



## Performance and Risk Report

**SciBeta Developed Narrow  
High-Factor-Intensity Low-Volatility  
Diversified Multi-Strategy (4-Strategy)**

# Overview

## Index Description as of 31-Dec-2018

The table summarises the index construction principles.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Index
Currency	USD
Number of Constituents	291
Cap Coverage (Global Universe)	22.6 %
Regional Universe	Developed
Stock Selection	H-FInt. Low Volatility
Weighting Scheme	Div. Multi-Strategy (4S)
Risk Control	None
TO Control	n/r
Base date	21-Jun-2002
Live Date	16-Mar-2018
Broad CW	SciBeta Dev CW
Beta CW	SciBeta Dev Nrw HFInt LVol CW
Bloomberg	SBDXVNBG (USD, RI)

Analytics are calculated at 31-Dec-2018.  
Analytics are updated quarterly.

The index coverage is calculated at the last rebalancing time.

## Index Characteristics

### Universe - Developed

The Developed universe consists of equities from Developed countries.

### Selection - Low Volatility Stock Selection

Indices which use volatility-based stock selection typically take a given universe of stocks, and rank each stock according to historical volatility, imposing a cut-off which selects/eliminates stocks above/below a threshold.

### Filter - Narrow High-Factor-Intensity Filter

The Narrow High-Factor-Intensity filter aims to improve the exposure to a given factor by selecting a fewer number of constituents at the stock selection stage and subsequently uses a filter to improve the exposure of the selection to other rewarded factors.

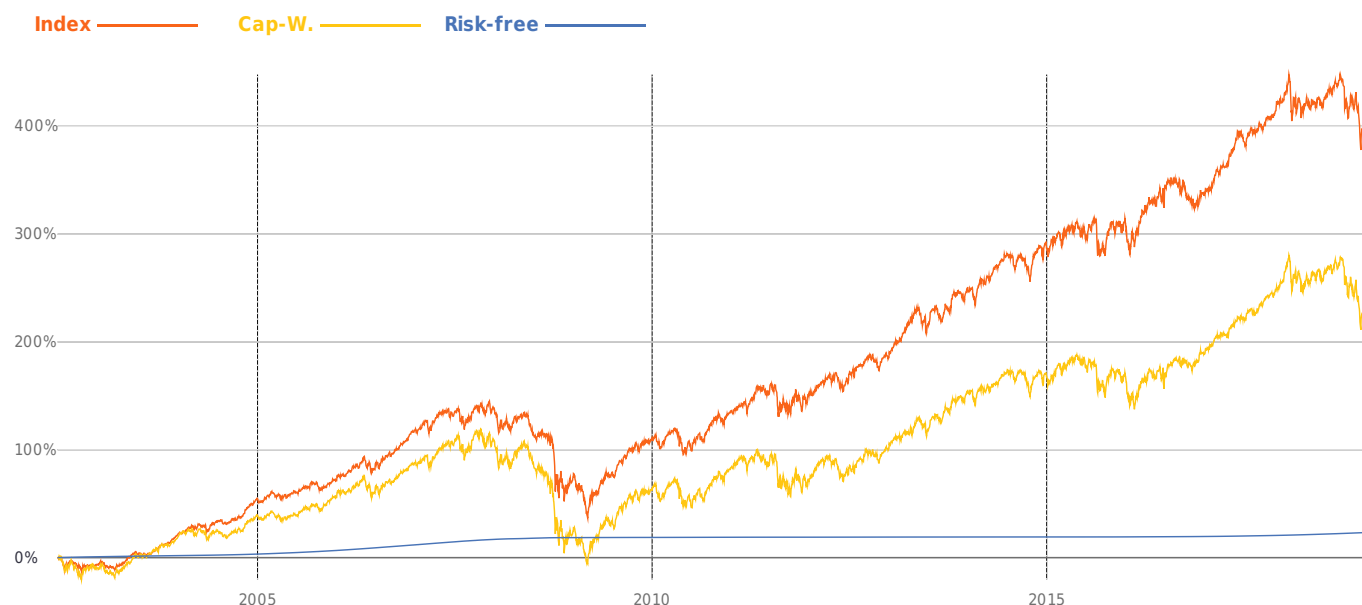
### Weighting - Diversified Multistrategy

In the Diversified Multistrategy weighting scheme, four Scientific Beta strategies are combined in order to diversify away individual strategies' specific risks and to mix strategies with different sensitivities to market conditions.

### Risk Control - No Relative Risk Control

No Relative Risk Control indicates that the strategy does not control the relative risk resulting from a stock selection and weighting scheme decision with regard to the cap-weighted reference index.

## Total Return Index in USD



# Latest Performances

Latest Performances refers to basic risk and return information for the most recent part of the strategy's history.

## Latest Performances (Total Return) as of 31-Jan-2019

The first table shows the index's absolute returns over recent short time periods. The next table reports the index's return, volatility and associated Sharpe ratio since the live date of the index. The last table reports the index's return, volatility and associated Sharpe ratio since the base date of the index. For periods longer than a year, the statistics are annualised, whereas the short-term statistics are calculated based on the period examined without annualisation. The corresponding statistics (calculated over the same dates) of the Broad cap-weighted reference index (Broad CW) are also reported, along with those of the Beta cap-weighted reference index (Beta CW) in case of univariated stock selection.

SciBeta Dev Nr w HFInt LVol Div MStrat (4S)	Index	Beta CW	Broad CW
1-Month Return	5.37 %	4.89 %	7.76 %
3-Month Return	1.62 %	1.45 %	0.89 %
Year-to-Date Return	5.37 %	4.89 %	7.76 %
1-Year Return	-3.08 %	-4.07 %	-6.00 %
3-Year Return	9.39 %	8.59 %	11.76 %
5-Year Return	9.03 %	6.80 %	7.44 %

*Analytics are based on daily **total** returns (dividends reinvested) in USD.  
Analytics are calculated at 31-Jan-2019 and updated monthly.*

Live	Index	Beta CW	Broad CW
Return	0.12 %	0.91 %	-2.88 %
Volatility	9.23 %	10.00 %	12.63 %
Sharpe ratio	n/r	n/r	n/r

*Analytics are based on daily **total** returns (dividends reinvested) in USD.  
Analytics are calculated at 31-Jan-2019 and updated monthly.  
Performances are annualised for periods longer than a year.  
Live date is 16-Mar-2018.*

Since base date	Index	Beta CW	Broad CW
Return	10.45 %	8.88 %	7.84 %
Volatility	11.43 %	12.63 %	15.51 %
Sharpe ratio	0.80	0.60	0.42

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Analytics are calculated at 31-Jan-2019 and updated monthly.  
Performances are annualised for periods longer than a year.  
Base date is 21-Jun-2002.*

The short-term returns are calculated based on the period examined and are not annualised. On periods longer than a year, the statistics are annualised. The risk-free rates used to calculate the historical Sharpe Ratio are defined according to the regional universe of the index. In case of univariated stock selection, the Beta cap-weighted reference index (Beta CW) is the cap-weighted index whose index constituents are drawn from the same stock selection as that of the Scientific Beta index being analysed. The Broad cap-weighted reference index (Broad CW) is the cap-weighted index whose index constituents cover all stocks in the geographical region of the Scientific Beta index being analysed.

## Latest Performances (Net Return) as of 31-Jan-2019

The first table shows the index's absolute returns over recent short time periods. The next table reports the index's return, volatility and associated Sharpe ratio since the live date of the index. The last table reports the index's return, volatility and associated Sharpe ratio since the base date of the index. For periods longer than a year, the statistics are annualised, whereas the short-term statistics are calculated based on the period examined without annualisation. The corresponding statistics (calculated over the same dates) of the Broad cap-weighted reference index (Broad CW) are also reported, along with those of the Beta cap-weighted reference index (Beta CW) in case of univariated stock selection.

SciBeta Dev Nr w HFInt LVol Div MStrat (4S)	Index	Beta CW	Broad CW
1-Month Return	5.35 %	4.85 %	7.73 %
3-Month Return	1.47 %	1.28 %	0.77 %
Year-to-Date Return	5.35 %	4.85 %	7.73 %
1-Year Return	-3.72 %	-4.75 %	-6.54 %
3-Year Return	8.68 %	7.83 %	11.12 %
5-Year Return	8.33 %	6.05 %	6.84 %

*Analytics are based on daily **net** returns (dividends net of tax reinvested) in USD.  
Analytics are calculated at 31-Jan-2019 and updated monthly.*

Live	Index	Beta CW	Broad CW
Return	-0.46 %	0.29 %	-3.35 %
Volatility	9.22 %	9.99 %	12.63 %
Sharpe ratio	n/r	n/r	n/r

*Analytics are based on daily **net** returns (dividends net of tax reinvested) in USD.  
Analytics are calculated at 31-Jan-2019 and updated monthly.  
Performances are annualised for periods longer than a year.  
Live date is 16-Mar-2018.*

Since base date	Index	Beta CW	Broad CW
Return	9.72 %	8.11 %	7.23 %
Volatility	11.43 %	12.63 %	15.51 %
Sharpe ratio	0.74	0.54	0.38

*Analytics are based on daily **net** returns (dividends net of tax reinvested) in USD.  
Analytics are calculated at 31-Jan-2019 and updated monthly.  
Performances are annualised for periods longer than a year.  
Base date is 21-Jun-2002.*

# Latest Relative Performances

Latest Performances refers to basic risk and return information for the most recent part of the strategy's history.

## Latest Relative Performances (Total Return) as of 31-Jan-2019

The first table shows the index's relative returns with regard to its Broad cap-weighted reference index (Broad CW) over recent short time periods, and to its Beta cap-weighted reference index (Beta CW) in case of unvaried stock selection. The next table reports the relative return, tracking error, and associated Information Ratio since the live date of the index. The last table reports the relative return, tracking error, and associated Information Ratio since the base date of the index. For periods longer than a year, the statistics are annualised, whereas the short-term statistics are calculated based on the period examined without annualisation.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	/ Beta CW	/ Broad CW
1-Month Relative Return	0.48 %	-2.39 %
3-Month Relative Return	0.18 %	0.73 %
Year-to-Date Relative Return	0.48 %	-2.39 %
1-Year Relative Return	0.99 %	2.92 %
3-Year Relative Return	0.80 %	-2.37 %
5-Year Relative Return	2.23 %	1.59 %

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated at 31-Jan-2019 and updated monthly.

Live	/ Beta CW	/ Broad CW
Relative Return	-0.79 %	2.99 %
Tracking-Error	1.92 %	5.49 %
Information ratio	n/r	0.54

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated at 31-Jan-2019 and updated monthly.  
Performances are annualised for periods longer than a year.  
Live date is 16-Mar-2018.

Since base date	/ Beta CW	/ Broad CW
Relative Return	1.57 %	2.61 %
Tracking-Error	2.71 %	5.93 %
Information ratio	0.58	0.44

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated at 31-Jan-2019 and updated monthly.  
Performances are annualised for periods longer than a year.  
Base date is 21-Jun-2002.

The short-term relative returns are calculated based on the period examined and are not annualised. On periods longer than a year, the statistics are annualised. In case of unvaried stock selection, the Beta cap-weighted reference index (Beta CW) is the cap-weighted index whose constituents are drawn from the same stock selection as that of the Scientific Beta index being analysed. The Broad cap-weighted reference index (Broad CW) is the cap-weighted index whose index constituents cover all stocks in the geographical region of the Scientific Beta index being analysed.

