

Scientific Beta Smart Beta Performance Report, December 2018

Introduction

Scientific Beta offers smart factor indices that provide exposure to the six well-known rewarded factors (Mid Cap, Value, High Momentum, Low Volatility, High Profitability and Low Investment) that are also well-diversified in order to reduce the specific risks. These indices are available in a wide range of versions, notably enabling broad and narrow indices to be distinguished that correspond to more or less pronounced choices of factor exposure. Furthermore, these single smart factor indices can be used in multi-factor allocations by taking into account the interactions between the indices in order to guarantee very high factor intensity.

In this report, we have chosen to present the smart factors represented by the Scientific Beta Narrow High Factor Intensity Diversified Multi-Strategy (4-Strategy) indices. Performance for smart factor indices exposed to risk factors known to be well-rewarded over long periods remains strong, with annual performance in excess of broad cap-weighted indices ranging from 2.40% to 3.92% since base date for the Developed universe. Over shorter periods, the strategies are exposed to fluctuations depending on variations in market conditions. **This quarter, ending December 31, 2018, the best performing index in the Developed universe among those smart factor indices is the SciBeta Developed Narrow High Factor Intensity Low Volatility Diversified Multi-Strategy (4-Strategy) index with a relative return of 4.84% compared to the broad cap-weighted index, while the SciBeta Developed Narrow High Factor Intensity High Momentum Diversified Multi-Strategy (4-Strategy) index posts the lowest relative return (-3.11%).** Half of the factors outperformed their cap-weighted benchmark this quarter, with the six indices showing an average outperformance of 0.31%.

Naturally, many investors choose to diversify their factor exposure so as not to be exposed to variations in the performance of a single factor. For this reason, Scientific Beta Multi-Beta Multi-Strategy (MBMS) indices provide an allocation to well-rewarded smart factor indices. Here again, Scientific Beta proposes a wide range of Multi-Beta Multi-Strategy indices based on its investment philosophy. This report presents those that enable the diversification of factor and specific risks to be reconciled. Among these indices, we have chosen to present some of the more popular ones, namely the strategy with the longest live track record – the SciBeta Multi-Beta Multi-Strategy 4-Factor Equal-Weight index, together with other strategies created more recently which take into account the interactions between single-factor indices in order to provide the highest factor intensity at a multi-factor level – represented by the SciBeta High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy Equal-Weight index, together with its Sector Neutral version, Market Beta Adjusted (Overlay) version that corrects for market beta bias, and combined Sector Neutral/Market Beta Adjusted (Overlay) version.

Over the past ten years, the SciBeta Developed Multi-Beta Multi-Strategy 4-Factor Equal-Weight index, the SciBeta Developed High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy Equal-Weight index, the SciBeta Developed High Factor Intensity Diversified Multi-Beta Multi-Strategy (Sector Neutral) 6-Factor 4-Strategy Equal-Weight index, the SciBeta Developed High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy Equal-Weight Market Beta Adjusted (Overlay) index, and the SciBeta Developed High Factor Intensity Diversified Multi-Beta Multi-Strategy (Sector Neutral) 6-Factor 4-Strategy Equal-Weight Market Beta Adjusted (Overlay) index post strong annual relative returns of 1.10%, 2.19%, 1.93%, 3.75% and 3.14% respectively compared to cap-weighted indices.

This quarter, the SciBeta Developed Multi-Beta Multi-Strategy 4-Factor Equal-Weight index, the SciBeta Developed High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy Equal-Weight index, the SciBeta Developed High Factor Intensity Diversified Multi-Beta Multi-Strategy (Sector Neutral) 6-Factor 4-Strategy Equal-Weight index, the SciBeta Developed High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy Equal-Weight Market Beta Adjusted (Overlay) index, and the SciBeta Developed High Factor Intensity Multi-Beta Multi-Strategy (Sector Neutral) 6-Factor 4-Strategy Equal-Weight Market Beta Adjusted (Overlay) index post relative returns of 0.05%, 0.70%, -0.60%, -0.73%, and -1.74% respectively compared to cap-weighted indices.

