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Simply SMARTER Beta™

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Smart beta, a form of factor investing, has rapidly become a popular alternative to both traditional active and passive management and is now firmly recognised by investors as a third approach to investing. Within equities, it is based on indices whose component stocks are weighted by something other than their market capitalisation.

Its aim is to systematically and efficiently harvest a single factor premium or multiple factor premia – those sources of excess returns that arise and persist in equity markets due to behavioural and structural anomalies – in order to enhance returns, lower risk, or both. Our proprietary and exclusive SMARTER Beta™ multifactor equity indices and funds, incorporating design features gleaned from over a decade of factor investing experience, are an example of the latter approach that aims to deliver superior risk-adjusted excess returns.

Historical Perspective

In the years since their formulation by Fama, Sharpe, Lintner, and Traynor in the 1960's, the Efficient Market Hypothesis (EMH) and the Capital Asset Pricing Model (CAPM) had a significant influence on the practice of investment management. The EMH states that the information relevant to the price of a stock is immediately and optimally compounded into a stock's price. In other words, stocks trade at fair value. The CAPM says that investors adjust their securities holdings to maximise the expected return for the level of risk they are willing to bear. This process leads to the market settling into equilibrium.

If both the EMH and CAPM are true then the market portfolio is the optimal portfolio. It offers the highest expected excess return to risk ratio and all investors should hold it. Stock selection and other forms of active management cannot consistently add value (i.e. generate 'alpha'). Risk-averse investors should hold the market portfolio together with a cash position while aggressive investors should hold it in leveraged form (through futures contracts, for example). Conventional passive management, or indexing, started simply as the embodiment of this idea: one invests in a market capitalisation weighted index as a proxy for the market while keeping costs to a minimum.

Starting in the 1980s, the EMH and the CAPM came under criticism from academic economists. Practitioners also questioned how the booms and busts they experienced were consistent with these ideas of market efficiency and equilibrium. Today, few accept that the market portfolio is an optimal portfolio. The justification for market capitalisation weighted indexing has shifted; rather than an optimal investment strategy, it is seen simply as a robust investment strategy whose returns will always equal or exceed those of the average active investor over the medium to long term.

This property arises because the sum of all the investment portfolios (both institutional and retail) must be the market portfolio. Since indexing does not involve the research and trading costs of active management, which searches for inefficiencies in securities markets and aims to outperform market capitalisation weighted indices, the average active investment strategy after costs must underperform the capitalisation weighted indexing strategy. So, unless one can identify in advance those managers who will succeed, it is inferior to market capitalisation weighted indexing.

An alternative to the EMH is the Noisy Market Hypothesis (NMH), popularised by Jeremy Siegel in 2006. It argues that stock prices fluctuate more than is justified by the variation in their fundamentals. As such, stock prices tend to mean revert around their intrinsic value. We find this to be a useful and plausible alternative description of the financial markets. It leads to important insight: if the NMH is true then market capitalisation weighted indexing is not an optimal strategy. Rather, a strategy where one periodically rebalances to an alternative set of target weights will produce better risk-adjusted excess returns.

The rebalancing captures the mean reversion of stock prices in a simple, robust fashion. For example, when a value stock performs well relative to its peers, its weight in the index increases above the target weight. When the index is next rebalanced some of the stock is sold. Conversely, when a value stock performs poorly, its weight relative to the target weight declines and, at the next rebalance, more of the stock is bought. Market capitalisation weighted indices do not rebalance and therefore cannot exploit this mean reversion – they just ride it out. Smart beta is based on this insight.

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Aberdeen Standard Investments

Smart Beta

There is a lot of confusion in the industry around the definition of 'smart beta' and even the term itself, which is viewed as an industry buzzword, is not universally accepted. For instance, it is also referred to as scientific beta, advanced beta, alternative beta, alternative indexing, factor investing, amongst others.

