

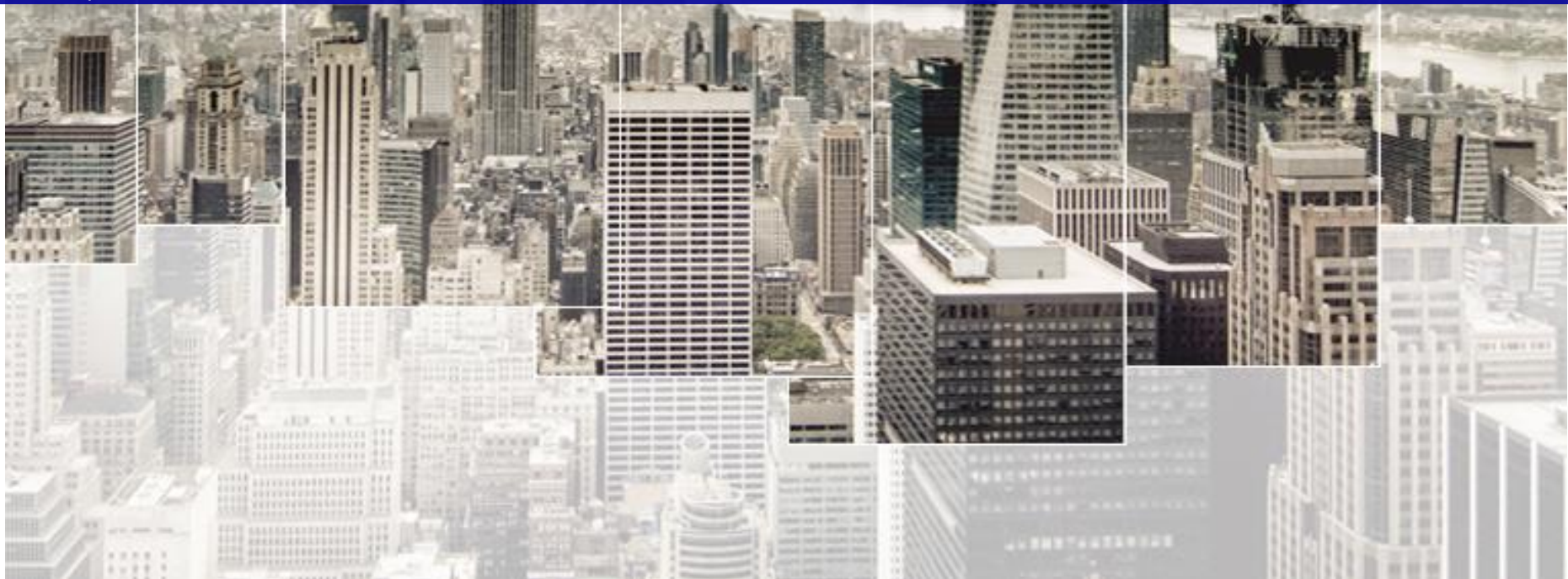
STOXX

 **DEUTSCHE BÖRSE
GROUP**

EURO STOXX[®] Multi Premia[®] Index

Equity risk premia with academic foundation

September 2018



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Introduction

About STOXX Limited

Innovative. Global. Indices.

Global index provider owned by Deutsche Börse

- » STOXX is part of Deutsche Börse Group, one of the world's leading exchange organizations.
- » Deutsche Börse Group covers the whole trading process value chain and has a wide spectrum of services.
- » STOXX and its 110+ employees run a leading global index offering – differentiated through innovation, quality and liquidity.
- » Headquartered in Zurich. Offices in Frankfurt, London, New York, Hong Kong and Tokyo.

Global and innovative index universe

- » Index offering covers 65 countries globally; wide product range used by more than 500 clients in 36 countries.
- » STOXX-owned brands STOXX, iSTOXX and STOXX Customized, marketed brands include DAX indices.
- » First bond indices launched in 1991.

Core values: innovation, objectivity and transparency

- » STOXX has been at the forefront of innovation since creating the market's first Eurozone blue-chip index in 1998 and has won many innovation awards.
- » All STOXX and DAX indices are fully rules-based, with rules disclosed in methodology guides.
- » Spearheading the revolution in investment services with quantitative and mathematics-based investment strategies.

What differentiates STOXX?