## Latest Relative Performances (Net Return) as of 31-Jan-2019

The first table shows the index's relative returns with regard to its Broad cap-weighted reference index (Broad CW) over recent short time periods, and to its Beta cap-weighted reference index (Beta CW) in case of unvaried stock selection. The next table reports the relative return, tracking error, and associated Information Ratio since the live date of the index. The last table reports the relative return, tracking error, and associated Information Ratio since the base date of the index. For periods longer than a year, the statistics are annualised, whereas the short-term statistics are calculated based on the period examined without annualisation.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	/ Beta CW	/ Broad CW
1-Month Relative Return	0.50 %	-2.38 %
3-Month Relative Return	0.19 %	0.70 %
Year-to-Date Relative Return	0.50 %	-2.38 %
1-Year Relative Return	1.03 %	2.82 %
3-Year Relative Return	0.85 %	-2.44 %
5-Year Relative Return	2.29 %	1.49 %

Analytics are based on daily **net** returns (dividends net of tax reinvested) in **USD**.  
Analytics are calculated at 31-Jan-2019 and updated monthly.

Live	/ Beta CW	/ Broad CW
Relative Return	-0.75 %	2.89 %
Tracking-Error	1.93 %	5.49 %
Information ratio	n/r	0.53

Analytics are based on daily **net** returns (dividends net of tax reinvested) in **USD**.  
Analytics are calculated at 31-Jan-2019 and updated monthly.  
Performances are annualised for periods longer than a year.  
Live date is 16-Mar-2018.

Since base date	/ Beta CW	/ Broad CW
Relative Return	1.61 %	2.49 %
Tracking-Error	2.71 %	5.93 %
Information ratio	0.60	0.42

Analytics are based on daily **net** returns (dividends net of tax reinvested) in **USD**.  
Analytics are calculated at 31-Jan-2019 and updated monthly.  
Performances are annualised for periods longer than a year.  
Base date is 21-Jun-2002.

# Annual Performances

Annual Performances refers to calendar year returns.

## Annual Performances (Total Return) as of 31-Jan-2019

The table shows the index's annual returns over the last 10 calendar years. The corresponding statistics of the Broad cap-weighted reference index (Broad CW) are also reported, along with those of the Beta cap-weighted reference index (Beta CW) in case of unvaried stock selection.

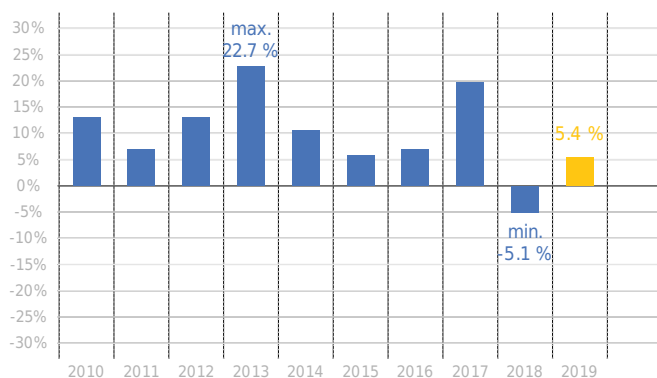
SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Index	Beta CW	Broad CW
Year 2019 (YTD)	5.37 %	4.89 %	7.76 %
Year 2018	-5.09 %	-5.85 %	-8.19 %
Year 2017	19.74 %	19.12 %	23.29 %
Year 2016	6.88 %	6.26 %	7.69 %
Year 2015	5.88 %	1.26 %	0.02 %
Year 2014	10.49 %	5.34 %	5.09 %
Year 2013	22.69 %	21.20 %	26.81 %
Year 2012	13.15 %	12.66 %	16.43 %
Year 2011	7.00 %	8.05 %	-5.59 %
Year 2010	13.09 %	10.96 %	12.64 %

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated at 31-Jan-2019 and updated monthly with EOM values.

The return of the current calendar year is the year-to-date return without annualisation. In case of unvaried stock selection, the Beta cap-weighted reference index (Beta CW) is the cap-weighted index whose index constituents are the same as the Scientific Beta index being analysed. The Broad cap-weighted reference index (Broad CW) is the cap-weighted index whose index constituents cover all stocks in the geographical region of the Scientific Beta index being analysed.

## Annual Performances (Total Return) as of 31-Jan-2019

The figure displays the index's annual returns over the last 10 calendar years.



The return of the current calendar year is the year-to-date return without annualisation. In case of unvaried stock selection, the Beta cap-weighted reference index (Beta CW) is the cap-weighted index whose index constituents are the same as the Scientific Beta index being analysed. The Broad cap-weighted reference index (Broad CW) is the cap-weighted index whose index constituents cover all stocks in the geographical region of the Scientific Beta index being analysed.

## Annual Performances (Net Return) as of 31-Jan-2019

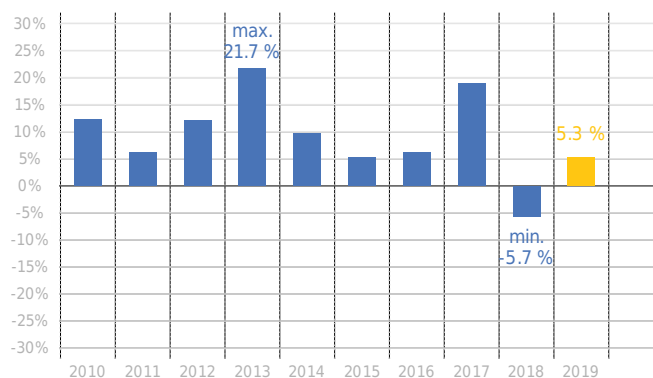
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SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Index	Beta CW	Broad CW
Year 2019 (YTD)	5.35 %	4.85 %	7.73 %
Year 2018	-5.72 %	-6.51 %	-8.71 %
Year 2017	18.99 %	18.31 %	22.61 %
Year 2016	6.16 %	5.48 %	7.04 %
Year 2015	5.23 %	0.55 %	-0.52 %
Year 2014	9.79 %	4.59 %	4.53 %
Year 2013	21.72 %	20.18 %	26.03 %
Year 2012	12.17 %	11.66 %	15.62 %
Year 2011	6.22 %	7.13 %	-6.20 %
Year 2010	12.33 %	10.07 %	12.01 %

Analytics are based on daily **net** returns (dividends net of tax reinvested) in **USD**.  
Analytics are calculated at 31-Jan-2019 and updated monthly with EOM values.

## Annual Performances (Net Return) as of 31-Jan-2019

The figure displays the index's annual returns over the last 10 calendar years.



# Annual Relative Performances

Annual Performances refers to calendar year returns.

## Annual Relative Performances (Total Return) as of 31-Jan-2019

The table shows the index's annual relative returns with regard to its Broad cap-weighted reference index (Broad CW) over the last 10 calendar years, and to its Beta cap-weighted reference index (Beta CW) in case of unvaried stock selection.

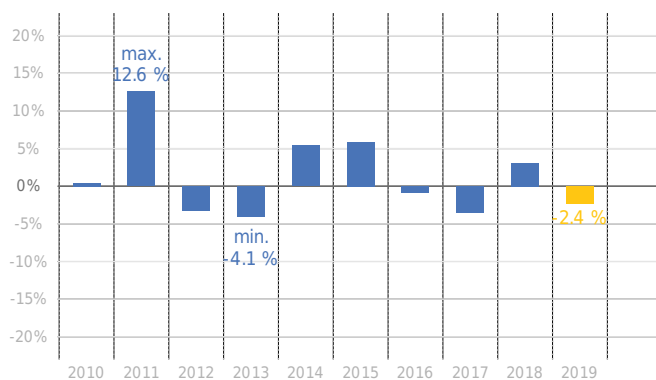
SciBeta Dev Nr w HFInt LVol Div MStrat (4S)	/ Beta CW	/ Broad CW
Year 2019 (YTD)	0.48 %	-2.39 %
Year 2018	0.75 %	3.10 %
Year 2017	0.62 %	-3.54 %
Year 2016	0.62 %	-0.82 %
Year 2015	4.62 %	5.86 %
Year 2014	5.15 %	5.40 %
Year 2013	1.49 %	-4.12 %
Year 2012	0.49 %	-3.28 %
Year 2011	-1.05 %	12.59 %
Year 2010	2.13 %	0.45 %

*Analytics are based on daily **total** returns (dividends reinvested) in USD.  
Analytics are calculated at 31-Jan-2019 and updated monthly with EOM values.*

The return of the current calendar year is the year-to-date return without annualisation.

## Annual Relative Performances (Total Return) as of 31-Jan-2019

The figure displays the index's annual relative returns with regard to its Broad cap-weighted reference index (Broad CW) over the last 10 calendar years.



The return of the current calendar year is the year-to-date return without annualisation.

## Annual Relative Performances (Net Return) as of 31-Jan-2019

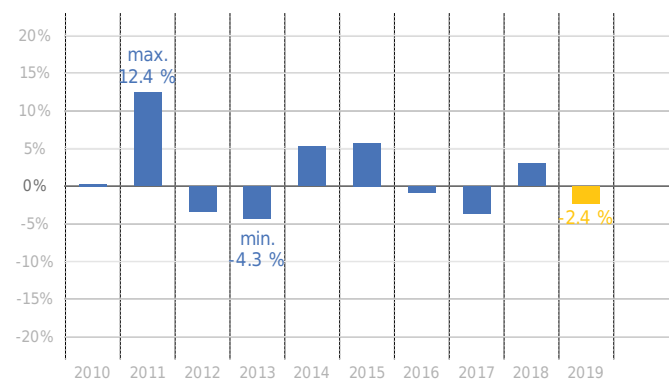
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SciBeta Dev Nr w HFInt LVol Div MStrat (4S)	/ Beta CW	/ Broad CW
Year 2019 (YTD)	0.50 %	-2.38 %
Year 2018	0.79 %	2.99 %
Year 2017	0.67 %	-3.63 %
Year 2016	0.68 %	-0.88 %
Year 2015	4.68 %	5.75 %
Year 2014	5.20 %	5.26 %
Year 2013	1.54 %	-4.31 %
Year 2012	0.51 %	-3.45 %
Year 2011	-0.91 %	12.42 %
Year 2010	2.27 %	0.32 %

*Analytics are based on daily **net** returns (dividends net of tax reinvested) in USD.  
Analytics are calculated at 31-Jan-2019 and updated monthly with EOM values.*

## Annual Relative Performances (Net Return) as of 31-Jan-2019

The figure displays the index's annual relative returns with regard to its Broad cap-weighted reference index (Broad CW) over the last 10 calendar years.



# Performance Analysis

Performance and Risk Characteristics of equity portfolios allow for the analysis of the reward, the amount of risk and the reward per unit of risk obtained by investors. These characteristics can be calculated in absolute terms, or in relative terms (i.e. in terms of the difference in risks and returns against a cap-weighted reference index).

