

The merits of multi-factor investing

UBS ETF **On Track Research**



Factor investing has become a mainstream investment approach, with assets in factor ETFs exceeding USD 650bn globally.

Indexed multi-factor portfolios have successfully delivered excess returns vis-à-vis market-cap-weighted portfolios over the long term (historical back-tests), as well as the more recent livetrack period.

Multi-factor exposures tend to deliver return enhancement, whilst limiting the drawdowns and inherent cyclicalities associated with single factors.

Investors are increasingly adopting multi-factor ETFs as part of their core equities allocation. For this purpose, it is advisable to choose a multi-factor exposure that is well diversified and whose active share is not excessive.

Multi-factor investing

Multi-factor solutions provide investors with exposure to well-known equity factors such as Value, Size, Momentum, Quality etc. and therefore have the potential to outperform market-cap-weighted portfolios. They are ideal for investors who want to harvest factor premia in a simple solution, with lower active risk compared to individual factors. Multi-factor solutions also have considerably lower drawdowns and cyclicalities compared to single factors and hence they are more suitable as a replacement of core equity allocations. As a result, demand for multi-factor ETFs continues to grow rapidly. In Q1 2018, they attracted USD 6.5bn globally, nearly 40% of all inflows into factor ETFs.

Our preferred multi-factor solution is based on the MSCI Select Factor Mix Index. It makes equal-weight allocations to six of the most established equity factors: Value, Size, Momentum, Quality, Yield, and Low Volatility (Figure 1). The index is rebalanced quarterly, which strikes a solid balance between turnover and maintaining factor parity, i.e. equal exposure to all six factors. The index follows a top-down allocation to individual factors, often called the “Lego” approach. It combines six individual portfolios,

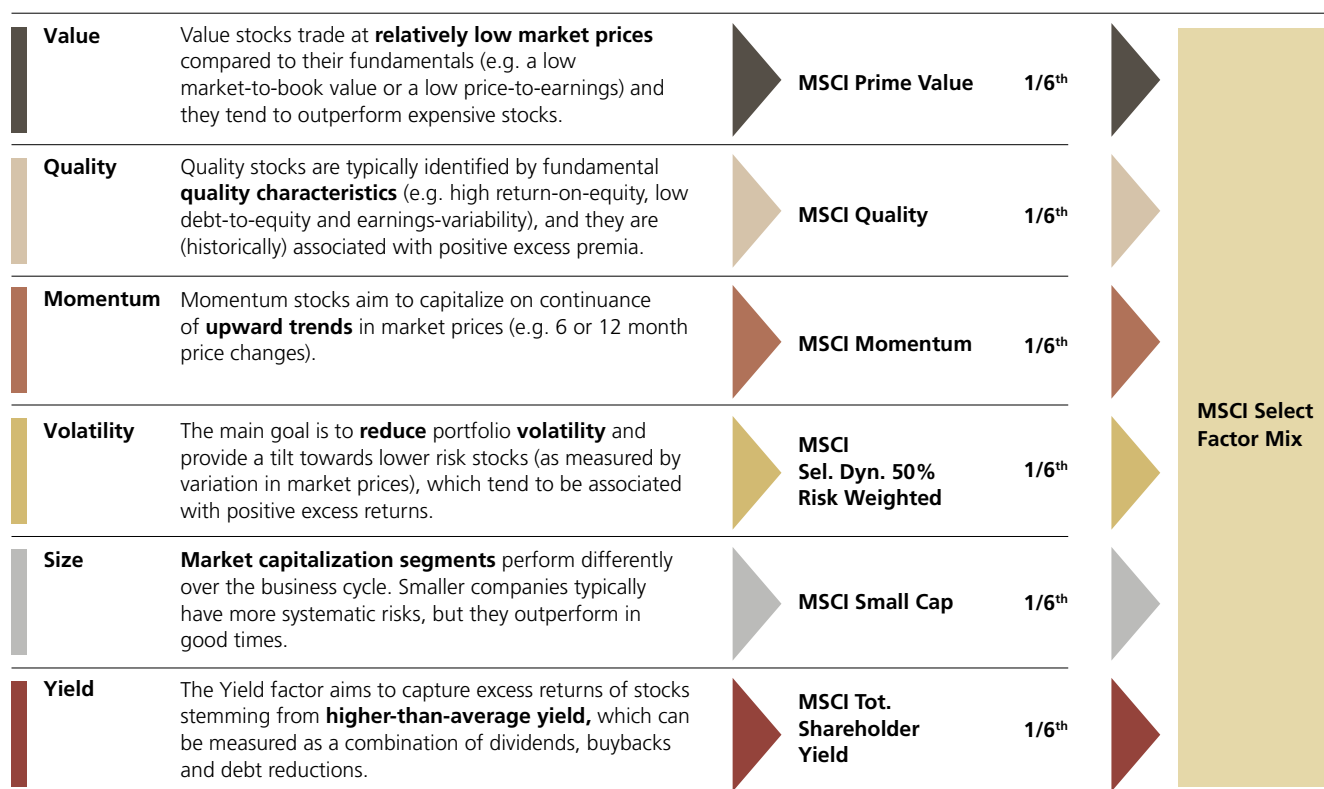
each of which has a strong exposure to one specific factor. This allows for a straightforward attribution of returns and risks, and for exposure to five or six different factors. An alternative method, called the “soup” approach, aims to select stocks that qualify for several factor criteria at the same time, e.g. Value stocks that also exhibit good Momentum and Quality characteristics. We think this approach works well, but only when combining two or at most three factors. The Lego approach is more suitable for mixing together a higher number of factors.

