

# EUROPE TOTAL MARKET EQUITY MODEL FOR LONG TERM INVESTORS (EULTS) FOR MSCI INDEXES

**March 2019**

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

# SUMMARY

- The MSCI Barra Factor Indexes (Long-Short, Market Neutral and Long-Only) are currently constructed using the Barra Europe Equity Base Model – Short Term Variant (EUE3S BAS)
- A new version of that model, the Barra Europe Total Market Equity Model for Long Term Investors - Responsive Variant (EULTS), was launched in December 2017.
- Enhancements include:
  - Introduction of new Style factors based on Systematic Equity Strategies
  - Enhanced industry and country exposures that capture the varying sensitivities of firms to the country and industry factors resulting in more precise attribution of stock returns
  - Point-in-Time fundamental data to help address potential look-ahead bias
  - Broad coverage of stocks, cross-listed securities, and depository receipts.
- MSCI proposes to transition the index construction of the MSCI Barra Factor Indexes to use the latest EULTS Model, using corresponding model factor definitions, so as to better capture the targeted risk premia
- MSCI welcomes feedback from the investment community on the proposal on or before April 5, 2019. MSCI will announce the results of the consultation on or before April 19, 2019.

# MSCI INDEXES IN SCOPE FOR PROPOSED USE OF BARRA EULTS MODEL IN INDEX CONSTRUCTION

MSCI Long-Short Barra Factor Index	Target Factor	Target Factor Exposure <sup>5</sup>	Leverage
MSCI Europe Barra Momentum Index	Momentum	1	130/30
MSCI Europe Barra Value Index	Value	1	130/30
MSCI Europe Barra Low Volatility Index	Volatility	-1	150/50
MSCI Europe Barra Low Leverage Index	Leverage	-1	130/30
MSCI Europe Barra Earnings Yield Index	Earnings Yield	1	130/30

MSCI Market Neutral Barra Factor Index	Target Factor	Target Factor Exposure
MSCI Europe Market Neutral Barra Momentum Index (EUR)	Momentum	1
MSCI Europe Market Neutral Barra Momentum Index (USD)	Momentum	1
MSCI Europe Market Neutral Barra Volatility Index (EUR)	Volatility	1
MSCI Europe Market Neutral Barra Volatility Index (USD)	Volatility	1

MSCI Long-Only Barra Factor Index	Target Factor	Target Factor Exposure	Leverage
MSCI Europe Momentum Tilt Index	Momentum	Positive	Long-only
MSCI Europe Value Tilt Index	Value	Positive	Long-only

# OVERVIEW OF THE EULTS MODEL

STYLE FACTOR	EUE3 Model	EULT Model
Asset Coverage	9400	16400+
Style Factors	9	18
Industry Allocation Scheme	Single-industry allocation	Multiple-industry allocation
<b>Book-to-Price (Value in EUE3)</b>	<p>Indicates how “inexpensively” a company is currently traded by using its book value and past revenues as yardsticks.</p> <ul style="list-style-type: none"> <li>• Book-to-Price Ratio • <b>Sales-to-Price Ratio</b></li> </ul>	<p>Explains the return component attributable to a stock's book-to-price ratio and can be an indicator of value</p> <ul style="list-style-type: none"> <li>• Book-to-Price</li> </ul>
<b>Earnings Yield</b>	<p>Relates the current market valuation of a company to its ability to generate positive earnings and cash flows.</p> <ul style="list-style-type: none"> <li>• Cash Earnings-to-Price Ratio • Trailing Annual Earnings-to-Price Ratio • Predicted Earnings- to-Price-Ratio • <b>Return on Equity</b></li> </ul>	<p>Describes stock return differences due to various ratios of the company's earnings relative to its price.</p> <ul style="list-style-type: none"> <li>• Cash Earnings-to-Price • Earnings-to-Price • Analyst-Predicted Earnings-to-Price • <b>Enterprise Multiple (EBIT to EV)</b></li> </ul>
<b>Momentum</b>	<p>Describes risk associated with the trending behavior of stock returns over a horizon of about a year.</p> <ul style="list-style-type: none"> <li>• 12-Month Relative Strength, lagged by 1 month • <b>6-Month Relative Strength, lagged by 1 month</b> • Historical Weekly Alpha</li> </ul>	<p>Explains the return differences of stocks based on their relative performance over the trailing 6-12 months.</p> <ul style="list-style-type: none"> <li>• Relative Strength 12-Month • Historical Alpha</li> </ul>
<b>Beta (Volatility in EUE3)</b>	<p>Captures return and risk differences between high-beta and low-beta stocks. Complements the regional market factor, which represents the volatility of a broadly diversified market portfolio with <math>\beta = 1</math>.</p> <ul style="list-style-type: none"> <li>• Historical Weekly Beta • Cumulative Range • Daily Asset Volatility</li> </ul>	<p>Captures the market risk that cannot be explained by the Market Equity factor</p> <ul style="list-style-type: none"> <li>• Historical Beta</li> </ul>
<b>Residual Volatility (Volatility in EUE3)</b>		<p>Explains returns associated with high-volatility stocks that are not captured by the Beta factor.</p> <ul style="list-style-type: none"> <li>• <b>Historical Sigma</b> • Daily Standard Deviation • Cumulative Range</li> </ul>
<b>Leverage</b>	<p>Captures the relationship between a firm’s stock returns and its level of indebtedness.</p> <ul style="list-style-type: none"> <li>• Market Leverage • Book Leverage</li> </ul>	<p>Captures the return differences between high-leverage and low-leverage stocks.</p> <ul style="list-style-type: none"> <li>• <b>Debt-to-Assets Ratio</b> • Book Leverage • Market Leverage</li> </ul>

# MSCI LONG SHORT BARRA FACTOR INDEXES

# EXISTING V/S PROPOSED METHODOLOGY

Parameter	MSCI Long-Short Barra Factor Indexes (Existing)	MSCI Long-Short Barra Factor Indexes (Proposed)
Parent Index (Stock Selection Universe)	MSCI Europe IMI	MSCI Europe IMI
Benchmark/ Reference Index	MSCI Europe	MSCI Europe
Barra Model	EUE3SBAS	EULTS
Index Type	Long-Short 130/30 (150/50 for Low Volatility)	Long-Short 130/30 (150/50 for Low Volatility)
Optimization Objective	Designed to achieve a high level of exposure to the Target Factor while controlling exposure to other factors and minimizing the ex-ante tracking error relative to the Benchmark Index (MSCI Europe).	
Gross Leverage	1.6 (2.0 for Low Volatility)	1.6 (2.0 for Low Volatility)
Target factor exposure	1 or -1 standard deviation*	1 or -1 standard deviation*
Non-target style factor exposure	+/- 0.1	+/- 0.1
Industry factor exposure	+/- 0.50%	+/- 0.50%
Country factor exposure	+/- 0.50%	+/- 0.50%
Max number of stocks	400	400
Maximum constituent weight	+/- 2%	+/- 2%
One-way monthly turnover	8% (one-way)	8% (one-way)
1-month ADV Trade Limit	10%	10%
Shorting Cost threshold	250bps (buffer-50bps)	250bps (buffer-50bps)

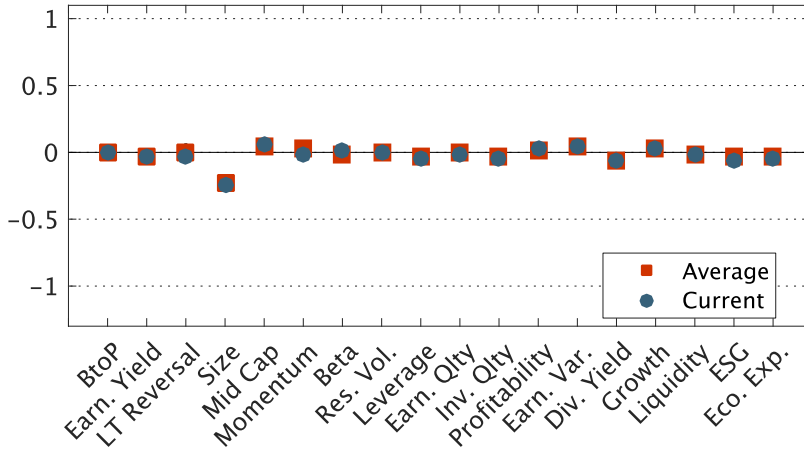
**Proposal** – Transition the EUE3-based Long-Short factor indexes to the EULT model using corresponding model factor definitions

* Target Factor Exposures	(Existing)	(Proposed)
MSCI Long-Short Barra Value Index	+1 standard deviation of EUE3SBAS Value	+1 standard deviation of EULTS Book To Price
MSCI Long-Short Barra Earnings Yield Index	+1 standard deviation of EUE3SBAS Earnings Yield	+1 standard deviation of EULTS Earnings Yield
MSCI Long-Short Barra Momentum Index	+1 standard deviation of EUE3SBAS Momentum	+1 standard deviation of EULTS Momentum
MSCI Long-Short Barra Low Leverage Index	-1 standard deviation of EUE3SBAS Leverage	-1 standard deviation of EULTS Leverage
MSCI Long-Short Barra Low Volatility Index	-1 standard deviation of EUE3SBAS Volatility	-1 standard deviation of EULTS Beta and EULTS Residual Volatility capped between [-1,0]

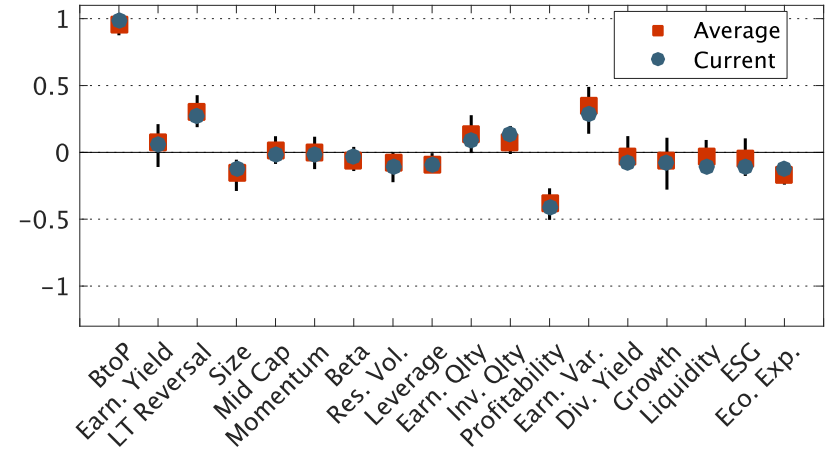
- At each monthly index rebalancing, the Index will have short positions only in securities whose Shorting Cost is below the Shorting Cost Cutoff
- At each monthly rebalancing, the weight of each Index constituent will not change more than a predefined Trade Limit linked to the stock's Average Daily Traded Value

