

Scientific Beta Smart Beta Performance Report, September 2018

Introduction

ERI 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 2.47% to 3.98% 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 September 30, 2018, the best performing index in the Developed universe among those smart factor indices is the SciBeta Developed Narrow High Factor Intensity High Profitability Diversified Multi-Strategy (4-Strategy) index with a relative return of 2.18% compared to the broad cap-weighted index, while the SciBeta Developed Narrow High Factor Intensity Low Volatility Diversified Multi-Strategy (4-Strategy) index posts the lowest relative return (-2.19%).**

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 Market Beta Adjusted (Leverage) version that corrects for market beta bias and its Sector Neutral 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 Market Beta Adjusted (Leverage) index, the SciBeta Developed High Factor Intensity Diversified Multi-Beta Multi-Strategy (Sector Neutral) 6-Factor 4-Strategy Equal-Weight index and the SciBeta Developed High Factor Intensity Diversified Multi-Beta Multi-Strategy (Sector Neutral) 6-Factor 4-Strategy Equal-Weight Market Beta Adjusted (Leverage) index post strong annual relative returns of 1.25%, 2.58%, 4.45%, 2.38% and 3.66% 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 6-Factor 4-Strategy Equal-Weight Market Beta Adjusted (Leverage) index, the SciBeta Developed High Factor Intensity Diversified Multi-Beta Multi-Strategy (Sector Neutral) 6-Factor 4-Strategy Equal-Weight index and the SciBeta Developed High Factor Intensity Multi-Beta Multi-Strategy (Sector Neutral) 6-Factor 4-Strategy Equal-Weight Market Beta Adjusted (Leverage) index post relative returns of -1.52%, -0.95%, -0.49%, -0.44% and 0.01% respectively compared to cap-weighted indices.** Since the beginning of the year, factor strategies have clearly not been performing well as the implicit sector bets proposed by the factors have a considerable impact on short-term performance. Moreover, it can be observed that the sector neutral versions of the multi smart factor indices are those that are resisting best to this under-performance of factors.

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 30/09/2018)			Year to Date (as of 30/09/2018)		
	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	2.33%	-0.62%	-1.55%	4.18%	0.78%	-1.55%
Value	3.99%	0.19%	-1.78%	3.94%	2.87%	-1.78%
High Momentum	3.36%	-1.99%	-1.25%	4.48%	-3.53%	-1.25%
Low Volatility	4.45%	-2.05%	-2.19%	3.54%	-2.10%	-2.19%
High Profitability	4.60%	-1.34%	2.18%	7.91%	-0.98%	2.18%
Low Investment	4.33%	-0.51%	-0.28%	5.45%	2.71%	-0.28%

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 High Profitability Diversified Multi-Strategy (4-Strategy) index with a relative return of 2.18% compared to the broad cap-weighted index, while the SciBeta Developed Narrow High Factor Intensity Low Volatility Diversified Multi-Strategy (4-Strategy) index posts the lowest relative return (-2.19%).

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 30/09/2018							
	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	11.76%	1.50%	3.30%	13.57%	0.77	9.44%	78.57%	92.94%
Value	12.43%	4.19%	3.98%	14.36%	0.78	5.17%	88.22%	100.00%
High Momentum	11.16%	2.03%	2.71%	14.92%	0.66	17.44%	75.81%	85.16%
Low Volatility	10.92%	2.29%	2.47%	11.42%	0.85	15.02%	57.14%	89.77%
High Profitability	11.81%	1.90%	3.35%	12.74%	0.83	8.39%	75.44%	97.69%
Low Investment	11.44%	2.49%	2.99%	13.67%	0.75	9.36%	79.70%	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. ERI 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 (3.98%) while the SciBeta Developed Narrow High Factor Intensity Low Volatility Diversified Multi-Strategy (4-Strategy) index posts the lowest relative return (2.47%).

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 Market Beta Adjusted (Leverage) and Sector Neutral versions.

