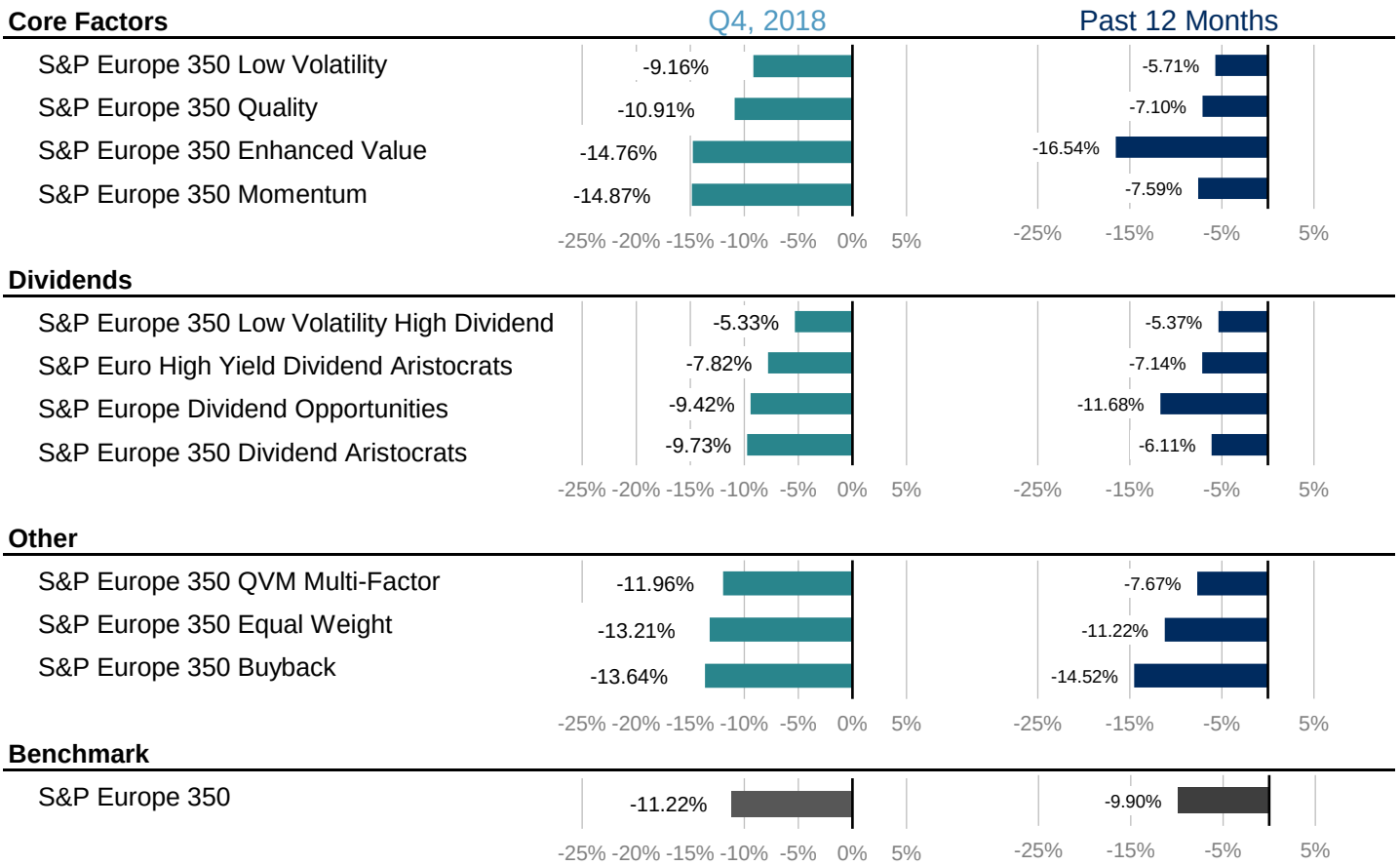
S&P Dow Jones Indices
A Division of S&P Global

Index Dashboard: S&P Europe 350® Factor Indices

Q4, 2018

RECENT PERFORMANCE



COMMENTARY

- Roiled by both Brexit & intra-Eurozone tensions, global trade uncertainty and sharp declines in commodity prices, the S&P Europe 350 fell 11.2%, and all of our European factor indices declined in Q4. Momentum had a reversal of fortune, declining 14.9%, making it the worst performing factor index in Q4.

- The strongest factors were defensive, with dividend-oriented and low volatility strategies benefiting from the flight to safety in Q4. The standout performer was the S&P Europe 350 Low Volatility High Dividend Index; it outperformed the S&P Europe 350 by 3.8% in Q4, leaving it at a 5.4% decline over the last 12 months - the best of any index in our report over 2018.

- The S&P Europe 350 Quality, Value and Momentum Index's relative positive load on Quality - which outperformed - helped to offset its tilt towards Momentum - which didn't. The multi-factor index posted a 12% quarterly decline, leaving it down 7.7% over the previous 12 months. The S&P Europe 350 Buyback Index struggled, declining 13.6% in Q4 to end the year down 14.5%.

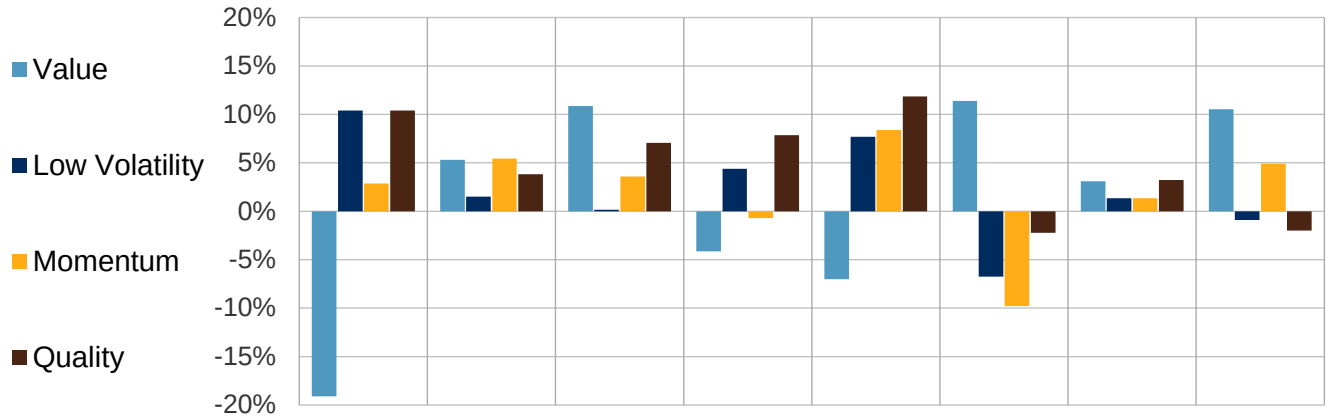
Source: S&P Dow Jones Indices LLC and/or its affiliates. Data as of Dec. 31, 2018.