# ACTIVE EULTS FACTOR EXPOSURES

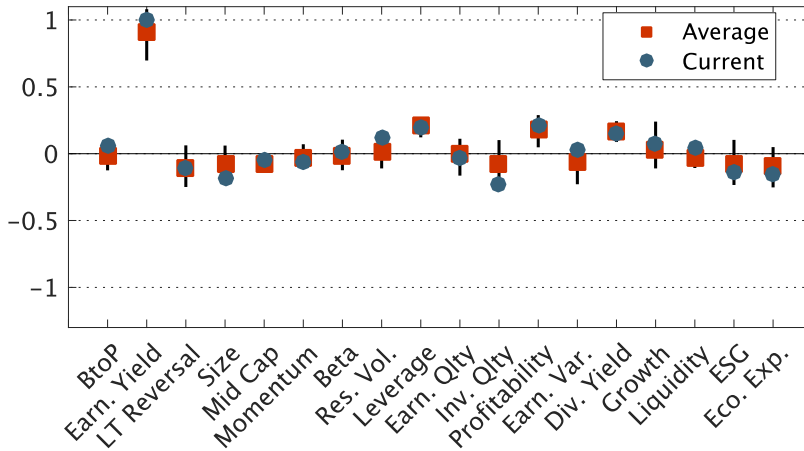
MSCI Europe IMI Index



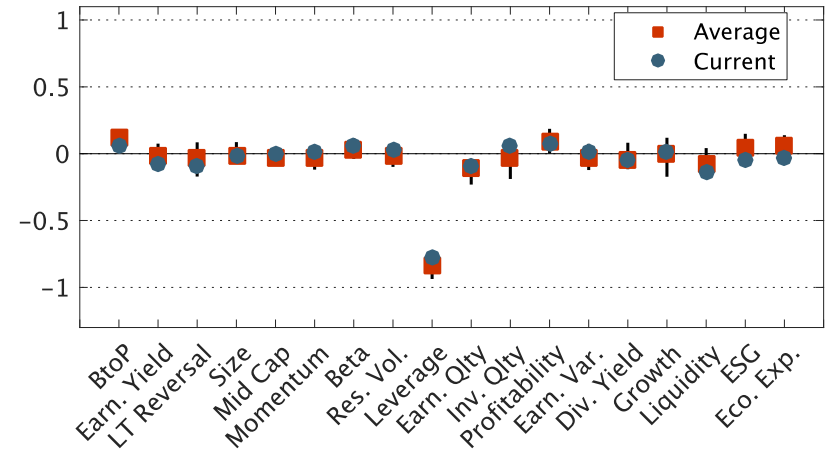
MSCI Europe Barra Value Index



MSCI Europe Barra Earnings Yield Index



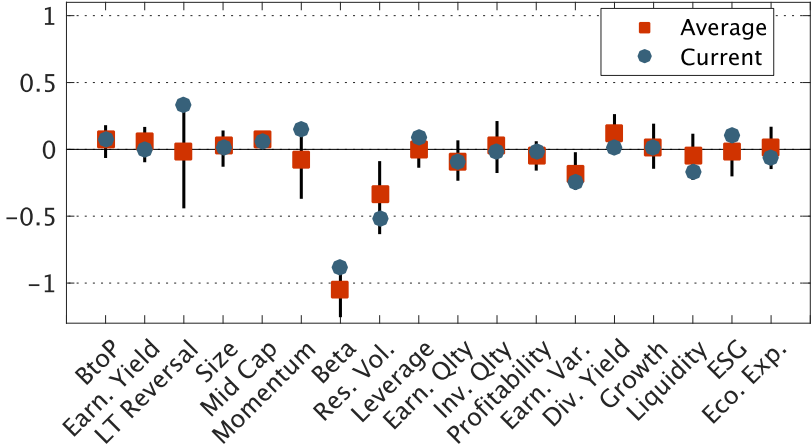
MSCI Europe Barra Low Leverage Index



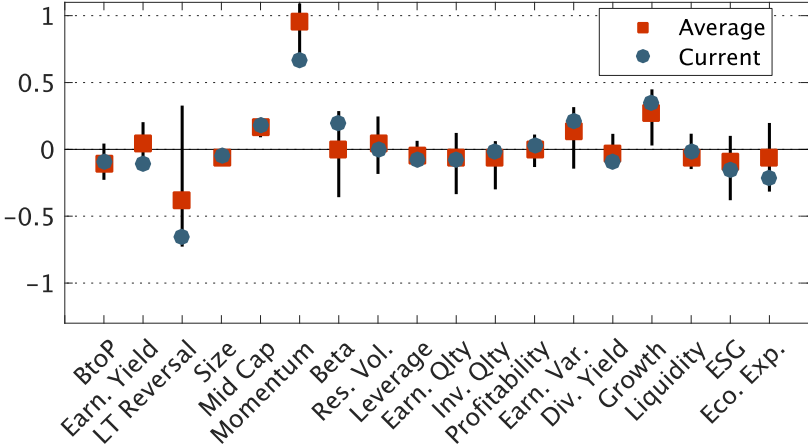


# ACTIVE EULTS FACTOR EXPOSURES (CONT...)

MSCI Europe Barra Low Volatility Index



MSCI Europe Barra Momentum Index



# CHARACTERISTICS OF SIMULATED INDEXES USING EXISTING AND PROPOSED METHODOLOGIES

# KEY METRICS

Key Metrics											
	MSCI Europe Index	Europe Barra Value EUE3SBAS	Europe Barra Value EULTS	Europe Barra Earnings Yield EUE3SBAS	Europe Barra Earnings Yield EULTS	Europe Barra Low Leverage EUE3SBAS	Europe Barra Low Leverage EULTS	Europe Barra Low Volatility EUE3SBAS	Europe Barra Low Volatility EULTS	Europe Barra Momentum EUE3SBAS	Europe Barra Momentum EULTS
Total Return* (%)	6.1	5.5	6.7	6.8	6.8	5.7	5.8	5.6	5.3	11.1	10.7
Total Risk (%)	16.7	17.4	16.9	17.0	16.9	16.8	16.7	13.4	13.6	16.6	16.5
Return/Risk	0.36	0.32	0.40	0.40	0.40	0.34	0.35	0.42	0.39	0.67	0.65
Sharpe Ratio	0.33	0.29	0.37	0.37	0.37	0.31	0.31	0.38	0.35	0.64	0.62
Active Return (%)	0.0	-0.5	0.7	0.7	0.7	-0.3	-0.3	-0.5	-0.7	5.1	4.7
Tracking Error (%)	0.0	2.7	1.9	2.5	2.0	1.4	1.2	4.8	4.7	4.7	4.4
Information Ratio	NaN	-0.20	0.35	0.29	0.37	-0.23	-0.25	-0.10	-0.15	1.08	1.06
Historical Beta	1.00	1.03	1.01	1.01	1.01	1.00	1.00	0.78	0.80	0.95	0.95
No of Stocks***	448	400	400	400	400	400	400	400	400	400	400
Turnover** (%)	2.5	97.0	96.2	96.7	96.4	93.7	80.2	120.9	120.0	96.7	100.1
Price To Book***	1.7	0.9	1.0	1.7	1.6	1.5	1.5	1.5	1.5	1.9	1.9
Price to Earnings***	16.0	15.9	15.1	8.5	8.6	15.8	16.5	15.2	14.8	12.7	13.8
Dividend Yield*** (%)	3.5	3.4	3.4	3.8	3.8	3.5	3.4	3.7	3.8	3.4	3.4

Period: 29-May-2009 to 31-Dec-2018

\* Gross returns annualized in USD

\*\* Annualized one-way index turnover over index reviews

\*\*\* Monthly averages

The definitions of all statistical parameters are available in the Appendix

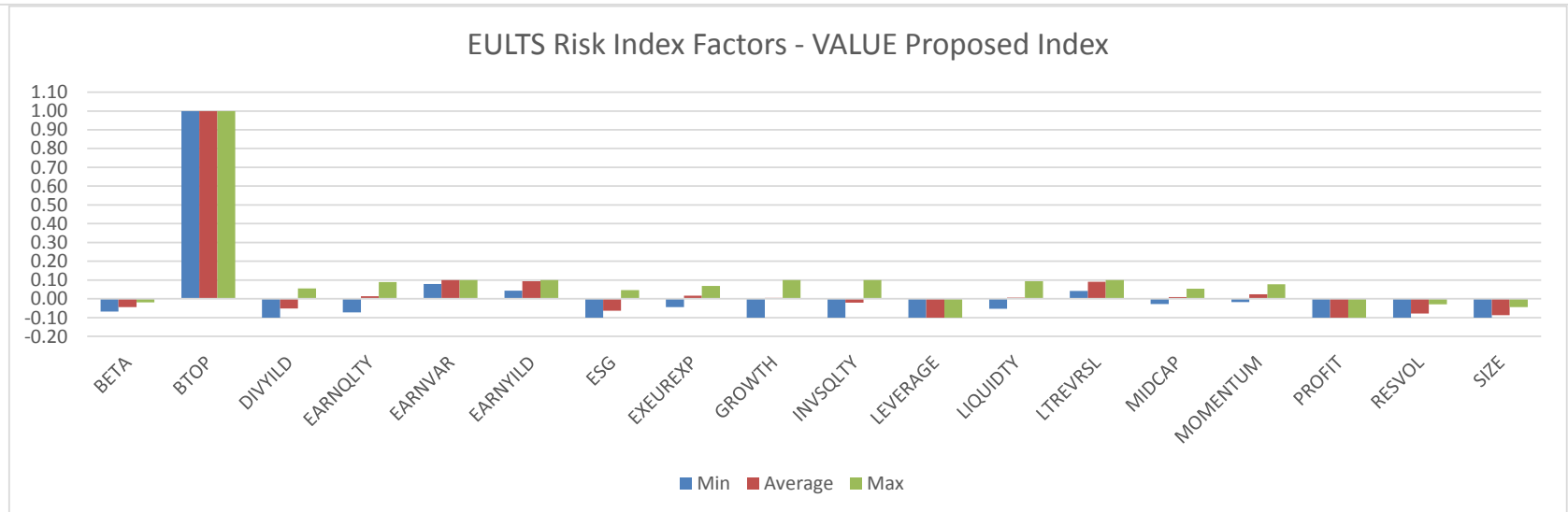
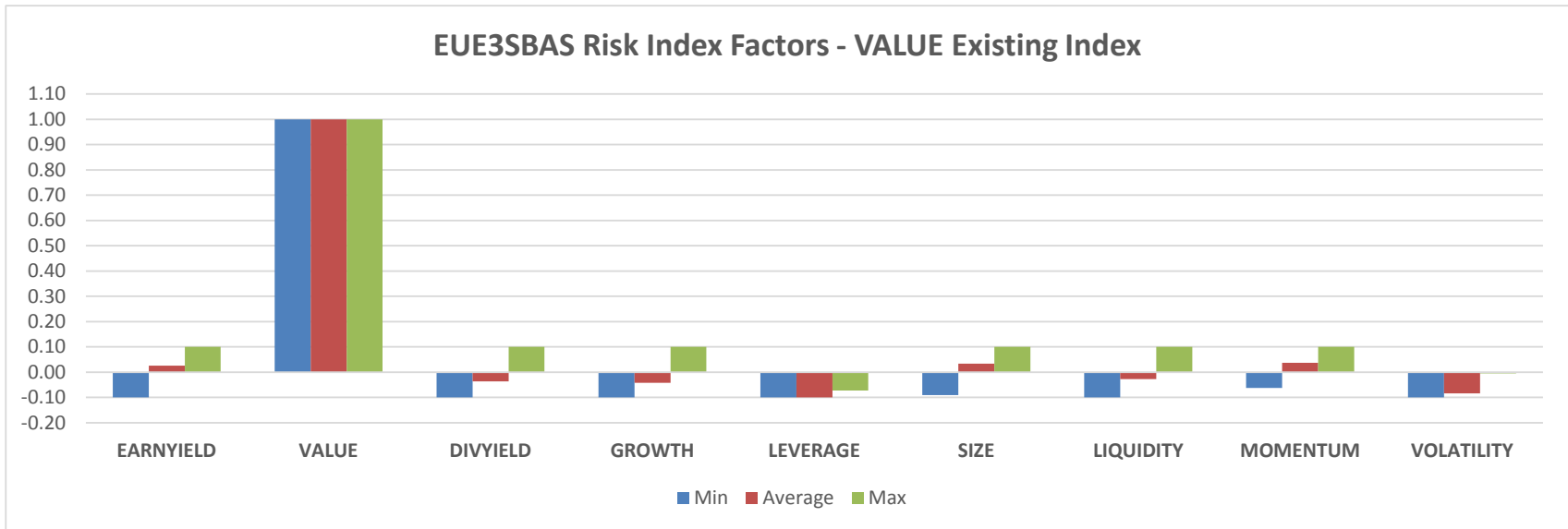
## Performance (%)

	MSCI Europe Index	Europe Barra Value EUE3SBAS	Europe Barra Value EULTS	Europe Barra Earnings Yield EUE3SBAS	Europe Barra Earnings Yield EULTS	Europe Barra Low Leverage EUE3SBAS	Europe Barra Low Leverage EULTS	Europe Barra Low Volatility EUE3SBAS	Europe Barra Low Volatility EULTS	Europe Barra Momentum EUE3SBAS	Europe Barra Momentum EULTS
YTD	-14.3	-15.7	-13.3	-15.3	-14.3	-14.1	-15.6	-9.9	-9.0	-14.9	-14.0
1 Yr	-14.3	-15.6	-13.3	-15.3	-14.2	-14.0	-15.5	-9.9	-9.0	-14.8	-13.9
3 Yr	2.7	3.1	4.2	2.7	2.2	3.2	2.4	2.3	3.3	3.4	3.5
5 Yr	0.0	-0.2	1.1	0.4	0.0	-0.1	-0.2	1.0	1.2	3.9	3.5
10 Yr	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN

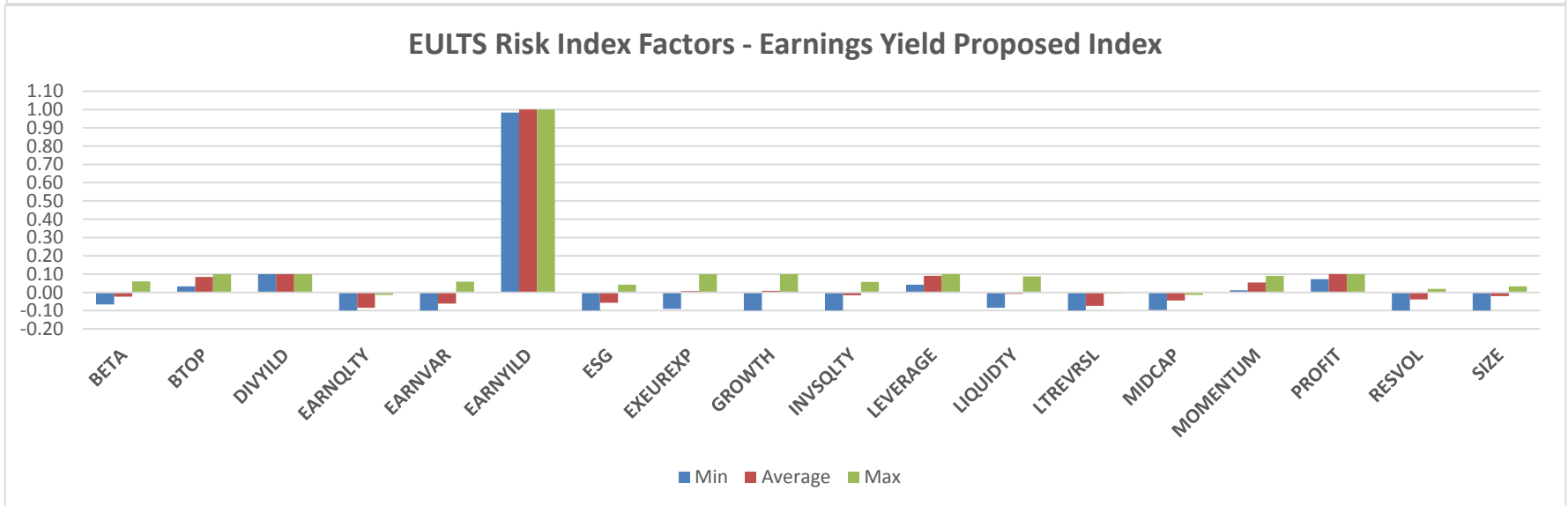
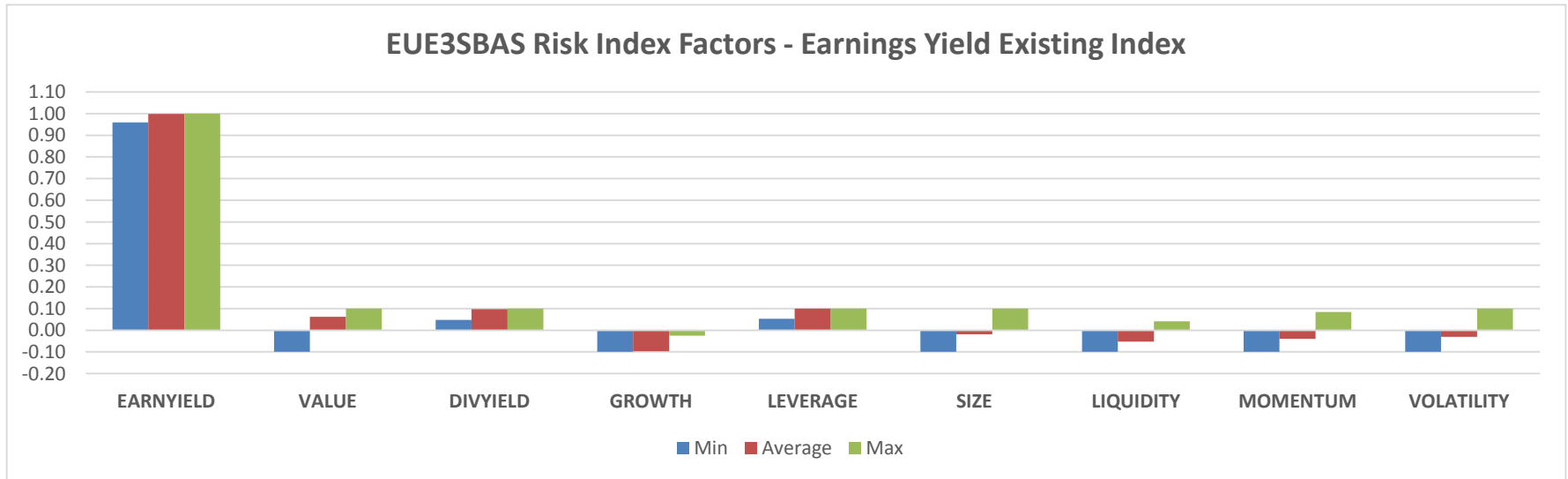
Gross returns in USD for the period ending 31-Dec-2018