A solutions oriented approach putting investors at the forefront of innovation

Investor First

1

- Alignment: Our philosophy recognizes our clients' growth as our own path to growth
 - Strong commercial focus: Track-record of launching indices with existing commercial commitment from clients
 - Industry-wide relationships: Deep relationships that encompass the entire value-chain including banks/managers, intermediaries, distributors and end-investor
-

Index Solutions

2

- Investor centric: Collaborative and objectives-focused approach that spans the process from concept through index solution
 - Expert knowledge: Specialist staff covering research and product development
 - Quality: Assurance of high quality standards has forged our market reputation
-

Innovations Meets Opportunity

3

- Aspiration of market leadership and innovation (e.g. EURO STOXX 50[®], TRU[®], thematic, low carbon and climate indices)
- Strategic choice for “open architecture”, e.g.: partner with best-in-class providers for the benefit of our customers (Sustainalytics, CDP, Axioma, Finreon)

EURO STOXX® Multi Premia® Index

Equity risk premia with academic foundation

Index overview

- The index integrates the academic research based Multi Premia® methodology developed by Finreon, a spin-off from the University of St. Gallen in Switzerland

Index setup

- The EURO STOXX® Multi Premia® Index is derived from 7 EURO STOXX® Single Premium Indices which are based on value, size, momentum, residual momentum, reversal, low risk and quality

Key features

- Based on the EURO STOXX® Index
- Equity risk premia with academic foundation¹⁾
- Single Premium Indices aimed at harvesting different equity risk premia
- Multi Premia® aims at diversifying across different sources of return by combining Single Premium Indices
- Balanced relative risk contribution of each factor while controlling risks and focusing on tradability

1) An overview of the scientific articles on which the Multi Premia® methodology is based on is available at <https://www.finreon.ch/en/foundation-of-solutions.html>



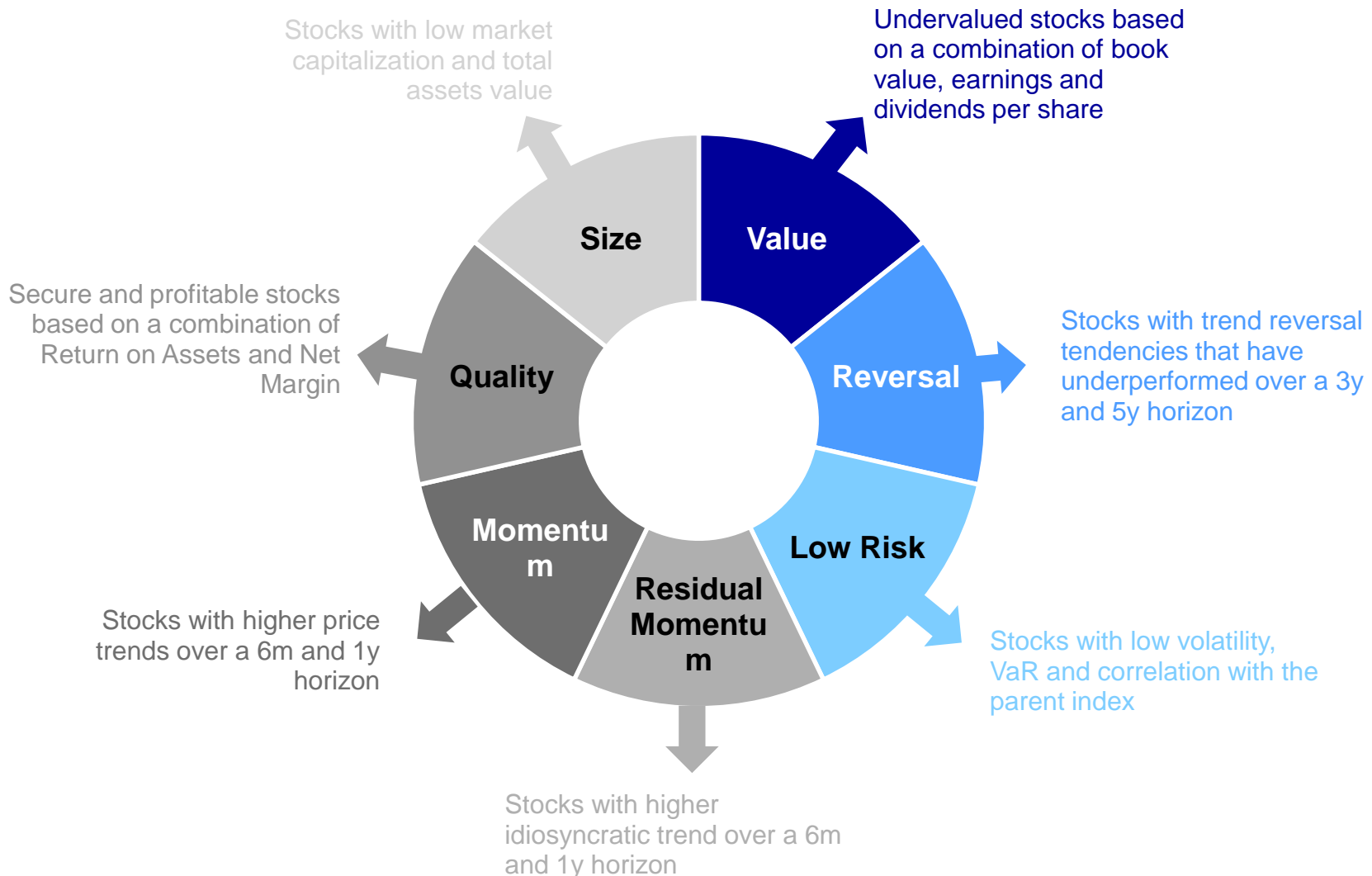
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EURO STOXX®