ANNUAL PERFORMANCE

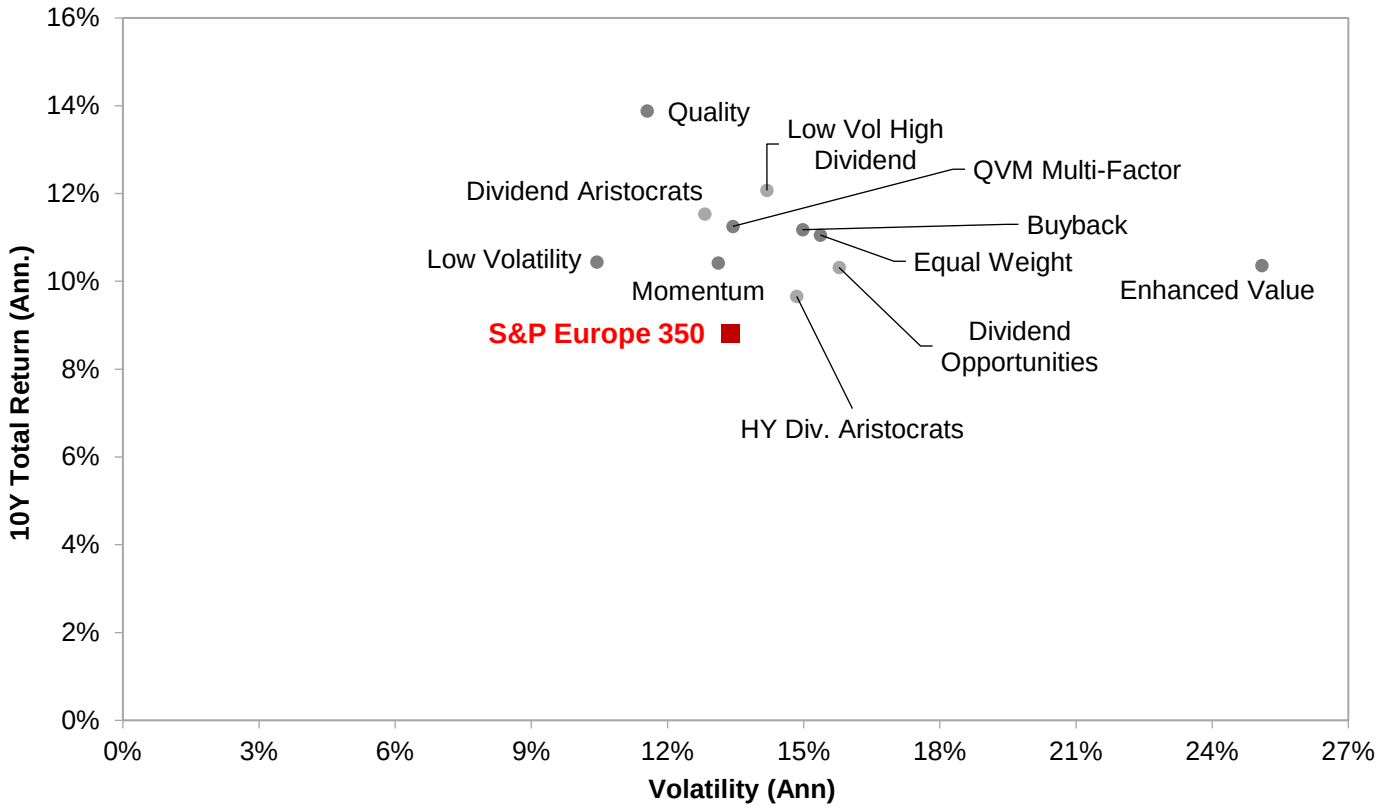
Core factor performance by calendar year, 2011-present:

Total Return	2011	2012	2013	2014	2015	2016	2017	2018
Enhanced Value	-26.3%	23.3%	31.8%	3.7%	1.6%	14.8%	12.3%	9.5%
Low Volatility	3.1%	19.5%	21.1%	12.3%	16.3%	-3.3%	10.6%	-1.9%
Momentum	-4.4%	23.5%	24.6%	7.2%	17.0%	-6.3%	10.6%	3.9%
Quality	3.2%	21.8%	28.0%	15.7%	20.5%	1.2%	12.5%	-3.0%
S&P Europe 350	-7.3%	18.0%	21.0%	7.9%	8.6%	3.4%	9.2%	-1.0%

