Strategic View

The strategic case for momentum

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About Strategic View

Strategic View is a series of papers written by the UK Strategic Solutions team. It complements our regular Thought Piece series, but seeks to take a longer-term, more in-depth view of issues relevant to investment strategy for UK pension schemes and other institutional investors.

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As the global economy continues to de-leverage, the next decade looks likely to be a period of weak growth and low interest rates, punctuated by bouts of heightened instability and crisis. In this environment many investors will be looking for strategies that can smooth investment returns, whilst allowing them to benefit from whatever growth there may be.

Although 'chasing returns' has a bad name, there is strong empirical evidence that asset class returns do trend and that, with careful construction, momentum based strategies can enhance risk adjusted returns. Furthermore, these strategies have performed particularly well in times of stagnation and crisis.

This paper examines the strategic case for momentum. It discusses:

- In which environments momentum strategies tend to outperform
- Evidence for momentum and why it exists
- The strategic case for incorporating momentum into portfolio construction
- The practical implementation of momentum strategies in an investment strategy

The main findings of this paper are:

- There are both behavioural and rational/market-based reasons for price momentum
- Momentum strategies have the potential to enhance risk adjusted returns across a wide range of asset classes
- Momentum strategy performance is negatively correlated with illiquidity and, as such, can be a valuable diversifier in times of market crisis
- Momentum strategies can be applied to multi-asset portfolios to help determine appropriate asset class weightings. Momentum can also signal when to de-risk or to put in place downside protection measures.

Types of momentum strategy

Long-short: These strategies focus on a single asset class or stock. They aim to go long the asset when it's showing positive price momentum and short when it's showing negative price momentum.

Diversified: These strategies allocate to more that one asset class or stock, overweighting those that have positive price momentum and underweighting those with negative price momentum.

What is momentum investing?

Essentially a momentum based strategy uses an asset's recent performance history as a guide to likely future returns. For example, a basic momentum strategy might invest long an asset class if the past year's return is positive and short if the past year's return is negative.

In Charts 1a,1b and 1c we show the performance of a simple momentum strategy in three different types of equity markets - the 1990s bull market in UK equities, US equities during the bursting of the dot-com bubble and the credit crunch, and the 'lost decade' in Japan in the 1990s.

In each scenario we track the annual performance of the underlying asset class on a monthly basis. If the past year's return is positive then we remain invested for the next month; if the past year's return is negative then we disinvest and remain disinvested until the annual index return turns positive.

Chart 1a: Momentum strategy for UK equities – 1990s bull market

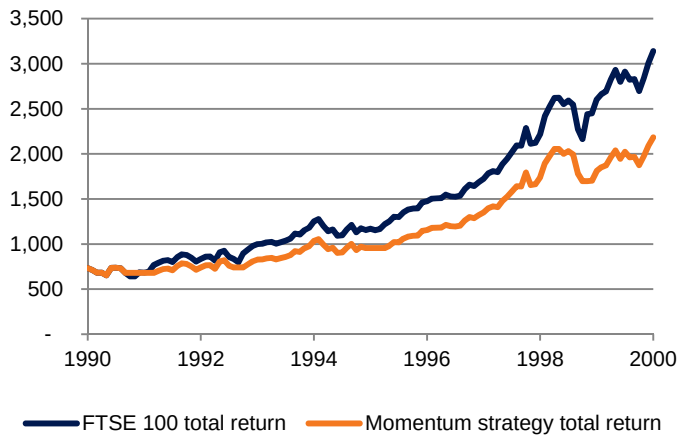


Chart 1b: Momentum strategy for US equities – the dot-com bubble and credit crunch

