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For Pension Schemes

BLENDING EQUITY FACTORS TO TARGET BETTER INVESTMENT OUTCOMES

Smart Beta has become a growing area of interest among UK pension schemes looking to improve on the long-term returns offered by traditional market cap equity indices. These Smart Beta strategies are often structured to capture various factors, such as Value, Momentum, Quality or Low Volatility. Since each factor has a different long-run risk and return outcome, pension schemes can use well-designed Smart Beta strategies to access factors and align their equity investments with their target outcome. In this paper, our Rosenberg Equities team highlights the performance patterns of these factors and explores how pension schemes can further manage their risk and return outcomes by blending exposure to more than one factor.

The rationale for Smart Beta investing

Market cap weighted indices have been the traditional way of investing in equities and the default approach for measuring the returns and risk that equities, as an asset class, offer. Today however most investors are aware of the pitfalls of a market cap weighted approach. The key failing of a market cap weighted approach is that prices determine a stocks' weight in the index and stock prices are often not rational. Stock mispricing occurs for many reasons: investors have different information, circumstances and objectives. Most influential of all in our view is that investors are subject to behavioural flaws, such as fear and greed, loss aversion and herding.

It is these inefficiencies that many believe ultimately explain the existence of the various factors that are well documented in academic and industry literature, such as Value, Momentum and more recently Low Volatility and Quality. The long-term returns and volatility for the Value, Momentum, Quality and Low Volatility factor portfolios compared to the overall market is shown in Table 1 overleaf, based on data calculated by our Rosenberg Equities team[1].

[1] The data shown in Table 1 are calculated by our Rosenberg Equities team based on simple long-only factor portfolios. These are constructed by taking the overall market universe, as proxied by constituents of the MSCI World Index, we then rank on the desired attribute (e.g. Low Volatility), and form portfolios by selecting the top 30% of the universe according to a square-root-of-market cap (SRMC) weighting scheme. The factor portfolios constructed are rebalanced monthly. Trading costs and other fees are not considered in the analysis. Note for comparability the Overall Market returns shown in Table 1 are also based on SRMC weightings. Over this time period an equivalent market cap index would have had an annualised return of 6.6% with 15.0% volatility.

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As Table 1 shows, the four factors have all delivered superior historical long-term returns compared to the market cap index. Momentum and Value factors have demonstrated the highest rates of return, but have the highest levels of volatility or total risk. Low Volatility and Quality factors exhibit lower levels volatility with somewhat lower levels of excess return.

Table 1: Risk Factors: > 25-Year Returns and Volatility

Global Developed Markets	Return (% p.a.)	Volatility (%)	Return to Risk Ratio	Tracking Error (%)	Maxiumum 3-year cumulative drawdown (%)
Low Volatility	7.9	12.3	0.64	5.9	-29.6
Quality	8.9	14.7	0.61	3.4	-34.0
Value	9.2	16.4	0.56	4.1	-46.2
Momentum	9.3	16.7	0.55	6.2	-41.4
Overall Market	7.5	15.5	0.48	-	-39.7

Source: AXA Investment Managers, Rosenberg Equities. Data presented are annualised from January 1990 to September 2016. See Footnote 1 for details on methodology.

It is our view that the reason the above four factors offer long-term superior performance compared to market cap indices is that they avoid investor behavioural flaws and instead provide a better connection with the fundamental characteristics of companies that ultimately drive a stock's risk and return, namely corporate earnings.

While the investment ideas underpinning factors aren't new, what is new is that pension schemes can now access these factors in a more direct, transparent, and efficient way using well-designed Smart Beta strategies.

Blending risk factors to reduce dependency on a single source of return

The returns shown in Table 1 are annualised averages over more than 25 years, clearly a very long investment horizon. Over shorter time horizons an individual factor may suffer from periods during which it is not in favour. For example, Low Volatility delivered weak relative returns between 1993 and 2000 and Value has been out of favour for much of the past five years. This is the reason why all of the factors shown in Table 1 have non-trivial levels of tracking error compared to the market.

Long periods of weakness may not suit the objectives of a pension scheme. Furthermore while pension schemes are long-term investors, downside volatility can lead to declining funding levels, which in turn can lead to increased contributions if these losses occur during a valuation period. So, instead of relying on the long-term risk and return characteristics of a single factor, pension schemes might look for a blended solution. By blending factors investors can reduce dependency on one source of return and further manage and target the risk and return outcomes offered through Smart Beta investing.

Finding the right blend

Understanding likely performance patterns of different factors is an important aspect of selecting the right blend. In our view a useful framework for analysing performance patterns is to look at each factor's behaviour in the context of the corporate earnings cycle. To do this, we split the earnings cycle into four stages:

(1) **Earnings expansion > Early cycle – Bull Market:** Earnings are growing rapidly and equity market prices are rising.