Single Premium Indices

EURO STOXX® Single Premium Indices

Aim at harvesting different equity risk premia



Each single premium is a combination of indicators

Indicators calculated from fundamental data and/or price data

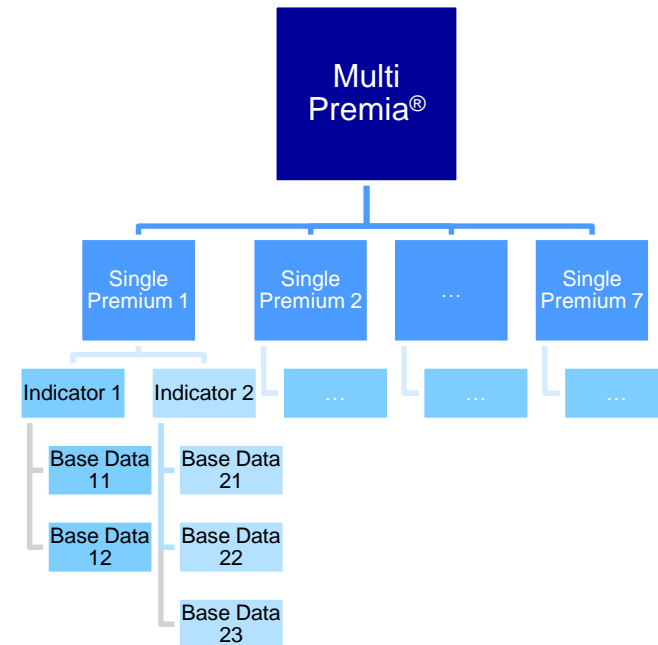
Step-by-step process

- For each constituent, a set of indicators are calculated according to specific screening criteria tailored for each individual risk-premium under consideration
- A ranking process takes place, ranking the constituents among their ICB industry¹⁾ or across all eligible stocks²⁾, and allocating a factor score to each, which is then standardised to increase the comparison between them and aggregated to an overall factor score
- A selection list composed of the top ranking stocks up to the target number⁴⁾ of components and an additional selection buffer of 10% is compiled.

Screening criteria

Premium	Indicator(s)
Value	<ul style="list-style-type: none"> Book Value per Share to Price (B/P) Earnings per Share to Price (E/P) Dividend per Share over last 12 months to Price (D/P)
Size	<ul style="list-style-type: none"> Natural logarithm of the free-float market capitalization (MCAP) Natural logarithm of the company's Total Assets (TA)
Momentum	<ul style="list-style-type: none"> 52 minus 4 weeks gross return (52-4TR) 26 minus 4 weeks gross return (26-4TR)
Residual Momentum	<ul style="list-style-type: none"> The 52 minus 4 weeks standardised³⁾ residual return (52-4RR) The 26 minus 4 weeks standardised³⁾ residual return (26-4RR)
Low Risk	<ul style="list-style-type: none"> Volatility calculated on the basis of weekly gross return data over the previous 156 weeks (VOL) 90% value-at-risk for the weekly gross returns over the previous 156 weeks (VaR). The loss is represented as a positive number. Correlation coefficient between the weekly gross returns of the component against the weekly gross return of the EURO STOXX® Index over the previous 156 weeks (CORR)
Quality	<ul style="list-style-type: none"> Gross income divided by Total Asset (ROA) Earnings per share divided by revenue per share (Net Margin)
Reversal	<ul style="list-style-type: none"> 260 minus 52 weeks gross return (260-52TR) 156 minus 52 weeks gross return (156-52TR)

Combination of premia



1) For value, size and quality Single Premium Indices

2) For momentum, residual momentum, reversal and low risk Single Premium Indices.