Irrespective of nomenclature, all of these names refer to indices that are constructed and rebalanced to an alternative set of weights for the purpose of outperforming relative to equivalent market capitalisation weighted indices with similar or reduced risk characteristics. In fact, all smart beta indices share **three features** in common which collectively contribute to the risk-adjusted outperformance of the equivalent market capitalisation weighted approach. Firstly, they are not reliant on market capitalisation weights; secondly, they systematically rebalance back to a set of target weights to maintain intended exposures; and, thirdly, they are sufficiently diversified in order to effectively exploit the negative cross-sectional correlations and noise inherent in financial markets. Smart beta indices typically fall into three categories with a focus either on return, risk, or both return and risk:

1) **Return focused**
   Equal weighting: where all companies in an index are weighted equally, irrespective of how large or small. Such indices have a small company bias relative to the equivalent market capitalisation weighted index;

   Fundamental weighting: where companies in an index are weighted according to their economic size using, for example, an average of stock weights proportional to sales, dividends, cashflow, and book value (the reason for averaging is that, taken individually, these simple measures all have flaws). Fundamental indices break the link between stock prices and weights and have a pronounced, albeit dynamic, value bias relative to the equivalent market capitalisation weighted index;

2) **Risk focused**
   Risk weighting: where companies in an index are weighted according to their volatility with the aim of improving portfolio efficiency by making assumptions about future volatilities and/or correlations, generally based on historical observations. Risk weighted indices include simple, non-optimised approaches such as volatility weighting and equal risk contribution as well as more sophisticated volatility minimisation approaches using an optimisation (e.g. risk efficient, maximum diversification, minimum variance, and targeted volatility); and

3) **Return and risk focused**
   Factor (or risk) premia weighting: where companies in an index are weighted according to a factor premium (single factor) exposure or factor premia (multifactor) exposures. These single or multiple factors are sources of excess returns that arise and persist in equity markets due to behavioural and structural anomalies. Within equities, single factors include Value, Quality, Momentum, Small Size, and Low Volatility. Multifactor indices employ a selected combination of various single factors, either within an asset classes or across multiple asset classes. Factor premia indices can be implemented via long-only strategies (factor premia) and long-short strategies (alternative factor premia).

At Aberdeen Standard Investments, we consider return and risk together and define smart beta as non-market capitalisation, systematic (rules-based) investment strategies designed to deliver targeted exposure to factor premia – in particular those enhanced RIPE Factors™ of Value, Quality, Momentum, Small Size, and Low Volatility that arise and persist in equity markets due to behavioural and structural anomalies – with the aim of delivering superior risk-adjusted excess returns relative to equivalent market capitalisation weighted indices.

The smart beta index employed for portfolio tracking purposes may be one of **three index forms**: a third-party index licensed from an index provider in exchange for a fee (with the intellectual property being owned by the index provider); a custom index designed by an investment management firm (with the intellectual property being owned by the investment management firm) but the index calculation and administration being outsourced to a reputable index calculation agent/administrator; or a self index, effectively an algorithm, implemented on the desk by a fund manager.

Overall, smart beta can be viewed as a **third approach** to investing (passive management through market capitalisation weighted indexing and active management being the other two) that combines the benefits of both active and passive management. Specifically, smart beta aims to achieve above market returns or below market risk, or both, by gaining targeted exposure to factor premia that are implemented via tracking non-market capitalisation weighted indices, thereby retaining the numerous benefits of conventional indexing such as simplicity, objectivity, transparency, and relatively low costs.

Targeting RIPE Factors™

Factors may be thought of as any metric that can be sorted and ranked for the purposes of investment selection. A quixotic example of this could be the sorting and ranking of companies based on the shoe size of its Chief Executive Officer (CEO). However, while such a factor can be sorted and ranked, selecting companies based on shoe size (such as choosing the top decile of shoe sizes in a universe of global company CEOs) lacks any economic theory or intuition as to why it should be a driver of superior stock market performance. Only certain factors, those that are Robust, Intuitive, Persistent, and Empirical (RIPE), qualify as factor premia and within equities these RIPE Factors™ include Value, Quality, Momentum, Small Size, and Low Volatility.