In 2018, in the Developed, Developed ex US and US regions, the poor cyclicality of the Value and High Momentum smart factor indices in particular has had a negative effect on the relative performance. Sector neutrality did not significantly improve performance. Nevertheless, the sector neutral versions remain the best performing indices among the Scientific Beta indices, with regional differences being observed. In 2018, the SciBeta Developed Europe High Factor Intensity Diversified Multi-Beta Multi-Strategy (Sector Neutral) 6-Factor 4-Strategy Equal-Weight index posted a relative return of 2.54%, while the SciBeta United States High Factor Intensity Diversified Multi-Beta Multi-Strategy (Sector Neutral) 6-Factor 4-Strategy Equal-Weight index posted a relative return of -0.83%.

Smart Factor Indices

Performance Overview

Tables 1a and 1b display the performance of Scientific Beta Developed Narrow High Factor Intensity Diversified Multi-Strategy (4-Strategy) indices. The six tilts selected – book-to-market, size, volatility, momentum, investment and profitability – are the common tilts documented in the literature as liable to produce outperformance compared to cap-weighted indices. The tables present performance statistics for the six rewarded factor tilts. All these indices serve to create a diversified portfolio of the relevant stocks. In particular, they draw on different smart beta weighting schemes¹, which we refer to as a diversified multi-strategy index. In addition, these indices offer investable proxies for smart beta factor indices. These indices allow investors to be both exposed to a specific risk factor (beta) and to have good diversification of other risk factors, leading to an attractive Sharpe ratio associated with the factor tilt.

Table 1a: Short-Term Performance Overview for Smart Factor Indices for the Scientific Beta Developed Universe

Narrow High Factor Intensity Diversified Multi-Strategy (4-Strategy) Index	Past Quarter (as of 31/12/2018)			Year to Date (as of 31/12/2018)		
	Absolute Return	Relative Return		Absolute Return	Relative Return	
		To Tilted Cap-Weighted	To Broad Cap-Weighted		To Tilted Cap-Weighted	To Broad Cap-Weighted
Mid Cap	-13.36%	-0.03%	-0.19%	-9.70%	-0.03%	-0.19%
Value	-12.56%	-0.26%	0.61%	-9.08%	-0.26%	0.61%
High Momentum	-16.28%	-2.64%	-3.11%	-12.48%	-2.64%	-3.11%
Low Volatility	-8.33%	-0.34%	4.84%	-5.07%	-0.34%	4.84%
High Profitability	-12.77%	-0.33%	0.40%	-5.85%	-0.33%	0.40%
Low Investment	-13.86%	-2.70%	-0.69%	-9.13%	-2.70%	-0.69%

The history of Scientific Beta indices considered here begins on 21/06/2002. The statistics are based on daily total return series (with dividends reinvested). The statistics reported in the table are not annualised. All results are in USD.

Looking at past quarter relative returns, the best performing index is the SciBeta Developed Narrow High Factor Intensity Low Volatility Diversified Multi-Strategy (4-Strategy) index with a relative return of 4.84% compared to the broad cap-weighted index, while the SciBeta Developed Narrow High Factor Intensity High Momentum Diversified Multi-Strategy (4-Strategy) index posts the lowest relative return (-3.11%).

¹Maximum Deconcentration, Diversified Risk Weighted, Maximum Decorrelation and Efficient Maximum Sharpe Ratio.

Table 1b: Long-Term Performance Overview for Smart Factor Indices for the Scientific Beta Developed Equity Universe

Narrow High Factor Intensity Diversified Multi-Strategy (4-Strategy) Index	Since Base Date: From 21/06/2002 to 31/12/2018							
	Absolute Return	Relative Return compared to Tilted Cap-Weighted	Relative Return compared to Broad Cap-Weighted	Volatility	Sharpe Ratio	Maximum Relative Drawdown	Outperformance Probability (1Y)	Outperformance Probability (3Y)
Mid Cap	10.61%	0.08%	3.21%	13.59%	0.69	9.44%	75.32%	97.27%
Value	11.32%	1.32%	3.92%	14.36%	0.70	5.17%	78.94%	100.00%
High Momentum	9.80%	1.15%	2.40%	14.99%	0.57	17.44%	74.26%	93.17%
Low Volatility	10.17%	1.55%	2.76%	11.44%	0.78	15.02%	53.19%	80.60%
High Profitability	10.70%	1.68%	3.30%	12.80%	0.74	8.39%	79.79%	100.00%
Low Investment	10.26%	1.16%	2.86%	13.70%	0.66	9.36%	76.81%	100.00%