Track record of outperformance

The popularity of factors stems primarily from their track record of solid returns. The MSCI Select Factor Mix indices have delivered robust outperformance for US, Eurozone, and global developed equities, varying from 140 bps to 220 bps (Figure 2) over the long term since May 2005 (back-test).

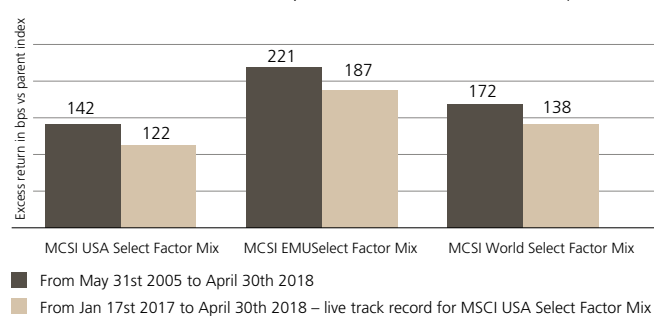
The live-track performance of factors is also positive. The MSCI Select Factor Mix methodology was launched on 16 January 2017 for MSCI USA exposure. Since then, it has delivered a 122 bps outperformance against the parent index, which is a solid result given that US markets are deemed to be very efficient. For other regions, the Select Factor Mix indices were only launched recently, but they are based on exactly the same methodology as the US index, so their back-test performance since 16 January 2017 can be considered to be as meaningful as the live-track. Moreover, the six individual factor indices which make up this multi-factor exposure have been live since April 2015. The MSCI EMU Multi-Factor Index delivered an excess return of 187 bps against its parent index since 16 January 2017, while the MSCI World Multi-Factor provided 138 bps of excess return. These results confirm that factor strategies delivered outperformance in the very recent years, such that there can be no concerns of data mining, during a time when factor investing was already in the mainstream.

Figure 1: Factor indices underlying MSCI USA Select Factor Mix



Source: MSCI, UBS Asset Management, as of 30 April, 2018.

Figure 2: Excess returns of multi-factor MSCI indices (TR Net in USD for MSCI USA and MSCI World, TR Net in EUR for MSCI EMU)



Source: MSCI, UBS Asset Management, data as of 30 April 2018.

Summary box

The multi-factor approach has potential to:

1. outperform the market and improve a portfolio's Sharpe ratio
2. limit drawdowns relative to single factors and the market
3. offer transparent return attribution and broadly diversified multi-factor indices that do not carry excessive active shares may be suitable for replacing core equity allocation.

Return attribution

The performance of the MSCI USA Select Factor Mix Index can be clearly attributed to its six constituent single factors (Figure 3). We can see that the MSCI USA Multi-Factor outperformed the market in 12 out of 17 years. The underperformances it showed were relatively marginal at 1 bps, 19 bps, 61 bps, 63 bps and, the largest annual underperformance, 143 bps. In contrast, the outperformances were often much higher, even exceeding 1200 bps in 2001 or 400 bps in 2002, 2004, and 2011. On average, the multi-factor index has provided an excess return of 228 bps per annum since 2001. The figures also show that the chosen single factors have diversifying properties with respect to each other, and incorporating all six factors together

adds value for investors. There has not been a single year when all factors outperformed or underperformed. The mix of factors provided good downside protection during periods of stock market crashes as in 2001 – +12.17% excess return over MSCI USA parent index, 2002 (+5.64%), and 2008 (+3.76%). Hence, in the past, the multi-factor solution not only managed to increase returns, but it also reduced risks. The same results have been observed for the multi-factor indices based on MSCI EMU and MSCI World stock universes.