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 Market Beta Adjusted (Leverage) and Sector Neutral versions.

Table 2a: Live Performance of Multi-Beta Multi-Strategy Indices as of 30/09/2018

Index	Multi-Beta Multi-Strategy	Nº of Constituents	Relative Return Compared to Broad Cap-Weighted	Absolute Return	Volatility	Sharpe Ratio
Developed	4-Factor EW	1640	0.72%	9.65%	9.60%	0.95
	HFI 6-Factor 4-Strategy EW	1118	1.79%	10.72%	9.42%	1.08
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	1118	3.23%	12.17%	10.67%	1.09
	HFI 6-Factor 4-Strategy EW Sector Neutral	1130	2.25%	11.20%	9.67%	1.10
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	1130	3.37%	12.33%	10.72%	1.10
Developed ex US	4-Factor EW	1174	2.30%	6.84%	10.93%	0.57
	HFI 6-Factor 4-Strategy EW	801	3.56%	8.09%	10.94%	0.69
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	801	4.42%	8.98%	12.19%	0.69
	HFI 6-Factor 4-Strategy EW Sector Neutral	812	3.63%	8.15%	10.86%	0.70
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	812	4.45%	9.00%	12.14%	0.69
United States	4-Factor EW	466	-0.60%	11.88%	11.51%	0.98
	HFI 6-Factor 4-Strategy EW	316	0.33%	12.83%	11.25%	1.09
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	316	2.16%	14.67%	12.69%	1.11
	HFI 6-Factor 4-Strategy EW Sector Neutral	318	1.04%	13.56%	11.72%	1.11
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	318	2.38%	14.91%	12.81%	1.12
Developed Europe	4-Factor EW	451	2.41%	6.14%	14.41%	0.39
	HFI 6-Factor 4-Strategy EW	302	3.68%	7.39%	14.33%	0.48
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	302	4.18%	7.91%	15.42%	0.48
	HFI 6-Factor 4-Strategy EW Sector Neutral	305	4.55%	8.28%	14.13%	0.55
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	305	5.12%	8.86%	15.40%	0.54
Developed Asia-Pacific ex Japan	4-Factor EW	266	1.66%	5.53%	10.62%	0.47
	HFI 6-Factor 4-Strategy EW	173	2.05%	5.90%	10.96%	0.49
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	173	3.43%	7.33%	13.90%	0.49
	HFI 6-Factor 4-Strategy EW Sector Neutral	175	1.33%	5.15%	10.93%	0.42
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	175	2.48%	6.33%	13.80%	0.42
Japan	4-Factor EW	369	2.87%	12.53%	16.90%	0.75
	HFI 6-Factor 4-Strategy EW	250	4.85%	14.52%	17.15%	0.85
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	250	9.21%	18.85%	24.40%	0.78
	HFI 6-Factor 4-Strategy EW Sector Neutral	255	3.76%	13.42%	17.05%	0.79
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	255	7.93%	17.57%	24.26%	0.73

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 Market Beta Adjusted (Leverage) and Sector Neutral 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 Japan High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy Equal-Weight Market Beta Adjusted (Leverage) index with a relative return of 6.19% while the worst performing index was the SciBeta United States Multi-Beta Multi-Strategy 4-Factor Equal-Weight index with a relative return of 0.34%.

In the past quarter, if we consider the cumulative excess returns, the best performing index is the SciBeta Japan High Factor Intensity Diversified Multi-Beta Multi-Strategy 6-Factor 4-Strategy Equal-Weight Market Beta Adjusted (Leverage) index with a relative return of 2.38%, while the worst performing index is the SciBeta United States Multi-Beta Multi Strategy 4-Factor Equal-Weight index with a relative return of -2.26%.