## Performance and Risk Characteristics as of 31-Jan-2019

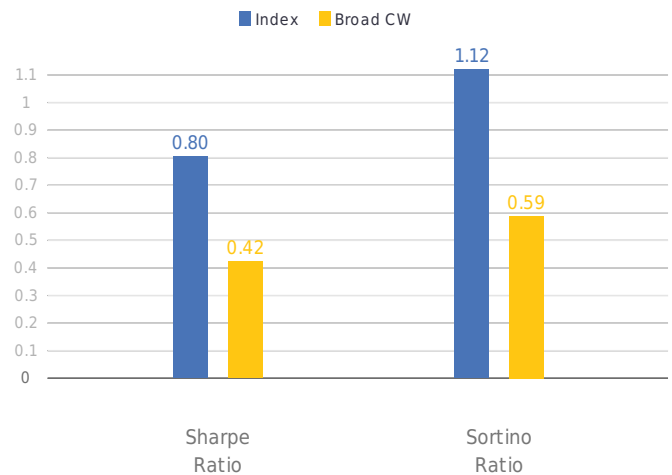
The table shows summary statistics of the index's absolute performance and risk over the selected analysis period. The corresponding statistics of the Broad cap-weighted reference index (Broad CW) are also reported, along with those of the Beta cap-weighted reference index (Beta CW) in case of univariied stock selection.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Index	Beta CW	Broad CW
Return	10.45 %	8.88 %	7.84 %
Volatility	11.43 %	12.63 %	15.51 %
Sharpe ratio	0.80	0.60	0.42
Sortino ratio	1.12	0.84	0.59
Max Drawdown	44.3 %	44.1 %	57.1 %

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated from base date (21-Jun-2002) to 31-Jan-2019.  
Analytics are updated monthly with EOM values.  
Performances are annualised for periods longer than a year.

## Performance and Risk Characteristics as of 31-Jan-2019

The figure shows the index's Sharpe Ratio and Sortino Ratio over the selected analysis period. The corresponding statistics of the Broad cap-weighted reference index (Broad CW) are also reported.



On periods longer than a year, statistics are annualised. The risk-free rates used are defined according to the regional universe of the index. In case of univariied stock selection, the Beta cap-weighted reference index (Beta CW) is the cap-weighted index whose constituents are drawn from the same stock selection as that of the Scientific Beta index being analysed. The Broad cap-weighted reference index (Broad CW) is the cap-weighted index whose constituents cover all stocks in the geographic region of the Scientific Beta index being analysed.

## Relative Performance and Risk as of 31-Jan-2019

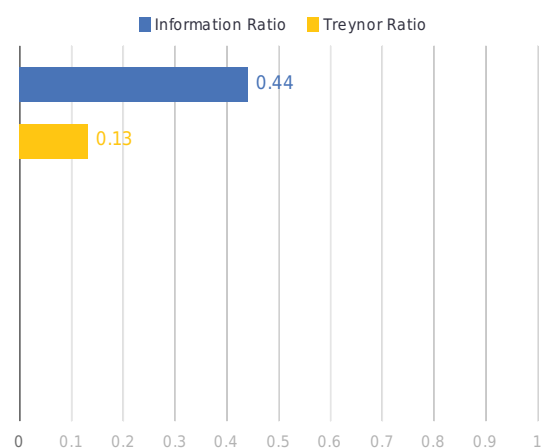
The table shows summary statistics of the index's relative performance and relative risk with regard to its Broad cap-weighted reference index (Broad CW) over the selected analysis period, along with those to its Beta cap-weighted reference index (Beta CW) in case of univariied stock selection.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	/ Beta CW	/ Broad CW
Relative Return Over CW	1.57 %	2.61 %
Tracking-Error	2.71 %	5.93 %
Information Ratio	0.58	0.44
Treynor Ratio	0.10	0.13
Max Relative Drawdown	6.2 %	15.0 %

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated from base date (21-Jun-2002) to 31-Jan-2019.  
Analytics are updated monthly with EOM values.  
Performances are annualised for periods longer than a year.

## Relative Performance and Risk as of 31-Jan-2019

The figure shows the index's Information Ratio and Treynor Ratio with regard to its Broad cap-weighted reference index (Broad CW) respectively over the selected analysis period.



The statistics are based on daily total returns (with dividends reinvested). On periods longer than a year, statistics are annualised.

# Risk Analysis

Performance and Risk Characteristics of equity portfolios allow for the analysis of the reward, the amount of risk and the reward per unit of risk obtained by investors.

## Risk Analysis as of 31-Jan-2019

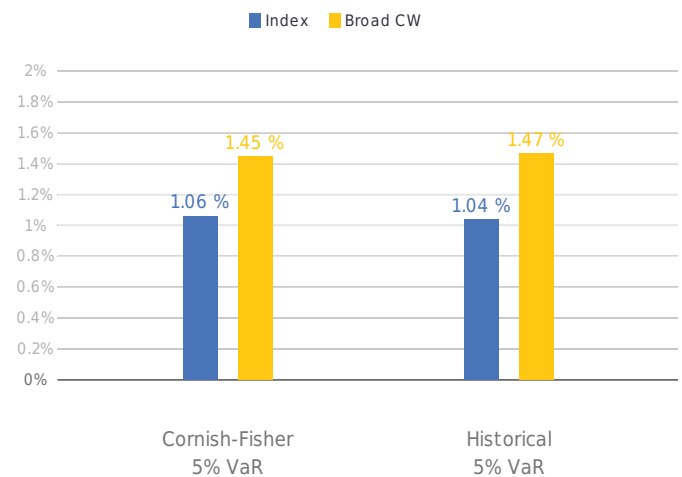
The table shows summary statistics of the index's absolute performance and risk over the selected analysis period. The corresponding statistics of the Broad cap-weighted reference index (Broad CW) are also reported.

SciBeta Dev Nrwl HFInt LVol Div MStrat (4S)	Index	Beta CW	Broad CW
Cornish-Fisher 5% VaR	1.06 %	1.10 %	1.45 %
Historical 5% VaR	1.04 %	1.13 %	1.47 %
Max Drawdown	44.3 %	44.12 %	57.1 %
Time Under Water	863	867	1 421

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated from base date (21-Jun-2002) to 31-Jan-2019.  
Analytics are updated monthly with EOM values.

## Risk Analysis as of 31-Jan-2019

The figure shows the index's Cornish-Fisher Value-at-Risk and Historical Value-at-Risk over the selected analysis period. The corresponding statistics of the Broad cap-weighted reference index (Broad CW) are also reported.



All statistics are annualised and performance ratios that involve the average returns are based on the geometric average, which reliably reflects multiple holding period returns for investors. The risk-free rates used are defined according to the regional universe of the index. The Broad cap-weighted reference index (Broad CW) is the cap-weighted index whose index constituents cover all stocks in the geographic region of the Scientific Beta index being analysed.

## Relative Risk Analysis as of 31-Jan-2019

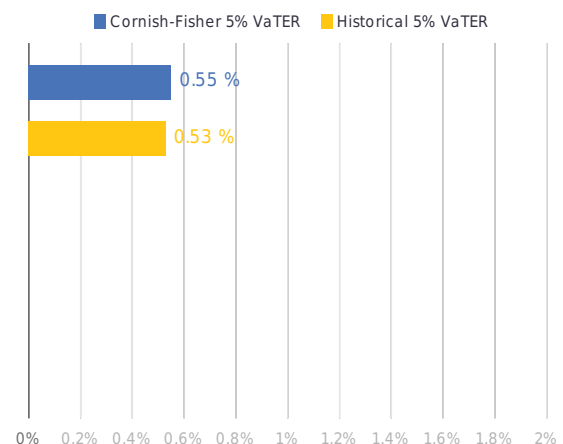
The table shows summary statistics of the index's relative performance and relative risk with regard to its Broad cap-weighted reference index (Broad CW) over the selected analysis period.

SciBeta Dev Nrwl HFInt LVol Div MStrat (4S)	/ Broad CW
Cornish-Fisher 5% VaTER	0.55 %
Historical 5% VaTER	0.53 %
Max Relative Drawdown	15.0 %
Rel. Time Under Water	802
Extreme Relative Return (5%)	-7.20 %
Extreme Tracking-Error (95%)	10.69 %
Average Tracking-Error	5.22 %

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated from base date (21-Jun-2002) to 31-Jan-2019.  
Analytics are updated monthly with EOM values.

## Relative Risk Analysis as of 31-Jan-2019

The figure shows the index's Cornish-Fisher Value-at-Tracking Error and Historical Value-at-Tracking Error with regard to its Broad cap-weighted reference index (Broad CW) over the selected analysis period.



The statistics are based on daily total returns (with dividends reinvested). All statistics are annualised and performance ratios that involve the average returns are based on the geometric average, which reliably reflects multiple holding period returns for investors. The risk-free rates used are defined according to the regional universe of the index. The Broad cap-weighted reference index (Broad CW) is the cap-weighted index whose constituents cover all stocks in the geographic region of the Scientific Beta index being analysed.



# Robustness Analysis

Alternative weighting schemes may expose an investor to a risk of underperforming respective cap-weighted reference indices over short investment horizons. Moreover, it seems reasonable to assume that certain market conditions may influence the capacity of a given weighting scheme to provide outperformance over the cap-weighted reference index. The Scientific Beta robustness analysis provides insights on the conditions of outperformance or underperformance of Scientific Beta indices with regard to their cap-weighted reference index.

## Robustness Analysis as of 31-Jan-2019

For long-only indices, the table shows summary statistics of the index's relative performance and relative risk with respect to its cap-weighted reference index, as well as the 1Y, 3Y and 5Y Probabilities of Outperformance over the last 10 years, and for the corresponding US Long-Term over the last 40 years. For long/short indices, the table shows the 1Y, 3Y and 5Y Probabilities of OutPerformance over the risk-free rate over the last 10 years.

SciBeta Dev Nr w HFInt LVol Div MStrat (4S)	Index	LT-US
Excess Return	0.34 %	n/r
Tracking-Error	5.39 %	n/r
Information Ratio	0.06	n/r
Prob. of Outperf. (1 year)	53.6 %	n/r
Prob. of Outperf. (3 years)	80.1 %	n/r
Prob. of Outperf. (5 years)	93.1 %	n/r
End of Period	31-Jan-2019	31-Dec-2017
Period	10 years	40 years

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.

Analytics are calculated at 31-Jan-2019.

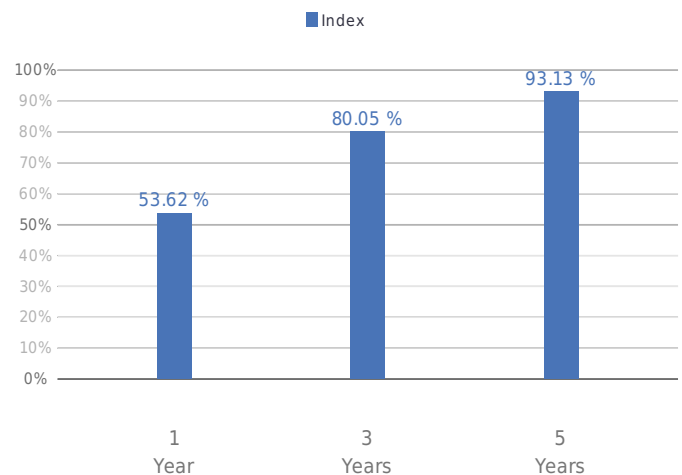
Analytics are updated monthly with EOM values.

Performances are annualised for periods longer than a year.

All statistics are annualised and based on the geometric average, which reliably reflects multiple holding period returns for investors.

## Robustness Analysis as of 31-Jan-2019

The figure, based on a rolling window analysis, shows the 1, 3, and 5 year Probability of Outperformance (over the risk-free rate for long/short indices) with respect to the cap-weighted reference index.



# Top Holdings

Top Holdings refers to the information on the largest companies in the strategy portfolio ordered by their weights.

