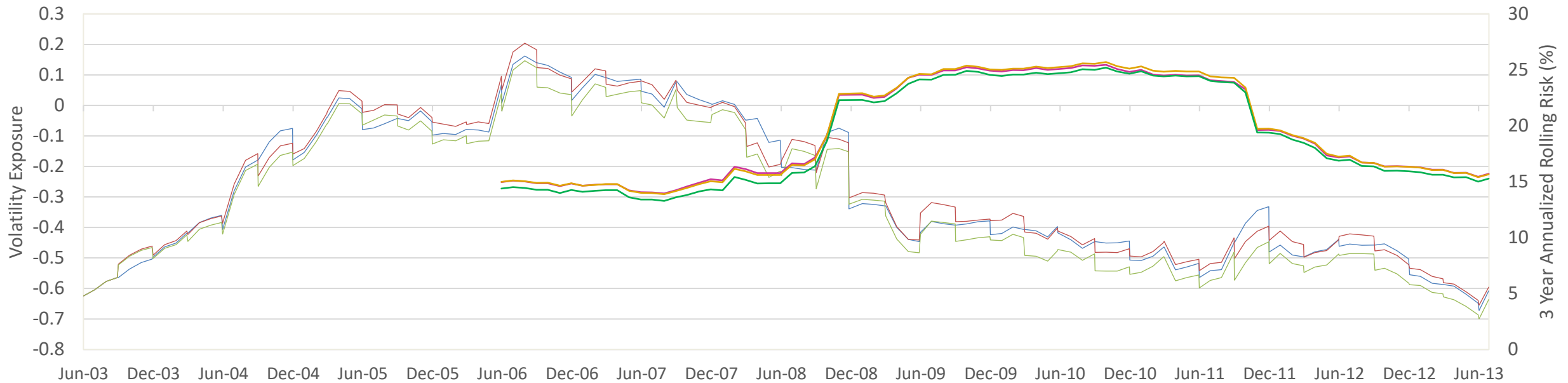
■ Volatility Active Factor Family Exposure ● Volatility Factor Returns Attri.

■ Specific Return Attribution (%) ■ Countries Return Attribution (%) ■ Industries Return Attribution (%)
 ■ Styles Return Attribution (%) ● Active Return (%)



This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

EM- Volatility Exposure Decay Timeseries



— Sim EM Min Vol
 — Sim EM Min Vol Quar 5% TO
 — Sim EM Min Vol Quar 7.5% TO
— Sim EM Min Vol 3 Yr Annualized Rolling Risk (RHS)
 — Sim EM Min Vol Quar 5% TO 3 Yr Annualized Rolling Risk (RHS)
 — Sim EM Min Vol Quar 7.5% TO 3 Yr Annualized Rolling Risk (RHS)



Open weights at the effective date of Index Rebalancing are multiplied by Volatility Exposures at different month end points to calculate decay. This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

Information Classification: GENERAL

USA Simulation Summary

		USA Minimum Volatility			
	MSCI USA Index	MSCI USA Minimum Volatility (USD) Index	Sim USA Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO	Sim Min Vol Quar 7.5% TO
Total Return* (%)	10.8	10.1	10.5	10.6	10.5
Total Risk (%)	14.8	11.7	11.4	11.3	11.2
Return / Risk	0.73	0.87	0.92	0.94	0.93
Tracking Error (%)	--	6.2	6.2	6.3	6.5
Beta	--	0.72	0.71	0.70	0.69
Turnover** (%)	--	23.7	20.0	20.1	30.0
Volatility Active Factor Family Exposure***	--	-0.67	-0.73	-0.73	-0.76
Specific Active Return Attribution (%)	--	-0.88	-0.90	-0.73	-0.78
Countries Active Return Attribution (%)	--	-0.12	-0.12	-0.13	-0.13
Industries Active Return Attribution (%)	--	-0.03	0.11	0.12	0.00
Styles Active Return Attribution (%)	--	0.42	0.68	0.62	0.65
Specific Risk (%)		2.86	2.68	2.69	2.72
Common Risk (%)		11.58	11.20	11.16	10.97