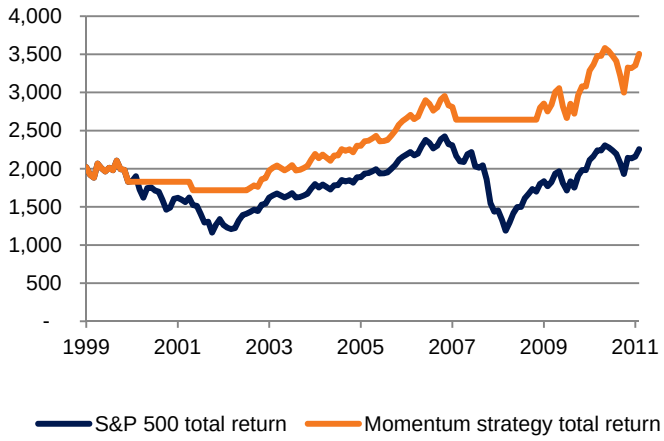
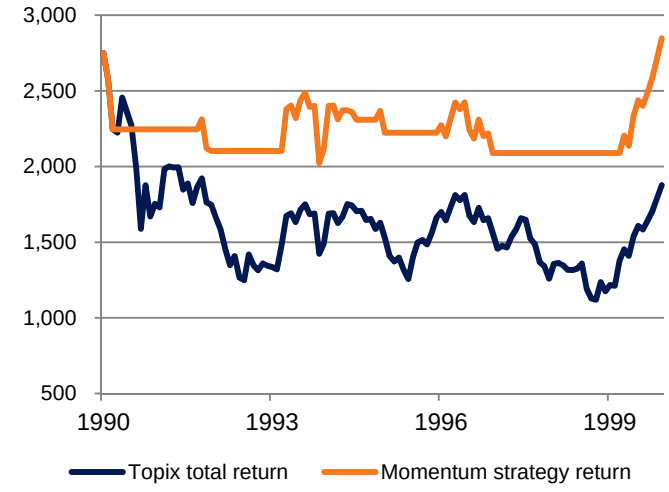


Chart 1c: Momentum strategy for Japanese equities – 'the lost decade'



Source: Schroders, Datastream. For illustration only. Analysis excludes trading costs

Chart 1a illustrates how momentum strategies tend to underperform in strong bull markets. This is because there are periods when the strategy has exited the market following temporary falls and only re-enters after the rebound has begun.

However, as illustrated in Chart 1b momentum strategies tend to perform particularly well in periods of acute crisis such as the dot-com crash in the early 2000s and the credit crunch in 2008/09. We discuss some of the reasons why later in this paper.

Chart 1c covers the 1990s in Japan. This period, often referred to as the 'lost decade', saw stagnant economic growth and risk asset values falling initially and then ranging from lows to highs, but ultimately not gaining over the period. The momentum strategy fairs particularly well in this scenario, protecting on the downside and participating to a certain extent on the upside. A momentum investor over this period would have seen strong relative gains and also a less volatile pattern of returns, as the strategy is out of the market during the most volatile periods.

Testing momentum empirically

Another way of asserting that momentum exists is to assert that asset returns show *serial correlation* – i.e. that the level of returns in the period just passed had a higher or lower likelihood of being positive given returns earlier on. It is therefore possible to demonstrate momentum empirically by examining the serial correlation of an asset class.

Many assets do exhibit serial correlation. As an example, Table 1 shows a selection of asset classes with material serial correlation over the last five years. The figures show the correlations of monthly returns with returns over the previous month. A figure greater than 25% indicates that the serial correlation is significant (at a 95% confidence level).

Table 1: Monthly serial correlations of a range of total return indices

Index	Serial correlation (January 2007 – December 2011)
MSCI Global (Equities)	25.6%**
GSCI (Commodities)	31.5%**
JP Morgan EMBI+ (Emerging Market Debt)	24.5%*
ML Sterling High Yield	46.6%**
S&P Listed Private Equity Index	38.7%**

Source: Schroders, Bloomberg. *Indicates significance at 90% confidence level. **Indicates significance at the 95% confidence level, based on t-distribution

As we shall see later, the historic performance of momentum based strategies is also supportive.

Why does momentum exist?

Why does such an apparently naïve investment strategy seem to 'work'? Explanations for momentum broadly fall into one of two camps: Irrational (or behavioural) explanations and rational (or market-based) explanations.

Irrational/behavioural explanations

Behavioural explanations centre on reasons for investor *under-reaction* - investors either react late or insufficiently to news that might change their view of an asset class. This causes prices to rise or fall for longer than might rationally be expected. Some of the reasons for investor under-reaction are:

Overconfidence: Studies[1] show that we have a tendency to see ourselves as more informed or knowledgeable than we really are and financial experts tend to be amongst the worst! Overconfidence leads to investors overweighting information and analysis that they have compiled themselves while underweighting publicly available information. Investors might therefore be inclined to maintain a position even when new information comes to light that suggests they should do otherwise.

[1]See for example Koriat, Lichtenstein and Fischhoff (1980)

Extrapolation of past returns: Although we all know that 'past performance is no guarantee of future returns', investor behaviour often does not reflect this.