## Top Holdings as of 21-Dec-2018

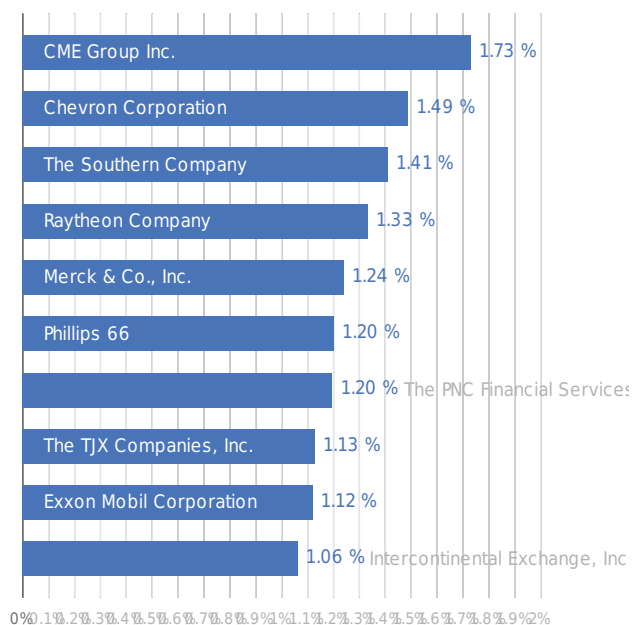
The table lists the weights of the ten largest constituents of the index, in descending order, based on the index's weight profile at the last quarterly rebalancing.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Country	Weight
CME Group Inc.	US	1.73 %
Chevron Corporation	US	1.49 %
The Southern Company	US	1.41 %
Raytheon Company	US	1.33 %
Merck & Co., Inc.	US	1.24 %
Phillips 66	US	1.20 %
The PNC Financial Services Group, Inc.	US	1.20 %
The TJX Companies, Inc.	US	1.13 %
Exxon Mobil Corporation	US	1.12 %
Intercontinental Exchange, Inc.	US	1.06 %

Analytics are calculated at 21-Dec-2018.  
Analytics are updated quarterly.

## Top Holdings as of 21-Dec-2018

The figure displays the weights of the ten largest constituents of the index, in descending order, based on the index's weight profile at the last quarterly rebalancing.



# Weight Profile Analysis

Weight Profile Analysis refers to the allocation of the investment weights to the constituents in the strategy.

## Index Weight Concentration as of 31-Dec-2018

The table shows the index concentration level under various portfolio concentration measures based on the index's weight profile at the last rebalancing time. The quarterly calculated active share expresses the overall deviation of the index vis-à-vis its Broad cap-weighted reference, calculated as half of the sum of the absolute deviations. The corresponding statistics of the Broad cap-weighted reference index (Broad CW) are also reported, along with those of the Beta cap-weighted reference index (Beta CW) in case of unvaried stock selection.

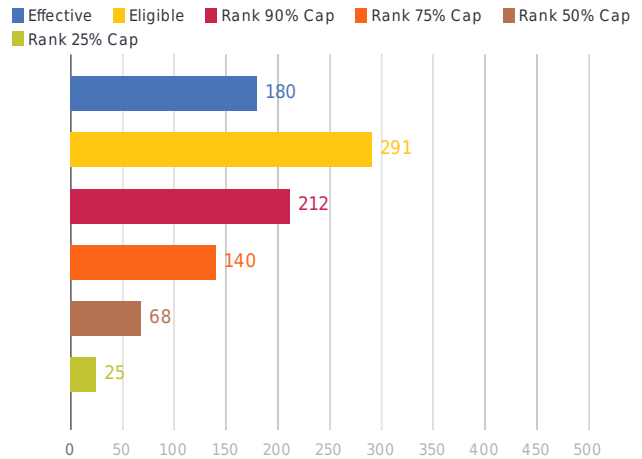
SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Index	Beta CW	Broad CW
Effective Number of Constituents	180	79	281
Number of Eligible Constituents	291	291	1 463
Nb. Stocks Cumul. to 90% Cap	212	154	798
Nb. Stocks Cumul. to 75% Cap	140	81	413
Nb. Stocks Cumul. to 50% Cap	68	28	136
Nb. Stocks Cumul. to 25% Cap	25	10	32
Deconcentration ratio	61.9 %	27.3 %	19.2 %
Active Share	76.28 %	74.61 %	0.00 %
Active Share (average)	77.68 %	74.57 %	0.00 %

*Analytics are calculated at 31-Dec-2018.  
Analytics are updated quarterly.*

In case of unvaried stock selection, the Beta cap-weighted reference index (Beta CW) is the cap-weighted index whose constituents are drawn from the same stock selection as that of the Scientific Beta index being analysed. The Broad cap-weighted reference index (Broad CW) is the cap-weighted index whose constituents cover all stocks in the geographic region of the Scientific Beta index being analysed.

## Index Weight Concentration as of 31-Dec-2018

The figure displays the index concentration level under various portfolio concentration measures based on the index's weight profile at the last rebalancing time.



# CAPM Analysis

The Capital Asset Pricing Model (CAPM) theoretically establishes the relationship between the expected excess return of an equity portfolio and its systematic risk as measured by its exposure to market risk. In CAPM analysis, the equity portfolio excess returns are regressed against market excess returns in order to estimate the exposure to market risk, and that exposure is then used to decompose the returns into reward for being exposed to the equity market and portfolio-specific returns.

## CAPM Analysis as of 31-Dec-2018

The table shows the coefficient estimates and R-squared of the regression of the index's excess returns (over the risk-free rate) using the CAPM single factor model over the selected analysis period. Based on the factor exposure, the excess returns attributed to each factor are reported in the last column. The t-statistics associated with the coefficient estimates are also reported.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Coefficient	t-stat	Perf.
Alpha	4.17 %	4.1	4.53 %
Market	0.70	82.9	4.26 %
r <sup>2</sup>	0.89		

Analytics are based on weekly **total** returns (dividends reinvested) in **USD**.

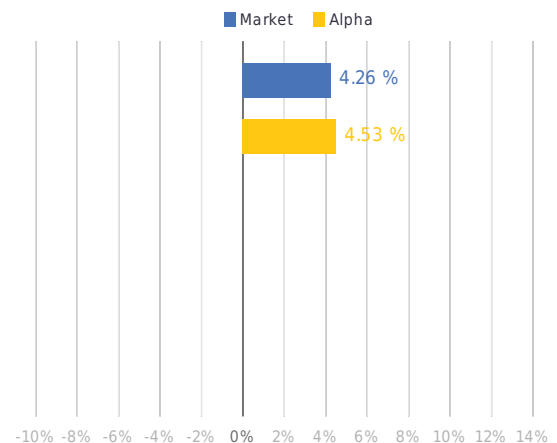
Analytics are calculated from base date (21-Jun-2002) to 31-Dec-2018.

Analytics are updated quarterly with EOQ values.

Performances are annualised for periods longer than a year.

## CAPM Performance Attribution as of 31-Dec-2018

The figure displays the attribution of the index's excess return (over the risk-free rate) to market factor and unexplained excess returns (Alpha).



The Market factor is the weekly return of the cap-weighted index of all stocks that constitute the index portfolio. The risk-free rates used are defined according to the regional universe of the index.

# Fama-French Factor Analysis

The Fama-French factor model extends the CAPM model by adding the small size factor and the value factor. In Fama-French factor analysis, we explain the equity portfolio performance via linear regression using all three risk factors to better understand the potential factor or investment style biases as well as to form a clear idea of its risk-adjusted performance.

## Fama-French Factor Analysis as of 31-Dec-2018

The table shows the coefficient estimates and R-squared of the regression of index's excess returns (over the risk-free rate) using the Fama French three-factor model over the selected analysis period. Based on the factor exposure, the excess returns attributed to each factor are reported in the last column. The t-statistics associated with the coefficient estimates are also reported.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Coefficient	t-stat	Perf.
Alpha	4.65 %	4.6	4.97 %
Market factor	0.71	83.9	4.33 %
Size (SMB) factor	-0.10	-4.7	-0.37 %
Value (HML) factor	-0.10	-3.5	-0.14 %
r <sup>2</sup>	0.89		

Analytics are based on weekly **total** returns (dividends reinvested) in **USD**.

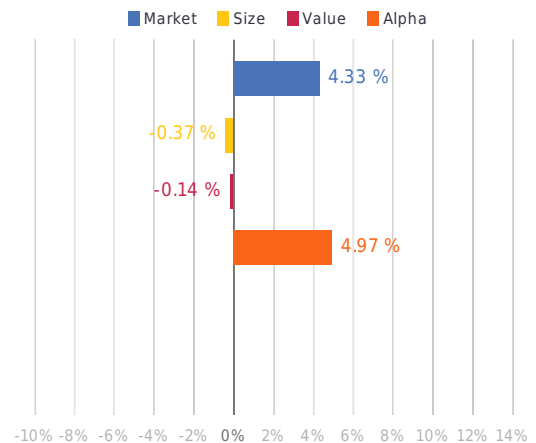
Analytics are calculated from base date (21-Jun-2002) to 31-Dec-2018.

Analytics are updated quarterly with EOQ values.

Performances are annualised for periods longer than a year.

## Fama-French Factor Performance Attribution as of 31-Dec-2018

The figure displays attribution of the index's excess return (over the risk-free rate) to market factor, HML factor, SMB factor, and unexplained excess returns (Alpha).



The Market factor is the excess return series of the cap-weighted index of all stocks that constitute the index portfolio over the risk-free rate. SMB factor is the return series of an equal-weighted portfolio that is long small-cap stocks and short the top 30% stocks ranked by market capitalisation (large market-cap stocks). HML factor is the return series of an equal-weighted portfolio that is long for the top 30% stocks (value stocks) and short for the bottom 30% stocks (growth stocks) sorted on book-to-market value in descending order. The SMB and HML factors are market beta neutralised ex-post on a quarterly basis. The risk-free rates used are defined according to the regional universe of the strategy.

# Carhart Factor Analysis

Carhart (1997) proposes an extended four-factor model incorporating the momentum factor. In Carhart four factor analysis, we explain the equity portfolio performance via linear regression using four risk factors to better understand the potential factor or investment style biases as well as to form a clear idea of its risk-adjusted performance.

## Carhart Factor Analysis as of 31-Dec-2018

The table shows the coefficient estimates and r-square of the regression of the strategy's excess returns (over the risk-free rate) using the Carhart four-factor model over the selected analysis period. Based on the factor exposure, the excess returns attributed to each factor are reported in the last column. The t-statistics associated with the coefficient estimates are also reported.

SciBeta Dev Nrwl HFInt LVol Div MStrat (4S)	Coefficient	t-stat	Perf.
Alpha	4.33 %	4.3	4.69 %
Market factor	0.72	84.6	4.34 %
Size (SMB) factor	-0.10	-4.6	-0.36 %
Value (HML) factor	-0.04	-1.1	-0.05 %
Momentum (MOM) factor	0.07	3.6	0.16 %
r <sup>2</sup>	0.90		

Analytics are based on weekly **total** returns (dividends reinvested) in **USD**.

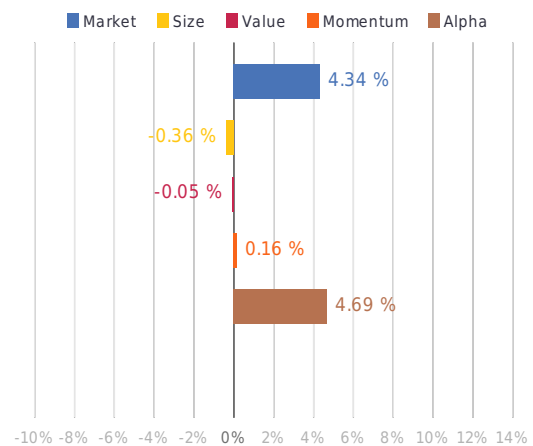
Analytics are calculated from base date (21-Jun-2002) to 31-Dec-2018.