Relative to Benchmark 2011 2012 2013 2014 2015 2016 2017 2018

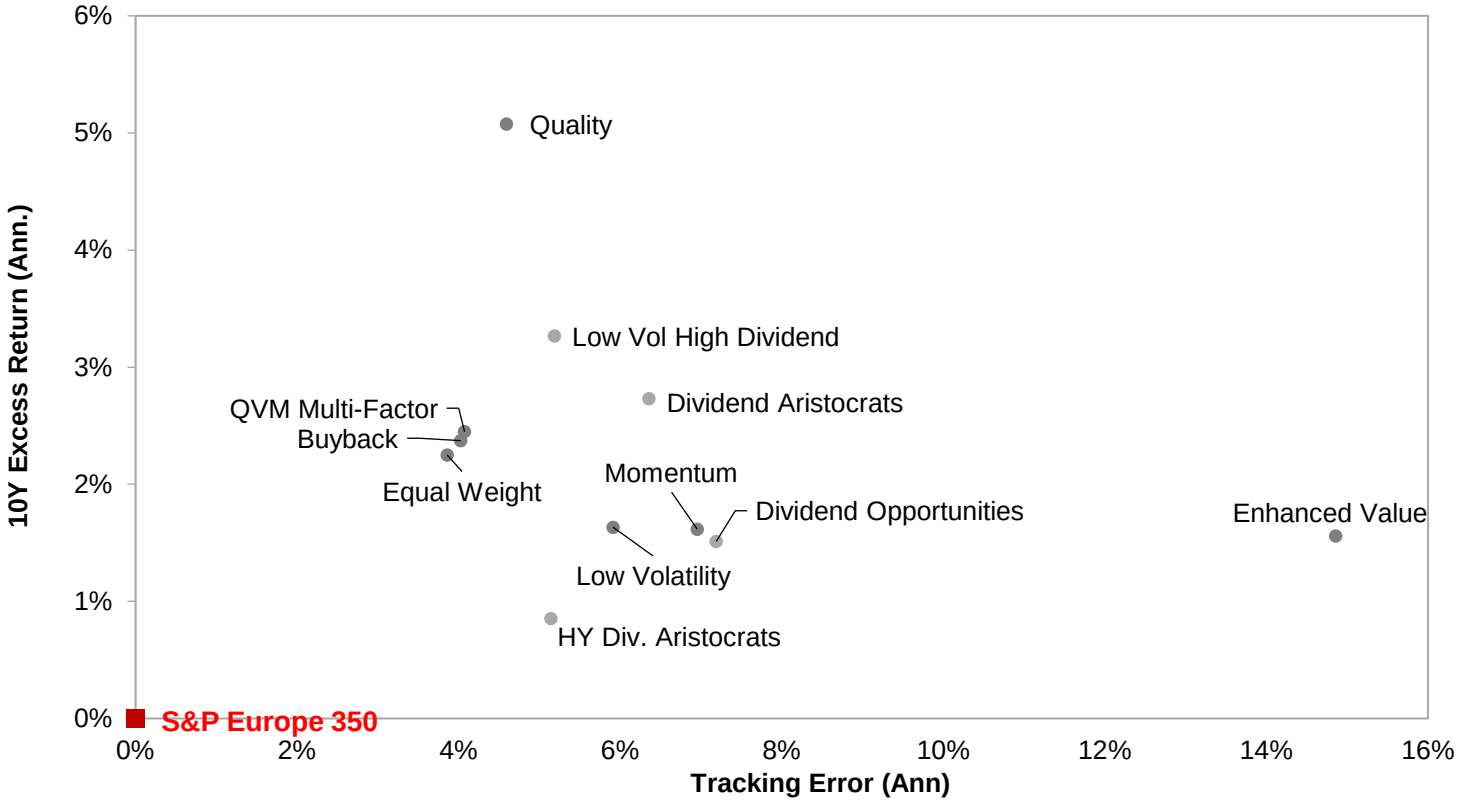


10-YEAR RISK / RETURN PROFILE



Source: S&P Dow Jones Indices LLC and/or its affiliates. Data as of Dec. 31, 2018.

RELATIVE RISK/RETURN PROFILE



PAIRWISE EXCESS RETURN CORRELATIONS

	Enhanced Value	Equal Weight	Buyback	Low Vol High Dividend	Quality	Euro HY Div. Aristocrats	QVM Multi-Factor	Momentum	Dividend Aristocrats	Quality	Low Volatility
S&P Europe 350 Enhanced Value	1.00	0.41	0.14	0.15	0.01	-0.26	-0.01	-0.49	-0.54	-0.60	-0.63
S&P Europe 350 Equal Weight	0.41	1.00	0.64	0.01	0.33	0.14	0.17	-0.13	-0.03	-0.03	-0.07
S&P Europe 350 Buyback	0.14	0.64	1.00	-0.11	0.22	0.11	0.07	0.05	0.01	0.14	0.03
S&P Europe 350 Low Volatility High Dividend	0.15	0.01	-0.11	1.00	0.44	0.38	-0.11	-0.21	0.02	-0.13	0.16
S&P Europe Dividend Opportunities	0.01	0.33	0.22	0.44	1.00	0.49	0.02	-0.06	0.25	0.12	0.42
S&P Euro High Yield Dividend Aristocrats	-0.26	0.14	0.11	0.38	0.49	1.00	0.13	0.17	0.18	0.27	0.56
S&P Europe 350 QVM Multi-Factor	-0.01	0.17	0.07	-0.11	0.02	0.13	1.00	0.40	-0.09	0.23	0.16
S&P Europe 350 Momentum	-0.49	-0.13	0.05	-0.21	-0.06	0.17	0.40	1.00	0.16	0.39	0.44
S&P Europe 350 Dividend Aristocrats	-0.54	-0.03	0.01	0.02	0.25	0.18	-0.09	0.16	1.00	0.50	0.58
S&P Europe 350 Quality	-0.60	-0.03	0.14	-0.13	0.12	0.27	0.23	0.39	0.50	1.00	0.62
S&P Europe 350 Low Volatility	-0.63	-0.07	0.03	0.16	0.42	0.56	0.16	0.44	0.58	0.62	1.00

Correlation of weekly excess total returns (versus S&P Europe 350), past 3 years.

Source: S&P Dow Jones Indices LLC and/or its affiliates. Data as of Dec. 31, 2018.

INDEX FACTOR SCORES - EXPLAINED

Every index is provided with a factor score between -100% and + 100% in each of Beta, Volatility, Momentum, Dividend, Size, Value and Quality.

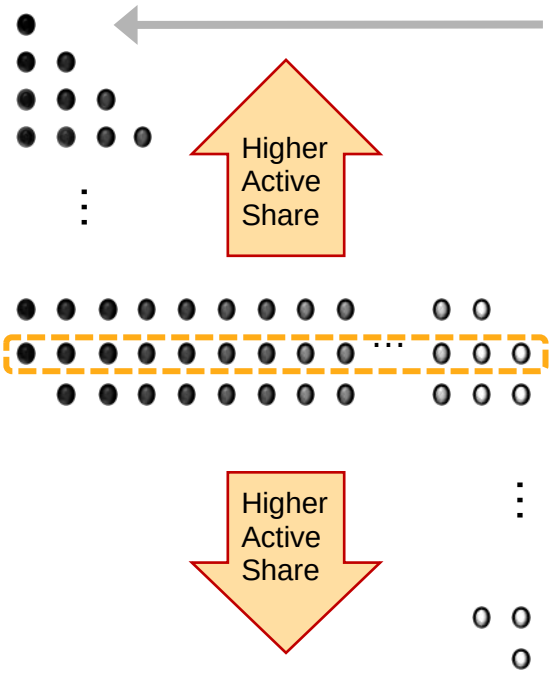
The score relates to the total trading required (sometimes called "active share") to convert a benchmark-replicating portfolio to a cap-weighted portfolio of ranked stocks with the same factor exposure.

