Combining factors with a defensive profile can help to achieve superior risk adjusted returns

Invesco Pan European Structured Equity Strategy

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Factor investing aims to benefit from stock characteristics which explain long-term equity performance. With over 35 years of experience, Invesco Quantitative Strategies constructs portfolios using these factors to achieve attractive investment outcomes for clients. The Invesco Pan European Structured Equity Strategy combines exposures to factors such as Momentum, Quality and Value with a low volatility focus to navigate through different market environments.

Introduction to Factor Investing

What drives equity returns?
Equities provide a return for bearing investment risk over the long term. The question for an investor is, how to identify stocks with the best return potential given their inherent investment risks. While each stock has unique characteristics, it can also share similarities with other stocks. Different processes for stock selection include a fundamental bottom-up approach and factor investing.

Fundamental fund managers tend to undertake company research to identify attractive stocks that they expect to outperform in a given business, macroeconomic and market environment. Their views typically result in high conviction portfolios that aim to benefit predominantly from stock specific drivers of performance.

In contrast, a factor investor analyses the stock market based on return drivers, or so-called factors. These have been identified by academic research and explain the majority of long-term stock performance. To embrace factors, a portfolio manager systematically selects stocks based on a given set of characteristics.

While the fundamental manager aims to construct portfolios of stock specific risks, a factor investor's objective is to diversify away stock-specific risks by constructing portfolios with exposures to intended factor characteristics.

How do we determine a meaningful factor?
Some transient factors explain return differences between stocks in certain market environments, but do not reflect long-term market behaviour. An example of this could be the share price of a developed market stock with a footprint in the emerging market space being driven higher during short periods of rapid emerging market growth, leading to a widening in return dispersions within developed markets only during those times. Also, there are **short-term factors** influencing an individual market such as changes in investor sentiment, available market liquidity and the economic environment that can impact security prices.

On the other hand, there are **long-term return factors** which explain return and risk differences between stocks in multiple markets over long periods. The most established ones are Momentum, Quality, Value, Size and Low Volatility. These have been constructed on sound academic research and have proven their potential to improve risk-adjusted performance over time.

What factors should long-term investors focus on?
Within the **Momentum** factor, there is both price and earnings momentum to consider. Price momentum refers to recent share price movements with stocks being purchased if they have performed well recently and sold if they have performed badly. Similarly, earnings momentum is defined as the trend in recent earnings surprises or changes in earnings expectations.

The **Quality** factor entails a focus on the shares of high-quality companies. Generally, the shares of highly profitable and/or less leveraged companies achieve better risk-adjusted performance than less profitable or highly indebted companies.

Within the **Value** factor, the emphasis is placed on stocks that are priced at a discount to other similar stocks. The assumption is that, over the long term, purchasing stocks on lower valuations will lead to higher returns as these revert back to their true intrinsic value.

Within the **Size** (i.e. small cap) factor, the focus is on the shares of small companies in the expectation that they will outperform those of large companies.

The (low) **Volatility** factor (also known as minimum volatility) implies that shares associated with lower volatility perform better on a risk-adjusted basis than those with higher volatility.

All of the above-mentioned factors help to explain risk and return in equities and have outperformed the market over the long term on a risk-adjusted basis. Possessing different characteristics, each factor performs differently over different stages of the economic cycle.

Why do factors persist over the long term?
There is significant empirical evidence that factor premia (i.e. returns above the market return), similar to equity risk premia, are an enduring component of markets. Factor returns may fluctuate over the short term, but positive premia are earnt over the long term.

Research into why factor premia persist in markets highlights several possible reasons. These are often gathered into three different groups: risk premia, behavioural rationales and market structure.

A **risk premium** is interpreted as the reward for bearing a systematic risk in the same manner that equity investors expect to earn a premium over less risky assets. This means that the return premium associated with that factor can only be accessed if one is happy to accept the risk of that factor. For example, the value (and also size) premium is seen by some as a compensation for the higher default risk in 'value' companies.