Herding: A reluctance to take a contrarian position, and the career risk that this can entail, may lead investors to seek comfort in the crowd. There is also a degree of self-perpetuation with material momentum investors, such as hedge funds, often adding to the price momentum of an asset class.

Rational/market-based explanations

A rational explanation for momentum is that poor market performance can predicate worsening illiquidity, which itself can drag performance lower. This was seen in 2008[2], when *market illiquidity* (when trading an asset becomes very expensive) and *funding illiquidity* (when investors do not have enough available funding from their own capital or from loans to trade) combined to form a 'liquidity spiral'[3].

Another hypothesis for momentum is that an investor's risk appetite is not usually constant. As the value of an investor's assets falls towards their 'base level' of wealth their ability to stomach further losses reduces[4]. Therefore, as prices fall, the extra return an investor *requires* to live with the higher perceived risk of the asset class can exceed the *expected* return of the asset class (even allowing for the asset class being cheaper than before). This can lead investors to sell, reducing the price further, leading to even lower risk appetites and lower prices.

Therefore markets can generate their own momentum when liquidity dries up and risk appetites fall. These rational factors would be exasperated by the behavioural factors listed above.

The strategic case for momentum

As shown in Chart 2 momentum strategies can deliver appealing risk-adjusted returns in their own right.

Chart 2 is taken from Moskowitz, Ooi and Pedersen (August 2010) and shows the Sharpe ratios of momentum strategies across 58 asset classes, using futures and forwards to gain exposures. For each instrument, in every month the trend strategy goes long (short) the asset if the excess return over the past 12 months of being long the asset is positive (negative). The Sharpe ratios are gross of transaction costs; although in practice, these are unlikely to have a material impact as exposures are derivative based and positions are adjusted at most monthly. Note that in every case the Sharpe ratios are positive, suggesting that momentum effects are prevalent across a wide range of asset classes.

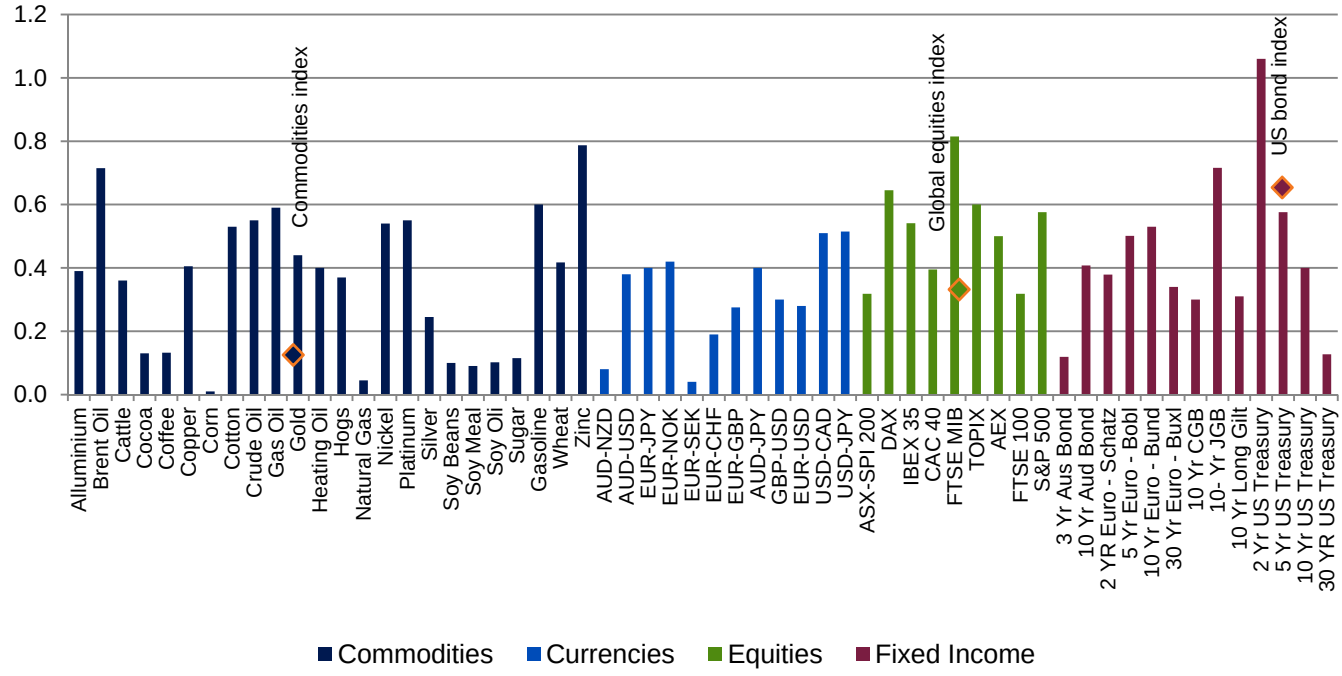
We have also plotted the Sharpe ratios for a selection of asset indices over the same period for comparison. The momentum strategies shown compare favourably to these indices in many cases, particularly in commodity and equity based strategies.