Figure 3: Excess annual returns of MSCI Select Factor Mix and its constituent factor indices, along with MSCI USA annual return (absolute) for comparison. (TR Net in USD, December '01 – December '17)

Annual return	Excess annual returns over MSCI USA							
	MSCI USA	Multi-Factor	Quality	Low Volatility	Dividend/Yield	Value	Momentum	Small Cap
2001	-12.38%	12.17%	2.62%	12.56%	8.33%	19.37%	-5.23%	28.98%
2002	-23.09%	5.64%	3.26%	13.69%	10.10%	0.85%	10.46%	-0.23%
2003	28.41%	-0.63%	-8.84%	-7.40%	-5.56%	-0.70%	-2.77%	25.19%
2004	10.14%	4.68%	-0.50%	6.62%	-1.41%	7.17%	6.26%	8.79%
2005	5.15%	2.61%	-3.13%	-0.39%	-4.29%	5.62%	13.65%	0.28%
2006	14.67%	0.63%	-3.24%	3.81%	4.87%	3.73%	-4.28%	-0.35%
2007	5.44%	0.30%	4.61%	-8.69%	-2.22%	5.44%	11.92%	-8.73%
2008	-37.57%	3.76%	6.94%	9.48%	5.75%	4.94%	-3.56%	1.39%
2009	26.25%	-0.61%	4.78%	-8.29%	-3.35%	-0.79%	-9.13%	12.81%
2010	14.77%	1.53%	-2.86%	-0.39%	-4.40%	0.55%	2.99%	12.71%
2011	1.36%	5.27%	6.36%	9.83%	10.08%	4.43%	4.12%	-4.79%
2012	15.33%	-1.43%	-2.07%	-4.32%	-0.87%	-3.29%	-1.04%	2.19%
2013	31.79%	2.57%	0.97%	-7.12%	0.85%	6.61%	2.24%	5.85%
2014	12.69%	-0.19%	-1.44%	6.69%	-2.39%	0.45%	1.56%	-5.62%
2015	0.69%	-0.01%	5.78%	3.15%	-1.55%	-8.08%	8.02%	-4.80%
2016	10.89%	1.56%	-3.54%	1.13%	4.11%	5.63%	-6.25%	8.26%
2017	21.19%	1.18%	4.12%	-5.49%	-1.43%	-1.11%	16.05%	-4.44%

~228 bps of excess return

The returns are based on the following indices: Quality = MSCI USA Quality, Low Volatility = MSCI USA Select Dynamic 50% Risk Weighted, Dividend/Yield = MSCI USA Total Shareholder Yield, Value = MSCI USA Prime Value, Momentum = MSCI USA Momentum, Small Cap = MSCI USA Small Cap, Multi-Factor = MSCI USA Total Shareholder Yield.

Source: MSCI, UBS Asset Management, data as of end 2017.

Suitable for core replacement

The MSCI Select Factor Mix methodology has several advantages (Figure 4). It provides exposure to the six most established equity factors and uses the Lego approach. This allows for transparent return attribution. The index offers broad exposure to the US stock market, holding on average 1705 stocks over the back-test period. At 39.2%, its active share is not excessive relative to MSCI USA, with 16.6% coming from the small cap exposure alone. This makes the index a suitable choice to replace core equity allocation.

The MSCI Diversified Multiple Factor Index is a competing multi-factor framework that applies the soup approach and optimization-based stock selection with numerous constraints (Figure 4). It includes only 140 stocks and has a very high active share of 83.9%, making it a less suitable choice for core equity allocation.

Figure 4: Comparison of MSCI Select Factor Mix and MSCI Diversified Multiple Factor based on MSCI USA universe

	MSCI Select Factor Mix	MSCI Diversified Multiple-Factor
Idea	Allocates to the six most established equity factors (Value, Size, Momentum, Quality, Yield and Low Volatility). Lego approach rebalanced quarterly.	Seeks exposure to four factors (Value, Momentum, Quality and Size). Soup approach obtained with Barra Equity Model Optimizer. Rebalanced semi-annually.
Weighting / criteria	Weighting = allocate 1/6 th of the portfolio to each single factor.	Weighting = given by Barra optimization to maximize exposure to selected factors subject to numerous constraints (sector active weights, non-targeted factor exposure, turnover, maximum weight multiplier etc.).
Comparison	May be suitable for replacement of the core equity allocation – broad market coverage.	Captures far fewer stocks. Less suitable for core allocation.