Behavioural rationales for factor performance are drawn from Behavioural Finance to explain market features which appear to imply irrational behaviour by investors. For example, Momentum factor performance is frequently described as a behavioural

Figure 1
Key factors

	Seeks to capture	Commonly captured by
Momentum	Excess returns of stocks with stronger past performance	Relative returns (6-mth, 12-mth, usually with last 1-mth excluded), earnings revisions
Quality	Excess returns of stocks that are characterised by low debt, stable earnings growth, profitability and other "quality" metrics	Return on equity, earnings stability, dividend growth stability, strength of balance sheet, financial leverage
Value	Excess returns of stocks that have low prices relative to peers with higher prices in the long run	P/B, P/E ratio, cash flow yield
Size	Excess return of smaller firms (by market cap)	Market capitalisation (full or free float)
Low volatility	Excess risk-adjusted returns of stocks with lower than average volatility or beta	Standard deviation (1-yr, 2-yrs), downside standard deviation, standard deviation of idiosyncratic returns, beta

Source: Invesco. Simplified schematic representation for illustrative purposes only.

phenomenon which can be seen when investors underreact or overreact to news events.

Market structure rationales imply the factor premium is a result of the industry or market structure which can lead to certain classes of investors or investment strategies earning abnormal returns such as a shorting strategy.

While the benefit of using factor strategies can be reduced through crowding effects if a factor gains in popularity, the research evidence supporting the persistence of long-term factor returns indicates that the underlying drivers of these factors are not disappearing. In fact, we believe that the persistence of these factors' excess returns is so prevalent that even a small tilt toward them is effective.

How do different factors perform over an economic cycle?
During a recovery, smaller companies (size) tend to perform better, as do Value stocks. Later when growth is positive but decelerating, Quality stocks achieve superior performance while momentum strategies show their strength during markets with persistent trends. Quality and Low Volatility factor strategies, on the other hand, tend to perform particularly well during times of crisis.

However, factor timing is difficult and our research has found it was not profitable when transaction costs are taken into consideration. While it is very easy to understand the behaviour of factors when the economic cycle is known, it is much more difficult to predict factor behaviour in the future. Hence, a well-diversified multi-factor model is well equipped to deliver attractive returns over a full market cycle, in our view.

It is worth to keep in mind that every portfolio has certain embedded factor characteristics that impacts its risk and return profile. Hence, the question is not, whether to have factor exposures, it is about being exposed to them explicitly, or implicitly.

Invesco Quantitative Strategies

Starting in 1983, Invesco Quantitative Strategies (IQS) has been successfully implementing diversified multi-factor strategies seeking to capture factor premia irrespective of the prevailing market environment and timing considerations. Since 2006, the team has been managing multi-factor low volatility equity strategies aiming to deliver superior long-term performance with a below-market level of volatility.

Today, IQS represents one of the largest quantitative equity teams in Europe with over 40 team members in Frankfurt. Together with team members in the U.S. and Australia, the 60+ strong team is split into two areas: the research team maintains and further develops the proprietary multi-factor model while the portfolio management team is responsible for portfolio construction and implementation, as well as investment communication.

Investment process
The investment process builds on three major return factors: Momentum, Quality and Value. Based on in-depth factor research, the team uses proprietary factor definitions which are expected to achieve returns over and above the industry standard factor definitions.

What do the proprietary definitions include?
The definitions include the application of Price to Cashflow measures within Value, sophisticated measures of Price Momentum and Earnings Momentum as well as Quality components, such as a fundamental health score (balance sheet strength) or net asset growth (where very high asset growth usually suggests poorer future performance).

These IQS factor definitions are based on widely respected academic research. Improving definitions, as well as utilising alternative data sources, is at the heart of our research process. For an overview of the factors applied in our process, please see figure 2 below.

As markets constantly evolve, the team continuously challenges the investment process. The model evolution is handled with particular care and changes are only implemented if in-depth research proves that changes would enhance the process. Recent

Figure 2
Factor model: our expected sources of reward – a thoughtful combination of proprietary signals

Factors Balanced, time-tested	**Momentum**		**Quality**	**Value**
	Earnings Momentum	**Price Momentum**		
Proprietary signals Quantifiable, predictive, complementary	-Earnings Momentum -Earnings / Sales Revisions -Revisions against Trend -Cash Flow Surprise -Linguistic Sentiment	-Specific Momentum -Risk-Adjusted Momentum -Event Momentum -Short Interest	-Net External Financing -Net Operating Assets -Profitability & Operating Efficiency -Fundamental Health -Accounting Integrity	-Cash Flow Yield -Gross Profit Yield -Earnings Yield -Book Yield -Dividend Yield

Source: Invesco. As of 30 June 2020. For illustrative purposes only. Not all signals are used in all regions and sub-models. Signals often have subcomponents. Additional signals are used in specific sub-models and definitions may vary across regions.

enhancements include a linguistic sentiment indicator that complements our Earnings Momentum factors.