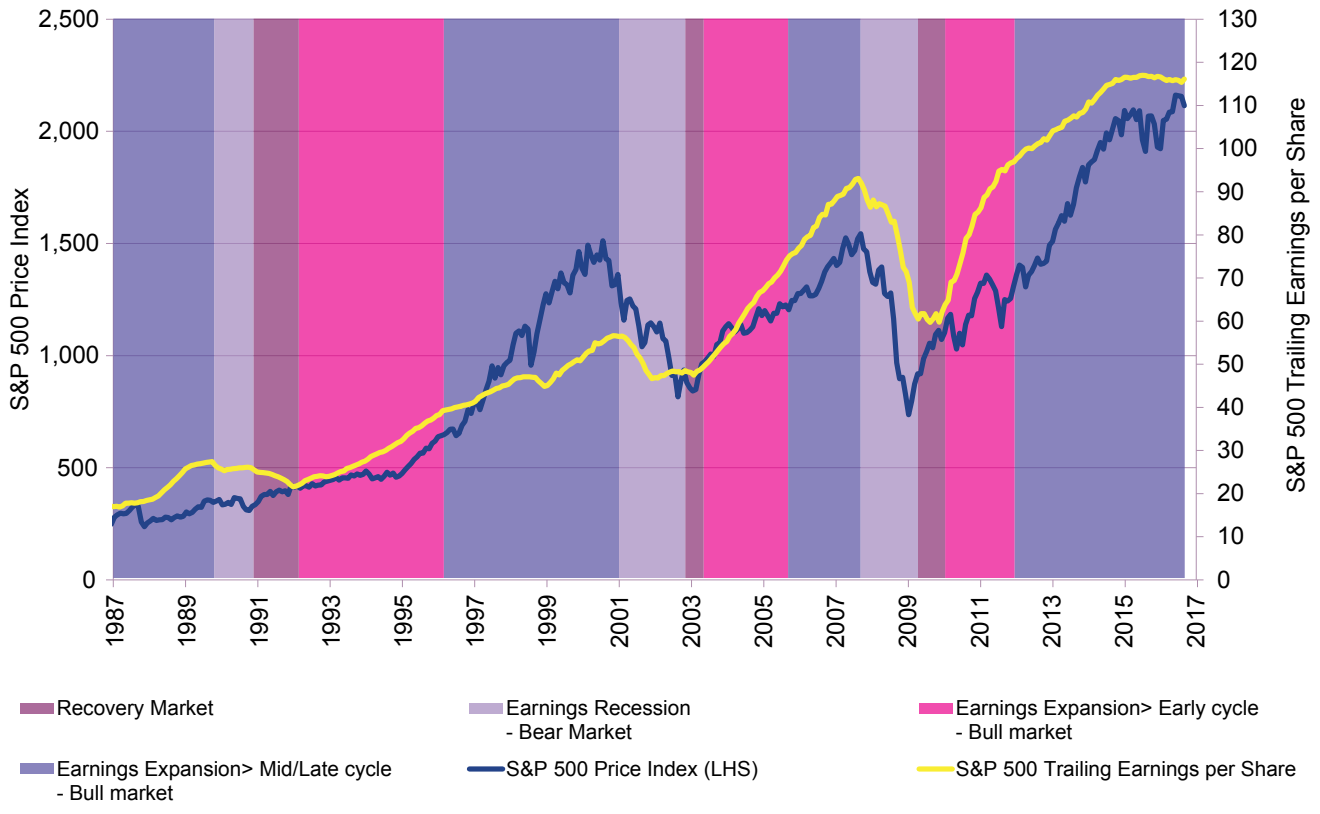
(2) **Earnings expansion > Mid/Late cycle – Bull Market:** Earnings are growing but the rate of change is steady or slowing. Equity market prices are rising.

(3) **Earnings recession – Bear Market:** Earnings are in recession (falling by 20% or more) and equity market prices are falling.

(4) **Recovery Market:** Earnings are in recession (falling by 20% or more) but equity market prices are rising in anticipation of recovery.

Since 1990 we have experienced three full earnings cycles. In Figure 1 we plot when each of the phases started and finished.

Figure 1: US Equity Market Earnings Cycles



Source: S&P, AXA Investment Managers, Rosenberg Equities (January 1987 to September 2016).

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In Figures 2 and 3 below we plot the performance[2] of the Value, Momentum, Quality and Low Volatility factor portfolios at each stage of the earnings cycle outlined above. To avoid the effect of separate investment regions experiencing differently timed earnings cycles, we have focused our analysis on the US earnings cycle.