Analytics are updated quarterly with EOQ values.

Performances are annualised for periods longer than a year.

## Carhart Factor Performance Attribution as of 31-Dec-2018

The figure displays the attribution of the index's excess return (over the risk-free rate) to market factor, HML factor, SMB factor, MOM factor, and unexplained excess returns (Alpha).



The Market factor is the excess return series of the cap-weighted index of all stocks that constitute the index portfolio over the risk-free rate. SMB factor is the return series of an equal-weighted portfolio that is long small-cap stocks and short for the top 30% stocks ranked by market capitalisation (large market-cap stocks). HML factor is the return series of an equal-weighted portfolio that is long for the top 30% stocks (value stocks) and short for the bottom 30% stocks (growth stocks) sorted on book-to-market value in descending order. The MOM factor is the return series of an equal-weighted portfolio that is long the winner stocks and short the loser stocks. The winner stocks (inversely the loser stocks) are defined as the top 30% (inversely the bottom 30%) of stocks, sorted on the past 52 weeks' compounded returns excluding the most recent month, in descending order. The SMB, HML and MOM factors are market beta neutralised ex-post on a quarterly basis. The risk-free rates used are defined according to the regional universe of the index.

# Country Performance Attribution

Country Performance Attribution is used to disentangle the sources of outperformance of a strategy portfolio over its cap-weighted reference index, from the perspective of country allocation.

## Country Performance Attribution as of 31-Jan-2019

The table shows the results of the adaptation of Menchero Multi-period Attribution applied to country attribution, in which the index's outperformance with regard to its cap-weighted reference index is broken down into stock effect, country effect, and interaction effect. The analysis is based on the selected period.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Index	Ref	Excess	Stock	Country	Inter
United States	50.88 %	50.92 %	-0.05 %	-12.34 %	0.58 %	-0.27 %
United Kingdom	8.79 %	8.78 %	0.00 %	3.13 %	0.22 %	-0.26 %
Japan	11.12 %	11.01 %	0.11 %	5.83 %	0.50 %	-0.61 %
Canada	3.45 %	3.47 %	-0.02 %	0.71 %	-0.08 %	-0.00 %
France	4.34 %	4.46 %	-0.12 %	1.24 %	0.03 %	-0.07 %
Australia	2.51 %	2.95 %	-0.45 %	0.00 %	0.37 %	-0.16 %
Switzerland	3.00 %	3.24 %	-0.24 %	0.36 %	0.09 %	0.06 %
Germany	2.78 %	3.80 %	-1.02 %	0.02 %	-1.17 %	0.61 %
South Korea	0.54 %	1.39 %	-0.85 %	0.52 %	0.87 %	-0.39 %
Hong Kong	1.48 %	1.33 %	0.15 %	-0.34 %	0.16 %	-0.14 %
Sweden	1.10 %	1.14 %	-0.04 %	-0.68 %	0.10 %	-0.20 %
Spain	1.75 %	1.71 %	0.04 %	0.03 %	1.27 %	0.20 %
Netherlands	1.16 %	1.00 %	0.16 %	0.17 %	0.05 %	-0.21 %
Italy	1.25 %	1.38 %	-0.13 %	0.30 %	0.09 %	-0.29 %
Singapore	1.34 %	0.65 %	0.69 %	0.39 %	0.05 %	0.32 %
Denmark	0.66 %	0.50 %	0.15 %	0.30 %	0.21 %	0.39 %
Belgium	1.37 %	0.50 %	0.87 %	-0.02 %	-0.38 %	-0.17 %
Norway	0.43 %	0.29 %	0.15 %	-0.07 %	0.06 %	-0.02 %
Finland	0.34 %	0.50 %	-0.16 %	0.45 %	0.08 %	-0.21 %
Israel	0.20 %	0.19 %	0.01 %	0.21 %	0.01 %	-0.01 %
Austria	0.27 %	0.17 %	0.09 %	-0.31 %	0.74 %	-0.38 %
Portugal	0.38 %	0.14 %	0.23 %	0.18 %	-0.35 %	0.53 %
New Zealand	0.56 %	0.08 %	0.48 %	0.05 %	0.14 %	0.18 %
Ireland	0.19 %	0.23 %	-0.04 %	0.17 %	0.22 %	-0.17 %
Greece	0.13 %	0.15 %	-0.01 %	-0.11 %	-0.11 %	-0.07 %
Total				0.18 %	3.75 %	-1.32 %

Analytics are based on daily **total** returns (dividends reinvested).

Analytics are calculated from base date to 31-Jan-2019.

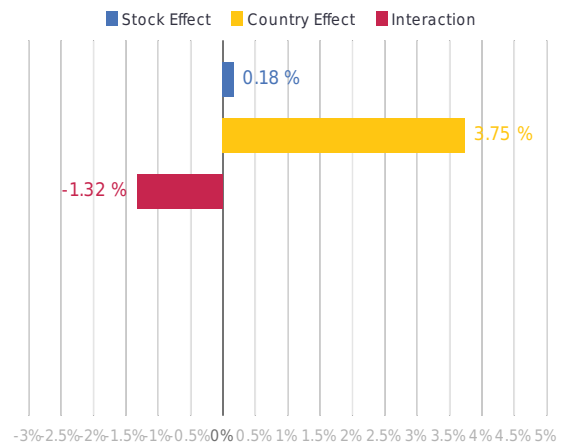
Analytics are updated monthly with EOM values.

Performances are annualised for periods longer than a year.

Please see Menchero Multi-period Attribution in the glossary for a detailed explanation of the attribution model that is adapted by ERI Scientific Beta to country attribution. The country classification used is the Scientific Beta country allocation explained in our Universe Construction Rules. The statistics of historical performance are annualised.

## Country Performance Attribution as of 31-Jan-2019

The figure displays the breakdown of the index's outperformance with regard to its cap-weighted reference index into returns attributed to stock effect, country effect, and interaction effect from the Menchero Multi-period Attribution model. The analysis is based on the selected period.



# Sector Performance Attribution

## Sector Performance Attribution as of 31-Jan-2019

The table shows the results of Menchero Multi-period Attribution, in which the index's outperformance with regard to its cap-weighted reference index is broken down into stock effect, sector effect, and interaction effect. The analysis is based on the selected period.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Index	Ref	Excess	Stock	Sector	Inter
Energy	4.07 %	8.62 %	-4.55 %	-0.47 %	0.54 %	1.21 %
Basic Materials	4.42 %	6.11 %	-1.69 %	1.40 %	1.24 %	-1.89 %
Industrials	11.48 %	12.10 %	-0.62 %	0.42 %	0.17 %	-0.20 %
Cyclical Consumer	10.30 %	12.27 %	-1.98 %	-4.64 %	-0.56 %	0.62 %
Non-Cyclical Consumer	23.18 %	9.11 %	14.08 %	1.27 %	-3.96 %	1.81 %
Financials	15.06 %	22.11 %	-7.05 %	9.83 %	1.82 %	-2.20 %
Healthcare	10.92 %	10.19 %	0.73 %	2.52 %	2.99 %	-0.70 %
Technology	2.31 %	11.04 %	-8.72 %	-3.78 %	-5.84 %	2.84 %
Telecoms	4.33 %	4.63 %	-0.30 %	0.46 %	-0.54 %	-0.24 %
Utilities	13.93 %	3.83 %	10.10 %	1.00 %	-3.90 %	1.37 %
Total				8.03 %	-8.04 %	2.62 %

Analytics are based on daily **total** returns (dividends reinvested).

Analytics are calculated from base date to 31-Jan-2019.

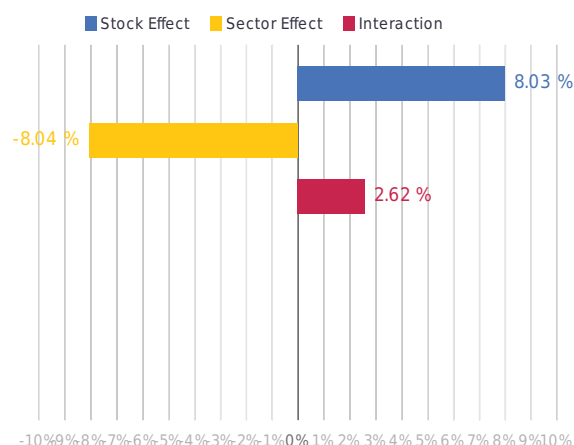
Analytics are updated monthly with EOM values.

Performances are annualised for periods longer than a year.

Please see Menchero Multi-period Attribution in the glossary for a detailed explanation of the attribution model. The sector classification used is the Thomson Reuters Business Classification. The statistics of historical performance are annualised.

## Sector Performance Attribution as of 31-Jan-2019

The figure displays the breakdown of the index's outperformance with regard to its cap-weighted reference index into returns attributed to stock effect, sector effect, and interaction effect from the Menchero Multi-period Attribution model. The analysis is based on the selected period.





# Index Diversification

The Diversification analytics measure the benefits of portfolio diversification after adjusting for the effect of factor exposures.

## Diversification as of 31-Dec-2018

The table shows the average index concentration level and the low correlation objective measure (GLR) based on historical returns and weights over the period. The GLR measure is the ratio of the variance of a portfolio's returns to the weighted average of the variance of its constituents' returns. The Idiosyncratic Risk-Adjusted Return is calculated as the ratio of unexplained return to the standard deviation of the residuals in the risk factor exposure (seven factor) regression. The Change in Specific Volatility is calculated as the difference in volatility of the strategy and its Multi-factor Benchmark, a synthetic portfolio levered to match returns of the respective strategy that contains the same magnitude of systematic risk.

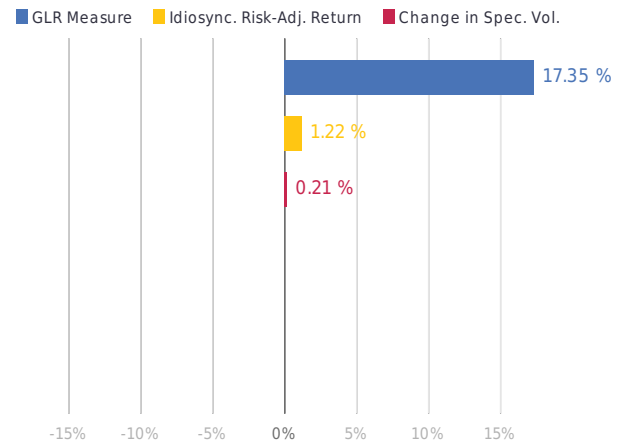
SciBeta Dev Nrwl HFInt LVol Div MStrat (4S)	Index	Beta CW	Broad CW
Effective Number of Constituents (a..	216.8	75.4	362.4
GLR Measure	17.4 %	21.7 %	19.3 %
Idiosyncratic Risk-Adj. Return	0.01	-0.48	n/r
Change in Specific Volatility	0.21 %	2.45 %	n/r

Analytics are calculated at 31-Dec-2018.

Analytics are updated quarterly.

## Diversification as of 31-Dec-2018

The figure displays the diversification measures of the index.



# Index Fundamentals

Fundamental attributes refers to the fundamental aggregate characteristics of the index.

## Index Fundamentals as of 31-Dec-2018

The table shows the index's fundamental attributes based on the index's weight profile at the last rebalancing time. The corresponding statistics of the Broad cap-weighted reference index (Broad CW) are also reported.