There are sound investment rationales as to why RIPE Factors™ generate superior risk-adjusted excess returns over the medium to long term vis-à-vis market capitalisation weighted index approaches. These explanations are rooted in a combination of behavioural (non risk-based) and structural (risk-based) arguments. From a behavioural perspective, a mispricing arises and persists because investors have mistaken beliefs, incomplete information, or non-rational preferences. Structurally, the mispricing arises and persists because there are limits or costs to arbitrage that prevent it from being bid away.

The **Value factor**[2], as first identified by Fama & French (1992), may be explained on both behavioural and structural grounds. Stocks priced low relative to fundamental metrics of value (such as high book yield) outperform due to the behavioural tendency of investors to persistently over-react to bad news which, in turn, suggests that by being long Value one is, on average, buying stocks below their intrinsic value. A structural explanation is that the Value risk premium is simply compensation for the risk of buying financially distressed stocks.

In the current low return environment, one Value metric of particular interest to investors is dividend yield and associated **High Income** equity strategies. Equity income has become increasingly attractive due to the relentless decline in bond yields since the 1980s and many stocks now exhibit meaningfully higher dividend yields than those available from US Treasury Bonds. Furthermore, over the longer term, diversified portfolios of dividend paying stocks have generated higher returns with lower risk than many market capitalisation weighted indices. Notwithstanding such empirical results, the highest cohorts of dividend yielding stocks tend to underperform due to the unsustainability of their dividends which is why we believe it is necessary to combine dividend yield with Quality metrics in order to avoid these so-called 'value traps'.

As an aside, it is interesting to note there is little or no evidence to suggest that Growth, which seems to underperform on average (due to investors being repeatedly too optimistic about earnings trends for fashionable growth companies and hence end up overpaying for such stocks), qualifies as a factor premium. This is because Growth is in fact a style[3] rather than a factor premium.

A compelling behavioural rationale for the outperformance of the **Small Size factor**, also first identified by Fama & French (1992), is the limited investor attention and sell-side research coverage towards smaller companies which in turn creates a disconnect between price and fundamentals. Structurally, small companies outperform because smaller cap stocks have a risk premium attached to compensate for their higher illiquidity and business risk. This is because smaller companies are less diversified with limited product lines and more restricted access to the financial markets.

The outperformance of the **Momentum factor**, which in essence is persistency of pricing trends (see Carhart (1997)), is behaviourally predicated on the under-reaction by investors to new information which then means subsequent investors still have the opportunity to generate excess profits. Other behavioural rationales posited for Momentum outperformance include the persistent over-reaction of investors to recent stock price performance; the instinctive 'herding' behaviour of groups of investors; and 'confirmation bias' which leads investors to become overconfident, ignoring evidence that they might lose money. From a structural perspective, stocks with improving fundamentals often exhibit strong momentum but the downside of this is that such stocks are then sensitive to any shocks in these fundamentals, such as a slowdown in expected earnings growth. In this sense, Momentum outperformance is compensation for the factor's inherently higher risk.

In contrast to other factor premia, the investment rationale for the Quality factor, where stocks of higher quality companies (as defined by metrics based on profitability such as return on assets or earnings stability) tend to outperform, is more hotly debated in academia. Perhaps the outperformance of Quality is due to investors' behavioural tendency to repeatedly under-estimate the persistent profitability of higher quality companies. An alternative behavioural explanation might be the so-called 'bonus effect' where lower quality, riskier companies present fund managers with the opportunity to beat their benchmarks. This then leads to a systematic under-pricing of higher quality stocks due to a relative lack of demand.

The Low Volatility factor, where less risky stocks (according to their beta or realised volatility, for example) tend to outperform riskier ones, can be used to significantly lower portfolio volatility than the equivalent market capitalisation weighted index. This can be achieved in a number of ways, such as identifying a basket of stocks that individually exhibit low volatility or reweighting all stocks in the universe in inverse proportion to their historical volatility. Both of these heuristic methods tend to produce portfolios with disproportionally large weights in defensive sectors like utilities and consumer staples. A related strategy is minimum variance where mean-variance optimisation is used to determine the minimum volatility portfolio and this more flexible approach militates against excessive country, industry, and stock concentration through the use of constraints.