Figure 2: US equity factor performance during recession and recovery

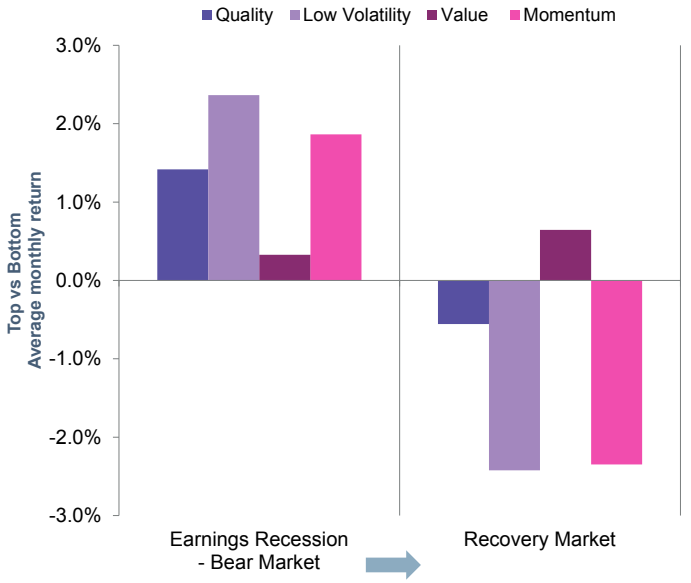
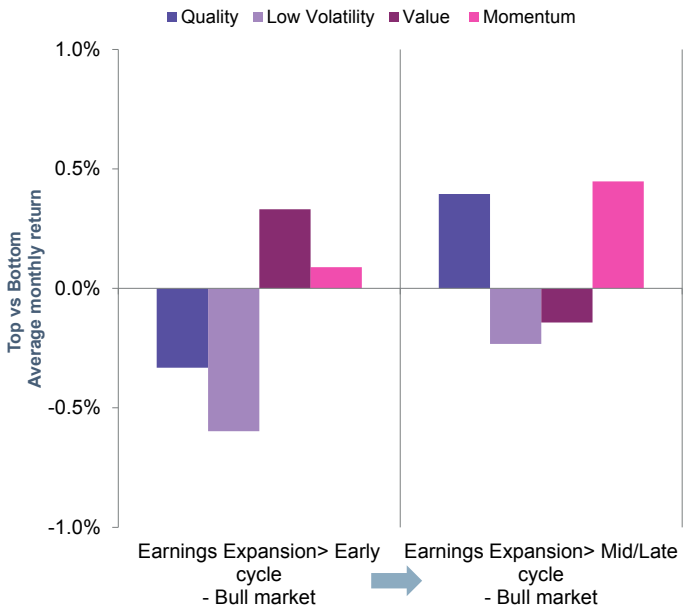


Figure 3: US equity factor performance during earnings expansion - early and mid/late



Source: AXA Investment Managers, Rosenberg Equities. Past performance is no guide to future performance. Please see foot note 2 for details on methodology.

[2] The factor data shown in Figures 2 and 3 are calculated by our Rosenberg Equities team based on simple long-only risk factor portfolios. These are constructed by taking the overall market universe as proxied by constituents of the MSCI USA Index, we then rank on the desired attribute (e.g. Low Volatility). The factor portfolios constructed are rebalanced monthly. Trading costs and other fees are not considered in the analysis. The analysis plots the performance of companies that rank highly (top 30%) on each factor relative to those that rank poorly (bottom 30%). Analysis is based on gross monthly returns from January 1990 until September 2016.

Table 2 provides a summary of how each factor performs during the earnings recession and earnings expansion phases.

Table 2: Performance of factors over an economic cycle

Period in economic cycle	Performance of factors
Recession and Recovery	· **Quality, Low Volatility** perform well in the earnings recession-bear market phase of the cycle, but suffer during the recovery phase. · **Momentum** also performs well in the earnings recession-bear phase, but has historically suffered significantly from underperformance in the recovery phase (the most acute being the recovery following global financial crisis). · On average, **Value** styles seem to navigate the recession-bear and recovery phases well, but with less consistency.
Earnings expansion	· **Low Volatility**, on average, lags the broader market in both the early and mid/late stages - an unsurprising result, as markets are in bull market rally mode. · **Quality** performs more effectively during earnings expansion and historically has become a more important source of return as the cycle matures. · **Value** generally performs well during periods of earnings expansion. However, a more detailed look at the range of value styles shows that as the earnings expansion cycle matures, book-to-price and dividend yield have historically become less effective while Value, as measured by price-to-earnings, remains effective. · **Momentum** has historically performed well during the mid/late stage of the earnings expansion phase. Typically, it becomes more effective as the earnings expansion phase matures.