The history of Scientific Beta indices' returns considered here begins on 21/06/2002. The statistics are based on daily total return series. 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. Scientific Beta uses the yield on Secondary Market US Treasury Bills (3M) as a proxy for the risk-free rate in US Dollars. The tilted cap-weighted indices are obtained based on the same selection of assets as each of the smart factor indices. All results are in USD.

Since base date, all Narrow High Factor Intensity Diversified Multi-Strategy (4-Strategy) indices exhibit positive relative returns compared to cap-weighted indices, whether broad or tilted cap-weighted indices.

The best performance relative to the broad cap-weighted index is posted by the SciBeta Developed Narrow High Factor Intensity Value Diversified Multi-Strategy (4-Strategy) index (3.92%) while the SciBeta Developed Narrow High Factor Intensity High Momentum Diversified Multi-Strategy (4-Strategy) index posts the lowest relative return (2.40%).

Tilted cap-weighted indices are factor indices that use the same universe of assets as each smart factor index. The outperformance of smart factor indices compared to those indices is due to the difference in weighting scheme, which results in better diversification for smart factor indices compared to cap-weighted indices.

1. Multi Smart Factor Indices

Multi-Beta Multi-Strategy Indices are Scientific Beta's flagship indices. These indices correspond to a multi-factor index allocation that uses Scientific Beta Diversified Multi-Strategy Factor Indices, with intensity to a particular factor, as building blocks. This approach minimises unintended specific risks and provides blended intensity to the desired risk factors. This double diversification – allocation across various factors (Multi-Beta allocation) along with a smart diversification of the specific risks (Diversified Multi-Strategy weighting scheme) – minimises the non-rewarded risks, hence the name Multi-Smart Factor Indices. Scientific Beta offers different types of Multi-Beta Multi-Strategy indices. This document presents the most popular ones, namely the strategy with the longest live track record – the SciBeta Multi-Beta Multi-Strategy 4-Factor Equal-Weight Index, together with more recently-created strategies that take into account the interactions between single-factor indices in order to provide greater factor intensity at a multi-factor level – represented by the SciBeta High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy Equal-Weight Index, together with its Sector Neutral version, Market Beta Adjusted (Overlay) version that corrects for market beta bias, and combined Sector Neutral/Market Beta Adjusted (Overlay) version.

Performance Overview

Live Performance

Table 2a presents the live performance of the multi-beta multi-strategy indices in various regions. The live date is 20 December 2013 for the SciBeta Multi-Beta Multi-Strategy 4-Factor Equal-Weight indices and 16 March 2018 for the SciBeta High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy Equal-Weight indices and their Sector Neutral versions, Market Beta Adjusted (Overlay) versions that correct for market beta bias, and combined Sector Neutral/Market Beta Adjusted (Overlay) versions.