[2]Over 2007/2008 losses from the US housing market rapidly reduced the value of many banks' balance sheets, meaning that funding liquidity dried up. Without funding liquidity trading volumes dried up as investors were no longer able to fund margins or provide collateral on new trades. Lower trading volumes reduced the number of market participants so market liquidity also dried up. When trading becomes expensive prices are bid down to compensate. Prices were also dragged lower by forced selling of assets by banks to fund existing trading commitments. Lower prices lead to even worse funding liquidity, which leads to worse market liquidity and even lower prices

[3]See Brunnermeier and Pedersen (November 2008) for a more complete account of the interaction of market and funding liquidity

[4]Formally we might say that an investor's marginal utility increases as their wealth decreases

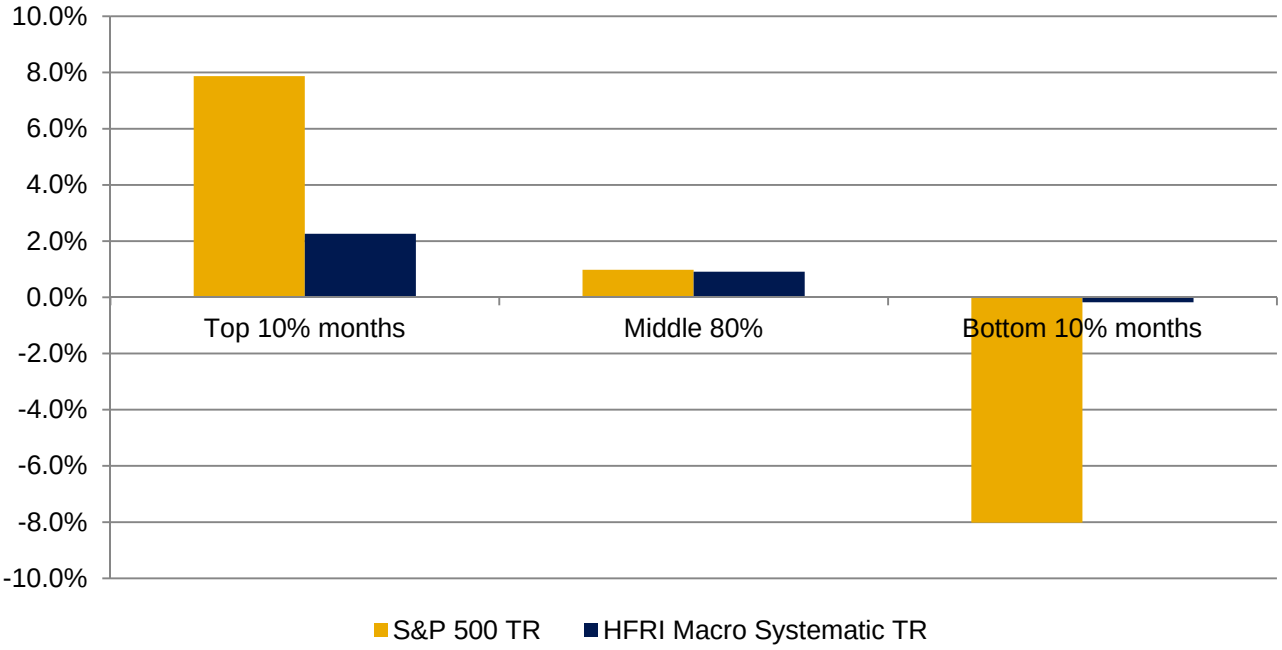
Chart 2: Risk adjusted returns of a range of momentum strategies compared to indices (1985-2009)