3) Based on CAPM regression over weekly data covering 156 weeks of the component against the reference market

4) The target number of components in the relevant EURO STOXX® Single Premium Index is set to 1/3 (rounded up to the closest integer) of the eligible stocks. Please refer to the index methodology: [STOXX Index Methodology Guide](#) for details.

Optimisation aims at balanced risk contribution

Constraints, turnover control and penalties applicable

Optimisation approach

- Component weights is estimated based on an optimisation approach
- The optimisation aims to have a balanced risk contribution¹⁾ of each of the components of the index to overall volatility of the respective EURO STOXX® Single Premium Index
- Optimisation also incorporates an objective to control the turnover in the index
- Optimisation function also includes a penalty term for breaching the caps on ICB industry weights and country weights of resulting selection of stocks, with an objective to minimise the penalty

Overview – constraints

- Non-negative component weights that sum-up to 100%
- Cap on the component weight of 4%, with component weight being determined based on a combination of market cap and ADTV
- Floor on ICB industry weight of selected stocks, with a penalty applied in case of breach of cap on ICB industry weight
- Floor on country weight of selected stocks, with a penalty applied in case of breach of cap on country weight

1) For definition of relative contribution to risk and marginal risk contribution, please refer to the detailed index methodology: [STOXX Index Methodology Guide](#).