What are the steps taken in the investment process?
For all stocks in the European investable universe (close to 1,000 companies), the team calculates daily factor scores. These scores are then compared with the average factor exposure of all other companies in the same peer group, (i.e. the same industry and region). In a final step, all factor scores are aggregated to a multi-factor attractiveness score for each stock. The higher the score, the more the stock reflects the intended characteristics that are driving the return.

At the same time, a proprietary risk model determines a corresponding risk forecast for each stock in the universe using the same multi-factor building blocks. The risk assessment also includes a measure of a stock's volatility as well as correlation effects.

Through a portfolio optimisation process, the combination of stocks that maximises the exposure to the intended return factors for a target level of portfolio volatility is determined. Liquidity characteristics and diversification parameters are embedded in the optimisation process with the target volatility typically being halfway between market risk and the lowest risk achievable from a fully invested portfolio, i.e. the minimum variance portfolio.

How is our multi-factor low volatility strategy achieved?
Using this benchmark agnostic optimisation approach, the portfolio achieves exposures to two additional intended factor characteristics that can improve the risk-adjusted performance over the cycle, Low Volatility and Size. Research (Haugen and Heins[1]) has shown that higher risk does not necessarily translate into higher returns and low volatility shares have outperformed those with high volatility over the long term on a risk-adjusted basis.

This has led us to believe that a strategy focused on achieving market returns while taking on risk below the market risk level is an attractive option for investors. This is one of the two objectives that our multi-factor low volatility strategy aims to achieve:

1) Above market returns from exposures to the Quality, Value and Momentum factors

2) Achieving returns with a lower risk level than the market through using a low volatility strategy

To achieve these two objectives, the portfolio only allocates to stocks with our intended factor exposures. While traditional indices may apply a market cap weighting scheme, this strategy's weights are derived from the stocks' factor exposures. This leads to a "Size effect", i.e. a smaller average market cap than the index.

The resulting portfolio typically holds a diversified mix of 100+ stocks and has diversified factor exposures aimed at capturing the long-term premia of the factors Momentum, Quality, Value, Size and Low Volatility. Its active share against the MSCI Europe Index is expected to be in the range of 75-80%.

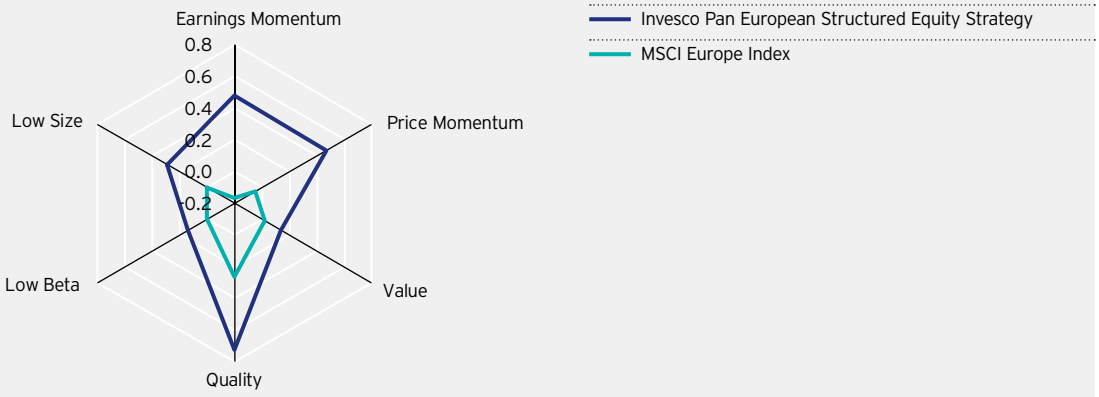
The process is generally very flexible and can adjust to individual clients' needs. Over recent years, ESG guidelines have become more important among our clients and can be implemented in segregated accounts. Needless to say, ESG aspects are an integral part of the investment process, considered within Quality as well as in the risk management process.