Table 2a: Live Performance of Multi-Beta Multi-Strategy Indices as of 31/12/2018

Index	Multi-Beta Multi-Strategy	Nº of Constituents	Relative Return Compared to Broad Cap-Weighted	Absolute Return	Volatility	Sharpe Ratio
Developed	4-Factor EW	1615	0.65%	6.14%	9.99%	0.55
	HFI 6-Factor 4-Strategy EW	1107	1.79%	7.28%	9.80%	0.68
	HFI 6-Factor 4-Strategy EW Sector Neutral	1120	1.92%	7.40%	10.12%	0.67
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	1107	2.47%	7.95%	11.05%	0.66
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	1120	2.39%	7.88%	11.17%	0.65
Developed ex US	4-Factor EW	1154	2.07%	3.61%	11.09%	0.27
	HFI 6-Factor 4-Strategy EW	792	3.34%	4.88%	11.09%	0.38
	HFI 6-Factor 4-Strategy EW Sector Neutral	803	3.29%	4.83%	11.04%	0.38
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	792	3.55%	5.09%	12.27%	0.36
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	803	3.48%	5.02%	12.25%	0.36
United States	4-Factor EW	462	-0.53%	8.16%	12.11%	0.62
	HFI 6-Factor 4-Strategy EW	316	0.53%	9.21%	11.84%	0.73
	HFI 6-Factor 4-Strategy EW Sector Neutral	318	0.73%	9.41%	12.42%	0.71
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	316	1.59%	10.28%	13.34%	0.72
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	318	1.46%	10.14%	13.55%	0.70
Developed Europe	4-Factor EW	445	2.01%	2.78%	14.59%	0.15
	HFI 6-Factor 4-Strategy EW	300	3.37%	4.14%	14.50%	0.24
	HFI 6-Factor 4-Strategy EW Sector Neutral	303	4.19%	4.96%	14.31%	0.30
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	300	3.40%	4.17%	15.55%	0.23
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	303	4.20%	4.97%	15.54%	0.28
Developed Asia-Pacific ex Japan	4-Factor EW	258	1.60%	3.56%	10.83%	0.27
	HFI 6-Factor 4-Strategy EW	169	1.73%	3.69%	11.22%	0.27
	HFI 6-Factor 4-Strategy EW Sector Neutral	171	1.07%	3.03%	11.20%	0.22
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	169	2.17%	4.13%	14.15%	0.25
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	171	1.32%	3.28%	14.15%	0.19
Japan	4-Factor EW	363	2.80%	8.04%	17.27%	0.47
	HFI 6-Factor 4-Strategy EW	247	4.63%	9.87%	17.50%	0.57
	HFI 6-Factor 4-Strategy EW Sector Neutral	252	3.52%	8.76%	17.42%	0.51
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	247	5.39%	10.63%	19.71%	0.54
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	252	4.29%	9.53%	19.62%	0.49

Based on daily total returns in USD for Developed, Developed ex US, United States, Developed Europe and Developed Asia-Pacific ex Japan, and in JPY for Japan.

Live date is 20 December 2013 for SciBeta Multi-Beta Multi-Strategy 4-Factor EW indices and 16 March 2018 for the High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy EW indices and their Sector Neutral, Market Beta Adjusted (Overlay) and combined Sector Neutral/Market Beta Adjusted (Overlay) versions. The performance is reported since 20 December 2013 for all the indices as that is the longest live track record available. Statistics covering a period of more than one year are annualised.

Latest Performance

Table 2b displays an overview of the relative and absolute performance of Scientific Beta Multi-Beta Multi Strategy indices for various regions and different time periods.

Over the long term, all Scientific Beta Multi-Beta Multi-Strategy indices post positive excess returns compared to broad cap-weighted indices. Over the past ten years, the best performing index was the SciBeta Developed Europe High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy Equal-Weight Market Beta Adjusted (Overlay) index with a relative return of 4.72% while the lowest performing index was the SciBeta United States Multi-Beta Multi-Strategy 4-Factor Equal-Weight index with a relative return of 0.39%.

In the past quarter, if we consider the cumulative excess returns, the best performing index is the SciBeta United States High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy Equal-Weight index with a relative return of 1.01%, while the lowest performing index is the SciBeta United States Multi-Beta Multi Strategy 6-Factor 4-Strategy Equal-Weight Market Beta Adjusted (Overlay) index with a relative return of -2.16%.

From table 2b, it also appears that the volatility of the Scientific Beta Multi-Beta Multi Strategy indices is significantly lower over the long term compared to the volatility of broad-cap weighted indices for all regions, with the highest differences being observed for the Developed Asia-Pacific ex-Japan indices, with volatilities of 18.18% for the broad cap-weighted index, and volatilities of 14.83% and 14.95% respectively for the Scientific Beta Multi-Beta Multi Strategy 4-Factor Equal-Weight and Scientific Beta High Factor Intensity Diversified Beta Multi-Beta Multi Strategy 6-Factor 4-Strategy Equal-Weight indices over the past ten years. As a result, we observe a considerable improvement in the Sharpe ratios for the Scientific Beta Multi-Beta Multi Strategy indices over the past ten years compared to the broad cap-weighted indices. Sharpe ratios range from 0.57 (Developed Europe) to 0.96 (Developed) for the Scientific Beta High Factor Intensity Diversified Multi-Beta Multi Strategy 6-Factor 4-Strategy Equal-Weight allocation indices, compared to 0.32 (Developed Europe) to 0.68 (Developed) for the broad cap-weighted indices.