Statistics for MSCI USA

Sharpe ratio	0.48	0.43
Tracking error	4.0%	4.7%
Number of stocks	1705	140
Turnover	33.8%	40.1%
Price to book	1.4	2.1
Market cap coverage	81.3%	24.3%
Active share	39.2%	83.9%
Max drawdown	51.8% (MSCI USA 55.4%)	56.7%
Top 10 security weights	17.5%	24.3%

Based on May '99 – Apr '18, reported data is computed as an average over the period.

Source: MSCI (Index Metrics Report), UBS Asset Management.

Figure 5: Top 10 Constituents of MSCI USA Select Factor Mix and MSCI USA Diversified Multiple Factor

MSCI USA Select Factor Mix Index

Top 10 Constituents	Index Wt. (%)	MSCI USA Wt. (%)	Sector
APPLE	3.18	3.58	info tech
NMICROSOFT CORP	1.83	2.89	info tech
JPMORGAN CHASE & CO	1.77	1.59	financials
VISA A	1.38	0.97	info tech
BANK OF AMERICA CORP	1.32	1.25	financials
BOEING CO	1.31	0.80	industrials
MASTERCARD A	1.3	0.71	info tech
INTEL CORP	1.22	1.02	info tech
IBM CORP	1.18	0.54	info tech
UNITEDHEALTH GROUP	1.14	0.97	health care

MSCI USA Diversified Multiple Factor Index

Top 10 Constituents	Index Wt. (%)	MSCI USA Wt. (%)	Sector
ACCENTURE A	2.44	0.39	info tech
ANTHEM	2.39	0.26	health care
NORTHROP GRUMMAN CORP	2.28	0.22	industrials
VALERO ENERGY CORP	2.09	0.20	energy
PHILLIPS 66	2.07	0.20	energy
APPLIED MATERIALS	1.93	0.22	info tech
INTUIT	1.92	0.19	info tech
CIGNA CORP	1.85	0.18	health care
GENERAL MOTORS	1.18	0.20	cons discr
NORFOLK SOUTHERN CORP	1.77	0.17	industrials

Source: MSCI, UBS Asset Management, data as of 30 April 2018.

We can also see that the MSCI USA Select Factor Mix has a better Sharpe ratio, lower maximum drawdown, and less concentration in the top 10 constituents compared to the alternative framework. Additionally, the top 10 constituents of the Select Factor Mix are all stocks with a large market cap, the smallest being IBM Corporation, with a weight of 0.54% in the MSCI USA parent index, and the largest allocation being Apple, which is the same for the MSCI USA (Figure 5). In contrast, the top 10 constituents of MSCI USA Diversified Multiple Factor Index are all companies that are smaller in size and have MSCI USA market cap weights of

between 0.17% to 0.39%, showing that this index is less suitable as a replacement of core equity allocations.

The Select Factor Mix indices based on MSCI EMU and MSCI World have very similar properties as described for the MSCI USA case. In Figure 6 in the appendix, we show comparison tables to the alternative multi-factor methodology and the results are qualitatively the same: the MSCI Select Factor Mix indices are broadly diversified and more suitable for core equity allocation.

Appendix

Figure 6: Comparison of MSCI Select Factor Mix and MSCI Diversified Multiple Factor indices for MSCI EMU and MSCI World universe

	MSCI EMU Select Factor Mix	MSCI EMU Diversified Multiple-Factor
Sharpe ratio	0.32	0.33
Tracking error	4.9%	5.0%
Number of stocks	584	97
Turnover	36.7%	40.2%
Price to book	1.8	1.6
Market cap coverage	77.1%	36.3%
Active share	44.7%	78.5%
Max drawdown	60.8% (MSCI EMU 64.7%)	63.8%
Top 10 security weights	20.8%	27.5%
	MSCI World Select Factor Mix	MSCI World Diversified Multiple-Factor
Sharpe ratio	0.51	0.54
Tracking error	2.1%	2.8%
Number of stocks	5048	412
Turnover	32.7%	40.0%
Price to book	2.2	1.8
Market cap coverage	78.9%	11.6%
Active share	38.8%	89.0%
Max drawdown	54.4% (MSCI World 57.8%)	56.8%
Top 10 security weights	11.8%	15.0%

Based on May '99 – Apr '18, reported data is computed as an average over the given period.