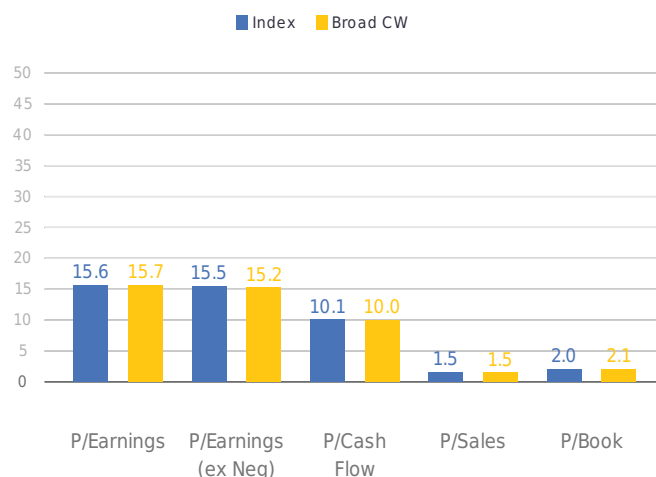
SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Index	Broad CW
Price / Earnings	15.65	15.65
Price / Earnings (ex Neg)	15.49	15.25
Price / Cash Flow	10.15	9.96
Price / Sales	1.53	1.51
Price / Book Value	2.01	2.09
Gross Profitability	25.08 %	24.36 %
Total Asset Growth	7.19 %	12.26 %
Dividend Yield	2.72 %	2.49 %

Analytics are calculated at 31-Dec-2018.

Analytics are updated quarterly.

## Index Fundamentals as of 31-Dec-2018

The figure displays the index's fundamental attributes based on the index's weight profile at the last rebalancing time. The corresponding statistics of the Broad cap-weighted reference index (Broad CW) are also reported.



The Broad cap-weighted reference index (Broad CW) is the cap-weighted index whose constituents cover all stocks in the geographic region of the Scientific Beta index being analysed.

# Extreme Risk Analysis

The Extreme Risk Analytics calculate two measures of downside risk – Value-at-Risk and Conditional Value-at-Risk – aggregated over a certain time period together with the corresponding risk-adjusted returns and also provide monthly forecasts of the two risk measures based on a conditional time-series model that takes into account the clustering of volatility and assumes the conditional return distribution is fat-tailed.

## Extreme Risk Analysis as of 31-Jan-2019

The table shows summary statistics of the index's extreme risk over the selected analysis period. The corresponding statistics of the Broad cap-weighted reference index (Broad CW) are also reported.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Index	Broad CW
Return	10.45 %	7.84 %
EVT 1% VaR	1.41 %	1.90 %
EVT 1% CVaR	1.72 %	2.30 %
Ret to EVT 1% VaR ratio	0.40	0.22
Ret to EVT 1% CVaR ratio	0.33	0.18
For. Monthly EVT 1% VaR	6.06 %	8.17 %
For. Monthly EVT 1% CVaR	7.39 %	9.92 %

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.

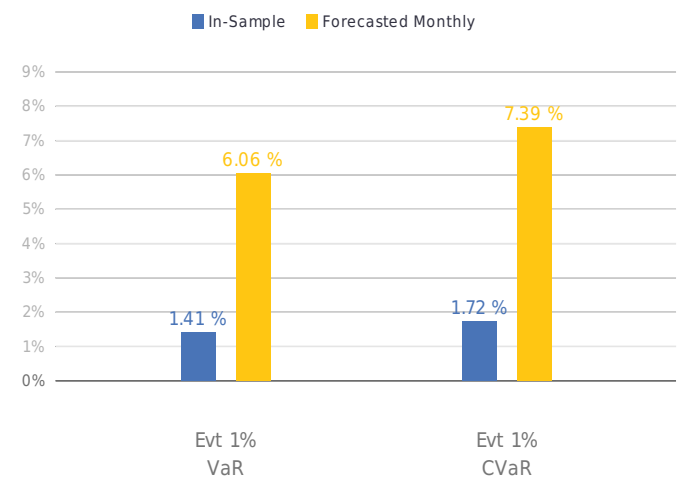
Analytics are calculated from base date (21-Jun-2002) to 31-Jan-2019.

Analytics are updated monthly with EOM values.

Performances are annualised for periods longer than a year.

## Extreme Risk Analysis as of 31-Jan-2019

The figure shows the in-sample and forecasted monthly Value-at-Risk and Conditional Value-at-Risk for the index over the selected analysis period.



Broad CW is the cap-weighted index whose constituents cover all stocks in the geographic region of the Scientific Beta index being analysed.

## Extreme Relative Risk Analysis as of 31-Jan-2019

The table shows summary statistics of the index's extreme relative risk with regard to its Broad cap-weighted reference index (Broad CW) over the selected analysis period.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	/ Broad CW
Excess Return	2.61 %
EVT 1% VaTER	0.84 %
EVT 1% CVaTER	1.02 %
Ret to EVT 1% VaTER ratio	0.19
Ret to EVT 1% CVaTER ratio	0.16
For. Monthly EVT 1% VaTER	4.21 %
For. Monthly EVT 1% CVaTER	5.35 %

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.

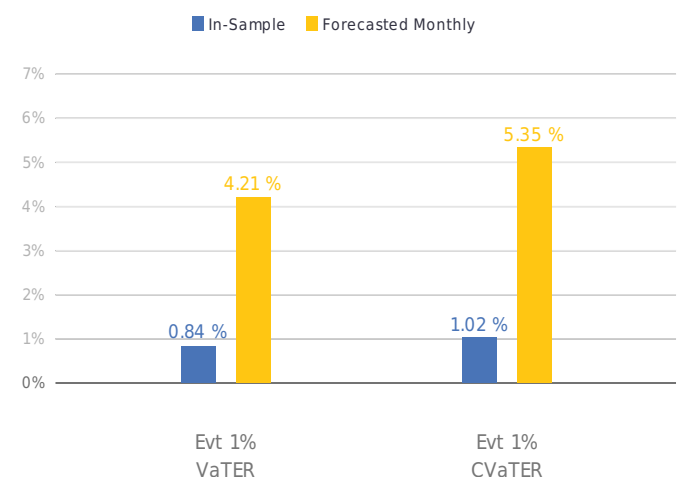
Analytics are calculated from base date (21-Jun-2002) to 31-Jan-2019.

Analytics are updated monthly with EOM values.

Performances are annualised for periods longer than a year.

## Extreme Relative Risk Analysis as of 31-Jan-2019

The figure shows the in-sample and forecasted monthly Value-at-Tracking Error and Conditional Value-at-Tracking Error for the index over the selected analysis period.



Broad CW is the cap-weighted index whose constituents cover all stocks in the geographic region of the Scientific Beta index being analysed.

# Risk Factor Exposure

The Risk Factor Exposure analysis assesses the exposure of a given strategy to a set of seven factors: Market factor, Size factor, Value factor, Momentum factor, Volatility factor, Profitability factor and Investment factor.

## Risk Factor Exposure as of 31-Dec-2018

The table shows the coefficient estimates and t-square of the regression of the strategy's excess returns (over the risk-free rate) using the seven-factor model over the selected analysis period. The t-statistics associated with the coefficient estimates are also reported.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Coefficient	t-stat
Unexplained	0.03 %	0.0
Market factor	0.72	152.1
Size (SMB) factor	0.08	6.4
Value (HML) factor	0.07	2.5
Momentum (MOM) factor	0.04	3.3
Volatility factor	0.44	40.1
Profitability factor	0.00	0.1
Investment factor	-0.02	-0.9
Factor Intensity	0.60	
r <sup>2</sup>	0.97	

Analytics are based on weekly **total** returns (dividends reinvested) in **USD**.

Analytics are calculated from base date (21-Jun-2002) to 31-Dec-2018.

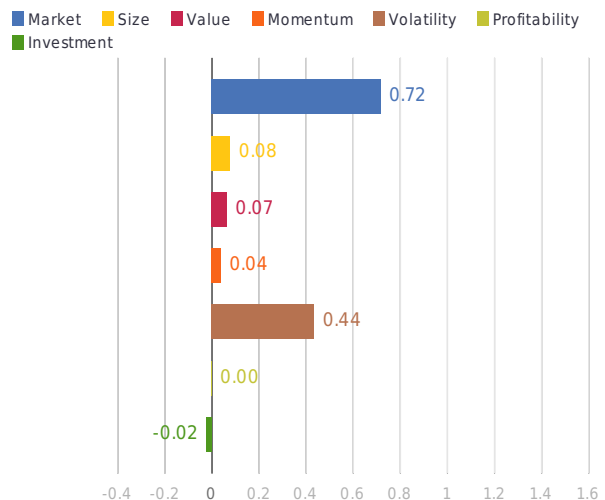
Analytics are updated quarterly with EOQ values.

Performances are annualised for periods longer than a year.

The Market factor is the excess return series of the cap-weighted index of all stocks that constitute the index portfolio over the risk-free rate. SMB factor is the return series of an equal-weighted portfolio that is long small-cap stocks and short for the top 30% stocks ranked by market capitalisation (large market-cap stocks). HML factor is the return series of an equal-weighted portfolio that is long for the top 30% stocks (value stocks) and short for the bottom 30% stocks (growth stocks) sorted on book-to-market value in descending order. The MOM factor is the return series of an equal-weighted portfolio that is long the winner stocks and short the loser stocks. The winner stocks (inversely the loser stocks) are defined as the top 30% (inversely the bottom 30%) of stocks, sorted on the past 52 weeks' compounded returns excluding the most recent month, in descending order. The VOL factor is the return series of an equal-weighted portfolio that is long the bottom 30% stocks (low volatility stocks) and short the top 30% stocks (high volatility stocks) sorted on past volatility in descending order. The PRO factor is the return series of an equal-weighted portfolio that is long the top 30% stocks (high profitability stocks) and short the bottom 30% stocks (low profitability stocks) sorted on gross profitability in descending order. The INV factor is the return series of an equal-weighted portfolio that is long the bottom 30% stocks (low investment stocks) and short the top 30% stocks (high investment stocks) sorted on two year asset growth in descending order. The SMB, HML, MOM, VOL, PRO and INV factors are market beta neutralised ex-post on a quarterly basis. The risk-free rates used are defined according to the regional universe of the index.

## Risk Factor Exposure as of 31-Dec-2018

The figure displays the exposure of the index's excess return (over the risk-free rate) to Market factor, SMB factor, HML factor, MOM factor, VOL factor, PRO factor and INV factor.



# Relative Factor Score

Relative Factor Score identifies the exposure of an index to the academically consensual factors such as Size, Value, Momentum, Volatility, Profitability and Investment.

## Relative Factor Score as of 31-Dec-2018

The table shows the relative factor score and relative score intensity of the strategy index, beta cap-weighted index and the broad cap-weighted index.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Index	Beta CW	Broad CW
Size (SMB) factor	-0.23	-0.66	-0.58
Value (HML) factor	-0.00	-0.10	-0.05
Momentum (MOM) factor	0.04	-0.00	0.01
Volatility factor	0.68	0.69	0.15
Profitability factor	0.16	0.28	0.02
Investment factor	0.12	0.12	-0.00
Relative Score Intensity	0.77	0.34	-0.46

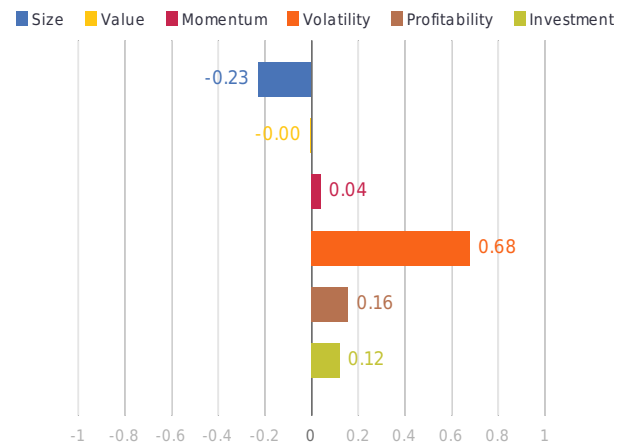
Analytics are based on quarterly weights.