The first step is to calculate the **factor scores of each constituent in the benchmark S&P Europe 350**. These measurements are based on the manner in which S&P Dow Jones Indices ranks stocks at the rebalance date for the relevant factor index, summarized below:

Beta	Trailing 1 year beta of stock daily returns to the benchmark's return.
Volatility	Trailing 12-month daily return volatility.
Momentum	Twelve-month price change as of one month ago ("13 minus 1 momentum"), divided by the daily volatility during the twelve-month period that ended one month prior. For more details, see the S&P Momentum methodology.
Value	The average of (normalized) earnings to price ratio, book to price ratio and sales to price ratio. For more details, see the S&P Value methodology.
Dividend	Trailing 12-month dividend.
Quality	The average of the (normalized) return on equity, the negative of the accruals ratio and the negative of the financial leverage ratio. For more details, see the S&P Quality methodology.
Size	Free-float market capitalization.

The next step is to use the ranked list of stocks create **comparison portfolios for each factor.** These are hypothetical portfolios, including greater or fewer stocks with higher and lower factor scores.

Comparison Portfolio Formation and Ranking



Single stock with the highest possible factor score

The stocks in the benchmark are ranked in order from highest to lowest factor score, and we examine portfolios including (or excluding) stocks with higher or lower factor scores.

Portfolios with fewer stocks have more extreme (positive or negative) factor tilts, while by definition the benchmark portfolio has no factor tilt.

Benchmark portfolio, containing all stocks

Portfolios with a tilt *against* the factor begin by excluding the highest-ranked stock and end up concentrated in the lowest-ranked stocks.

The most extreme portfolios are single-stock porttfolios containing only the stock with the highest or lowest factor score.

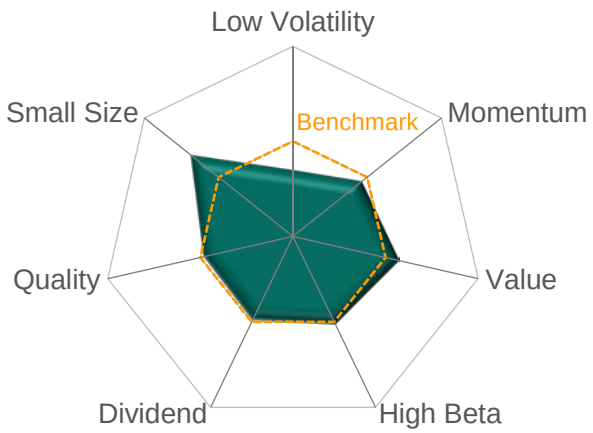
Single stock with the lowest possible factor score

INDEX FACTOR SCORES - CONT'D

For each index and each factor, the **index factor score** is equal to the active share of the comparison portfolio whose weighted-average constituent factor score matches that of the index. The score is positive for tilts towards the factor, negative for tilts away from the factor.

For example, the chart below shows the current factor scores for the S&P Europe 350 Equal Weight Index, together with a table summarizing the values. The benchmark S&P Europe 350 is included for purposes of comparison.

Example: S&P Europe 350 Equal Weight Factor Scores



Factor	Score	Versus Benchmark Portfolio
Low Volatility	-30.7%	Higher volatility stocks
Momentum	-7.7%	Underperforming stocks
Value	14.2%	Cheaper stocks
High Beta	2.6%	Higher beta stocks
Dividend	-2.5%	Lower yielding stocks
Quality	-4.6%	Lower quality stocks
Small Size	36.4%	Smaller stocks

As of the most recent quarter-end, the index-weighted average free-float market capitalization of the consitutuents of the S&P Europe 350 Equal Weight was EUR 27.3 billion, compared to EUR 58.9 billion for the S&P Europe 350. In order to match the size score of the S&P Europe 350 Equal Weight, one would need to exclude the largest 36.4% of stocks in the benchmark by capitalization. Accordingly, the Small Size score of the S&P Europe 350 Equal Weight is 36.4 %.

For more details on how we provide factor scores, see our post on Indexology. Notes on additional statistics provided in our dashboard follow below.

Notes On Additional Index Statistics

Statistic	Notes
Active Share (Stock)	Ranging from 0 to 100%, "active share" is a measure of how much a portfolio's composition differs from that of its benchmark. The Active Share (Stock) for each index is calculated as the absolute sum of difference between benchmark weights and index weights in each constituent, divided by two.
Active Share (Sector)	The Active Share (Sector) is the absolute sum of difference between benchmark sector weights and index sector weights, divided by two.
Concentration (HH Index)	The Herfindahl-Hirschman ("HH") concentration measure is equal to the sum of an index constituent's percentage weights, squared. For example, the HH measure of a single-stock portfolio is 10,000 (the maximum possible). The HH measure of a 100-stock, equally weighted index is 100.
Correlation (Stock)	Calculated as the weighted-average one year trailing daily variance of current index constituents, divided by the index variance. The value approximates an average stock-to-stock correlation of index constituents, weighted proportionally to both constituent weight and constituent volatility.

Source: S&P Dow Jones Indices LLC and/or its affiliates. Data as of Dec. 31, 2018.