Period: May 30, 2003 to Jun 28, 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 Minimum Volatility (USD) Index	Sim USA Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO	Sim Min Vol Quar 7.5% TO
1 Yr	26.7	16.6	16.6	16.6	16.4
3 Yr	9.2	6.2	6.1	6.6	6.2
5 Yr	15.0	8.3	8.3	8.6	8.2
10 Yr	12.8	10.7	10.6	10.9	10.6

Gross returns for the period ending Jun 28, 2024. Returns are annualized for periods longer than a year



This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

Information Classification: GENERAL

World ex USA Simulation Summary

		World ex USA Minimum Volatility			
	MSCI World ex USA Index	MSCI World ex USA Minimum Volatility (USD) Index	Sim World ex USA Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO	Sim Min Vol Quar 7.5% TO
Total Return* (%)	7.5	8.3	8.0	8.4	8.0
Total Risk (%)	16.5	11.9	11.7	11.7	11.6
Return / Risk	0.45	0.70	0.69	0.71	0.69
Tracking Error (%)	--	6.9	7.2	7.2	7.3
Beta	--	0.67	0.66	0.66	0.65
Turnover** (%)	--	20.1	20.0	20.0	30.0
Volatility Active Factor Family Exposure***	--	-0.79	-0.81	-0.80	-0.85
Specific Active Return Attribution (%)	--	0.45	0.34	0.62	0.30
Countries Active Return Attribution (%)	--	0.02	0.06	0.07	0.09
Industries Active Return Attribution (%)	--	-0.25	-0.30	-0.24	-0.33
Styles Active Return Attribution (%)	--	0.36	0.19	0.20	0.25
Specific Risk (%)	--	2.17	2.17	2.17	2.09
Common Risk (%)	--	9.20	9.14	9.12	8.97

Period: May 30, 2003 to Jun 28, 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 Minimum Volatility (USD) Index	Sim World ex USA Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO	Sim Min Vol Quar 7.5% TO
1 Yr	12.9	7.0	7.0	7.2	6.5
3 Yr	3.1	0.2	0.1	0.4	0.0
5 Yr	7.1	2.7	2.5	3.1	2.6
10 Yr	4.8	4.4	4.3	4.8	4.4

Gross returns for the period ending Jun 28, 2024. Returns are annualized for periods longer than a year



This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

Information Classification: GENERAL

EM Simulation Summary

		EM Minimum Volatility			
	MSCI EM (Emerging Markets) Index	MSCI EM Minimum Volatility (USD) Index	Sim EM Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO	Sim Min Vol Quar 7.5% TO
Total Return* (%)	9.0	10.6	10.7	11.0	11.2
Total Risk (%)	20.6	16.0	15.8	15.6	15.3
Return / Risk	0.44	0.66	0.68	0.70	0.73
Tracking Error (%)	--	6.4	6.4	6.5	6.8
Beta	--	0.75	0.75	0.74	0.72
Turnover** (%)	--	21.9	20.5	21.0	30.8
Volatility Active Factor Family Exposure***	--	-0.71	-0.74	-0.74	-0.80
Specific Active Return Attribution (%)	--	0.14	-0.03	0.31	0.33
Countries Active Return Attribution (%)	--	0.30	0.37	0.28	0.39
Industries Active Return Attribution (%)	--	-0.23	-0.11	-0.09	-0.11
Styles Active Return Attribution (%)	--	1.51	1.37	1.42	1.50
Specific Risk (%)		3.03	2.91	2.94	3.03
Common Risk (%)		11.55	11.47	11.32	11.12

Period: May 30, 2003 to Jun 28, 2024. * Gross returns annualized in USD ** Annualized one-way index turnover over index reviews *** Active values are w.r.t MSCI EM Index.