Returns are annualized for periods longer than one year

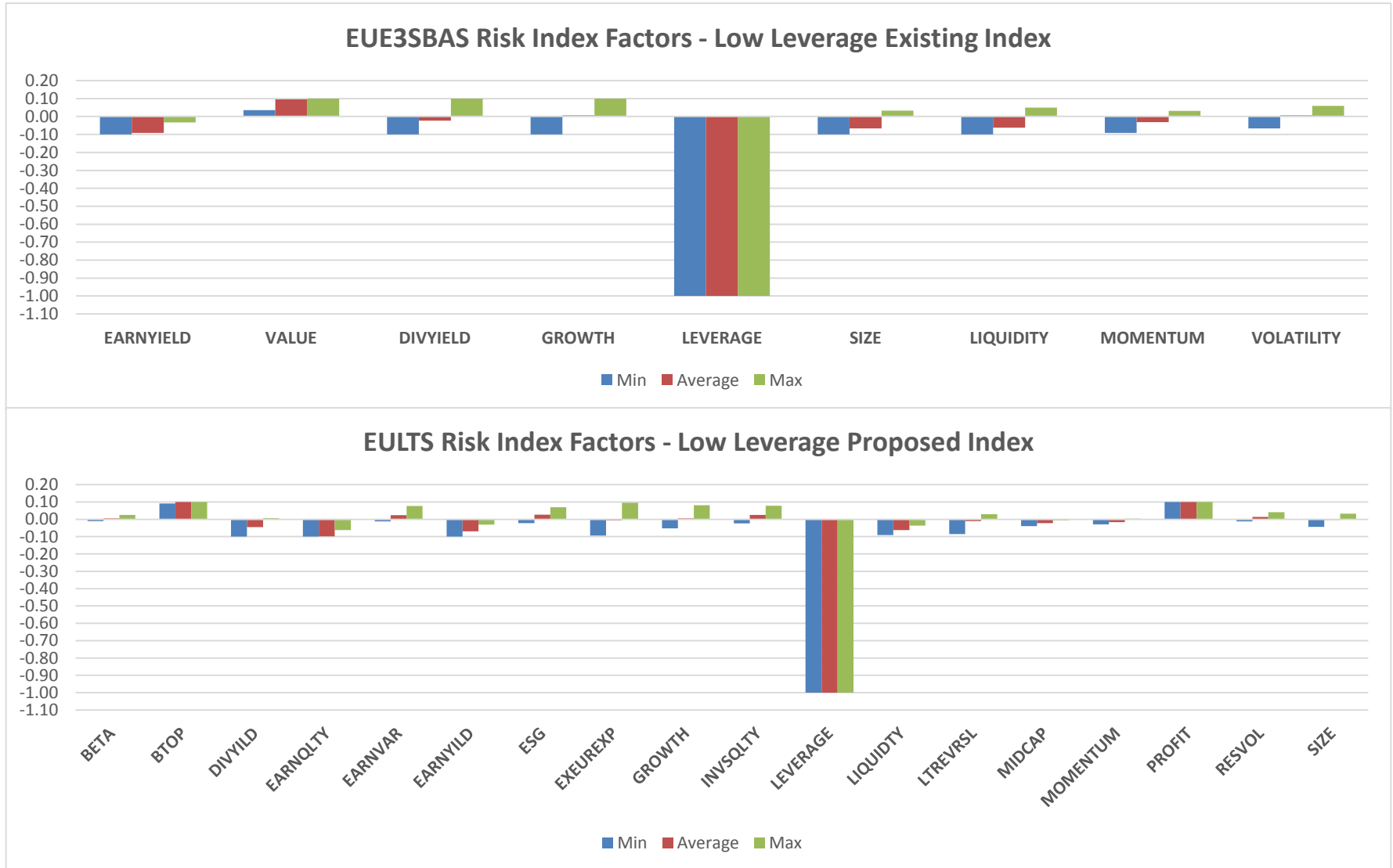
# ACTIVE FACTOR EXPOSURES: VALUE EXISTING V/S PROPOSED



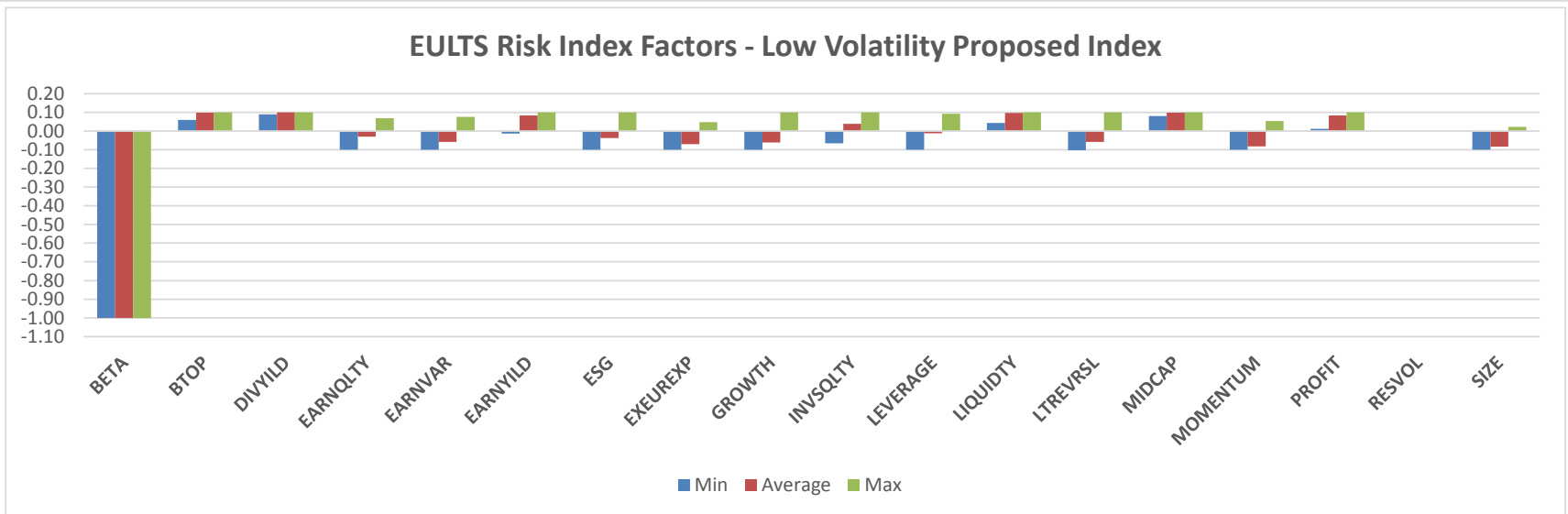
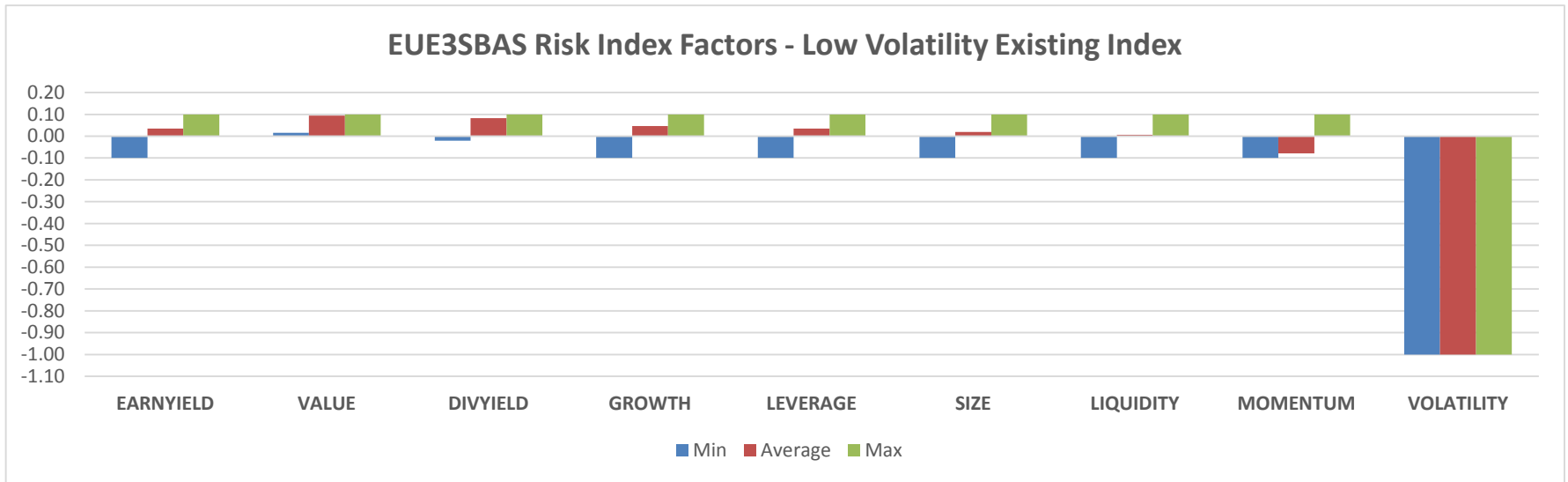
# ACTIVE FACTOR EXPOSURES: EARNINGS YIELD - EXISTING V/S PROPOSED