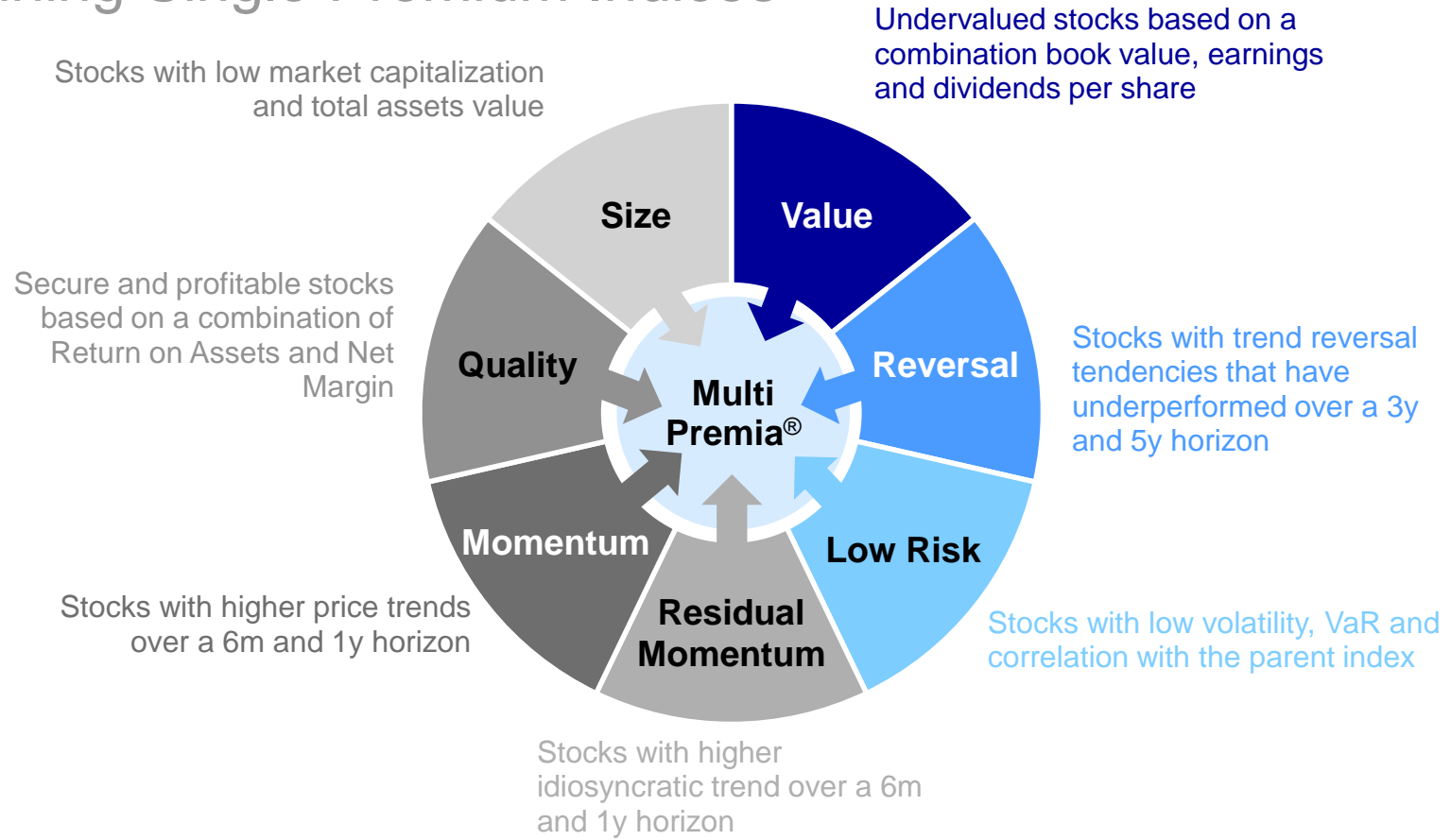


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EURO STOXX®
Multi Premia® Index

EURO STOXX® Multi Premia® Index

Aims at diversifying across different sources of return by combining Single Premium Indices



Balanced relative contribution of each of the Single Premium Indices to overall tracking error of EURO STOXX® Multi Premia® Index versus the EURO STOXX® Index

Multi Premia[®] optimisation

Balanced tracking-error contribution of each Single Premium Index

Optimisation approach

- Combines the seven Single Premium Indices to diversify across the equity risk premia
- The weight of each EURO STOXX[®] Single Premium Index is assigned such that the tracking error contribution¹⁾ of each Single Premium Index to the overall EURO STOXX[®] Multi Premia[®] Index is equal

Overview - constraints

- Weight of each EURO STOXX[®] Single Premium Index between 11% and 17.5%
- Cumulative weights of the EURO STOXX[®] Single Premium Indices must equal 100%

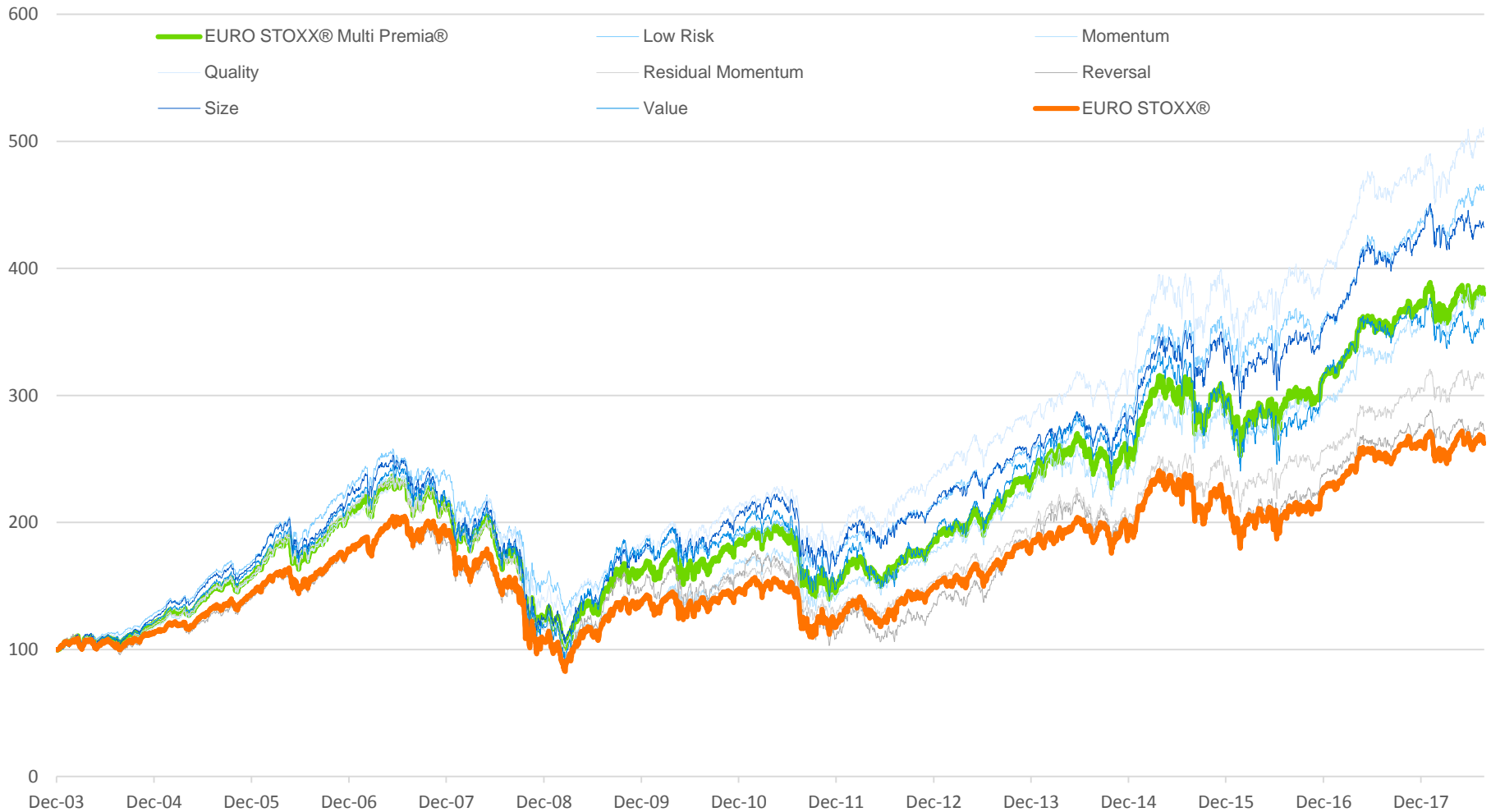
1) For definition of tracking error contribution, please refer to the detailed index methodology: [STOXX Index Methodology Guide](#).