Invesco Pan European Structured Equity Strategy: Positioning & Performance

The portfolio positioning can be best represented by its factor exposures. This is illustrated in the adjacent spider web chart (figure 3). It compares the index's factor exposures in lighter blue against the portfolio's exposures in dark blue. As the scale increases from the centre to the rim, the strategy shows higher exposures to all factor characteristics that provide the potential for superior risk-adjusted performance over a full market cycle.

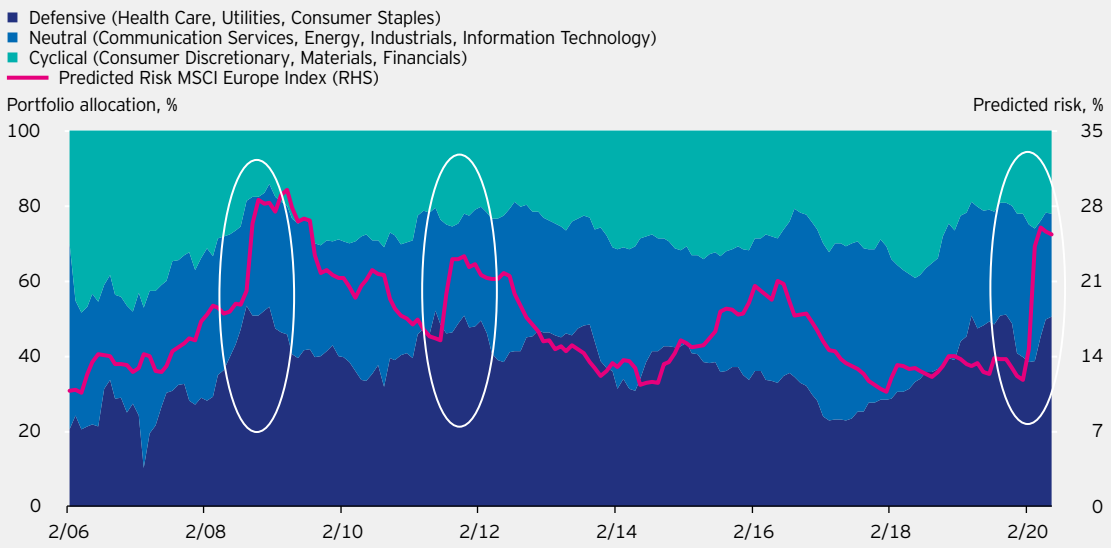
The sector and country positions are an outcome of the optimisation process which considers the factor exposures of stocks relative to their risk contribution to the portfolio. These are evaluated and compared to peers from the same region and industry to identify attractive companies from a return perspective.

Figure 3
Standardised factor exposures*



Source: Invesco, as at 30 June 2020. The above information is based on analysis using our proprietary risk model. *Factor exposure is measured in standard deviations from the benchmark. Low Beta is measured as difference to the benchmark

Figure 4
Monthly absolute sector weights of the Pan European Structured Equity Strategy



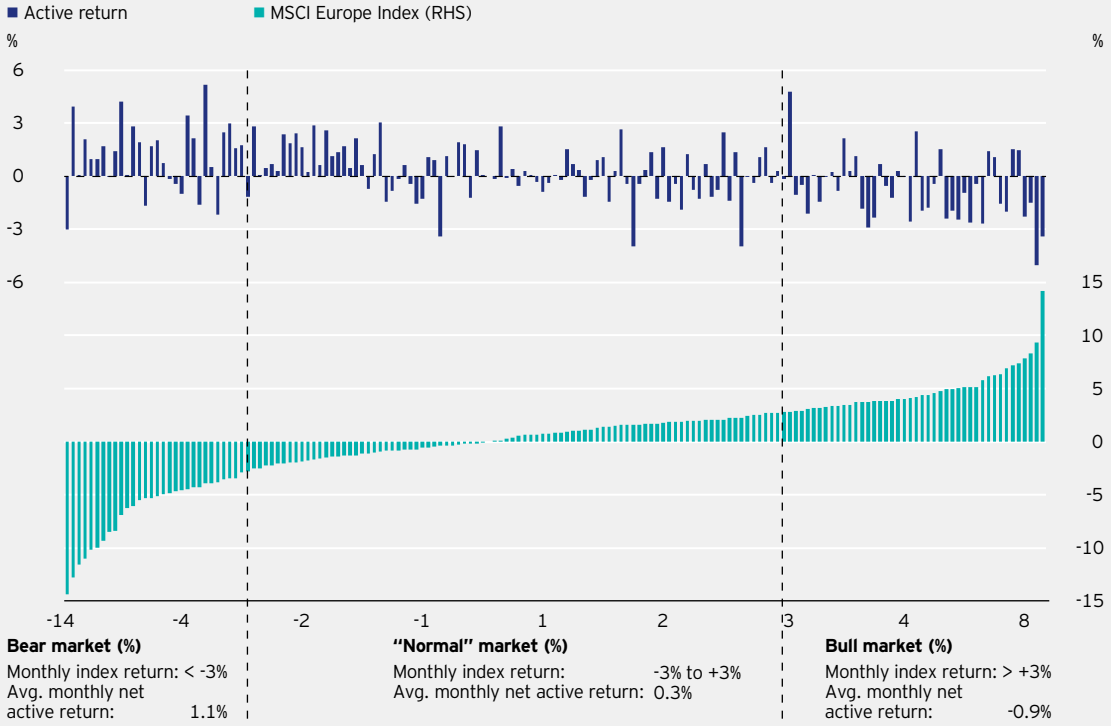
Source: Invesco, MSCI and Morningstar. Data as of 30 June 2020, sector weights can change any time and without warning. Data relates to the Invesco Pan European Structured Equity Strategy. The classification is based on the Morningstar Stock Sector Structure.