# ACTIVE FACTOR EXPOSURES: LOW LEVERAGE - EXISTING V/S PROPOSED

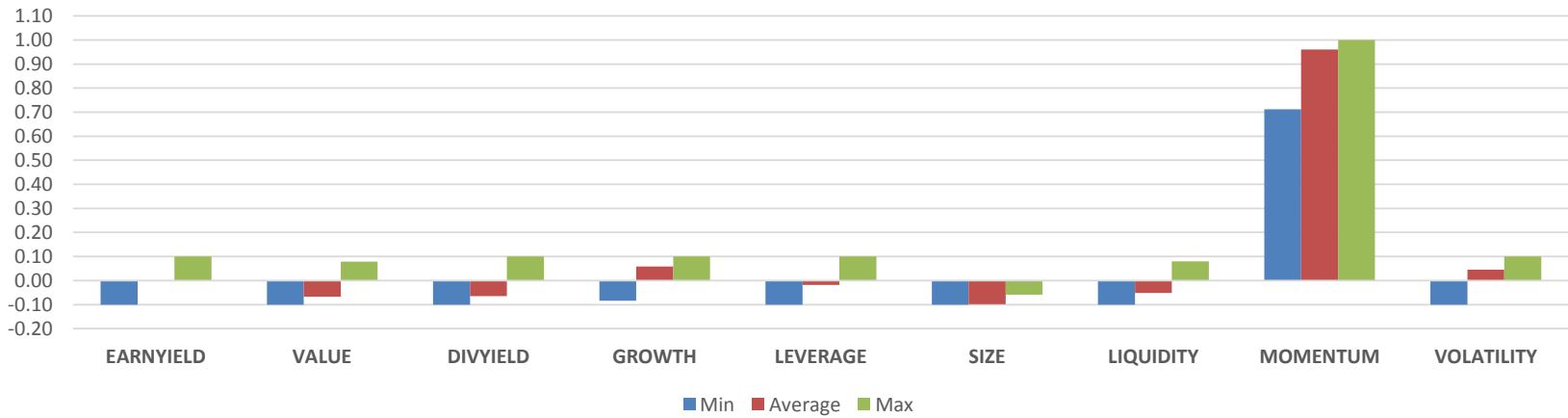


# ACTIVE FACTOR EXPOSURES: LOW VOLATILITY - EXISTING V/S PROPOSED

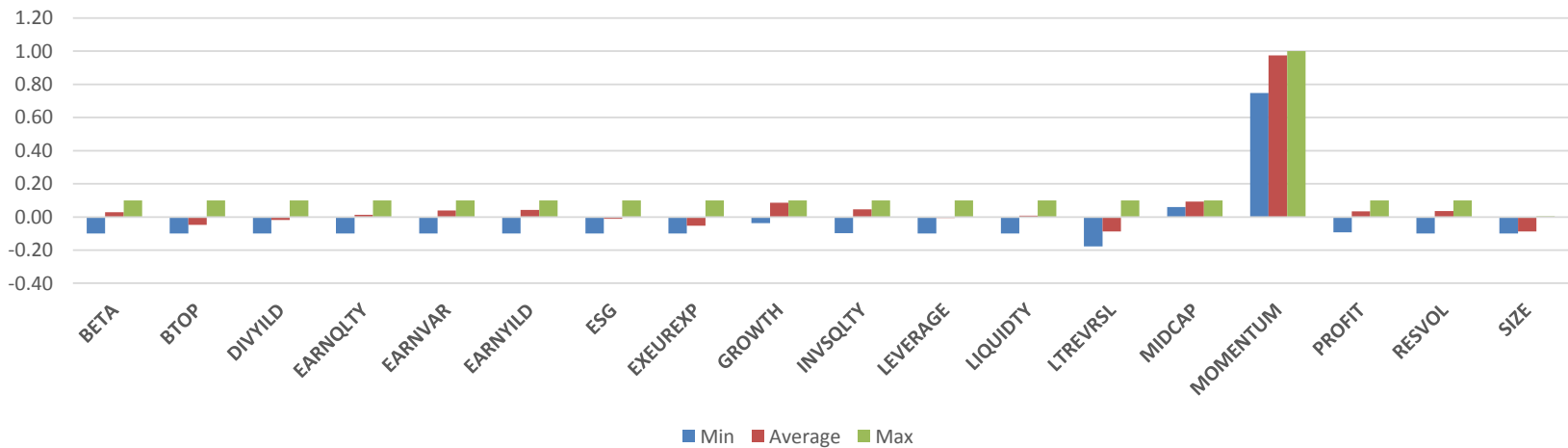


# ACTIVE FACTOR EXPOSURES: MOMENTUM - EXISTING V/S PROPOSED

EUE3SBAS Risk Index Factors - Momentum Existing Index



EULTS Risk Index Factors - Momentum Proposed Index





# MSCI MARKET-NEUTRAL BARRA FACTOR INDEXES

# EXISTING V/S PROPOSED METHODOLOGY

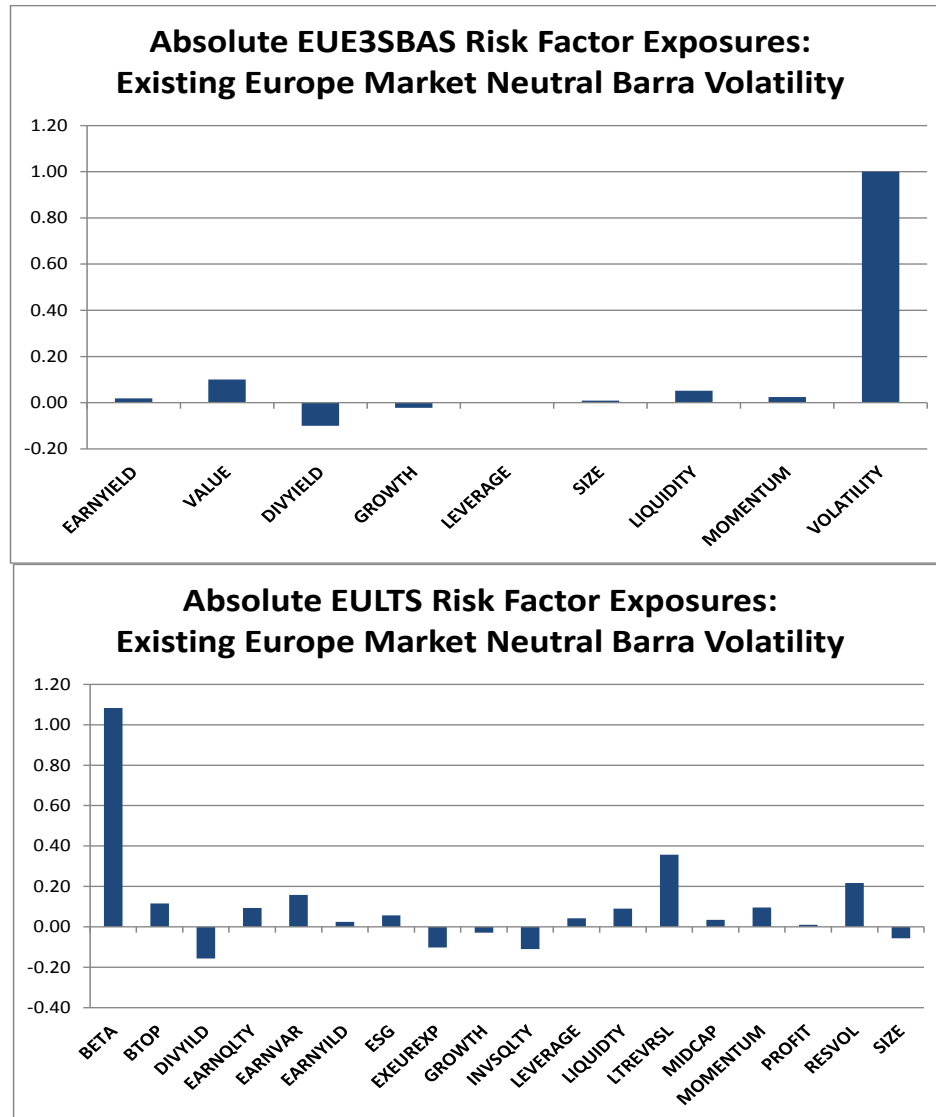
Parameter	MSCI Market Neutral Barra Factor Indexes (Existing)	MSCI Market Neutral Barra Factor Indexes (Proposed)
Parent Index (Stock Selection Universe)	MSCI Europe	MSCI Europe
Benchmark/ Reference Index	MSCI Europe	MSCI Europe
Barra Pure Factor portfolio	<ul style="list-style-type: none"> <li>• Volatility from the EUE3SBAS Model</li> <li>• Momentum from the EUE3SBAS Model</li> </ul>	<ul style="list-style-type: none"> <li>• Beta from the EULTS Model</li> <li>• Momentum from the EULTS Model</li> </ul>
Barra Model	EUE3SBAS	EULTS
Index Type	Market Neutral Barra Factor	Market Neutral Barra Factor
Optimization Objective	Designed to achieve a high level of exposure to the Target Factor while controlling exposure to other factors and minimizing the ex-ante tracking error relative to the corresponding Barra Pure Factor portfolio.	
Gross Leverage	2 (100% Long and 100% Short)	2 (100% Long and 100% Short)
Target factor exposure	1 or -1 standard deviation*	1 or -1 standard deviation*
Non-target style factor exposure	+/- 0.1	+/- 0.1
Industry factor exposure	+/- 3%	+/- 3%
Country factor exposure	+/- 3%	+/- 3%
Max number of stocks	300	300
Maximum constituent weight	+/- 3%	+/- 3%
One-way monthly turnover	10% (one-way)	10% (one-way)
1-month ADV Trade Limit	10%	10%
Shorting Cost threshold	250bps (buffer-50bps)	250bps (buffer-50bps)

**Proposal** – Transition the EUE3-based Market Neutral factor indexes to the EULT model using corresponding model factor definitions

* Target Factor Exposures	(Existing)	(Proposed)
MSCI Market Neutral Barra Momentum Index	+1 standard deviation of EUE3SBAS Momentum	+1 standard deviation of EULTS Momentum
MSCI Market Neutral Barra Volatility Index	+1 standard deviation of EUE3SBAS Volatility	+1 standard deviation of EULTS Beta and EULTS Residual Volatility capped between [0, +1]

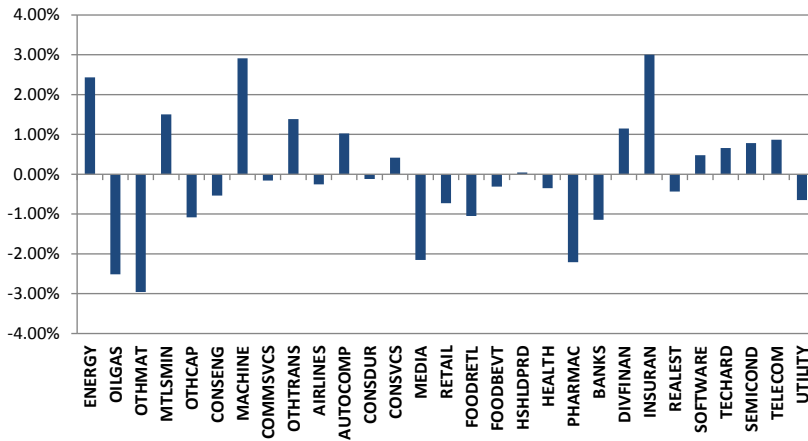
- At each monthly index rebalancing, the Index will have short positions only in securities whose Shorting Cost is below the Shorting Cost Cutoff
- At each monthly rebalancing, the weight of each Index constituent will not change more than a predefined Trade Limit linked to the stock's Average Daily Traded Value

# STYLE FACTOR EXPOSURES OF EXISTING MARKET NEUTRAL INDEX

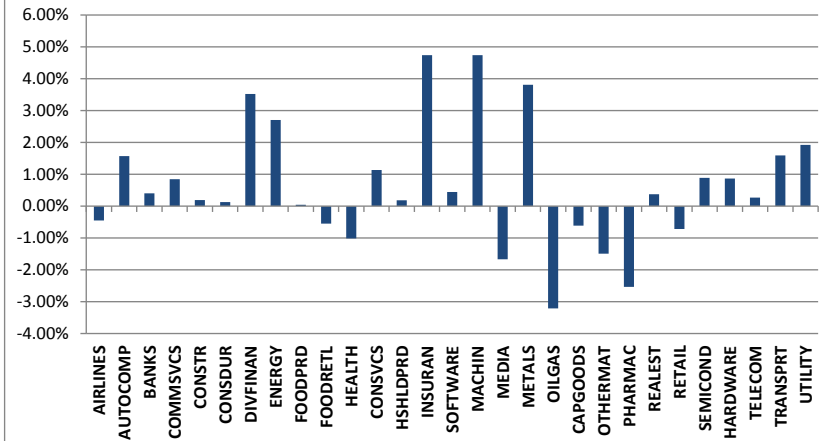


# INDUSTRY/COUNTRY FACTOR EXPOSURE OF EXISTING MARKET NEUTRAL INDEX

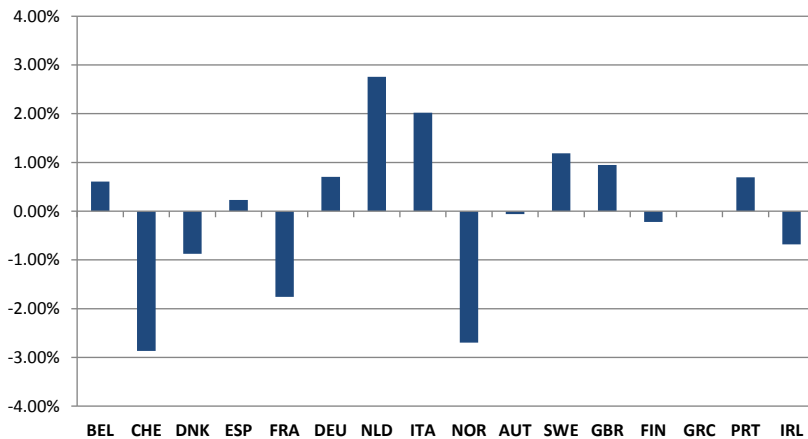
**Absolute EUE3SBAS Industry Factor Exposures:  
Existing Europe Market Neutral Barra Volatility**



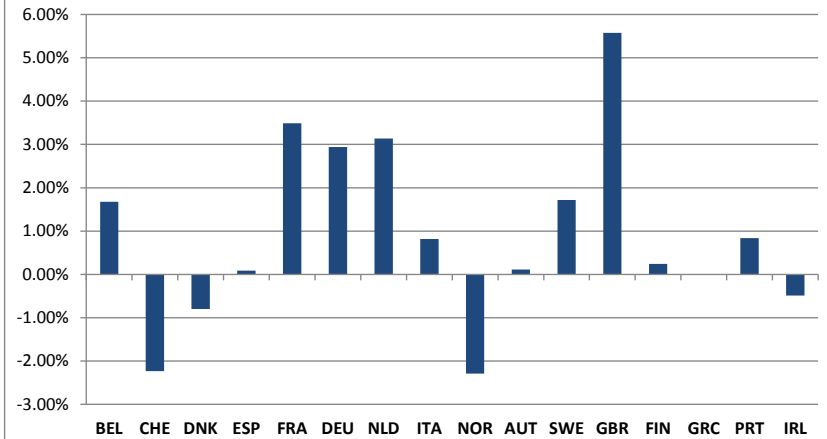
**Absolute EULTS Industry Factor Exposures:  
Existing Europe Market Neutral Barra Volatility**



**Absolute EUE3SBAS Country Factor Exposures:  
Existing Europe Market Neutral Barra Volatility**



**Absolute EULTS Country Factor Exposures:  
Existing Europe Market Neutral Barra Volatility**



# CHARACTERISTICS OF SIMULATED INDEXES USING EXISTING AND PROPOSED METHODOLOGIES

# SIMULATED MARKET NEUTRAL MOMENTUM INDEXES : EXISTING V/S PROPOSED METHODOLOGY

Key Metrics	<Existing>		<Proposed>		<Existing>	<Proposed>	
	(Long)	(Short)	(Long)	(Short)	(Net Long-Short)	(Net Long-Short)	
	MSCI Europe Index	Europe EUE3SBAS MN Momentum Long	Europe EUE3SBAS MN Momentum Short	Europe EULTS MN Momentum Long	Europe EULTS MN Momentum Short	Europe EUE3SBAS MN Momentum	Europe EULTS MN Momentum
Total Return* (%)	4.3	7.7	3.3	7.6	2.9	4.0	4.3
Total Risk (%)	13.0	13.5	14.2	13.1	14.3	5.4	4.5
Return/Risk	0.33	0.57	0.23	0.58	0.20	0.73	0.94
Active Return (%)	0.0	3.3	-1.0	3.3	-1.4	-0.3	-0.04
Tracking Error (%)	0.0	3.9	3.2	3.1	2.9	14.9	15.0
Information Ratio	NaN	0.85	-0.32	1.08	-0.49	-0.02	-0.003
Historical Beta	1.00	1.00	1.07	0.98	1.09	0.02	-0.01
No of Stocks***	441	137	148	150	148	286	298
Turnover** (%)	2.4	60.5	67.4	61.2	67.7	122.9	125.3

Period: 30-Nov-2012 to 31-Dec-2018

\* Gross returns annualized in USD

\*\* Annualized one-way index turnover over index reviews

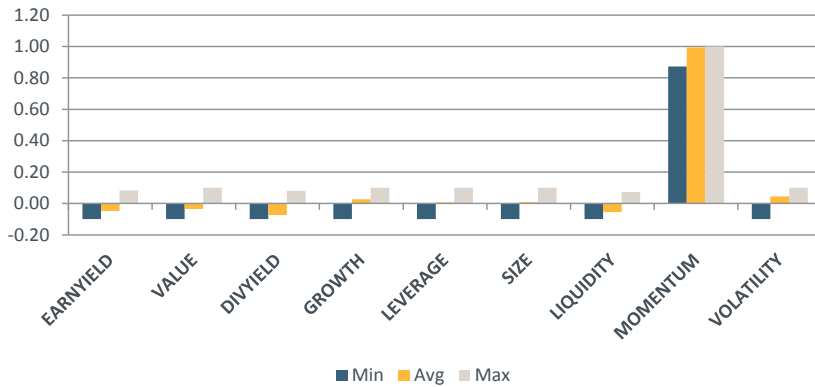
\*\*\* Monthly averages

The definitions of all statistical parameters are available in the Appendix

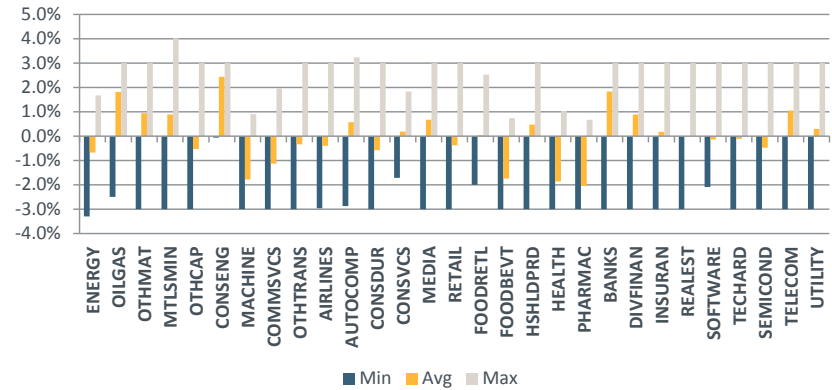
- The (Net Long-Short) Indexes are the Indexes that are expected to be transitioned
- The (Long) and (Short) Indexes represent the Long part and Short part of the corresponding (Net Long-Short) Indexes (for illustration only)
- The (Short) Index is represented by the absolute security weight of the short positions in the (Net Long-Short) Indexes

# SIMULATED EUROPE MARKET NEUTRAL BARRA MOMENTUM INDEX – EXISTING METHODOLOGY

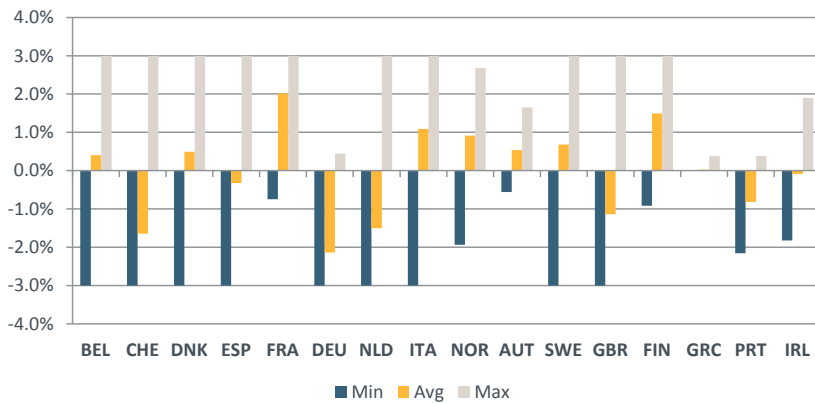
## EUE3SBAS Style Active Factor Exposure