Performance (%)	MSCI EM (Emerging Markets) Index	MSCI EM Minimum Volatility (USD) Index	Sim EM Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO	Sim Min Vol Quar 7.5% TO
1 Yr	12.8	9.0	9.5	9.7	10.7
3 Yr	-4.8	-0.6	-0.1	-0.1	0.8
5 Yr	3.5	2.9	3.1	3.5	3.8
10 Yr	3.2	2.8	3.0	3.3	3.4

Gross returns for the period ending Jun 28, 2024. Returns are annualized for periods longer than a year



This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

Information Classification: GENERAL

USA Simulation Summary – Most recent risk model data

		USA Minimum Volatility			
	MSCI USA Index	MSCI USA Minimum Volatility (USD) Index	Sim USA Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO Lagged Model Data	Sim Min Vol Quar 5% TO Latest Model Data
Total Return* (%)	10.8	10.1	10.5	10.5	10.5
Total Risk (%)	14.8	11.7	11.4	11.4	11.4
Return / Risk	0.73	0.87	0.92	0.92	0.92
Tracking Error (%)	--	6.2	6.2	6.2	6.2
Beta		0.72	0.71	0.71	0.71
Turnover** (%)	--	23.7	20.0	20.1	20.1
Volatility Active Factor Family Exposure***	--	-0.67	-0.73	-0.73	-0.74
Specific Active Return Attribution (%)	--	-0.88	-0.90	-0.85	-0.79
Countries Active Return Attribution (%)	--	-0.12	-0.12	-0.13	-0.12
Industries Active Return Attribution (%)	--	-0.03	0.11	0.13	0.08
Styles Active Return Attribution (%)	--	0.42	0.68	0.62	0.62

Period: May 30, 2003 to Jun 28, 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 Minimum Volatility (USD) Index	Sim USA Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO Lagged Model Data	Sim Min Vol Quar 5% TO Latest Model Data
1 Yr	26.7	16.6	16.6	16.4	16.1
3 Yr	9.2	6.2	6.1	6.4	6.2
5 Yr	15.0	8.3	8.3	8.4	8.5
10 Yr	12.8	10.7	10.6	10.7	10.8

Gross returns for the period ending Jun 28, 2024. Returns are annualized for periods longer than a year

- 'Lagged Model Data' is the simulation with risk model data as of last end of month, prior to the rebalancing date.
- 'Latest Model Data' is the simulation with risk model data as of previous day (T-10), prior to the rebalancing date.



This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

Information Classification: GENERAL

World ex USA Simulation Summary – Most recent risk model data

		World ex USA Minimum Volatility			
	MSCI World ex USA Index	MSCI World ex USA Minimum Volatility (USD) Index	Sim World ex USA Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO Lagged Model Data	Sim Min Vol Quar 5% TO Latest Model Data
Total Return* (%)	7.5	8.3	8.0	8.3	8.3
Total Risk (%)	16.5	11.9	11.7	11.7	11.7
Return / Risk	0.45	0.70	0.69	0.71	0.70
Tracking Error (%)	--	6.9	7.2	7.2	7.1
Beta	--	0.67	0.66	0.66	0.66
Turnover** (%)	--	20.1	20.0	20.0	20.0
Volatility Active Factor Family Exposure***	--	-0.79	-0.81	-0.79	-0.79
Specific Active Return Attribution (%)	--	0.45	0.34	0.58	0.60
Countries Active Return Attribution (%)	--	0.02	0.06	0.08	0.08
Industries Active Return Attribution (%)	--	-0.25	-0.30	-0.23	-0.26
Styles Active Return Attribution (%)	--	0.36	0.19	0.19	0.16

Period: May 30, 2003 to Jun 28, 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 Minimum Volatility (USD) Index	Sim World ex USA Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO Lagged Model Data	Sim Min Vol Quar 5% TO Latest Model Data
1 Yr	12.9	7.0	7.0	7.3	7.3
3 Yr	3.1	0.2	0.1	0.1	0.4
5 Yr	7.1	2.7	2.5	3.0	3.1
10 Yr	4.8	4.4	4.3	4.8	4.6

Gross returns for the period ending Jun 28, 2024. Returns are annualized for periods longer than a year

- 'Lagged Model Data' is the simulation with risk model data as of last end of month, prior to the rebalancing date.
- 'Latest Model Data' is the simulation with risk model data as of previous day (T-10), prior to the rebalancing date.