Analytics are calculated from base date (21-Jun-2002) to 31-Dec-2018.

Analytics are updated quarterly with EOQ values.

## Relative Factor Score as of 31-Dec-2018

The figure displays the relative factor scores of the index.



# Bull / Bear Market Performances

Bull / Bear Market Performances refer to return and risk in phases with positive/negative market returns.

## Bull / Bear Market Performances as of 31-Jan-2019

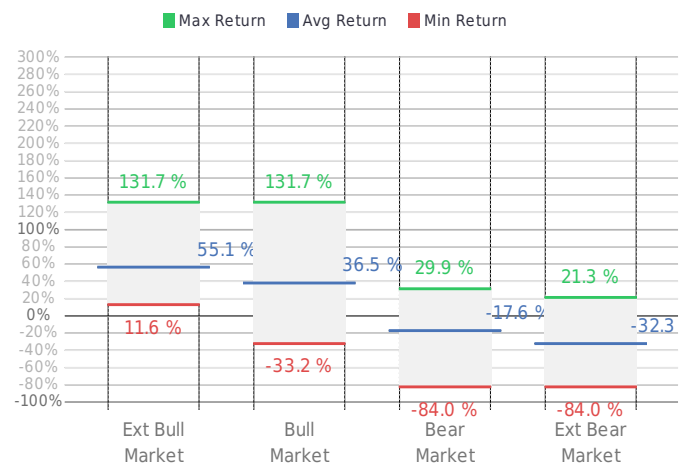
The analysis is based on the complete history of index returns. The table shows general statistics of the index's absolute performance and risk in periods of bull and bear market regimes and in periods of extreme bull and extreme bear market regimes.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Ext Bull Market	Bull Market	Bear Market	Ext Bear Market
Return	52.01 %	33.30 %	-21.96 %	-36.37 %
Volatility	9.38 %	8.69 %	15.02 %	18.46 %
Sharpe ratio	5.39	3.68	n/r	n/r

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated from base date (21-Jun-2002) to 31-Jan-2019.  
Analytics are updated monthly with EOM values.  
Performances are annualised.

## Bull / Bear Market Performances as of 31-Jan-2019

The figure displays the index's average, minimum, and maximum annualised absolute returns in quarters characterised by bull and bear market regimes and by extreme bull and extreme bear market regimes. The analysis is based on the complete history of index returns.



The returns and volatility are annualised. The risk-free rate used is defined according to the regional universe of the index.

## Bull / Bear Market Rel. Performances as of 31-Jan-2019

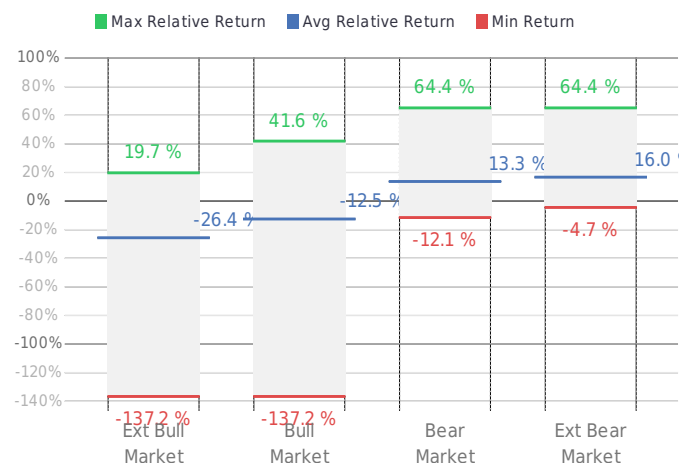
The analysis is based on the complete history of index returns. The table shows general statistics of the index's relative performance and relative risk (with respect to its cap-weighted reference index) in the periods of bull and bear market regimes respectively.

SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Ext Bull Market	Bull Market	Bear Market	Ext Bear Market
Relative Return	-23.33 %	-9.76 %	14.06 %	15.98 %
Tracking-Error	5.67 %	5.11 %	7.08 %	8.47 %
Information Ratio	n/r	n/r	1.99	1.89

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated from base date (21-Jun-2002) to 31-Jan-2019.  
Analytics are updated monthly with EOM values.  
Performances are annualised.

## Bull / Bear Market Rel. Performances as of 31-Jan-2019

The figure displays the index's average, minimum and maximum annualised relative returns (with respect to its cap-weighted reference index) in quarters characterised by bull and bear market regimes, respectively. The analysis is based on the complete history of index returns.



The statistics are based on daily total returns (with dividends reinvested). The relative returns and tracking error are annualised. The risk-free rate used is defined according to the regional universe of the index.

# High / Low Vol Regime Performances

High / Low Volatility Regime Performances indicate performance statistics in high/low volatility regimes.

## High / Low Vol Regime Performances as of 31-Jan-2019

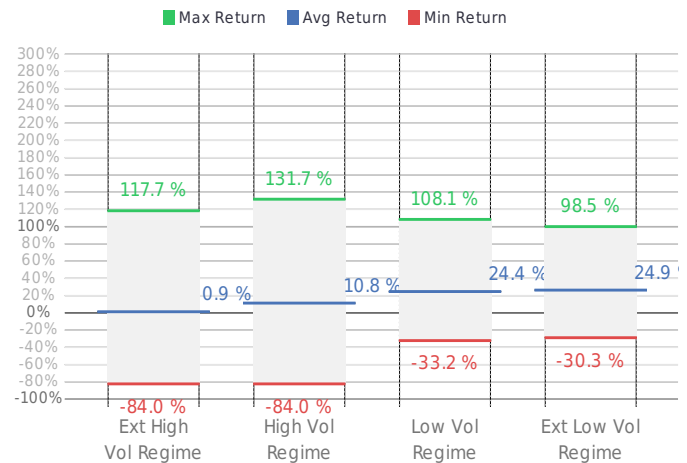
The analysis is based on the complete history of index returns. The table shows general statistics of the index's absolute performance and risk in periods of high and low volatility market regimes and in periods of extreme high and low volatility market regimes.

SciBeta Dev Nr w HFInt LVol Div MStrat (4S)	Ext High Vol Regime	High Vol Regime	Low Vol Regime	Ext Low Vol Regime
Annualized Return	-10.45 %	1.15 %	20.55 %	21.87 %
Volatility	18.48 %	14.76 %	6.60 %	6.11 %
Sharpe ratio	n/r	0.00	2.89	3.31

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated from base date (21-Jun-2002) to 31-Jan-2019.  
Analytics are updated monthly with EOM values.  
Performances are annualised.

## High / Low Vol Regime Performances as of 31-Jan-2019

The figure displays the index's average, minimum, and maximum quarterly absolute returns in quarters characterised by high and low volatility market regimes and by extreme high and low volatility market regimes. The analysis is based on the complete history of index returns.



The returns and volatility are annualised. The risk-free rate used is defined according to the regional universe of the index.

## High / Low Vol Regime Rel. Performances as of 31-Jan-2019

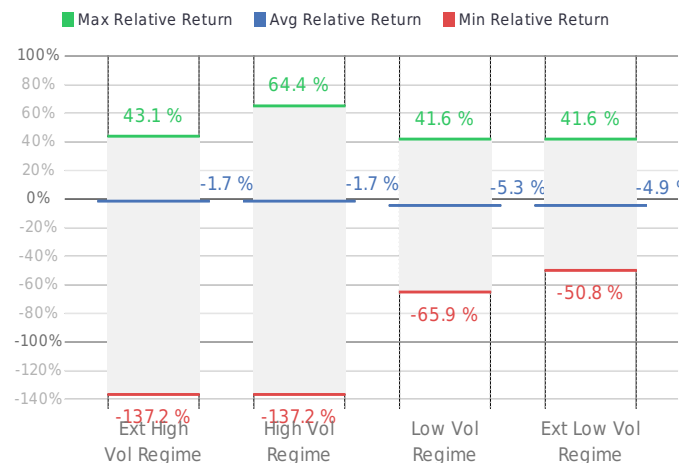
The analysis is based on the complete history of index returns. The table shows general statistics of the index's relative performance and relative risk (with respect to its cap-weighted reference index) in the periods of high and low volatility market regimes respectively.

SciBeta Dev Nr w HFInt LVol Div MStrat (4S)	Ext High Vol Regime	High Vol Regime	Low Vol Regime	Ext Low Vol Regime
Annualized Relative Return	11.00 %	8.19 %	-4.44 %	-4.17 %
Tracking-Error	9.27 %	7.53 %	3.68 %	3.47 %
Information Ratio	1.19	1.09	n/r	n/r

Analytics are based on daily **total** returns (dividends reinvested) in **USD**.  
Analytics are calculated from base date (21-Jun-2002) to 31-Jan-2019.  
Analytics are updated monthly with EOM values.  
Performances are annualised.

## High / Low Vol Regime Rel. Performances as of 31-Jan-2019

The figure displays the index's average, minimum and maximum quarterly relative returns (with respect to its cap-weighted reference index) in quarters characterised by high and low volatility market regimes, respectively. The analysis is based on the complete history of index returns.



The statistics are based on daily total returns (with dividends reinvested). The relative returns and tracking error are annualised. The risk-free rate used is defined according to the regional universe of the index.

# Turnover & Capacity

Turnover and capacity analysis addresses the main implementation issues of Scientific Beta indices.

## Turnover & Capacity as of 31-Dec-2018

The table shows the turnover level of the index in % and the capacity of the index (long-only indices) as measured by the average market capitalisations, in M\$. The corresponding statistics of the Broad cap-weighted reference index (Broad CW) are also reported, along with those of the Beta cap-weighted reference index (Beta CW) in case of univariated stock selection. \* For long/short indices, the table also reports the average capacity and latest capacity in M\$ of the long branch and the short branch of the unleveraged branch indices. \* For Market Beta Adjusted (Overlay) indices, the reported investability measures do not take into account the cost of replication of the cap-weighted index using futures overlay.

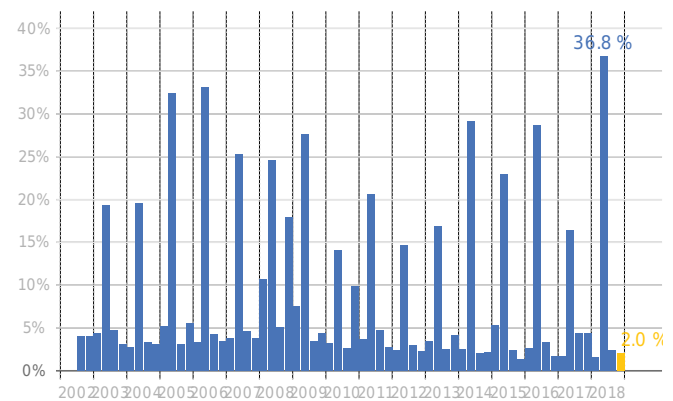
SciBeta Dev Nrw HFInt LVol Div MStrat (4S)	Index	Beta CW	Broad CW
Turnover (annualised)	35.3 %	19.1 %	3.9 %
Average Capacity (M\$)	31 983	89 955	74 640
Latest Capacity (M\$)	47 983	109 160	121 253

Analytics are calculated at 31-Dec-2018.  
Analytics are updated quarterly.