## EUE3SBAS Industry Active Factor Exposure

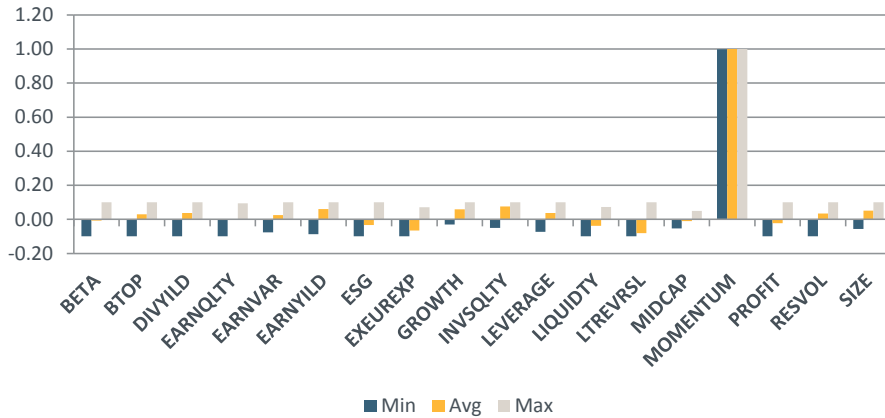


## EUE3SBAS Country Active Factor Exposure

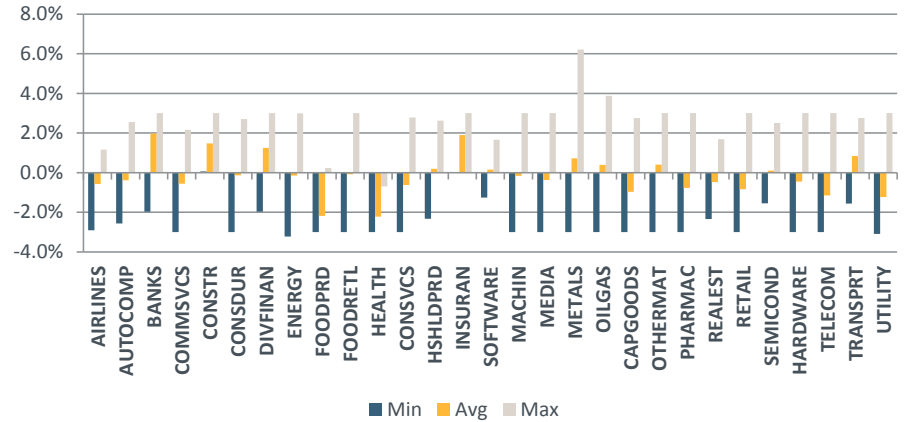


# SIMULATED EUROPE MARKET NEUTRAL BARRA MOMENTUM INDEX – PROPOSED METHODOLOGY

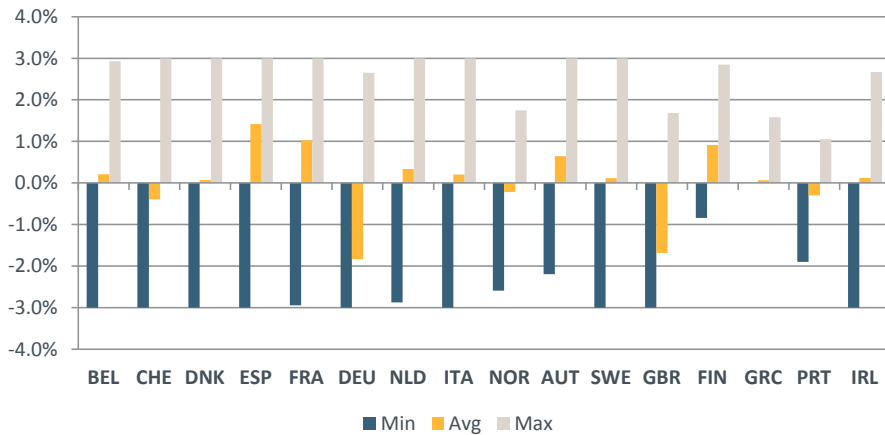
## EULTS Style Active Factor Exposure



## EULTS Industry Active Factor Exposure



## EULTS Country Active Factor Exposure





# SIMULATED MARKET NEUTRAL VOLATILITY INDEXES : EXISTING V/S PROPOSED METHODOLOGY

Key Metrics	<Existing>		<Proposed>		<Existing>	<Proposed>	
	(Long)	(Short)	(Long)	(Short)	(Net Long-Short)	(Net Long-Short)	
	MSCI Europe Index	Europe EUE3SBAS MN Vol Long	Europe EUE3SBAS MN Vol Short	Europe EULTS MN Vol Long	Europe EULTS MN Vol Short	Europe EUE3SBAS MN Volatility	Europe EULTS MN Volatility
Total Return* (%)	4.3	6.8	6.8	5.4	5.3	0.3	0.3
Total Risk (%)	13.0	14.8	12.3	14.5	12.6	4.2	3.6
Return/Risk	0.33	0.46	0.55	0.38	0.42	0.06	0.08
Active Return (%)	0.0	2.5	2.5	1.1	1.0	-4.1	-4.0
Tracking Error (%)	0.0	3.7	2.3	2.9	2.1	11.3	11.6
Information Ratio	NaN	0.68	1.06	0.38	0.50	-0.36	-0.35
Historical Beta	1.00	1.11	0.94	1.09	0.96	0.21	0.18
No of Stocks***	441	155	144	149	150	299	299
Turnover** (%)	2.4	62.4	65.5	60.7	69.4	124.2	128.2

Period: 30-Nov-2012 to 31-Dec-2018

\* Gross returns annualized in USD

\*\* Annualized one-way index turnover over index reviews

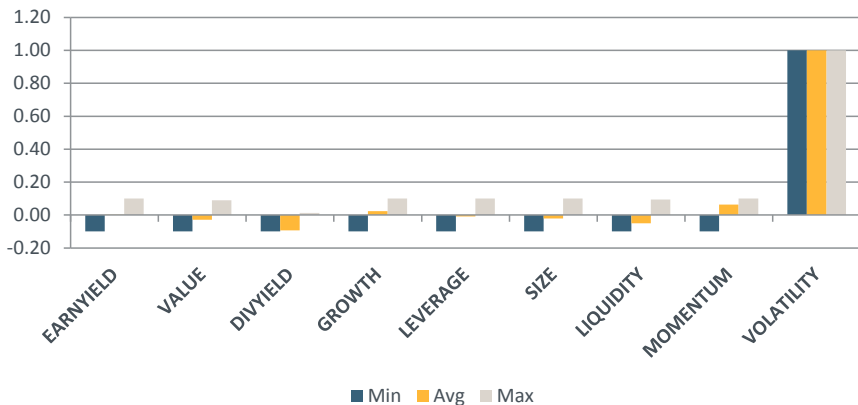
\*\*\* Monthly averages

The definitions of all statistical parameters are available in the Appendix

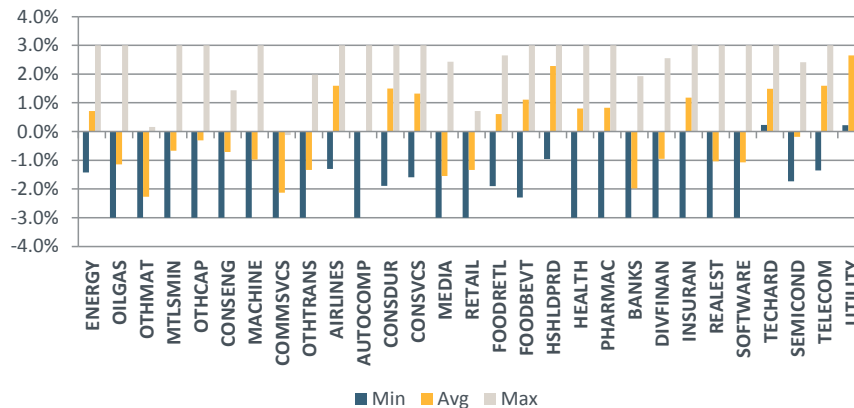
- The (Net Long-Short) Indexes are the Indexes that are expected to be transitioned
- The (Long) and (Short) Indexes represent the Long part and Short part of the corresponding (Net Long-Short) Indexes (for illustration only)
- The (Short) Index is represented by the absolute security weight of the short positions in the (Net Long-Short) Indexes

# SIMULATED EUROPE MARKET NEUTRAL BARRA VOLATILITY INDEX – EXISTING METHODOLOGY

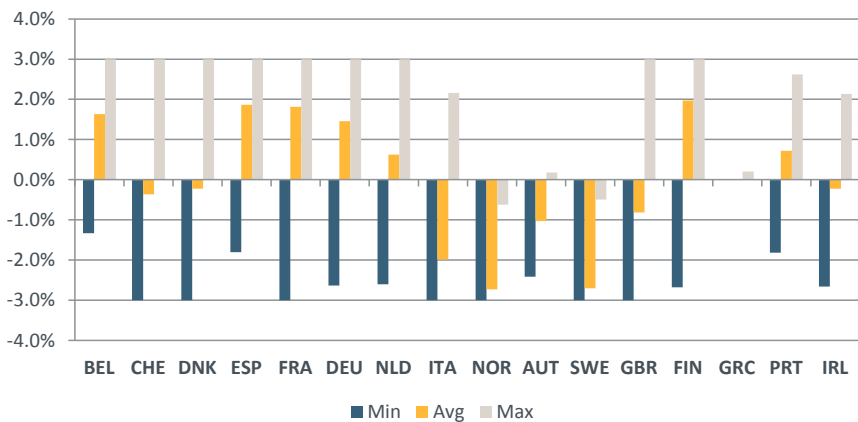
## EUE3SBAS Style Active Factor Exposure



## EUE3SBAS Industry Active Factor Exposure

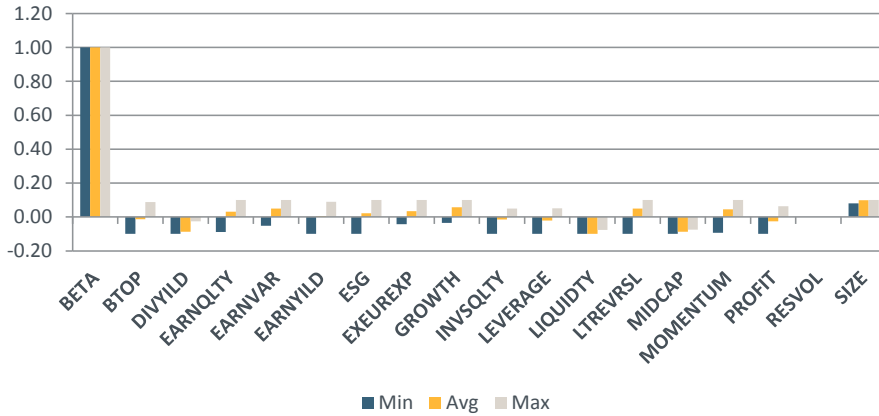


## EUE3SBAS Country Active Factor Exposure

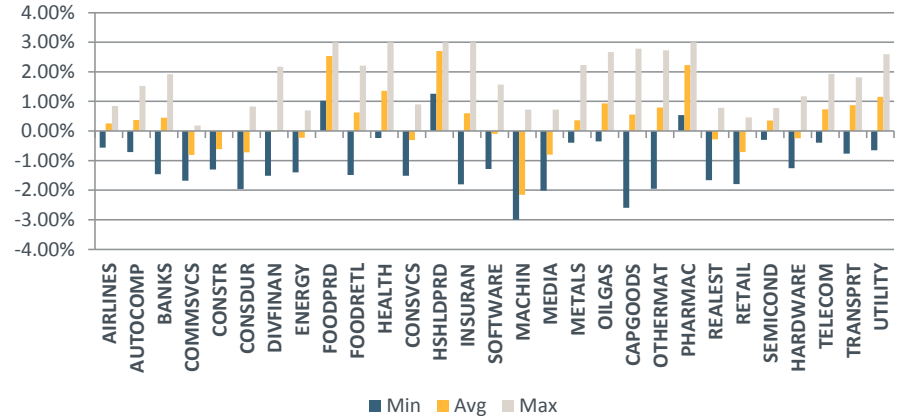


# SIMULATED EUROPE MARKET NEUTRAL BARRA VOLATILITY INDEX – PROPOSED METHODOLOGY

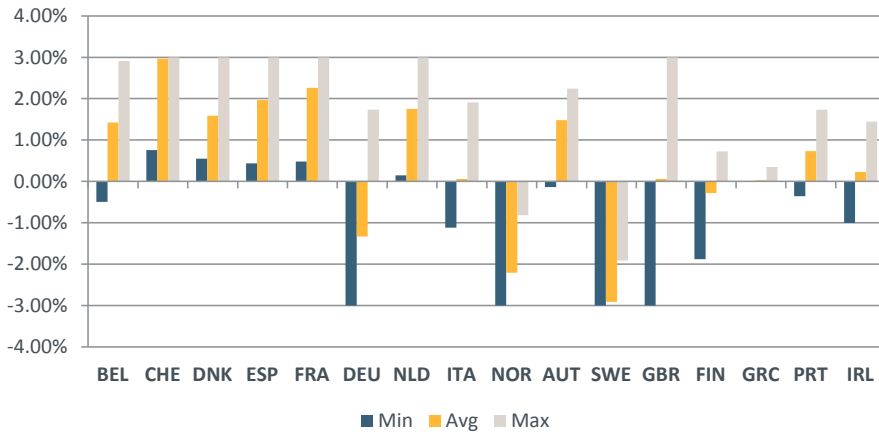
## EULTS Style Active Factor Exposure



## EULTS Industry Active Factor Exposure



## EULTS Country Active Factor Exposure



# MSCI LONG-ONLY BARRA FACTOR INDEXES

# EXISTING V/S PROPOSED METHODOLOGY

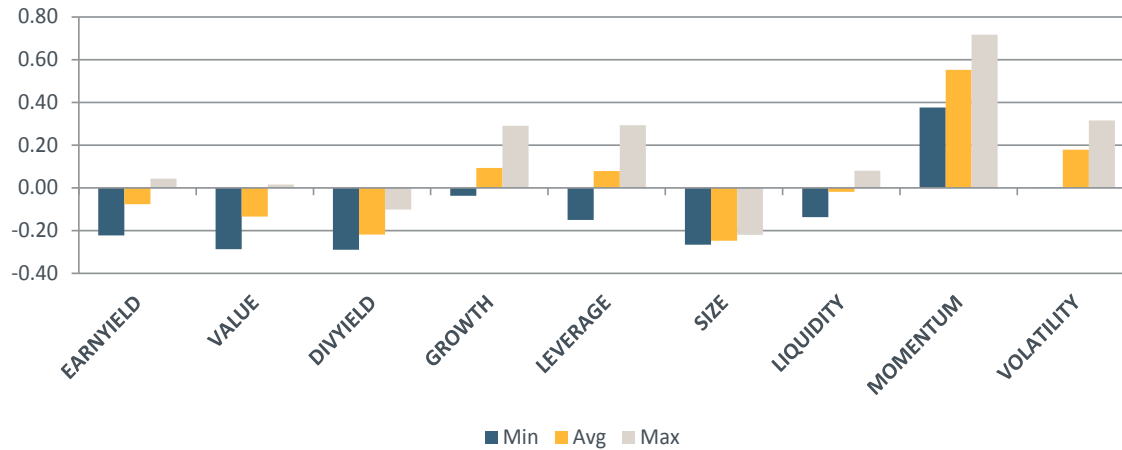
Parameter	MSCI Long-only Barra Factor Indexes (Existing)	MSCI Long-only Barra Factor Indexes (Proposed)
Parent Index (Stock Selection Universe)	MSCI Europe	MSCI Europe
Benchmark/ Reference Index	MSCI Europe	MSCI Europe
Barra Model	EUE3SBAS	EULTS
Index Type	Long-Only	Long-Only
Optimization Objective	Designed to maximize exposure to the Target Factor while controlling exposure to other factors and minimizing the ex-ante tracking error relative to the Benchmark Index (MSCI Europe).	
Gross Leverage	Long-Only	Long-Only
Target factor exposure	Unconstrained*	Unconstrained*
Non-target style factor exposure	+/- 0.25	+/- 0.25
Industry factor exposure	+/- 5%	+/- 5%
Country factor exposure	+/- 5%	+/- 5%
Max number of stocks	200	200
Maximum constituent weight	+/- 2%	+/- 2%
One-way monthly turnover	5% (one-way)	5% (one-way)
1-month ADV Trade Limit	10%	10%