S&P Europe 350 Low Volatility

Description

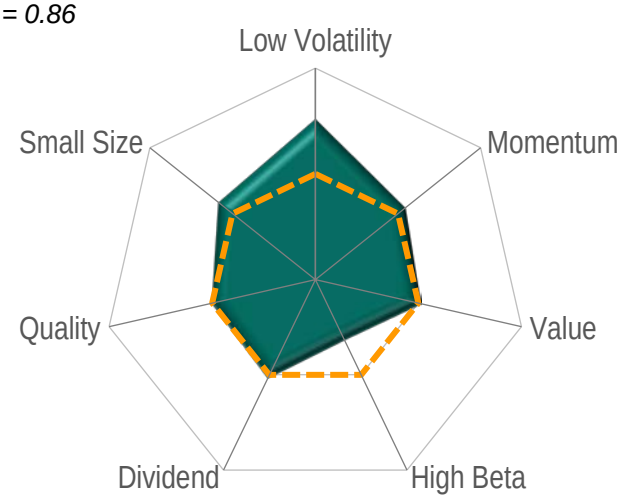
The S&P Europe 350 Low Volatility measures the performance of the 100 least-volatile stocks in the S&P Europe 350. Constituents are weighted relative to the inverse of their corresponding volatility, with the least volatile stocks receiving the highest weights.

Index Statistics	**1M**	**3M**	**12M**	**3Y**	**5Y**	**10Y**	**15Y**
Total Return (Ann)	-5.1%	-9.2%	-5.7%	0.5%	5.8%	10.4%	9.2%
Relative to Benchmark	0.5%	2.1%	4.2%	-0.6%	1.9%	1.6%	3.3%
Index Volatility			9.1%	9.3%	10.9%	10.4%	10.8%
Tracking Error			2.8%	3.7%	3.9%	5.9%	5.6%

Benchmark: S&P Europe 350. 1 Yr trailing beta to benchmark = 0.86

Top Sector Tilts (versus benchmark)	*Index Weight*	*Difference v Bmark*
Financials	29%	+11%
Real Estate	9%	+7%
Energy	3%	-5%
Health Care	6%	-8%

Portfolio Statistics	
Active Share (Stock)	64%
Active Share (Sector)	26%
Concentration (HH Index)	100.7
Correlation (stock)	0.38
Average Market Cap (EUR bn)	39.91



S&P Europe 350 Quality

Description

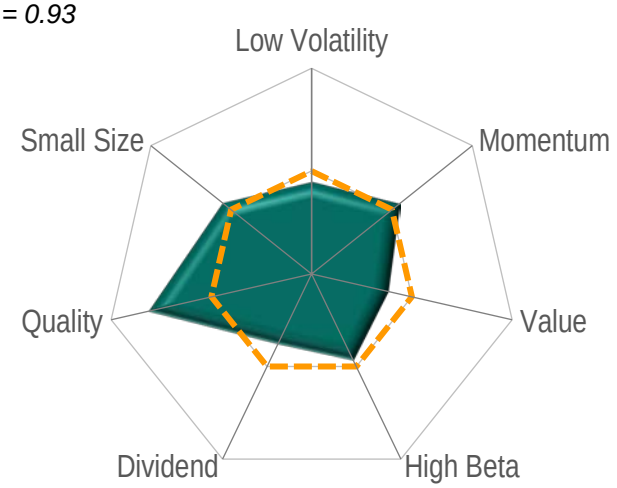
The S&P Europe 350 Quality measures the performance of the 50 stocks in the S&P Europe 350 with the highest quality score, based on return on equity, accruals ratio and financial leverage ratio. The weighting is proportional to both the quality score and the market capitalization of each component, subject to turnover and diversification constraints.

Index Statistics	**1M**	**3M**	**12M**	**3Y**	**5Y**	**10Y**	**15Y**
Total Return (Ann)	-5.0%	-10.9%	-7.1%	1.5%	7.8%	13.9%	9.9%
Relative to Benchmark	0.5%	0.3%	2.8%	0.4%	4.0%	5.1%	4.0%
Index Volatility			9.4%	9.2%	11.5%	11.6%	12.2%
Tracking Error			4.1%	3.8%	4.1%	4.6%	4.7%

Benchmark: S&P Europe 350. 1 Yr trailing beta to benchmark = 0.93

Top Sector Tilts (versus benchmark)	*Index Weight*	*Difference v Bmark*
Consumer Discretionary	28%	+19%
Industrials	28%	+15%
Energy	0%	-8%
Financials	9%	-9%

Portfolio Statistics	
Active Share (Stock)	86%
Active Share (Sector)	38%
Concentration (HH Index)	307.7
Correlation (stock)	0.29
Average Market Cap (EUR bn)	45.24



S&P Europe 350 Momentum

Description

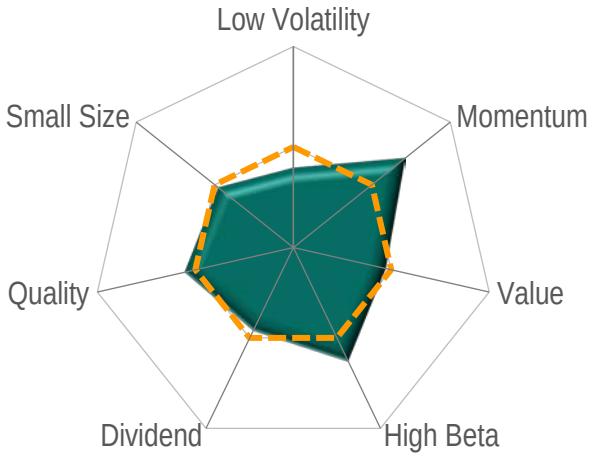
The S&P Europe 350 Momentum measures the performance of securities within the S&P Europe 350 that are in the top quintile of recent risk-adjusted return. The weighting is proportional to the momentum score, and to market capitalization, subject to turnover and concentration constraints. As of December 31, 2018, the index comprised 72 constituents.