Source: MSCI (Index Metrics Report), UBS Asset Management.

Relevant ETF Exposure

The USA MultiFactor ETF with all CCY hedged share classes.

Fund name	Fee	AuM (GBPm)	NAV ccy	Repl- cation	Distri- bution	ISIN	Bloomberg	Sedol
UBS ETF (IE) Factor MSCI USA Low Volatility UCITS ETF	0.25%		USD	Physical	Yes	IE00BX7RQY03	UC95 LN	BYTLLP3
UBS ETF (IE) Factor MSCI USA Low Volatility hedged CHF UCITS ETF	0.35%		CHF	Physical	No	IE00BX7RR250	ULOVS SW	BX7RR25
UBS ETF (IE) Factor MSCI USA Low Volatility hedged EUR UCITS ETF	0.35%		EUR	Physical	No	IE00BWT3KJ20	ULOVE SW	BWT3KJ2
UBS ETF (IE) Factor MSCI USA Low Volatility hedged GBP UCITS ETF	0.35%		GBP	Physical	Yes	IE00BXDZNF85	ULOV LN	BYX4493
UBS ETF (IE) Factor MSCI USA Prime Value UCITS ETF	0.25%		USD	Physical	Yes	IE00BX7RR706	UC96 LN	BYTLLR5
UBS ETF (IE) Factor MSCI USA Prime Value hedged CHF UCITS ETF	0.35%		CHF	Physical	No	IE00BX7RRC57	UPVLS SW	BX7RRC5
UBS ETF (IE) Factor MSCI USA Prime Value hedged EUR UCITS ETF	0.35%		EUR	Physical	No	IE00BWT3KL42	UPVLE SW	BWT3KL4
UBS ETF (IE) Factor MSCI USA Prime Value hedged GBP UCITS ETF	0.35%		GBP	Physical	Yes	IE00BXDZNH00	UPVL LN	BYX44B5
UBS ETF (IE) Factor MSCI USA Quality UCITS ETF	0.25%		USD	Physical	Yes	IE00BX7RRJ27	UC99 LN	BYTLLT7
UBS ETF (IE) Factor MSCI USA Quality hedged CHF UCITS ETF	0.35%		CHF	Physical	No	IE00BX7RRN62	UQLTS SW	BX7RRN6
UBS ETF (IE) Factor MSCI USA Quality hedged EUR UCITS ETF	0.35%		EUR	Physical	No	IE00BWT3KN65	UQLTE SW	BWT3KN6
UBS ETF (IE) Factor MSCI USA Quality hedged GBP UCITS ETF	0.35%		GBP	Physical	Yes	IE00BXDZNK39	UQLT LN	BYX2M9
UBS ETF (IE) Factor MSCI USA Total Shareholder Yield UCITS ETF	0.25%		USD	Physical	Yes	IE00BX7RRT25	UD01 LN	BYTLLW0
UBS ETF (IE) Factor MSCI USA Total Shareholder Yield h. CHF UCITS ETF	0.35%		CHF	Physical	No	IE00BX7RRY77	UTSYS SW	BX7RRY7
UBS ETF (IE) Factor MSCI USA Total Shareholder Yield h. EUR UCITS ETF	0.35%		EUR	Physical	No	IE00BWT3KQ96	UTSYE SW	BWT3KQ9
UBS ETF (IE) Factor MSCI USA Total Shareholder Yield h. GBP UCITS ETF	0.35%		GBP	Physical	Yes	IE00BXDZNM52	UTSY LN	BYX44C6
UBS ETF (IE) MSCI USA Select Factor Mix UCITS ETF	0.30%		USD	Physical	Yes	IE00BDGV0308	USFM LN	BDGV030
UBS ETF (IE) MSCI USA Select Factor Mix hedged CHF UCITS ETF	0.40%		CHF	Physical	No	IE00BDGV0C91	USMUF5 SW	BDGV0C9
UBS ETF (IE) MSCI USA Select Factor Mix hedged EUR UCITS ETF	0.40%		EUR	Physical	No	IE00BDGV0746	USMUFE SW	BDGV074
UBS ETF (IE) MSCI USA Select Factor Mix hedged GBP UCITS ETF	0.40%		GBP	Physical	Yes	IE00BDGV0852	USMUFH SW	BDGV085

Source: UBS Asset Management, data as of 31 May 2018.

Find all product details here:

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