**Proposal** – Transition the EUE3-based Long-only factor indexes to the EULT model using corresponding model factor definitions

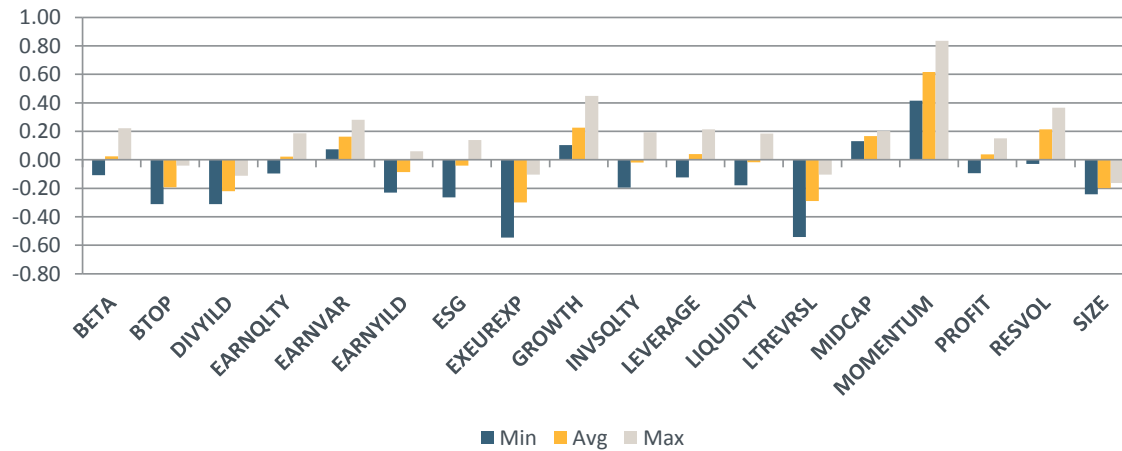
* Target Factor Exposures	(Existing)	(Proposed)
MSCI Europe Value Tilt Index	High exposure to the EUE3SBAS Value factor	High exposure to the EULTS Book To Price factor
MSCI Europe Momentum Tilt Index	High exposure to the EUE3SBAS Momentum factor	High exposure to the EULTS Momentum factor

# MSCI EUROPE BARRA MOMENTUM TILT INDEX

## EUE3SBAS Style Active Factor Exposure

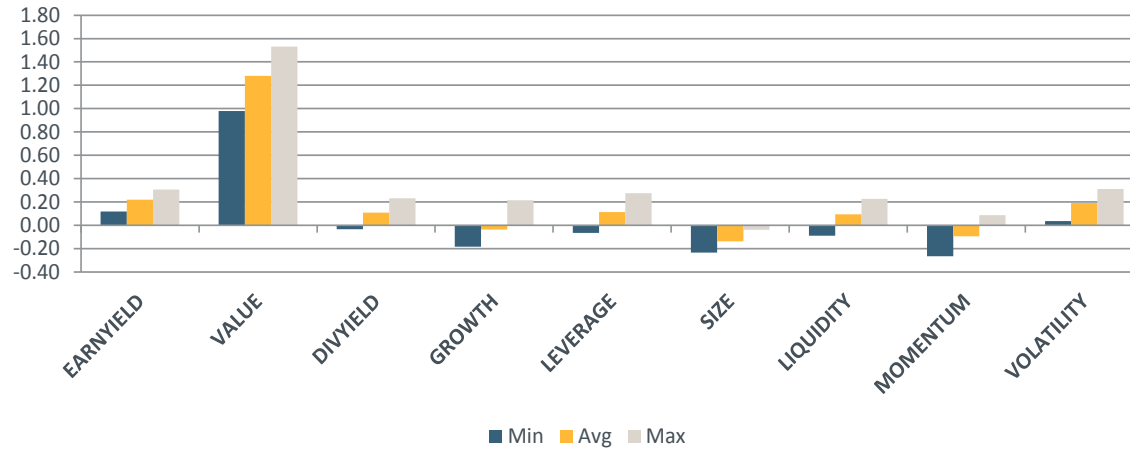


## EULTS Style Active Factor Exposure



# MSCI EUROPE BARRA VALUE TILT INDEX

## EUE3SBAS Style Active Factor Exposure



## EULTS Style Active Factor Exposure



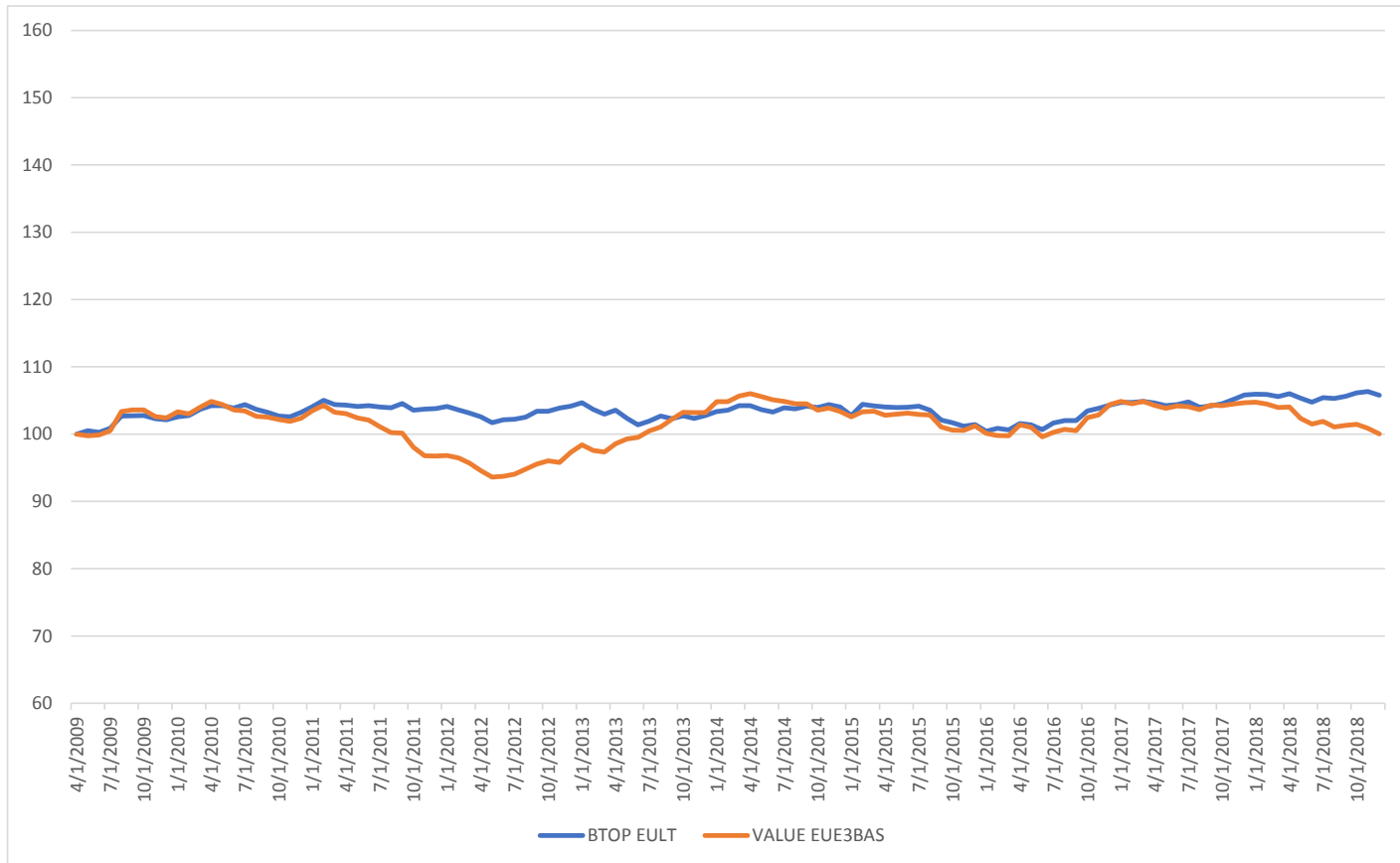
# DISCUSSION POINTS

- Do you agree with the proposal to use the latest Barra Europe Equity Model in the index construction of:
  - MSCI Long-Short Barra Factor Indexes
  - MSCI Market Neutral Barra Factor Indexes
  - MSCI Long-only Barra Factor Indexes
- Do you agree with the mapping of target factors in the proposal for the:
  - MSCI Long-Short Barra Factor Indexes
  - MSCI Market Neutral Barra Factor Indexes
  - MSCI Long-only Barra Factor Indexes
- Do you agree with the mapping of constraints for the:
  - MSCI Long-Short Barra Factor Indexes
  - MSCI Market Neutral Barra Factor Indexes
  - MSCI Long-only Barra Factor Indexes
- Do you agree that the turnover allowed by the optimisation at transition should be as proposed?



# APPENDIX 1: LEVELS BASED ON MODEL FACTOR RETURNS

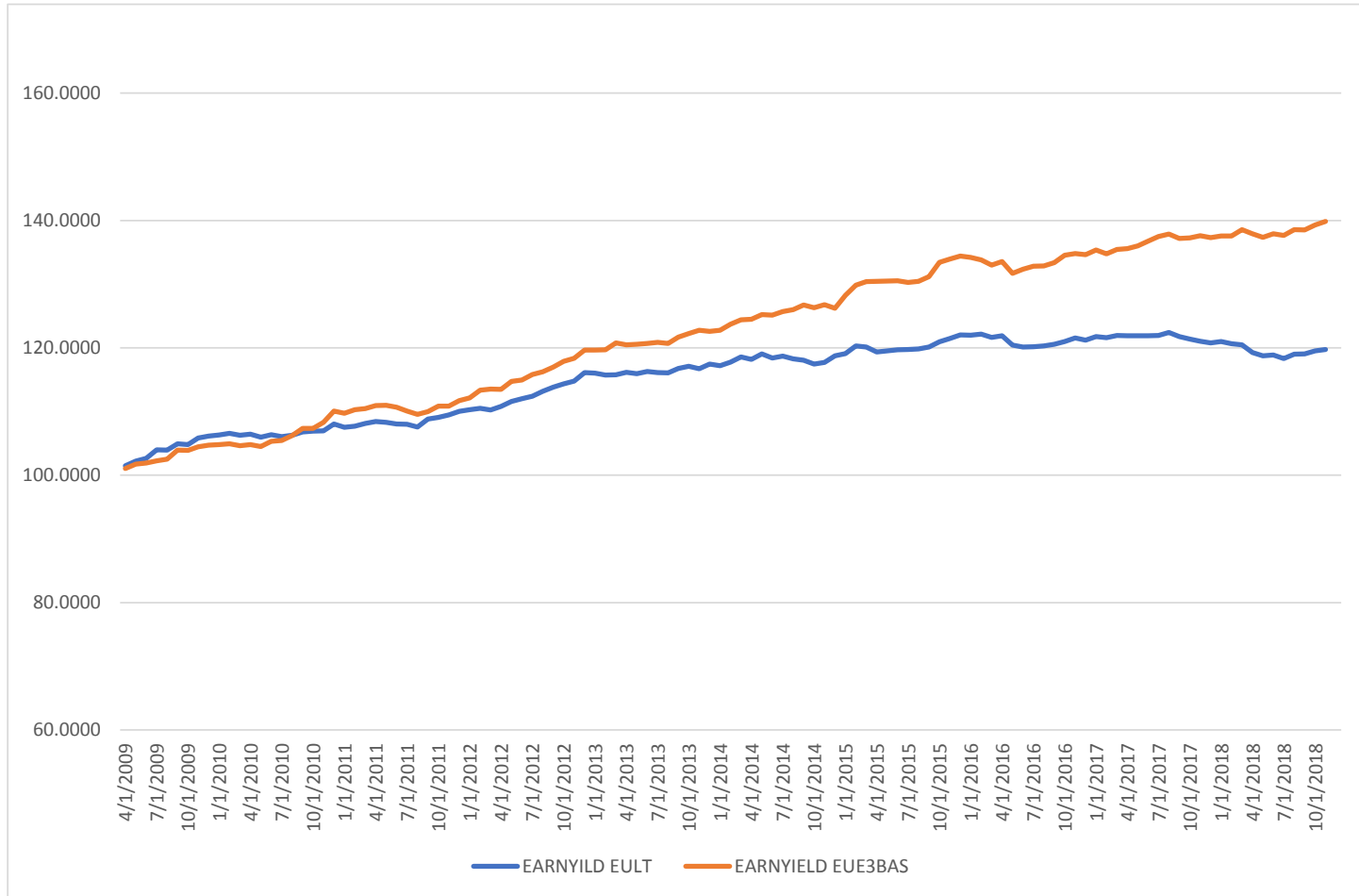
# LEVELS: VALUE



## Correlation of Factor Returns

	<i>BTOP EULT</i>	<i>VALUE EUE3BAS</i>
<i>BTOP EULT</i>	1	
<i>VALUE</i>	0.72441961	1