Index Statistics	**1M**	**3M**	**12M**	**3Y**	**5Y**	**10Y**	**15Y**
Total Return (Ann)	-4.4%	-14.9%	-7.6%	-0.4%	4.4%	10.4%	8.4%
Relative to Benchmark	1.1%	-3.6%	2.3%	-1.5%	0.5%	1.6%	2.5%
Index Volatility			13.8%	12.4%	13.0%	13.1%	13.6%
Tracking Error			5.5%	6.3%	5.6%	7.0%	6.5%

Benchmark: S&P Europe 350. 1 Yr trailing beta to benchmark = 1.11

Top Sector Tilts (versus benchmark)	*Index Weight*	*Difference v Bmark*
Energy	35%	+27%
Information Technology	10%	+5%
Consumer Staples	5%	-9%
Financials	2%	-16%

Portfolio Statistics	
Active Share (Stock)	79%
Active Share (Sector)	38%
Concentration (HH Index)	373.9
Correlation (stock)	0.39
Average Market Cap (EUR bn)	61.78



S&P Europe 350 Enhanced Value

Description

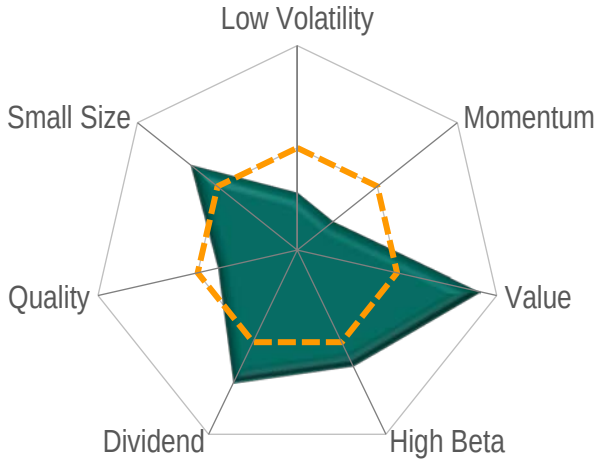
The S&P Europe 350 Enhanced Value is designed to measure the performance of the 50 stocks in the S&P Europe 350 with the highest average book value-to-price, earnings-to-price, and sales-to-price ratios. The weighting is proportional to both the value score and the market capitalization of each component.

Index Statistics	**1M**	**3M**	**12M**	**3Y**	**5Y**	**10Y**	**15Y**
Total Return (Ann)	-7.3%	-14.8%	-16.5%	4.6%	3.8%	10.4%	6.2%
Relative to Benchmark	-1.8%	-3.5%	-6.6%	3.5%	-0.1%	1.6%	0.3%
Index Volatility			15.0%	17.0%	16.9%	25.1%	23.9%
Tracking Error			5.8%	9.6%	8.6%	14.9%	13.4%

Benchmark: S&P Europe 350. 1 Yr trailing beta to benchmark = 1.04

Top Sector Tilts (versus benchmark)	*Index Weight*	*Difference v Bmark*
Financials	40%	+21%
Consumer Discretionary	25%	+16%
Energy	3%	-6%
Health Care	0%	-14%

Portfolio Statistics	
Active Share (Stock)	89%
Active Share (Sector)	41%
Concentration (HH Index)	317.9
Correlation (stock)	0.32
Average Market Cap (EUR bn)	27.28



Source: S&P Dow Jones Indices LLC and/or its affiliates. Data as of Dec. 31, 2018.

S&P Europe 350 Dividend Aristocrats

Description

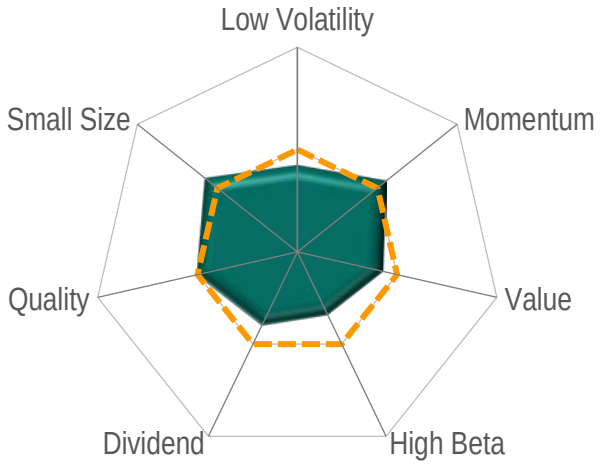
The S&P Europe 350 Dividend Aristocrats measure the performance of S&P Europe 350 constituents that have consistently maintained or increased their dividends. The constituents are equally weighted. As of December 31, 2018, the index comprised 40 constituents.

Index Statistics	**1M**	**3M**	**12M**	**3Y**	**5Y**	**10Y**	**15Y**
Total Return (Ann)	-5.4%	-9.7%	-6.1%	-0.1%	4.3%	11.5%	N/A
Relative to Benchmark	0.2%	1.5%	3.8%	-1.2%	0.5%	2.7%	N/A
Index Volatility			11.3%	10.7%	11.8%	12.8%	N/A
Tracking Error			5.0%	5.7%	5.2%	6.4%	N/A

Benchmark: S&P Europe 350. 1 Yr trailing beta to benchmark = 0.84

Top Sector Tilts (versus benchmark)	*Index Weight*	*Difference v Bmark*
Consumer Staples	23%	+8%
Health Care	20%	+6%
Energy	3%	-6%
Financials	8%	-11%

Portfolio Statistics	
Active Share (Stock)	80%
Active Share (Sector)	21%
Concentration (HH Index)	259.0
Correlation (stock)	0.25
Average Market Cap (EUR bn)	41.60



S&P Europe Dividend Opportunities

Description

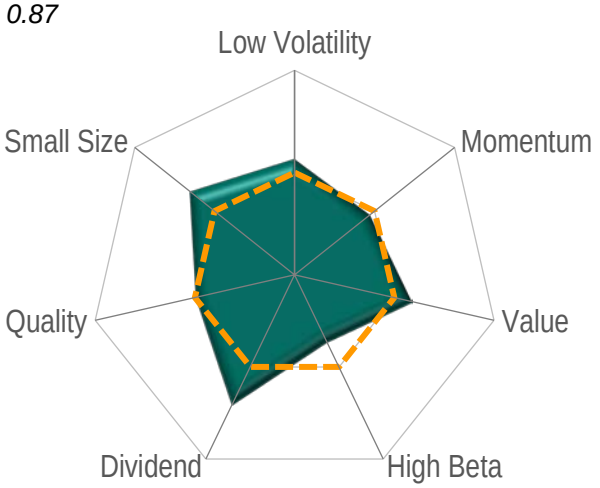
The S&P Europe Dividend Opportunities measures the performance of the 100 highest-yielding stocks in the wider European equity market, subject to diversification, stability, and tradability requirements. The weighting is according to dividend yield, subject to diversification constraints.