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 21.65% for the broad cap-weighted index, and volatilities of 17.81% and 17.82% respectively for the Scientific Beta High Factor Intensity Diversified Multi-Beta Multi Strategy 6-Factor 4-Strategy Equal-Weight and Scientific Beta Multi-Beta Multi Strategy 4-Factor Equal-Weight allocation 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 0.47 (Developed Europe) to 0.79 (Developed) for the Scientific Beta High Factor Intensity Diversified Multi-Beta Multi Strategy 6-Factor 4-Strategy Equal-Weight allocation indices, compared to 0.23 (Developed Europe) to 0.53 (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 30/09/2018

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	1768	-1.52%	-1.64%	-1.71%	1.25%	-0.84	0.49	9.96%	10.28%	8.42%	15.04%	0.98	0.66
	HFI 6-Factor 4-Strategy EW	1192	-0.95%	-1.38%	-1.07%	2.58%	-0.47	0.78	10.60%	11.62%	8.37%	14.24%	1.07	0.79
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	1192	-0.49%	-1.00%	0.09%	4.45%	0.04	1.70	11.76%	13.48%	9.37%	16.89%	1.08	0.78
	HFI 6-Factor 4-Strategy EW Sector Neutral	1213	-0.44%	0.43%	1.17%	2.38%	0.62	0.88	12.84%	11.41%	8.71%	14.70%	1.28	0.75
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	1213	0.01%	0.90%	2.24%	3.66%	1.21	1.63	13.91%	12.70%	9.47%	17.07%	1.29	0.72
SciBeta Global Developed CW		1886							11.67%	9.04%	9.35%	16.50%	1.07	0.53
Developed ex US	4-Factor EW	1296	-0.50%	-0.27%	0.47%	2.29%	0.30	0.67	3.67%	8.21%	9.09%	15.92%	0.22	0.50
	HFI 6-Factor 4-Strategy EW	874	-0.37%	0.66%	1.41%	3.77%	0.85	0.95	4.61%	9.69%	9.13%	15.46%	0.32	0.61
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	874	-0.35%	0.58%	1.69%	5.26%	0.97	1.73	4.89%	11.18%	9.77%	18.30%	0.33	0.59
	HFI 6-Factor 4-Strategy EW Sector Neutral	893	-0.16%	0.74%	1.42%	3.15%	0.93	0.86	4.62%	9.08%	9.20%	15.61%	0.32	0.56
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	893	-0.12%	0.65%	1.64%	4.41%	1.02	1.58	4.84%	10.33%	9.78%	18.23%	0.32	0.55
SciBeta Developed ex US CW		1386							3.20%	5.92%	9.38%	18.11%	0.16	0.31
United States	4-Factor EW	472	-2.26%	-2.71%	-3.44%	0.34%	-1.08	0.11	14.49%	12.13%	10.76%	18.32%	1.19	0.64
	HFI 6-Factor 4-Strategy EW	318	-1.33%	-2.93%	-3.02%	1.51%	-0.83	0.38	14.91%	13.30%	10.65%	17.16%	1.24	0.76
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	318	-0.42%	-2.01%	-1.00%	3.47%	-0.29	0.92	16.94%	15.25%	11.94%	20.15%	1.28	0.74
	HFI 6-Factor 4-Strategy EW Sector Neutral	319	-0.66%	0.14%	0.88%	1.63%	0.29	0.53	18.81%	13.42%	11.19%	17.99%	1.53	0.73
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	319	0.15%	1.10%	2.72%	2.68%	0.93	0.77	20.65%	14.46%	12.11%	20.72%	1.57	0.68
SciBeta United States CW		500							17.93%	11.78%	12.34%	19.29%	1.32	0.59
Developed Europe	4-Factor EW	466	-0.36%	1.16%	2.55%	2.48%	1.14	0.60	2.65%	8.16%	11.17%	20.83%	0.09	0.38
	HFI 6-Factor 4-Strategy EW	308	0.03%	3.00%	4.48%	4.17%	2.05	0.93	4.58%	9.85%	11.20%	20.35%	0.26	0.47
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	308	0.01%	2.97%	4.63%	5.27%	2.08	1.43	4.73%	10.95%	11.79%	22.49%	0.26	0.47