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Historical performance



Historical index performance



1) Data as on August 31, 2018

Risk and returns

Robust outperformance of EURO STOXX® Multi Premia® index

Key figures ¹⁾	EURO STOXX® Index	EURO STOXX® Multi Premia®	Value	Size	Momentum	Residual Momentum	Reversal	Low Risk	Quality
YTD return	1.2%	2.8%	-1.6%	1.2%	7.0%	3.8%	-2.2%	6.8%	7.8%
1Y return	5.2%	8.1%	0.7%	7.8%	14.0%	9.8%	3.9%	13.5%	11.5%
3Y (ann.) return	7.1%	10.3%	5.8%	10.8%	12.0%	11.1%	8.5%	12.4%	12.6%
5Y (ann.) return	10.1%	12.8%	10.3%	12.9%	13.6%	12.8%	11.4%	14.5%	14.5%
Overall (ann.) return	6.9%	9.6%	9.0%	10.7%	9.6%	8.2%	7.1%	11.2%	11.9%
Volatility YTD	12.4%	11.3%	12.5%	11.2%	13.3%	12.5%	10.7%	9.9%	11.7%
Volatility 1 Y (ann.)	11.1%	10.1%	11.4%	10.1%	11.9%	11.1%	9.9%	9.1%	10.4%
Volatility 3 Y (ann.)	16.2%	14.5%	17.8%	14.0%	14.7%	14.8%	15.9%	12.7%	14.1%
Volatility 5 Y (ann.)	16.7%	14.9%	17.3%	13.8%	15.9%	15.7%	16.9%	12.9%	14.3%
Volatility overall (ann.)	20.2%	18.1%	21.0%	17.7%	18.2%	18.4%	21.2%	14.8%	16.9%
3y Sharpe ratio ²⁾	0.53	0.77	0.43	0.83	0.87	0.81	0.61	1.01	0.94
Maximum drawdown ³⁾	59.7%	57.4%	63.1%	58.6%	57.6%	60.2%	59.4%	50.6%	49.7%

1) Data based on Gross Return Index data in EUR as on August 31, 2018.

2) Sharpe ratio calculated by using Euribor 1m rate.

3) Calculated using index data between from December 19, 2003 and August 31, 2018



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Appendix

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About STOXX

STOXX Ltd. is an established and leading index specialist, which started in Europe. The launch of the first STOXX® indices in 1998, including the EURO STOXX 50® Index, marked the beginning of a unique success story, based on the company's neutrality and independence. Since then, STOXX has been at the forefront of market developments and has continuously expanded its portfolio of innovative indices. STOXX now operates globally across all asset classes.

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