Source (momentum strategies): Moskowitz, Ooi and Pedersen (August 2010). The authors scale up or down the size of each trade based on the past volatility of the instrument, with the aim of maintaining a constant volatility over the sample period and across each strategy. Source (indices): Schroders, Datastream. Indices used: Commodities - GSCI index, Global equities - MSCI World, US bonds - BoFA ML Master Treasury index

Perhaps even more appealing is the ability of momentum to act as a diversifier. Chart 3 shows the performance of a composite index of hedge funds that use diversified momentum strategies, compared to the S&P 500. We show results for the 10% worst, middle 80% and 10% best months for equity performance. The momentum strategies underperform equities in very strong months, but do considerably better in the worst months.

Chart 3: Performance of hedge fund momentum strategies and S&P 500, 1990 - 2011



Source: hedgefundresearch.com, Datastream, Schroders

Reasons why momentum diversifies

As discussed above, momentum can be partly explained by liquidity patterns in asset classes. Therefore, momentum strategies tend to do well in periods of low liquidity. As market illiquidity usually coincides with poor market performance, momentum strategies have the potential to perform particularly well compared to risk asset in times of crisis.

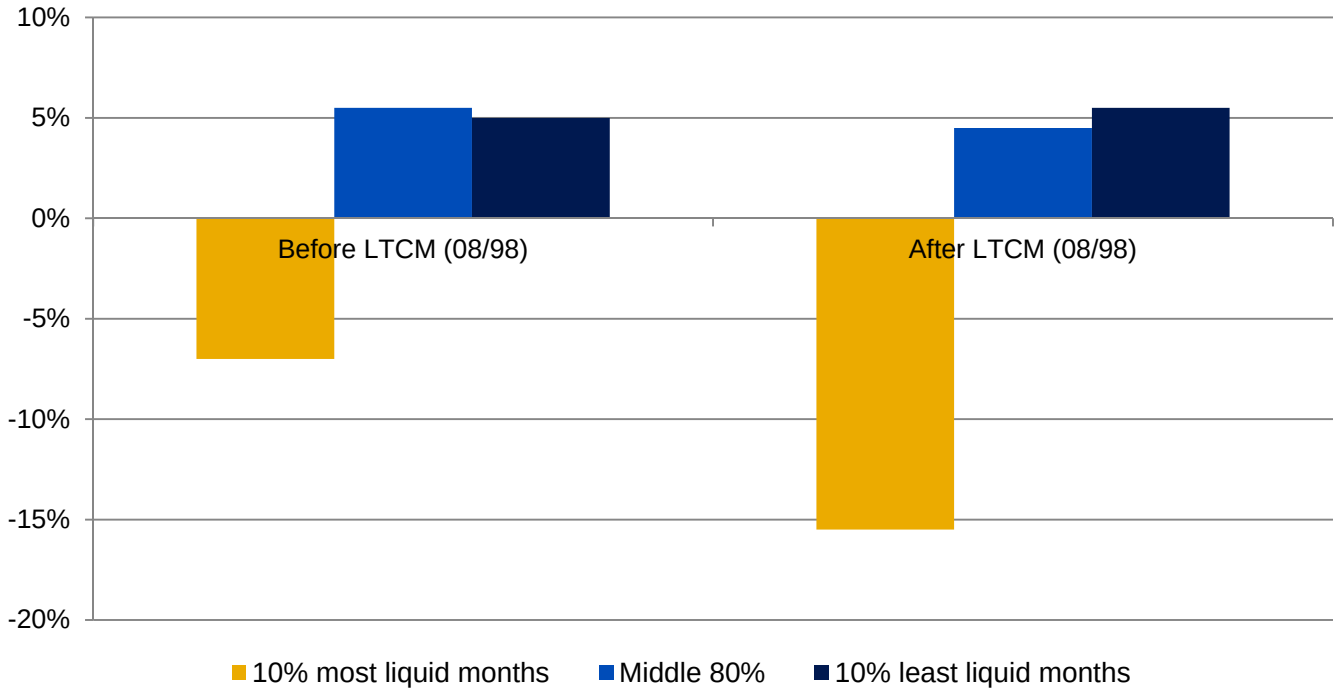
This is illustrated in Chart 4. The chart shows the annualised returns of a composite momentum strategy across equities, currencies, bonds and commodities, before and after the Russian default and subsequent collapse of the Long-Term Capital Management (LTCM) hedge fund in 1998 – a significant period of funding illiquidity and market turmoil. Returns are shown for periods of high, moderate and low liquidity, as measured by a global average TED spread[5].