A number of behavioural explanations have been postulated for low volatility outperformance. One rationale is due to fund manager compensation where the manager is paid a bonus if performance is sufficiently high. More volatile portfolios increase the expected value of the bonus which leads to the over-pricing of high volatility stocks and under-pricing of low volatility stocks. Another explanation is that fund managers favour newsworthy stocks for which they can make a compelling investment case. However, due to the relatively intense newsflow surrounding these stocks, they are often volatile. Baker & Haugen (2012) believe agency issues such as the two just described create excess demand for highly volatile stocks which boost prices and depress future expected returns. The flipside is that low volatility stocks become relatively cheap, generating a tailwind for future returns.

A structural rationale has been described in a paper by Vayanos & Woolley (2016) who suggest that the anomaly could be related to the so-called 'curse of the benchmark'. Specifically, if the price of a stock doubles and a fund manager has a half-weight relative to the benchmark then the active bet doubles. If, on the other hand, the price halves then the negative active bet halves also. Hence volatile stocks have the greatest potential to cause underperformance so

[2] As opposed to **Value investing** – a methodology to identify and buy securities priced well below their true value – which was conceived in the 1920s by Columbia Business School finance professors Benjamin Graham and David Dodd who subsequently published their infamous book entitled *Security Analysis* in 1934. This book, along with their security analysis teaching at Columbia, heavily influenced the investment management profession and gave rise to a generation of successful value investors including Warren Buffett (Berkshire Hathaway), Mario Gabelli (Gabelli Asset Management), Glenn Greenberg (Brave Warrior Advisors), Charles Royce (Royce & Associates), Walter Schloss (Walter & Edwin Schloss Associates), and John Shapiro (Chieftain Capital), amongst others.

[3] According to FTSE Russell (2015), **styles** split market segments based on market capitalisation weighting into symmetrical, two-sided components that sum to the whole segment (e.g. Value plus Growth equals the whole segment) whereas factor premia are a one-sided subset of a market segment based on factor weighting. Consequently, factor premia focus only on the direction that has historically exhibited persistent excess returns over time (i.e. Value but not Growth) and factor indices therefore have higher turnover than style indices because they require more frequent rebalancing to maintain the targeted (one-sided) factor exposure.

fund managers have an incentive to buy such stocks and neutralise positions relative to their benchmark. This dynamic will push up the prices of volatile stocks and dampen prices of low volatility stocks.

It is important to note that we have deliberately excluded Environmental, Social, and Governance (ESG) as a factor premium. This is not because we believe ESG to be unimportant; indeed, the opposite is true. As a Responsible Investor[4], we have moved beyond simply ascribing to principles by fully integrating ESG into our systematic investment processes and multifactor equity indices as we believe ESG helps promote competitive financial returns and positive environmental and societal impact. However, the availability of ESG data is not sufficiently long enough for it to be Empirical so it does not, for the time being, meet our prerequisite criteria for inclusion as a RIPE Factor.

Multifactor Matters

Although there is a wealth of academic and empirical research demonstrating that Value, Quality, Momentum, Small Size, and Low Volatility each outperform over the medium to long term, it is important to realise that on an individual basis these factor premia can move sideways or underperform for significant periods of time, sometimes a year or more.

Crucially though such factor premia are lowly correlated, or even negatively correlated, with each other because they tend to outperform at different stages of market and economic cycles. For instance, Low Volatility and Quality tend to perform better during an economic slowdown whereas Value and Small Size typically outperform during an economic recovery. Momentum generally performs well when markets trend and underperforms at turning points in the market cycle. This correlation benefit provides the opportunity to meaningfully increase risk-adjusted returns at the portfolio level by blending the single factors in a multifactor approach in such a way that there is persistent positive exposure to all the RIPE Factors™ in order to reap the full benefits of factor diversification.

Moreover, a multifactor approach helps mitigate the effects of drawdowns relative to equivalent market capitalisation weighted indices. This is achieved by implementing a persistent exposure to both the Low Volatility and Quality factor premia. In isolation, both of these factors produce superior risk-adjusted excess returns over the medium to long term but they also provide downside protection when fear forces equity investors into panic selling. This makes intuitive sense since it is the volatile and financially weak stocks that sell off the most when risk aversion rises.