This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

Information Classification: GENERAL

EM Simulation Summary – Most recent risk model data

		EM Minimum Volatility			
	MSCI EM (Emerging Markets) Index	MSCI EM Minimum Volatility (USD) Index	Sim EM Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO Lagged Model Data	Sim Min Vol Quar 5% TO Latest Model Data
Total Return* (%)	9.0	10.6	10.7	11.1	10.8
Total Risk (%)	20.6	16.0	15.8	15.8	15.9
Return / Risk	0.44	0.66	0.68	0.71	0.68
Tracking Error (%)	--	6.4	6.4	6.4	6.3
Beta	--	0.75	0.75	0.75	0.75
Turnover** (%)	--	21.9	20.5	21.1	20.6
Volatility Active Factor Family Exposure***	--	-0.71	-0.74	-0.72	-0.72
Specific Active Return Attribution (%)	--	0.14	-0.03	0.35	0.12
Countries Active Return Attribution (%)	--	0.30	0.37	0.30	0.22
Industries Active Return Attribution (%)	--	-0.23	-0.11	-0.08	-0.09
Styles Active Return Attribution (%)	--	1.51	1.37	1.48	1.45

Period: May 30, 2003 to Jun 28, 2024. * Gross returns annualized in USD ** Annualized one-way index turnover over index reviews *** Active values are w.r.t MSCI EM Index.

Performance (%)	MSCI EM (Emerging Markets) Index	MSCI EM Minimum Volatility (USD) Index	Sim EM Min Vol (Semi Annual)	Sim Min Vol Quar 5% TO Lagged Model Data	Sim Min Vol Quar 5% TO Latest Model Data
1 Yr	12.8	9.0	9.5	9.7	9.2
3 Yr	-4.8	-0.6	-0.0	-0.2	-0.5
5 Yr	3.5	2.9	3.0	3.5	3.6
10 Yr	3.2	2.8	3.0	3.3	3.4

Gross returns for the period ending Jun 28, 2024. Returns are annualized for periods longer than a year

- 'Lagged Model Data' is the simulation with risk model data as of last end of month, prior to the rebalancing date.
- 'Latest Model Data' is the simulation with risk model data as of previous day (T-10), prior to the rebalancing date.



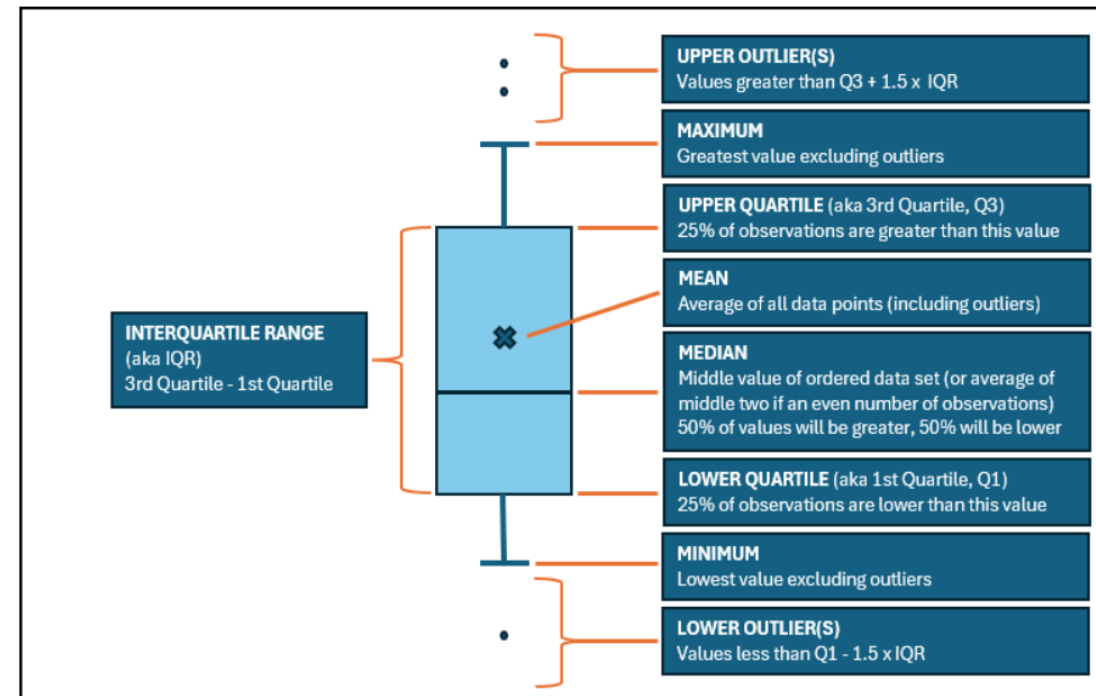
This analysis uses historical back-tested or simulated data. Such performance data is not indicative of future performance, which may differ materially. Please refer to the disclosures at the end of this presentation for more information.