Index Statistics	**1M**	**3M**	**12M**	**3Y**	**5Y**	**10Y**	**15Y**
Total Return (Ann)	-5.9%	-9.4%	-11.7%	0.2%	5.3%	10.3%	7.8%
Relative to Benchmark	-0.4%	1.8%	-1.8%	-0.8%	1.4%	1.5%	1.9%
Index Volatility			8.9%	10.0%	11.2%	15.8%	15.8%
Tracking Error			2.5%	3.4%	3.6%	7.2%	6.8%

Benchmark: S&P Europe 350. 1 Yr trailing beta to benchmark = 0.87

Top Sector Tilts (versus benchmark)	*Index Weight*	*Difference v Bmark*
Utilities	14%	+10%
Real Estate	10%	+8%
Information Technology	0%	-5%
Health Care	5%	-9%

Portfolio Statistics	
Active Share (Stock)	75%
Active Share (Sector)	26%
Concentration (HH Index)	112.8
Correlation (stock)	0.35
Average Market Cap (EUR bn)	28.63



S&P Euro High Yield Dividend Aristocrats

Description

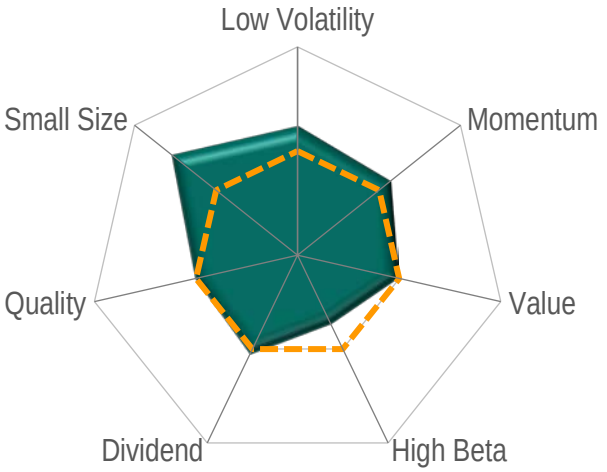
The S&P Euro High Yield Dividend Aristocrats measures the performance of the 40 highest-yielding Eurozone companies within the broader european equity market that have consistently maintained or increased their dividends. The weighting is proportional to dividend yield, subject to concentration constraints.

Index Statistics	**1M**	**3M**	**12M**	**3Y**	**5Y**	**10Y**	**15Y**
Total Return (Ann)	-3.8%	-7.8%	-7.1%	4.4%	5.5%	9.7%	N/A
Relative to Benchmark	1.7%	3.4%	2.8%	3.4%	1.7%	0.9%	N/A
Index Volatility			9.6%	10.1%	11.7%	14.8%	N/A
Tracking Error			3.1%	4.7%	4.9%	5.1%	N/A

Benchmark: S&P Europe 350. 1 Yr trailing beta to benchmark = 0.84

Top Sector Tilts (versus benchmark)	*Index Weight*	*Difference v Bmark*
Utilities	19%	+15%
Industrials	21%	+8%
Financials	12%	-6%
Consumer Staples	1%	-13%

Portfolio Statistics	
Active Share (Stock)	91%
Active Share (Sector)	32%
Concentration (HH Index)	311.4
Correlation (stock)	0.34
Average Market Cap (EUR bn)	17.80



S&P Europe 350 Low Volatility High Dividend

Description

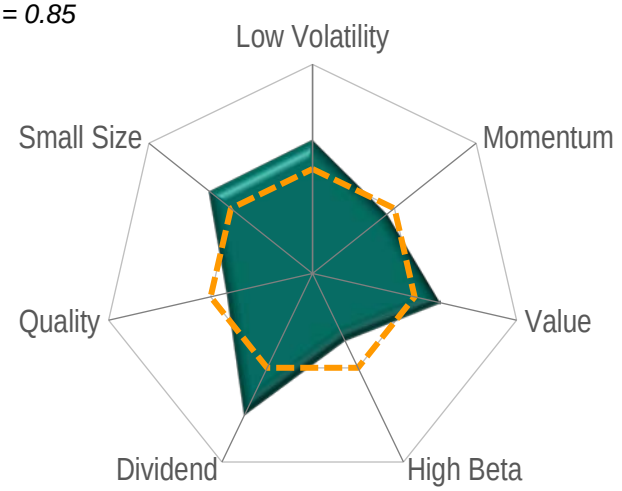
The S&P Europe 350 Low Volatility High Dividend is designed to measure the performance of 50 high-yielding companies within the S&P Europe 350, while meeting diversification, volatility and tradability requirements.

Index Statistics	**1M**	**3M**	**12M**	**3Y**	**5Y**	**10Y**	**15Y**
Total Return (Ann)	-4.3%	-5.3%	-5.4%	5.4%	7.6%	12.1%	10.3%
Relative to Benchmark	1.2%	5.9%	4.5%	4.4%	3.7%	3.3%	4.4%
Index Volatility			10.2%	9.8%	11.4%	14.2%	13.8%
Tracking Error			4.5%	4.9%	4.4%	5.2%	5.0%

Benchmark: S&P Europe 350. 1 Yr trailing beta to benchmark = 0.85

Top Sector Tilts (versus benchmark)	*Index Weight*	*Difference v Bmark*
Utilities	21%	+17%
Communication Services	20%	+15%
Health Care	4%	-10%
Consumer Staples	1%	-13%

Portfolio Statistics	
Active Share (Stock)	80%
Active Share (Sector)	42%
Concentration (HH Index)	202.9
Correlation (stock)	0.37
Average Market Cap (EUR bn)	32.42



S&P Europe 350 Equal Weight

Description

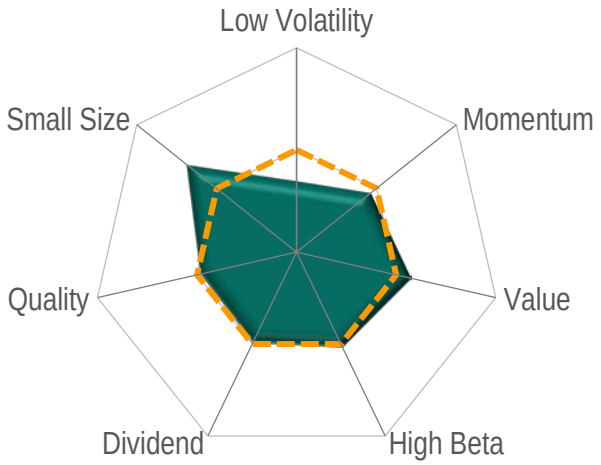
The S&P Europe 350 Equal Weight comprises all the constituents of the S&P Europe 350, equally weighted.