In case of univariated stock selection, the Beta cap-weighted reference index (Beta CW) is the cap-weighted index whose constituents are drawn from the same stock selection as that of the Scientific Beta index being analysed. The Broad cap-weighted reference index (Broad CW) is the cap-weighted index whose constituents cover all stocks in the geographic region of the Scientific Beta index being analysed.

## Turnover History as of 31-Dec-2018

The chart below shows the turnover history of the index since inception on a quarterly basis.





# Country Allocation

Country Allocation refers to the separation of investment weights of the strategy portfolio into different countries.

## Country Allocation as of 31-Dec-2018

The table shows top country exposures (in weight percentage) of the index, based on the index's weight profile at the last rebalancing time.

SciBeta Dev Nr w HFInt LVol Div MStrat (4S)	Weight
United States	60.7 %
Japan	9.4 %
United Kingdom	6.0 %
Germany	4.3 %
France	4.0 %
Canada	3.5 %
Switzerland	2.7 %
Australia	1.9 %
Singapore	1.4 %
Other	6.3 %

Analytics are calculated at 31-Dec-2018.

Analytics are updated quarterly.

The top countries are ordered by the index exposure at the last rebalancing time.

## Country Allocation as of 31-Dec-2018

The table shows top relative country exposures (in relative weight percentage) of the index with regard to its Broad cap-weighted reference index (Broad CW), based on the index's weight profile at the last rebalancing time.

SciBeta Dev Nr w HFInt LVol Div MStrat (4S)	Excess Weight
Germany	1.2 %
Netherlands	-0.9 %
Singapore	0.7 %
Australia	-0.7 %
Italy	-0.6 %
Belgium	0.6 %
Switzerland	-0.4 %
Israel	0.4 %
Denmark	-0.3 %
Other	0.1 %

Analytics are calculated at 31-Dec-2018.

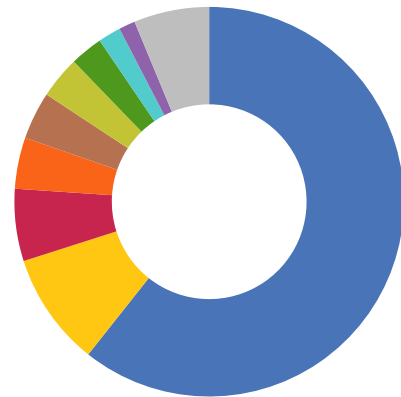
Analytics are updated quarterly.

The top countries are ordered by the index relative exposures at the last rebalancing time.

## Country Allocation as of 31-Dec-2018

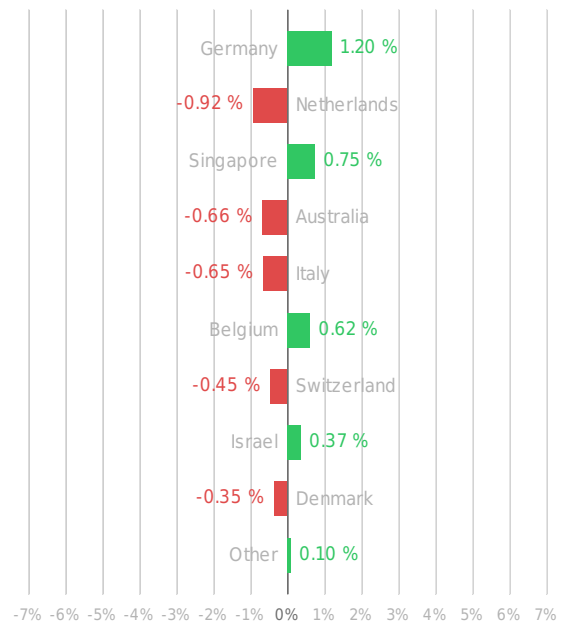
The figure displays top country exposures (in weight percentage) of the index, based on the index's weight profile at the last rebalancing time.

United States Japan United Kingdom Germany France  
Canada Switzerland Australia Singapore Other



## Country Allocation as of 31-Dec-2018

The figure displays top relative country exposures (in relative weight percentage) of the index with regard to its Broad cap-weighted reference index (Broad CW), based on the index's weight profile at the last rebalancing time.



# Sector Allocation

Sector Allocation refers to the separation of investment weights of the strategy portfolio into various sectors.

## Sector Allocation as of 31-Dec-2018

The table shows industry sector exposures (in weight percentage) of the index, based on the index's weight profile at the last rebalancing time.

SciBeta Dev Nrwl HFInt LVol Div MStrat (4S)	Weight
Energy	4.0 %
Basic Materials	2.4 %
Industrials	15.5 %
Cyclical Consumer	8.0 %
Non-Cyclical Consumer	15.1 %
Financials	22.3 %
Healthcare	9.0 %
Technology	6.0 %
Telecoms	3.8 %
Utilities	14.0 %

Analytics are calculated at 31-Dec-2018.  
Analytics are updated quarterly.

The sector classification used is the Thomson Reuters Business Classification.

## Sector Allocation as of 31-Dec-2018

The table shows the differences in aggregated sector weights of the index with regard to its Broad cap-weighted reference index (Broad CW), based on the index's weight profile at the last rebalancing time.

SciBeta Dev Nrwl HFInt LVol Div MStrat (4S)	Excess Weight
Energy	-2.0 %
Basic Materials	-1.9 %
Industrials	3.7 %
Cyclical Consumer	-4.6 %
Non-Cyclical Consumer	6.3 %
Financials	2.8 %
Healthcare	-4.7 %
Technology	-11.1 %
Telecoms	0.9 %
Utilities	10.5 %

Analytics are calculated at 31-Dec-2018.  
Analytics are updated quarterly.

The sector classification used is the Thomson Reuters Business Classification.

## Sector Allocation as of 31-Dec-2018

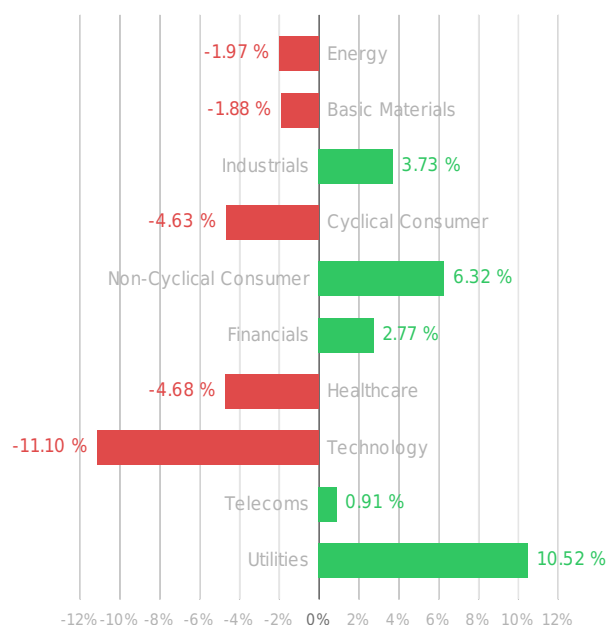
The figure displays industry sector exposures (in weight percentage) of the index, based on the index's weight profile at the last rebalancing time.

Energy Basic Materials Industrials Cyclical Consumer  
Non-Cyclical Consumer Financials Healthcare Technology  
Telecoms Utilities



## Sector Allocation as of 31-Dec-2018

The figure displays the differences in aggregated sector weights of the index with regard to its Broad cap-weighted reference index (Broad CW), based on the index's weight profile at the last rebalancing time.



# Currency Allocation

Currency Allocation refers to the separation of investment weights of the strategy portfolio into the quote currencies of its stocks.

## Currency Allocation as of 31-Dec-2018

The figure displays top currency exposures (in weight percentage) of the index, based on the index's weight profile at the last rebalancing time.

SciBeta Dev Nrwl HFInt LVol Div MStrat (4S)	Weight
US Dollar	61.2 %
Euro	11.2 %
Japanese Yen	9.4 %
British Pound	6.0 %
Canadian Dollar	3.5 %
Swiss Franc	2.7 %
Australian Dollar	1.9 %
Hong Kong Dollar	1.1 %
Swedish Krona	1.0 %
Other	1.9 %

Analytics are calculated at 31-Dec-2018.

Analytics are updated quarterly.

The table shows top currency exposures (in weight percentage) of the index, based on the index's weight profile at the last rebalancing time.

## Currency Allocation as of 31-Dec-2018

The figure displays top relative currency exposures (in relative weight percentage) of the index with regard to its Broad cap-weighted reference index (Broad CW), based on the index's weight profile at the last rebalancing time.

SciBeta Dev Nrwl HFInt LVol Div MStrat (4S)	Excess Weight
US Dollar	0.7 %
Australian Dollar	-0.7 %
Swiss Franc	-0.5 %
Israeli Shekel	0.4 %
Danish Krone	-0.3 %
Singapore Dollar	0.3 %
Hong Kong Dollar	-0.2 %
Swedish Krona	0.1 %
British Pound	0.1 %
Other	0.1 %

Analytics are calculated at 31-Dec-2018.

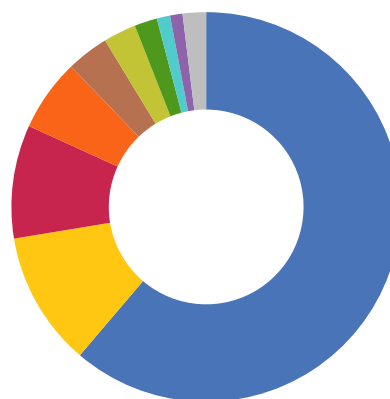
Analytics are updated quarterly.

The table shows top relative currency exposures (in relative weight percentage) of the index with regard to its Broad cap-weighted reference index (Broad CW), based on the index's weight profile at the last rebalancing time.

## Currency Allocation as of 31-Dec-2018

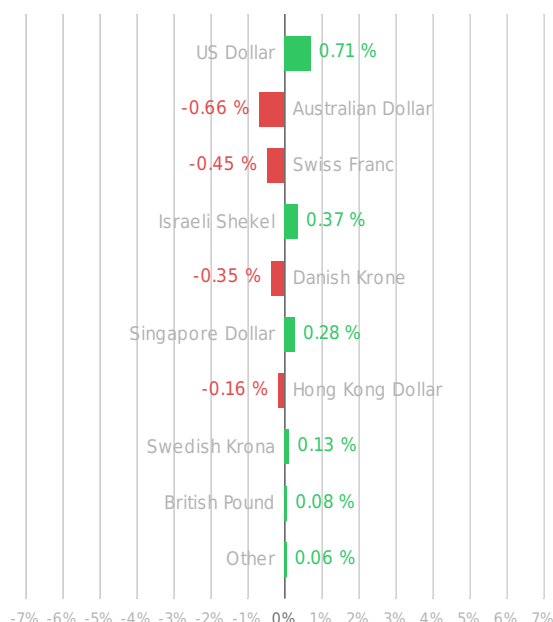
The top currencies are ordered by the index exposure at the last rebalancing time.

US Dollar Euro Japanese Yen British Pound Canadian Dollar  
 Swiss Franc Australian Dollar Hong Kong Dollar Swedish Krona  
 Other



## Currency Allocation as of 31-Dec-2018

The top currencies are ordered by the index relative exposure at the last rebalancing time.



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