SMARTER Beta™ Multifactor Equity

Aberdeen Standard Investments' proprietary and exclusive SMARTER Beta™ equity indices include eight multifactor index families – Balanced Multifactor, High Income Multifactor, Value Multifactor, Quality Multifactor, Momentum Multifactor, Low Volatility Multifactor, Small Size Multifactor, and ESG Multifactor – across a range of developed and emerging markets globally, regionally, and locally.

Having provided our clients with access to portfolios employing factor investing for over a decade, **seven salient features** of how we construct and implement our proprietary and exclusive SMARTER Beta™ multifactor equity indices, and hence our funds tracking them, are significant:

1) **Diversified factor premia:** based on our long-term experience in using factors across the investment continuum (beta/smart beta/alpha strategies), we advocate a multifactor approach that aims to provide simultaneous positive exposures to all targeted RIPE Factors™, even when applied to a single factor index. For instance, even our Low Volatility index is multifactor in approach (hence the name Low Volatility Multifactor), which means that in addition to Low Volatility we also consider, at the margin, Quality factors such as the strength of the balance sheet and Value factors like valuation. This is a key point as many competing single factor designs have factor exposures that, more often than not, are underexposed to other desirable factors e.g. Value often has a negative exposure to Momentum, or even low beta, due to negative correlations. Given that all RIPE Factors™ are engineered to provide risk-adjusted excess returns over the medium to long term, we believe this to be a design flaw in competing designs and one that we have consciously corrected in our multifactor approach.

2) **Fully integrated ESG and active Voting & Engagement:** as a Responsible Investor, we have fully integrated ESG within our multifactor equity indices since we believe ESG helps promote competitive financial returns and positive environmental and societal impact. Our 'ESG Inside' methodology excludes controversial companies from the initial index universe; specifically, those companies involved in the production of controversial weapons (i.e. cluster bombs and munitions, landmines, depleted uranium weapons and armour, and chemical and biological weapons) and those companies deemed to have severe controversies (i.e. the 'worst of the worst' in a peer group context where there are severe ongoing risks posed) based on ratings by our ESG data partner Sustainalytics[5]. For our ESG Multifactor index family, we also optimise these specific indices towards companies that score highly on ESG criteria which results in a tilt towards sustainable companies. In addition, for all of our funds tracking our multifactor equity indices, we vote on all portfolio company holdings and, through our dedicated Stewardship team, actively engage with company management to encourage them to embrace sustainable business practices and ESG reporting.

3) **Smarter factor design:** our SMARTER Beta™ multifactor equity indices employ enhanced, or 'smarter', versions of the factors used in academia. Specifically, our smarter factors make use of multiple metrics within the factor itself to enhance diversification and utilise forward looking data (where available). For example, Value is usually defined as simply book

[4] We have been a signatory to the United Nations supported **Principles for Responsible Investment** (PRI) since 2007.
[5] **Sustainalytics** is an independent, world leading provider of ESG research, ratings, and analysis.

yield in academic papers whereas we also target EBITDA/EV[6], forward earnings yield, and dividend yield. Our more diversified Value factor is less cyclical than book yield alone and more likely to outperform over the full market cycle with lower risk. Similarly, our more diversified Momentum factor not only captures momentum at the stock level but also at an industry level and we look at earnings momentum using forward estimates. Our more diversified Quality factor incorporates both Prudent Management metrics (such as free cash flow yield and capital deployment) and a variety of Financial Strength metrics (such as improving profitability, liquidity,and turnover and decreasing leverage). This 'aggregate' approach enhances diversification and improves risk-adjusted returns.

4) **Optimised index construction:** all of our multifactor equity indices make use of an optimiser which allows us to target desired outcomes. For example, the optimisation can target a higher dividend yield, higher ESG score, and/or lower volatility vis-à-vis the equivalent market capitalisation weighted index. The optimiser also considers both risk and return in index construction which avoids unintended risk exposures and ensures that the risk contributions are proportionate to the size of stock positions and their expected future returns (i.e. it prevents overconcentration issues).