Source: AXA Investment Managers.

We can draw two conclusions from the above analysis:

1. There is some observable consistency in the historical behaviour of individual factors at different stages of the earnings cycle.

2. No single factor performs well at all stages of the cycle. A Smart Beta investor may therefore benefit from blending more than one factor to take advantage of the different performance patterns and to reduce the possibly of a protracted period of underperformance.

When considering a blended Smart Beta approach, it is important that a pension scheme checks if the selected blend is consistent with their overall long-term objectives. For example, a pension scheme that wants to minimise drawdown when markets are distressed might not see any benefit from investing in a blended factor strategy that has too much exposure to Value and Momentum. While such a blend can be expected to reduce the overall tracking error when markets are rising, it will also increase overall volatility and is not expected to reduce the drawdown when markets fall. This trade-off is clearly shown in Table 3 overleaf where cumulative drawdown on a blend of Low Volatility, Value and Momentum is similar to that of the overall market.

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However some factors are more natural complements to each other in terms of their overall risk profile while also potentially improving the pattern of returns.

For example, as noted earlier in Figure 3, both the Quality and Low Volatility exhibit defensive behaviour in bear markets. When blended, these complementary strategies offer attractive down-market performance, as highlighted in Table 3.

Blending these two factors may also boost overall returns and help to reduce the risk of a long period of underperformance because the Quality factor is expected to outperform during periods of earnings expansion (notably in the mid to latter stage of expansion).

Table 3: Factors and example blends: return and volatility summary

Global Developed Markets	Return (% p.a.)	Volatility (%)	Return to Risk Ratio	Tracking Error (%)	Maxiumum 3-year cumulative drawdown (%)
Low Volatility	7.9	12.3	0.64	5.9	-29.6
Quality	8.9	14.7	0.61	3.4	-34.0
Value	9.2	16.4	0.56	4.1	-46.2
Momentum	9.3	16.7	0.55	6.2	-41.4
Example Blends					
Low Volatility, Value, Momentum	8.9	14.6	0.61	2.9	-39.3
Low Volatility, Quality	8.5	13.3	0.64	3.9	-31.7
Overall Market	7.5	15.5	0.48	-	-39.7

Source: AXA Investment Managers, Rosenberg Equities. Data presented are annualised from January 1990 to September 2016. See Footnote 1 for details on calculation methodology.

In our view the reason that Quality has the twin attributes of defensiveness during recession and solid performance as the earnings cycle matures is because Quality benefits from a fundamental link to corporate earnings growth stability and balance sheet strength. As such, in recession, Quality is less exposed to balance sheet distress and earnings drawdown than the market. Its importance grows in the latter stages of the earnings expansion phase because it offers exposure to earnings growth that is becoming harder for companies to achieve and for investors to capture.

A Smart Beta approach that blends Low Volatility and Quality may suit pension schemes that have an objective to improve long-term equity returns and reduce volatility and drawdown risks and that also want to avoid long periods of cyclical underperformance, which may occur with an approach that focuses on Low Volatility alone.

Conclusion:

Individual factors demonstrate different performance patterns over the earnings cycle with long-term risk and return characteristics that may result in long periods of underperformance. For this reason, instead of relying on a single factor, pension schemes seeking to align their long-term equity investments with their overall investment goals may choose to adopt a Smart Beta solution that blends them. By carefully selecting and blending factors, pension schemes can better manage risk and target their desired long-term outcomes in a cost-effective and efficient manner.

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Back-test Disclosures: AXA IM Equity Smart Beta and AXA IM Equity Smart Beta ESG Strategies

This performance information was derived from hypothetical back-testing of the AXA Investment Managers' Equity SmartBeta strategy and/or AXA Investment Managers' Equity SmartBeta ESG strategy for the period(s) indicated elsewhere in this article. The investment strategy was not available to clients during the back-test period (or a portion thereof).

Back-testing is conducted by a computer program that starts on the first day of the back-test period and estimates the return that the strategy would have achieved if the output from the SmartBeta and/or ESG screening and portfolio process, as relevant, had been fully implemented. The performance data shown has not been verified by an independent calculation agent. The actual strategies that will be made available to investors going forward may use different trading frequencies than was used in the back-tests, and the universe of securities that will be used in an actual portfolio may not reflect the universe of securities used in these back-tests.

Since trades have not actually been executed, results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. No cash balance or cash-flow is included in the calculation.

The back-tested performance shown is gross of management fees. An investor's actual return will be reduced by management fees and other expenses the investor may incur. Past (or back-tested hypothetical) performance does not equate to future performance.

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