The momentum strategy returns are positive on average in the least liquid months – periods when market performance is likely to have suffered particularly badly. On the other hand, high liquidity, which usually coincides with large capital flows into the market and sharp price rises, is generally bad for momentum strategies. This is because momentum investors can be left on the side-lines if the rebound follows a period of poor performance, as is often the case.

This analysis suggests that momentum strategies have the potential to be strong diversifiers in times of crisis. What is also interesting is that the LTCM crisis in 1998 marked somewhat of a watershed, with the correlation with illiquidity becoming even more negative. This might reflect increased investor awareness of the importance of liquidity, which in itself may have reinforced the momentum/liquidity relationship, as investor behaviour become even more sensitive to rises and falls in liquidity (certainly the 2000s saw the emergence of a large number of hedge funds looking to take advantage of this relationship, often using momentum type strategies).

This also suggests, somewhat ironically, that the recent liquidity crisis in 2008 may go even further to reinforce market volatility (and trending), despite a heightened awareness of financial risk.

Chart 4: Annualised return of a composite momentum strategy before and after the LTCM liquidity crisis



Source: Asness, Moskowitz and Pedersen (February 2009)

[5]The TED spread is the 3-month LIBOR rate minus the 3 month T-bill rate. When the TED spread is wide, banks' financing costs are high, suggesting that funding liquidity is scarce. TED spreads tend to be strongly (negatively) correlated with market levels

When do momentum strategies underperform?

A momentum strategy will underperform a buy and hold strategy when a market reverses direction very quickly as the momentum investor will be out of the market for the early portion of the rally. This was the case in 2009 when markets stepped back from the abyss and confidence returned very quickly. The liquidity of the strategy at these turning points is an important consideration as momentum investors need to be able to act quickly when markets begin to reverse. For this reason derivatives usually play an important role in momentum strategies.

Interestingly, equity markets also tend to exhibit short term reversal, where last month's winners are often this month's losers. For this reason momentum strategies often omit the most recent month's data.

Markets also often exhibit longer term reversal patterns ('boom and bust'), so investors should be wary of jumping on the band waggon too late. Most literature tends to construct momentum strategies using data from between 1 month ago and 1 year ago.

Finally momentum strategies will underperform if trading costs are too high. This is particularly the case in markets with only weak trending patterns. Using momentum strategies with longer data windows to restricting trading frequency can help to mitigate this, as can trading in instruments with lower dealing costs (again often using derivatives).

Exploiting momentum in a multi-asset portfolio

Return enhancement

As we saw in Chart 2, momentum has the potential to add value across a wide range of asset classes. This can be a standalone strategy (see page 1) or as one input into a wider multi-asset strategy. For example, asset allocations can be tilted to include higher weights in those assets displaying strong positive price momentum. Momentum might sit alongside other 'conditioners' on the asset allocation such as the economic outlook and value.

Risk management

Momentum's negative correlation with liquidity (and therefore often market performance) means that the momentum element of a multi-asset strategy can act as a strong diversifier, particularly in times of crises. This should reduce the overall risk of a portfolio. Furthermore, momentum has historically shown a strong negative correlation with more pro-cyclical conditioners such as value[6].

Momentum can also act as a powerful 'risk-off' indicator, perhaps alongside other downside risk indicators, or even as a signal that it is time to put in place specific downside protection measures such as put options[7].

Conclusions

Momentum strategies have the potential to enhance risk adjusted returns across a wide range of asset classes. Momentum strategy performance is also negatively correlated with illiquidity and, as such, can be a valuable diversifier in times of market crisis.

Investors potentially face a decade of weak growth and volatile risk asset performance. In this environment momentum strategies have the potential to add signficant value either as stand-alone strategies, part of a multi-asset portfolio constuction process or as part of a wider risk management strategy.

If you would like to discuss any of the topics discussed in this paper, please contact a member of the UK Strategic Solutions team.

[6]See Moskowitz, Ooi and Pedersen (August 2010) for a detailed discussion of the historic relationship between value and momentum
[7]The holder of a put option makes a profit if the underlying market is below a certain level on a certain date. The profit partially offsets losses on the portfolio

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Important information

Schroders