Information Classification: GENERAL

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



About MSCI

MSCI is a leading provider of critical decision support tools and services for the global investment community. With over 50 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.

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>.

Contact Us

AMERICAS	EUROPE, MIDDLE EAST & AFRICA	ASIA PACIFIC
United States +1 888 588 4567 *	South Africa + 27 21 673 0103	China + 86 21 61326611
Canada + 1 416 687 6270	Germany + 49 69 133 859 00	Hong Kong + 852 2844 9333
Brazil + 55 11 4040 7830	Switzerland + 41 22 817 9777	India + 91 22 6784 9160
Mexico + 52 81 1253 4020	United Kingdom + 44 20 7618 2222	Malaysia 1800818185 *
	Italy + 39 02 5849 0415	South Korea +82 70 4769 4231
	France + 33 17 6769 810	Singapore +65 67011177
		Australia +612 9033 9333
		Taiwan 008 0112 7513*
		Thailand 0018 0015 6207 7181*
		Japan +81 3 4579 0333

* = toll free
[msci.com/contact-us](https://www.msci.com/contact-us)



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 and 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 disseminated in whole or in part without prior written permission from MSCI. All rights in the Information are reserved by MSCI and/or its Information Providers.

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 may include "Signals," defined as quantitative attributes or the product of methods or formulas that describe or are derived from calculations using historical data. Neither these Signals nor any description of historical data are intended to provide investment advice or a recommendation to make (or refrain from making) any investment decision or asset allocation and should not be relied upon as such. Signals are inherently backward-looking because of their use of historical data, and they are not intended to predict the future. The relevance, correlations and accuracy of Signals frequently will change materially.

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 investable assets/securities. MSCI maintains and calculates indexes, but does not manage actual assets. The calculation of indexes and index returns may deviate from the stated methodology. 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 msci.com.

MSCI ESG Research LLC is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc. 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 a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such, provided that applicable products or services from MSCI ESG Research may constitute investment advice. 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. MSCI ESG and climate ratings, research and data are produced by MSCI ESG Research LLC, a subsidiary of MSCI Inc. MSCI ESG Indexes, Analytics and Real Estate are products of MSCI Inc. that utilize information from MSCI ESG Research LLC. MSCI Indexes are administered by MSCI Limited (UK) and MSCI Deutschland GmbH.

Please note that the issuers mentioned in MSCI ESG Research materials sometimes have commercial relationships with MSCI ESG Research and/or MSCI Inc. (collectively, "MSCI") and that these relationships create potential conflicts of interest. In some cases, the issuers or their affiliates purchase research or other products or services from one or more MSCI affiliates. In other cases, MSCI ESG Research rates financial products such as mutual funds or ETFs that are managed by MSCI's clients or their affiliates, or are based on MSCI Inc. Indexes. In addition, constituents in MSCI Inc. equity indexes include companies that subscribe to MSCI products or services. In some cases, MSCI clients pay fees based in whole or part on the assets they manage. MSCI ESG Research has taken a number of steps to mitigate potential conflicts of interest and safeguard the integrity and independence of its research and ratings. More information about these conflict mitigation measures is available in our Form ADV, available at <https://adviserinfo.sec.gov/firm/summary/169222>.

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 S&P Global Market Intelligence. "Global Industry Classification Standard (GICS)" is a service mark of MSCI and S&P Global Market Intelligence.

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.

Privacy notice: For information about how MSCI collects and uses personal data, please refer to our Privacy Notice at <https://www.msci.com/privacy-pledge>.