How is the portfolio allocation impacted by risk parameters?
In times of low market volatility, there is little risk differentiation between cyclical and defensive sectors resulting in a larger allocation of cyclical stocks. In times of market turmoil, like the Global Financial Crisis or the Covid-19 sell-off, the risk gap between risky and defensive sectors widens, thus causing the portfolio to shift into more defensive sectors. This allows the strategy to benefit from attractive stocks from all sectors while moving towards a less risky positioning when it is needed.

Additionally, the optimisation also penalises industries/countries which experience sudden risk spikes. Figure 4 shows the absolute sector allocation of the strategy since its inception in 2006 while the pink line illustrates the predicted risk from our proprietary risk model.

It can be seen that the Global Financial Crisis (2008/09), the European Debt Crisis (2011) as well as the Covid-19 sell-off were all accompanied by spikes in the predicted risk levels, and consequently led to a move towards the more defensive sectors.

Figure 5
Performance of the Invesco Pan European Structured Equity Strategy



Source: Invesco, MSCI; For illustrative purposes only. Data for the period October 2006 until June 2020. 'MSCI' is MSCI Europe ND. Strategy performance: inclusive of net reinvested income and net of the annual management charge and all other fund expenses.

What has been the strategy performance?
The strategy has been able to deliver attractive returns at a reduced risk level benefiting from both the multi-factor approach and its low volatility focus. Figure 5 shows the monthly returns of the MSCI Europe Index at the bottom and at the top of the chart, the strategy's active returns of the corresponding month.

In negative months, when markets declined by 3% or more, the strategy achieved an average monthly outperformance of 1.1%, highlighting its defensive nature. In "normal" market periods, the strategy benefited from its multi-factor approach adding 30 bps to the benchmark return on average. Alternatively, in rising markets, the strategy's defensive nature capped the upside participation to some extend (average by 0.9%).

While the strategy captured approx. 93% of the market upside moves, it only participated on 75% of the downside returns, leading to a significant excess return against the MSCI Europe Index since inception in 2006. The historical average beta has been 0.85. In aggregate, this approach results in a style neutral large cap equity portfolio that many of our investors use as a core equity holding.

Outlook
Despite recently challenging markets for multi-factor strategies, we are optimistic about the future. The rationales behind our intended factors remain intact and have added value over the full economic cycle. In turbulent markets and in times of uncertainty about Europe's economic future, defensive low volatility strategies could be a valuable building block for a portfolio, allowing investors to participate in a market recovery while being well positioned to weather potential setbacks.

Note
1 Haugen, Robert A. and Heins, A. James, On the Evidence Supporting the Existence of Risk Premiums in the Capital Market (December 1, 1972). Available at SSRN: https://ssrn.com/abstract=1783797 or http://dx.doi.org/10.2139/ssrn.1783797

Risk Warnings

The value of investments and any income will fluctuate (this may partly be the result of exchange rate fluctuations) and investors may not get back the full amount invested.

Important Information