Table 2b: Relative and Absolute Performance of Scientific Beta Multi-Beta Multi-Strategy Indices across Regions as of 31/12/2018

Index	Multi-Beta Multi-Strategy	Nº of Constituents	Relative Return compared to Cap-Weighted				Information Ratio		Absolute Return		Volatility		Sharpe Ratio	
			1Q	YTD	1Y	10Y	1Y	10Y	1Y	10Y	1Y	10Y	1Y	10Y
Developed	4-Factor EW	1749	0.05%	-1.37%	-1.37%	1.10%	n/r	0.45	-9.53%	11.21%	11.27%	13.04%	n/r	0.83
	HFI 6-Factor 4-Strategy EW	1183	0.70%	-0.46%	-0.46%	2.19%	n/r	0.73	-8.62%	12.30%	11.11%	12.42%	n/r	0.96
	HFI 6-Factor 4-Strategy EW Sector Neutral	1204	-0.60%	-0.26%	-0.26%	1.93%	n/r	0.78	-8.42%	12.03%	11.76%	12.84%	n/r	0.91
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	1183	-0.73%	-1.51%	-1.51%	3.75%	n/r	1.76	-9.67%	13.85%	12.49%	14.42%	n/r	0.94
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	1204	-1.74%	-1.11%	-1.11%	3.14%	n/r	1.71	-9.27%	13.24%	12.82%	14.54%	n/r	0.89
SciBeta Global Developed CW		1873							-8.16%	10.10%	12.63%	14.34%	n/r	0.68
Developed ex US	4-Factor EW	1279	-0.25%	-0.48%	-0.48%	1.98%	n/r	0.65	-14.04%	8.88%	11.00%	14.02%	n/r	0.61
	HFI 6-Factor 4-Strategy EW	866	0.25%	0.82%	0.82%	3.22%	0.48	0.94	-12.73%	10.11%	10.98%	13.67%	n/r	0.71
	HFI 6-Factor 4-Strategy EW Sector Neutral	885	-0.17%	0.47%	0.47%	2.61%	0.31	0.80	-13.09%	9.50%	11.08%	13.70%	n/r	0.67
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	866	-0.60%	-0.15%	-0.15%	4.38%	n/r	1.78	-13.70%	11.28%	11.75%	15.81%	n/r	0.69
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	885	-1.02%	-0.48%	-0.48%	3.66%	n/r	1.59	-14.04%	10.55%	11.81%	15.75%	n/r	0.65
SciBeta Developed ex US CW		1373							-13.56%	6.89%	11.28%	15.72%	n/r	0.42
United States	4-Factor EW	470	0.25%	-2.06%	-2.06%	0.39%	n/r	0.13	-6.34%	13.36%	14.54%	15.52%	n/r	0.84
	HFI 6-Factor 4-Strategy EW	317	1.01%	-1.44%	-1.44%	1.33%	n/r	0.36	-5.72%	14.30%	14.30%	14.64%	n/r	0.95
	HFI 6-Factor 4-Strategy EW Sector Neutral	319	-0.86%	-0.83%	-0.83%	1.38%	n/r	0.48	-5.11%	14.35%	15.33%	15.46%	n/r	0.91
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	317	-0.77%	-2.35%	-2.35%	3.16%	n/r	1.04	-6.63%	16.14%	16.35%	16.68%	n/r	0.95