5) **Frequent rebalancing with limited turnover:** since all of our multifactor equity indices are optimised this ensures that, at each point in time, we are only trading the most significant risk-adjusted changes in factor premia exposures. This is both important and distinctive as changes in the middle of the distribution are mostly noise yet many rival approaches trade based on all changes rather than just the most pronounced risk-adjusted changes in the desirable tail end of the distribution. As such, we are able to rebalance more frequently than rival approaches (i.e. on a monthly basis rather than quarterly, semi-annually or annually) with limited turnover and minimal trading costs. This more frequent rebalancing also reduces factor decay and thereby increases our exposures to targeted factor premia.

6) **Concentrated and differentiated indices:** we combine our multiple enhanced RIPE Factors™ – Value, Quality, Momentum, Small Size, and Low Volatility – in a balanced, risk-controlled way in order to reap the benefits of diversification and increase expected return per unit of risk. Consequently, our multifactor equity indices in aggregate hold a small subset of attractively valued, high quality, outperforming, smaller sized stocks exhibiting lower volatility at the portfolio level than the equivalent market capitalisation weighted index. This small yet sufficiently diversified[7] subset of stocks, each with high exposure to the targeted factors, results in both concentrated indices (with around 150 securities per index[8]) and differentiated indices (with a high active share[9] relative to the equivalent market capitalisation weighted index) so avoids crowded/overpriced trades.

7) **Proprietary and exclusive indices:** our SMARTER Beta™ multifactor equity indices are both proprietary and exclusive so they are only accessible through funds (segregated funds or mutual funds) managed by Aberdeen Standard Investments. In other words, the indices are bundled together with our funds so we do not charge an index licensing fee which provides a material cost benefit to investors. It also means that while the performance of our SMARTER Beta™ multifactor equity indices and funds are publically available, the composition and rebalancing dates are not so the market does not know how and when our rebalances will take place. We thereby avoid our rebalance trades being front run by hedge funds and other market participants – an effect that lowers the returns of all index tracking funds that track indices with pre-announced rebalancing dates.

Conclusion

Interest in smart beta, and multifactor equity strategies in particular, is mounting. Investors see the advantages of conventional market capitalisation weighted indexing but are keen to obtain higher risk-adjusted excess returns and are sceptical of their ability to select active managers who can consistently outperform. Smart beta, including our proprietary and exclusive SMARTER Beta™ multifactor equity indices and funds which incorporate design features gleaned from over a decade of factor investing experience, is thus a third approach to investing that combines the best features of both active and passive management and provides a pragmatic, cost-effective core solution to current investor needs.

[6] **EBITDA/EV** is a Value metric that is independent of a company's capital structure. Earnings Before Interest, Tax, Depreciation & Amortisation (EBITDA) is a measure of a company's operating performance while Enterprise Value (EV) is a measure of the total value of a company. Using EBITDA normalises for differences in capital structure, taxation, and fixed asset accounting while EV also normalises for differences in a company's capital structure.

[7] **Elton & Gruber (2009)** suggest that the most portfolio diversification benefits (the elimination of unsystematic risk) are realised after relatively few stocks are added to a portfolio and adding additional stocks thereafter only leads to marginal risk reduction. Based on their empirical research, they concluded that the average standard deviation (a measure of volatility) of a portfolio of 1 stock was 49.2%, and that increasing the number of stocks in the portfolio to 1,000 could reduce its standard deviation to a limit of 19.2%. They also concluded that with a portfolio of 20 stocks the risk was reduced to approximately 20%. Therefore, while the first 20 stocks reduced the portfolio's risk by 29.2%, the additional stocks between 20 and 1,000 only reduced the portfolio's risk by about 0.8%.

[8] For the **Small Size Multifactor** index family, this number is increased to 450 stocks in order to efficiently capture the Small Size factor.

[9] **Active share** is a measure premium of the percentage of stock holdings in a portfolio that differs from the benchmark index.

About the Author

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