Index Statistics	**1M**	**3M**	**12M**	**3Y**	**5Y**	**10Y**	**15Y**
Total Return (Ann)	-5.8%	-13.2%	-11.2%	1.7%	4.6%	11.1%	7.4%
Relative to Benchmark	-0.2%	-2.0%	-1.3%	0.6%	0.7%	2.3%	1.5%
Index Volatility			10.9%	11.2%	12.4%	15.4%	15.6%
Tracking Error			2.2%	2.6%	2.4%	3.9%	3.8%

Benchmark: S&P Europe 350. 1 Yr trailing beta to benchmark = 1

Top Sector Tilts (versus benchmark)	*Index Weight*	*Difference v Bmark*
Industrials	21%	+8%
Materials	11%	+3%
Consumer Staples	8%	-6%
Health Care	6%	-8%

Portfolio Statistics	
Active Share (Stock)	41%
Active Share (Sector)	19%
Concentration (HH Index)	28.2
Correlation (stock)	0.27
Average Market Cap (EUR bn)	25.50



S&P Europe 350 Buyback

Description

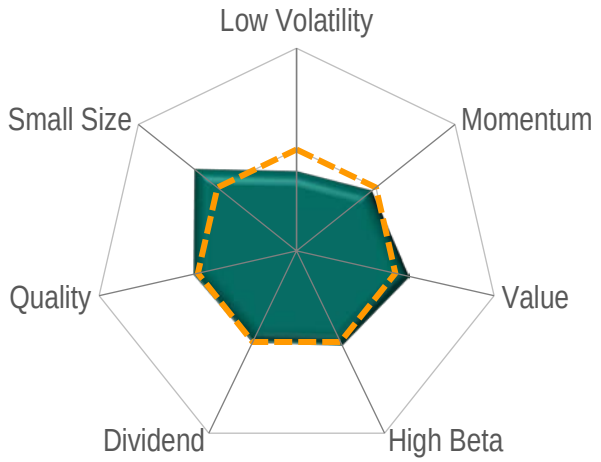
The S&P Europe 350 Buyback measures the performance of the 70 stocks with the highest buyback ratio in the S&P Europe 350, equally weighted.

Index Statistics	**1M**	**3M**	**12M**	**3Y**	**5Y**	**10Y**	**15Y**
Total Return (Ann)	-6.0%	-13.6%	-14.5%	0.0%	4.8%	11.2%	7.7%
Relative to Benchmark	-0.5%	-2.4%	-4.6%	-1.0%	0.9%	2.4%	1.8%
Index Volatility			10.5%	11.1%	12.3%	15.0%	15.1%
Tracking Error			3.7%	3.5%	3.3%	4.0%	3.9%

Benchmark: S&P Europe 350. 1 Yr trailing beta to benchmark = 1.04

Top Sector Tilts (versus benchmark)	*Index Weight*	*Difference v Bmark*
Industrials	24%	+11%
Communication Services	8%	+3%
Consumer Staples	8%	-6%
Health Care	5%	-9%

Portfolio Statistics	
Active Share (Stock)	75%
Active Share (Sector)	20%
Concentration (HH Index)	149.3
Correlation (stock)	0.32
Average Market Cap (EUR bn)	30.71



S&P Europe 350 Quality, Value & Momentum Multi-Factor

Description

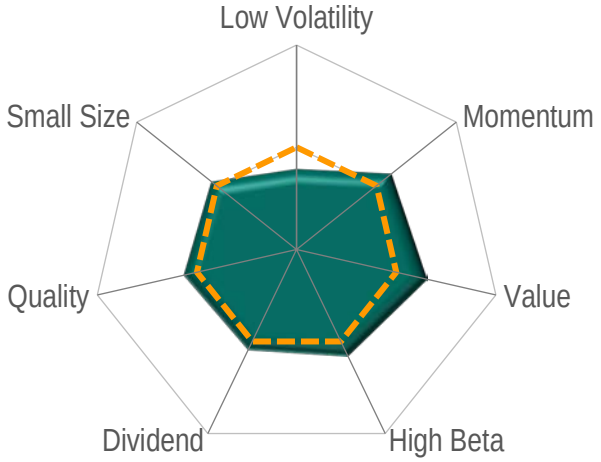
The S&P Europe 350 Quality, Value & Momentum Multi-Factor comprises the 70 stocks with the highest combined quality, value and momentum scores, weighted in proportion to both market capitalization and multifactor score.

Index Statistics	**1M**	**3M**	**12M**	**3Y**	**5Y**	**10Y**	**15Y**
Total Return (Ann)	-4.6%	-12.0%	-7.7%	2.6%	5.6%	11.3%	8.8%
Relative to Benchmark	0.9%	-0.7%	2.2%	1.6%	1.7%	2.4%	2.9%
Index Volatility			12.2%	11.7%	12.6%	13.4%	13.9%
Tracking Error			3.8%	4.5%	4.1%	4.1%	4.1%

Benchmark: S&P Europe 350. 1 Yr trailing beta to benchmark = 1.12

Top Sector Tilts (versus benchmark)	*Index Weight*	*Difference v Bmark*
Energy	25%	+17%
Materials	15%	+8%
Consumer Staples	7%	-7%
Health Care	6%	-7%

Portfolio Statistics	
Active Share (Stock)	80%
Active Share (Sector)	30%
Concentration (HH Index)	253.1
Correlation (stock)	0.38
Average Market Cap (EUR bn)	52.26



More Factor Resources

Factor Allocator is a complimentary web-based tool from Optimal Asset Management that allows advisors to build and analyze simulated portfolios using S&P Factor Indices. Using 15 years of S&P 500 factor index data, explore how individual risk factors behave together and in different market conditions in order to meet specific performance goals. Visit **factorallocator.com/spdji.**

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