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	319	-2.16%	-1.51%	-1.51%	2.63%	n/r	1.01	-5.79%	15.60%	16.83%	16.99%	n/r	0.90
SciBeta United States CW		500							-4.28%	12.97%	16.95%	16.49%	n/r	0.76
Developed Europe	4-Factor EW	462	-0.92%	0.10%	0.10%	2.45%	0.04	0.65	-14.37%	9.37%	13.70%	18.81%	n/r	0.48
	HFI 6-Factor 4-Strategy EW	307	-0.07%	2.53%	2.53%	3.91%	1.07	0.97	-11.94%	10.82%	13.69%	18.37%	n/r	0.57
	HFI 6-Factor 4-Strategy EW Sector Neutral	312	-0.05%	2.54%	2.54%	3.42%	1.19	0.85	-11.94%	10.33%	13.78%	18.12%	n/r	0.55
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	307	-0.96%	1.47%	1.47%	4.72%	0.60	1.48	-13.00%	11.64%	14.51%	20.25%	n/r	0.56
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	312	-0.90%	1.53%	1.53%	4.22%	0.69	1.42	-12.94%	11.14%	14.54%	20.22%	n/r	0.53
SciBeta Developed Europe CW		489							-14.47%	6.92%	13.79%	20.55%	n/r	0.32
Developed Asia-Pacific ex Japan	4-Factor EW	318	0.22%	0.46%	0.46%	1.25%	0.12	0.23	-9.54%	11.09%	11.43%	14.83%	n/r	0.72
	HFI 6-Factor 4-Strategy EW	207	-0.76%	-3.15%	-3.15%	1.52%	n/r	0.28	-13.16%	11.36%	11.72%	14.95%	n/r	0.74
	HFI 6-Factor 4-Strategy EW Sector Neutral	210	-0.64%	-3.36%	-3.36%	1.05%	n/r	0.20	-13.36%	10.89%	11.82%	15.36%	n/r	0.69
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	207	-1.62%	-4.38%	-4.38%	3.42%	n/r	0.89	-14.38%	13.26%	13.51%	18.41%	n/r	0.70
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	210	-1.50%	-4.53%	-4.53%	2.66%	n/r	0.67	-14.53%	12.50%	13.42%	18.69%	n/r	0.65
SciBeta Developed Asia-Pacific ex Japan CW		338							-10.00%	9.84%	12.93%	18.18%	n/r	0.52
Japan	4-Factor EW	409	0.76%	-1.65%	-1.65%	0.94%	n/r	0.16	-16.05%	8.58%	16.95%	17.32%	n/r	0.49
	HFI 6-Factor 4-Strategy EW	276	0.83%	-0.73%	-0.73%	2.61%	n/r	0.41	-15.12%	10.26%	16.92%	17.36%	n/r	0.59
	HFI 6-Factor 4-Strategy EW Sector Neutral	285	0.42%	-1.55%	-1.55%	2.22%	n/r	0.41	-15.94%	9.87%	16.76%	17.62%	n/r	0.56
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	276	-0.53%	-1.85%	-1.85%	4.30%	n/r	0.84	-16.25%	11.95%	18.49%	20.65%	n/r	0.58
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	285	-1.16%	-2.87%	-2.87%	3.80%	n/r	0.85	-17.27%	11.44%	18.48%	20.63%	n/r	0.55
SciBeta Japan CW		446							-14.40%	7.64%	17.24%	20.07%	n/r	0.38