	HFI 6-Factor 4-Strategy EW Sector Neutral	313	0.36%	2.97%	4.44%	3.68%	2.18	0.83	4.54%	9.35%	11.33%	20.18%	0.25	0.45
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	313	0.38%	2.93%	4.53%	4.70%	2.16	1.38	4.63%	10.38%	11.86%	22.57%	0.25	0.45
SciBeta Developed Europe CW		491							0.11%	5.68%	11.49%	23.10%	-0.14	0.23
Developed Asia-Pacific ex Japan	4-Factor EW	325	0.88%	0.27%	0.50%	1.43%	0.14	0.23	4.99%	9.23%	9.38%	17.82%	0.35	0.50
	HFI 6-Factor 4-Strategy EW	211	0.66%	-2.65%	-3.98%	1.94%	-1.06	0.31	0.50%	9.74%	9.33%	17.81%	-0.13	0.53
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	211	0.64%	-3.61%	-3.64%	3.56%	-0.90	0.56	0.85%	11.36%	11.27%	23.59%	-0.07	0.47
	HFI 6-Factor 4-Strategy EW Sector Neutral	215	0.10%	-3.00%	-4.37%	1.19%	-1.17	0.21	0.11%	8.99%	9.43%	18.58%	-0.17	0.47
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	215	0.02%	-3.82%	-4.09%	2.64%	-1.04	0.42	0.40%	10.44%	11.06%	23.82%	-0.12	0.42
SciBeta Developed Asia-Pacific ex Japan CW		344							4.49%	7.80%	10.52%	21.65%	0.27	0.35
Japan	4-Factor EW	415	-1.27%	-2.90%	-3.17%	1.94%	-1.40	0.30	8.67%	9.01%	13.40%	19.06%	0.66	0.47
	HFI 6-Factor 4-Strategy EW	279	-0.94%	-1.88%	-1.71%	3.64%	-0.62	0.51	10.14%	10.71%	13.38%	19.07%	0.77	0.56
	HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	279	2.38%	-0.90%	0.33%	6.19%	0.04	0.49	12.17%	13.26%	17.81%	28.98%	0.69	0.46
	HFI 6-Factor 4-Strategy EW Sector Neutral	288	-1.32%	-2.37%	-2.55%	3.40%	-1.09	0.55	9.30%	10.47%	13.12%	19.37%	0.72	0.54
	HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	288	2.00%	-1.45%	-0.56%	6.02%	-0.08	0.49	11.28%	13.09%	17.56%	29.11%	0.65	0.45
SciBeta Japan CW		451							11.84%	7.07%	13.44%	22.39%	0.89	0.31

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 (Leverage) 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 31/12/1976 (as of 31/12/2017): 41 years			
United States	Relative Return compared to Cap-Weighted	Volatility	Sharpe Ratio
4-Factor 4-Strategy EW	3.39%	13.95%	0.67
HFI 6-Factor 4-Strategy EW	3.33%	14.03%	0.66
HFI 6-Factor 4-Strategy EW Market Beta Adjusted (Leverage)	3.22%	16.56%	0.55
HFI 6-Factor 4-Strategy EW Sector Neutral	3.02%	14.82%	0.60
HFI 6-Factor 4-Strategy EW Sector Neutral Market Beta Adjusted (Leverage)	2.59%	17.25%	0.49

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 ERI Scientific Beta

ERI 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, ERI 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 ERI 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, ERI 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 ERI 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, ERI 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. ERI Scientific Beta has a dedicated team of 45 people who cover not only client support from Nice, Singapore and Boston, but also the development, production and promotion of its index offering. ERI Scientific Beta signed the United Nations-supported Principles for Responsible Investment (PRI) on September 27, 2016.

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