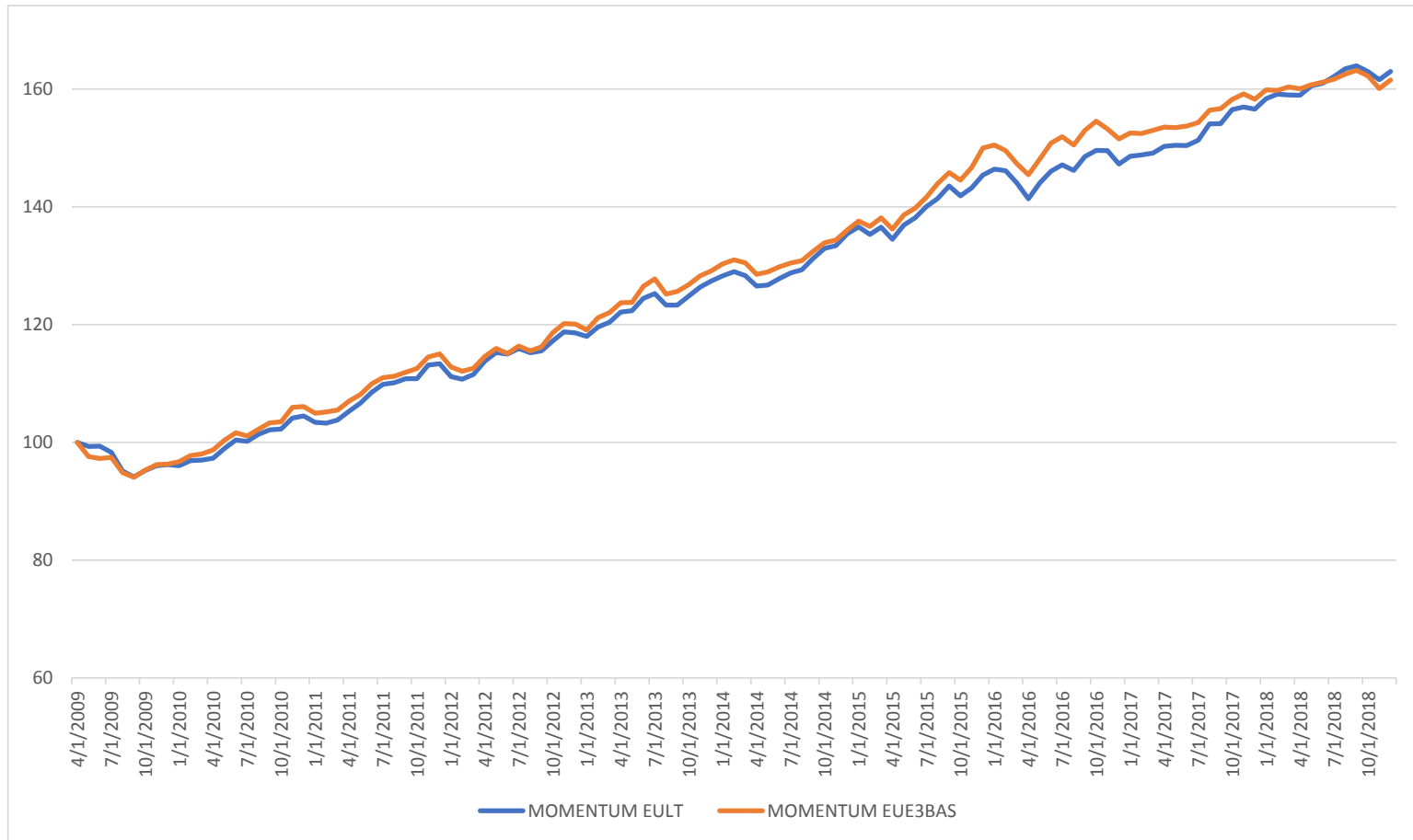
# LEVELS: EARNINGS YIELD



## Correlation of Factor Returns

	<i>EARNYIELD EULT</i>	<i>EARNYIELD EUE3BAS</i>
<i>EARNYIELD EULT</i>	1	
<i>EARNYIELD EUE3BAS</i>	0.638391646	1

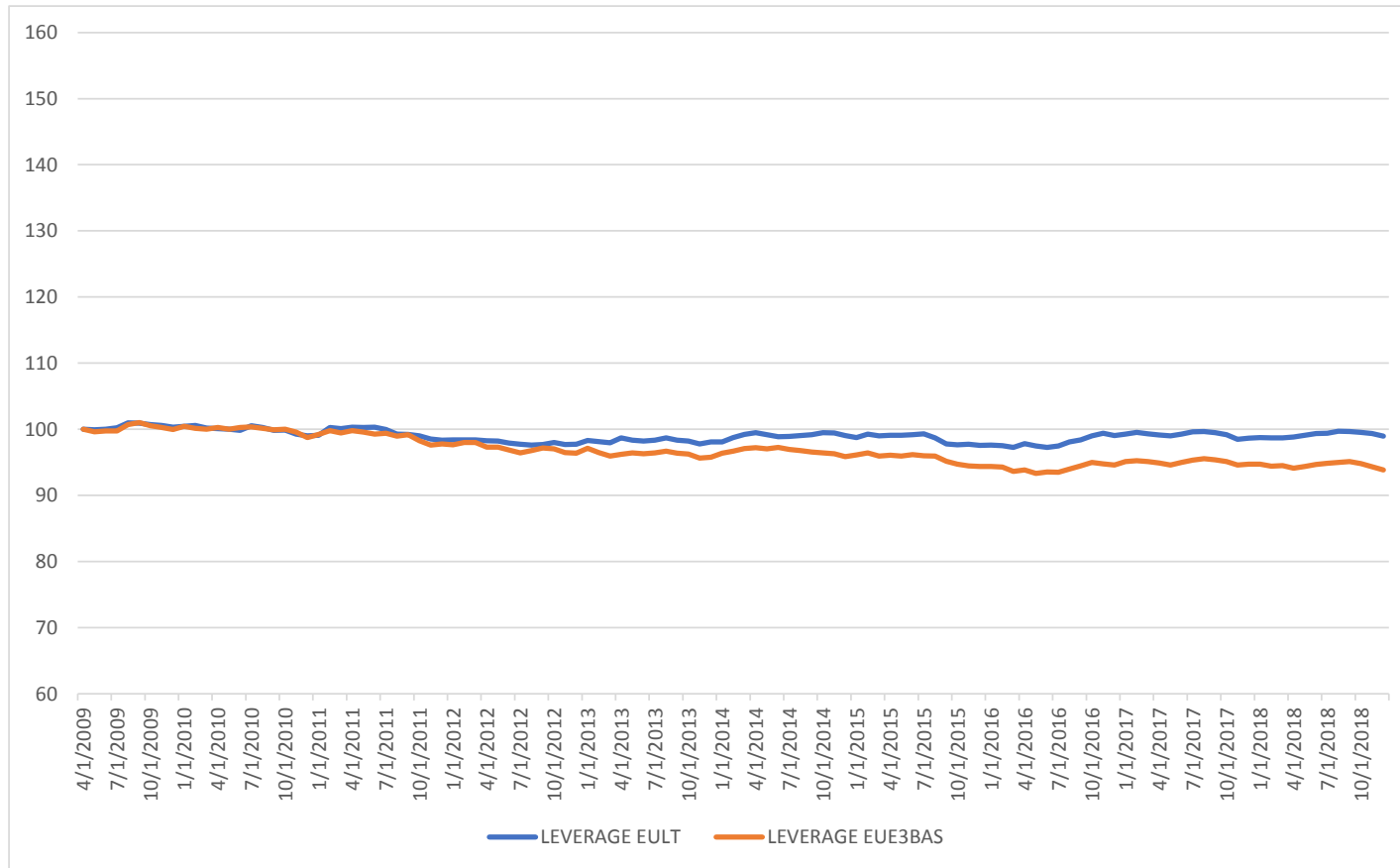
# LEVELS: MOMENTUM



## Correlation of Factor Returns

	<i>MOMENTUM EULT</i>	<i>MOMENTUM EUE3BAS</i>
<i>MOMENTUM EULT</i>	1	
<i>MOMENTUM EUE3BAS</i>	0.932489859	1

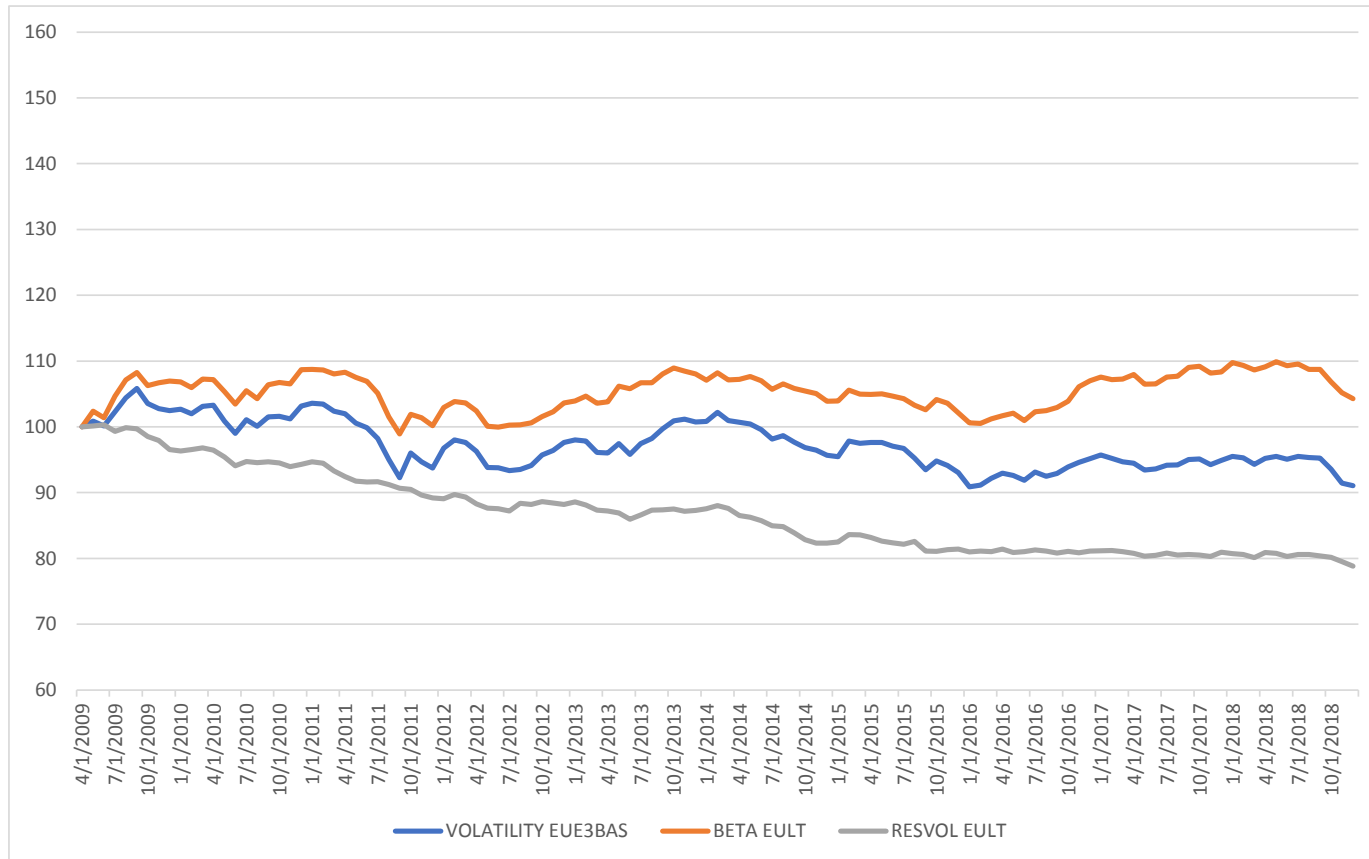
# LEVELS: LEVERAGE



## Correlation of Factor Returns

	LEVERAGE EULT	LEVERAGE EUE3BAS
LEVERAGE EULT	1	
LEVERAGE EUE3BAS	0.650557949	1

# LEVELS: VOLATILITY

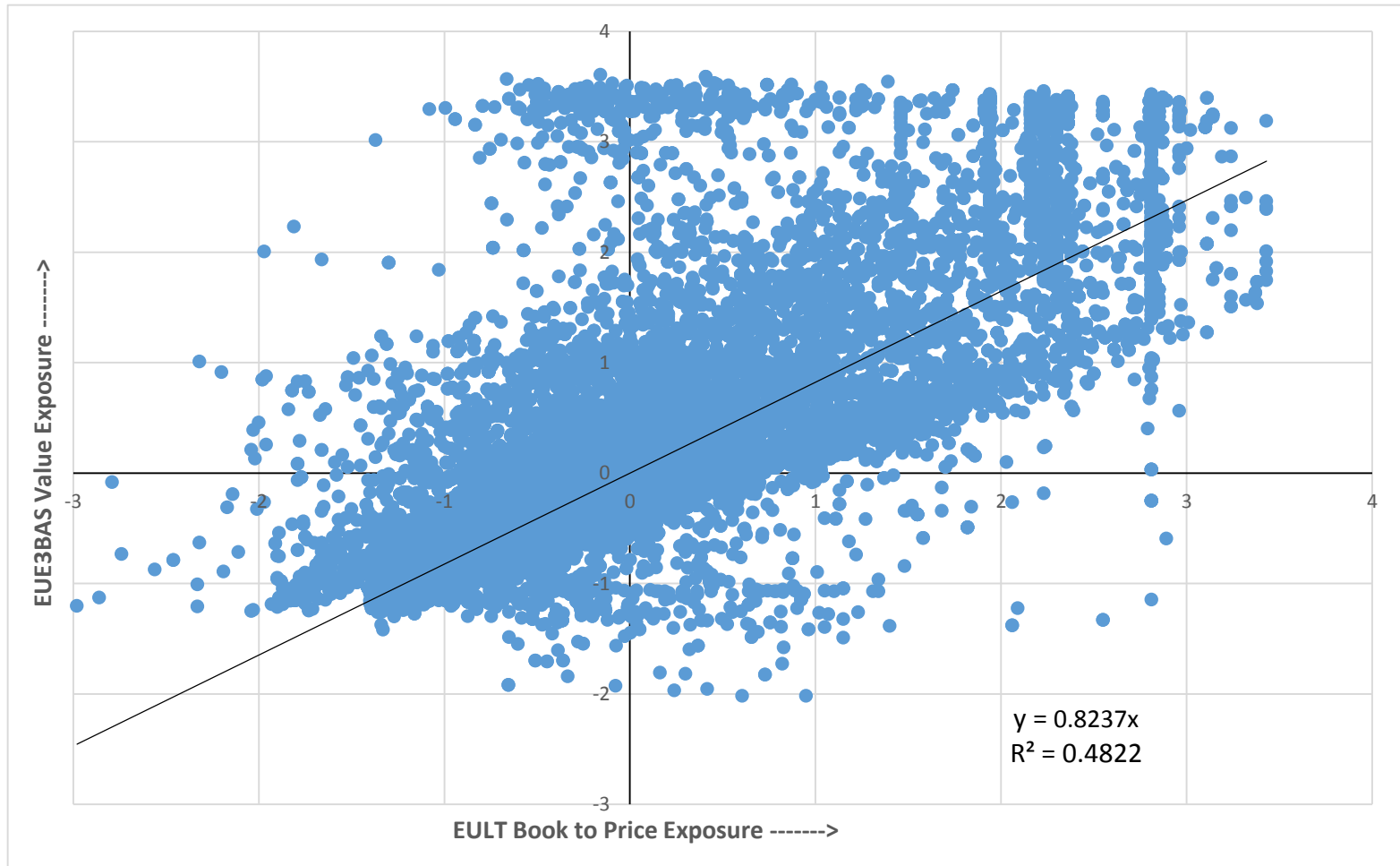


## Correlation of Factor Returns

	<i>VOLATILITY EUE3BAS</i>	<i>BETA EULT</i>	<i>RESVOL EULT</i>
<i>VOLATILITY EUE3BAS</i>	1		
<i>BETA EULT</i>	0.912648913	1	
<i>RESVOL EULT</i>	0.55181514	0.363109229	1