Based on daily total returns in USD for Developed, Developed ex US, United States, Developed Europe, Developed Asia-Pacific ex Japan, and in JPY for Japan. Base date is June 21 2002 for Scientific Beta Multi-Beta Multi-Strategy 4-Factor EW indices and Scientific Beta High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy EW indices and their Sector Neutral version, June 18 2004 for Scientific Beta High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay) indices and their Sector Neutral version and December 19 2003 for Scientific Beta Multi-Beta Multi-Strategy CW indices. The statistics other than for 1Q and YTD 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 number of index constituents is average over the 10-year period.

Long-Term Track Records

Table 2c displays the performance of long-term US data series, the initial reference universe being the 500 largest market-cap US stocks.

Table 2c: Performance Overview of Multi-Beta Multi-Strategy Indices for US Long-Term Data Series

Long-Term US Track Records since 31/12/1977 (as of 31/12/2017): 40 years			
United States	Relative Return compared to Cap-Weighted	Volatility	Sharpe Ratio
HFI 4-Factor 4-Strategy EW	2.84%	14.35%	0.68
HFI 6-Factor 4-Strategy EW	2.88%	14.38%	0.68
HFI 6-Factor 4-Strategy EW Sector Neutral	2.56%	15.27%	0.62
HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Overlay)	3.84%	17.73%	0.61
HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Overlay)	3.29%	18.30%	0.56

Long-Term US data series are style factor data series constructed from the 500 largest market-cap US stocks. The statistics are based on daily total return series (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 yield on Secondary Market US Treasury Bills (3M) is used as a proxy for the risk-free rate in US Dollars. All results are in USD.

About Scientific Beta

Scientific Beta aims to be the first provider of a smart beta indices platform to help investors understand and invest in advanced beta equity strategies.

Established by EDHEC-Risk Institute, one of the very top academic institutions in the field of fundamental and applied research for the investment industry, Scientific Beta shares the same concern for scientific rigour and veracity, which it applies to all the services that it offers investors and asset managers.

The Scientific Beta offering covers three major services:

- **Scientific Beta Indices** are smart beta indices that aim to be the reference for the investment and analysis of alternative beta strategies. Scientific Beta Indices reflect the state-of-the-art in the construction of different alternative beta strategies and allow for a flexible choice among a wide range of options at each stage of their construction process. This choice enables users of the platform to construct their own benchmark, thus controlling the risks of investing in this new type of beta (Smart Beta 2.0).

Within the framework of Smart Beta 2.0 offerings, Scientific Beta provides access to smart factor indices, which give exposure to risk factors that are well rewarded over the long-term while at the same time diversifying away unrewarded specific risks. By combining these smart factor indices, one can design very high performance passive investment solutions.

- **Scientific Beta Analytics** are detailed analytics and exhaustive information on its smart beta indices to allow investors to evaluate the advanced beta strategies in terms of risk and performance. The analytics capabilities include risk and performance assessments, factor and sector attribution, and relative risk assessment. Scientific Beta Analytics also allow the liquidity, turnover and diversification quality of the indices offered to be analysed. In the same way, analytics provide an evaluation of the probability of out-of-sample outperformance of the various strategies present on the platform.
- **Scientific Beta Fully-Customised Benchmarks and Smart Beta Solutions** is a service proposed by Scientific Beta, and its partners, in the context of an advisory relationship for the construction and implementation of benchmarks specially designed to meet the specific objectives and constraints of investors and asset managers. This service notably offers the possibility of determining specific combinations of factors, considering optimal combinations of smart beta strategies, defining a stock universe specific to the investor, and taking account of specific risk constraints during the benchmark construction process.

With a concern to provide worldwide client servicing, Scientific Beta is present in Boston, London, Nice, Singapore and Tokyo. As of June 30, 2018, the Scientific Beta indices corresponded to USD 34bn in assets under replication. Scientific Beta has a dedicated team of 52 people who cover not only client support from Nice, Singapore and Boston, but also the development, production and promotion of its index offering. Scientific Beta signed the United Nations-supported Principles for Responsible Investment (PRI) on September 27, 2016.

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For more information, please contact:
Carolyn Essid: +33 493 187 824 or by e-mail to: carolyn.essid@scientificbeta.com

Scientific Beta HQ & Asia-Pacific
1 George Street
#15-02
Singapore 049145
Tel: +65 6438 0030

Scientific Beta R&D
393 promenade des Anglais
BP 3116 - 06202 Nice Cedex 3
France
Tel: +33 493 187 863

Scientific Beta—Europe
10 Fleet Place, Ludgate
London EC4M 7RB
United Kingdom
Tel: +44 207 332 5600

Scientific Beta—North America
One Boston Place, 201 Washington Street
Suite 2608/2640, Boston, MA 02108
United States of America
Tel: +1 857 239 8891

Scientific Beta—Japan
East Tower 4th Floor, Otemachi First Square,
1-5-1 Otemachi, Chiyoda-ku, Tokyo 100-0004
Japan
Tel: +81 352 191 418

www.scientificbeta.com