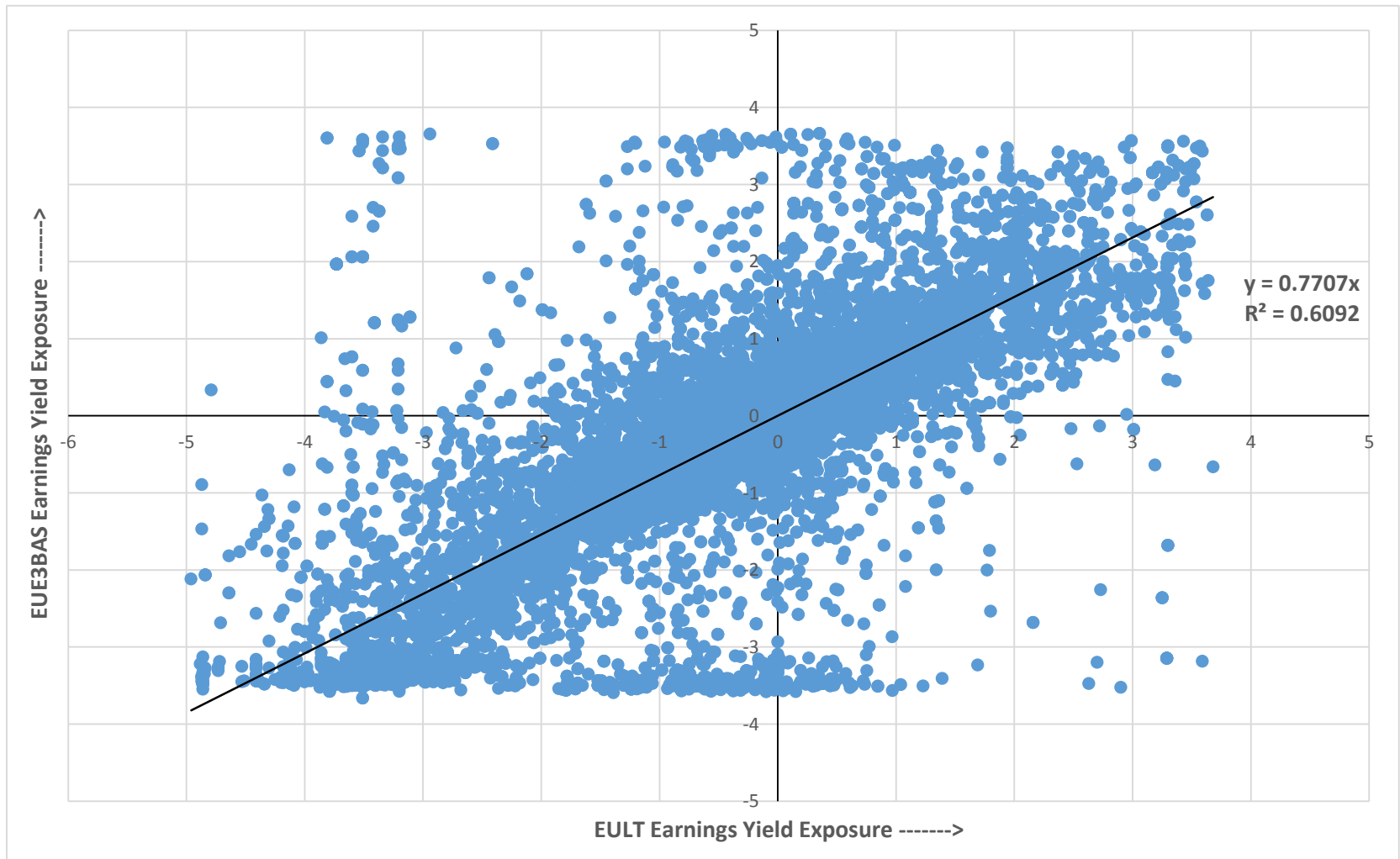
# APPENDIX 2: FACTOR EXPOSURE CORRELATION (AS OF MAY 2018)

# VALUE FACTOR EXPOSURE

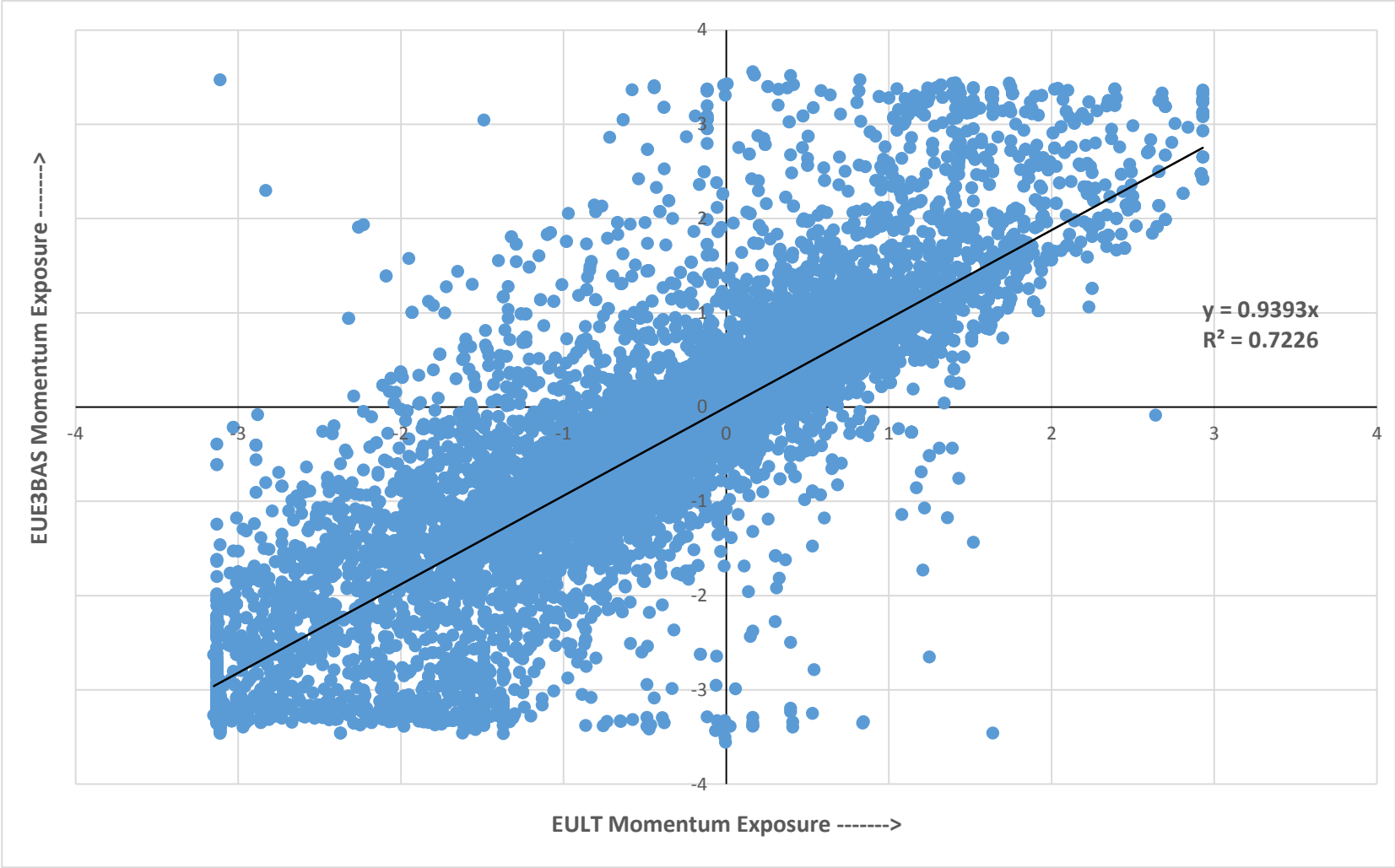




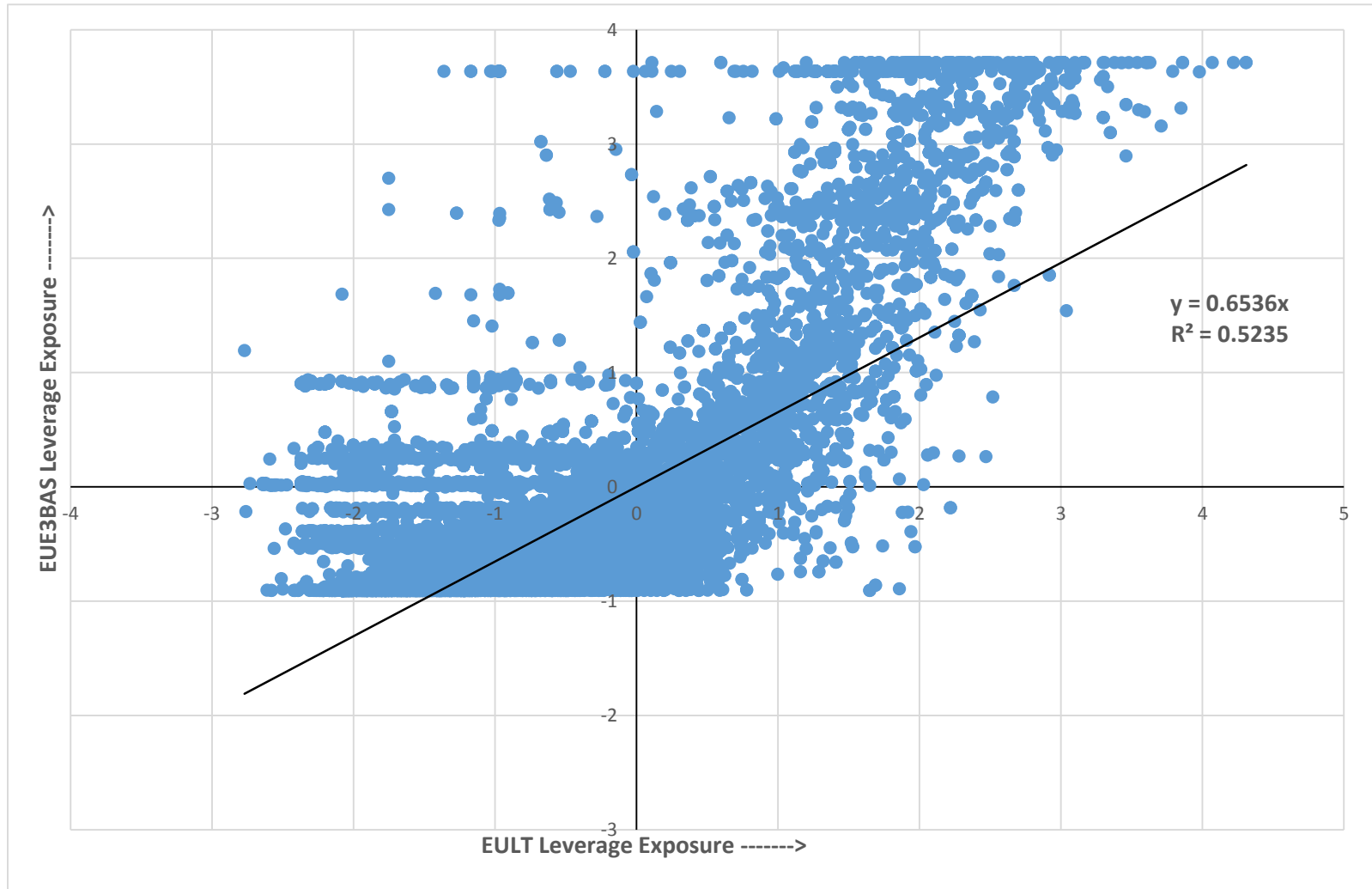
# EARNINGS YIELD FACTOR EXPOSURE



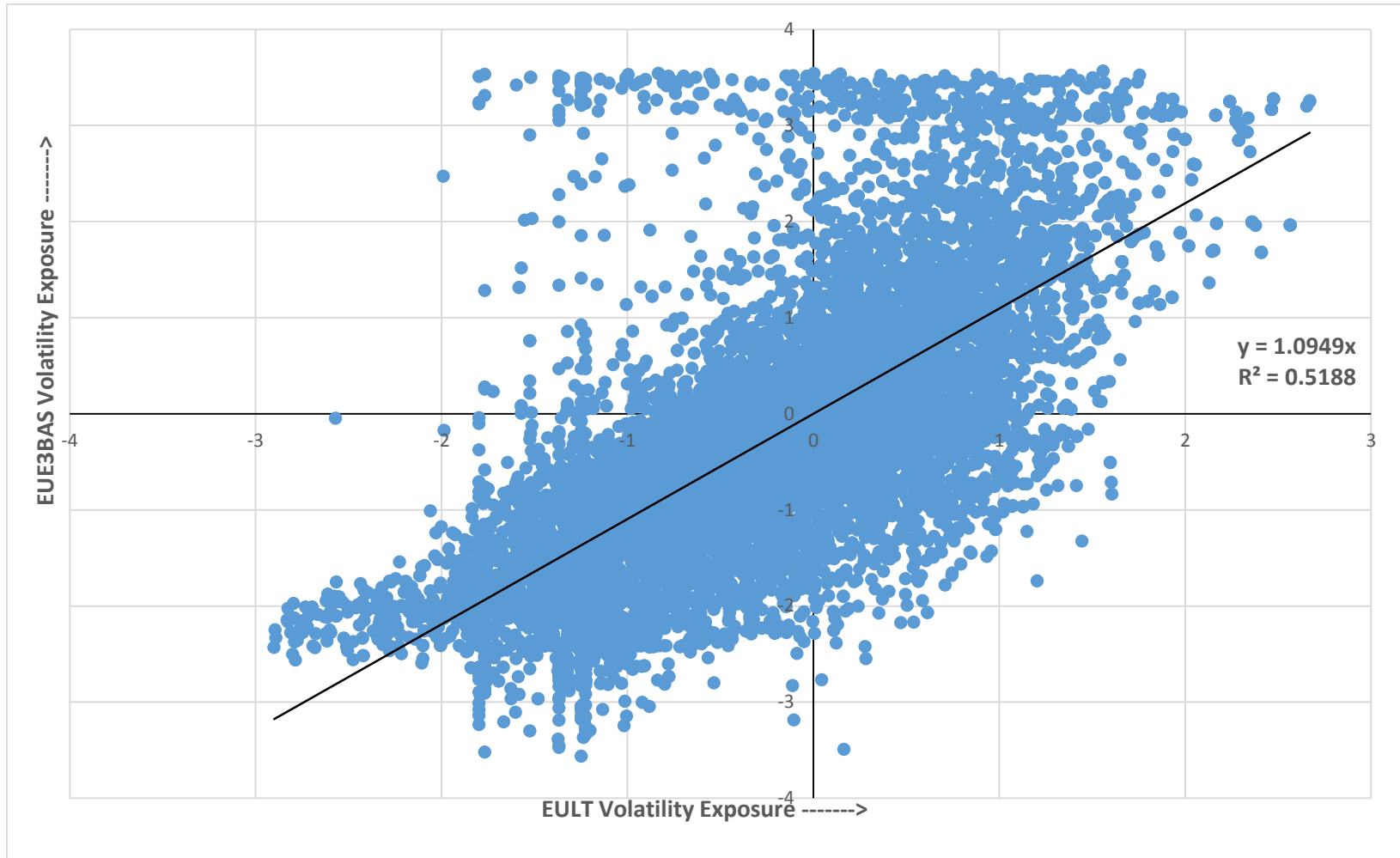
# MOMENTUM FACTOR EXPOSURE



# LEVERAGE FACTOR EXPOSURE



# VOLATILITY FACTOR EXPOSURE



- EULT Volatility represented as  $0.5 * \text{EULT BETA} + 0.5 * \text{EULT Residual Volatility}$

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