WINTON

Research Brief

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A closer look at the trend-following smile

Investors often perceive trend-following as a way to mitigate the impact of market downturns on their portfolios as the strategy can profit from strong, downwards price trends. But this is not always the case as recent selloffs have shown. In this research brief, we assessed the extent to which trend-following strategies have performed well during past market crises.

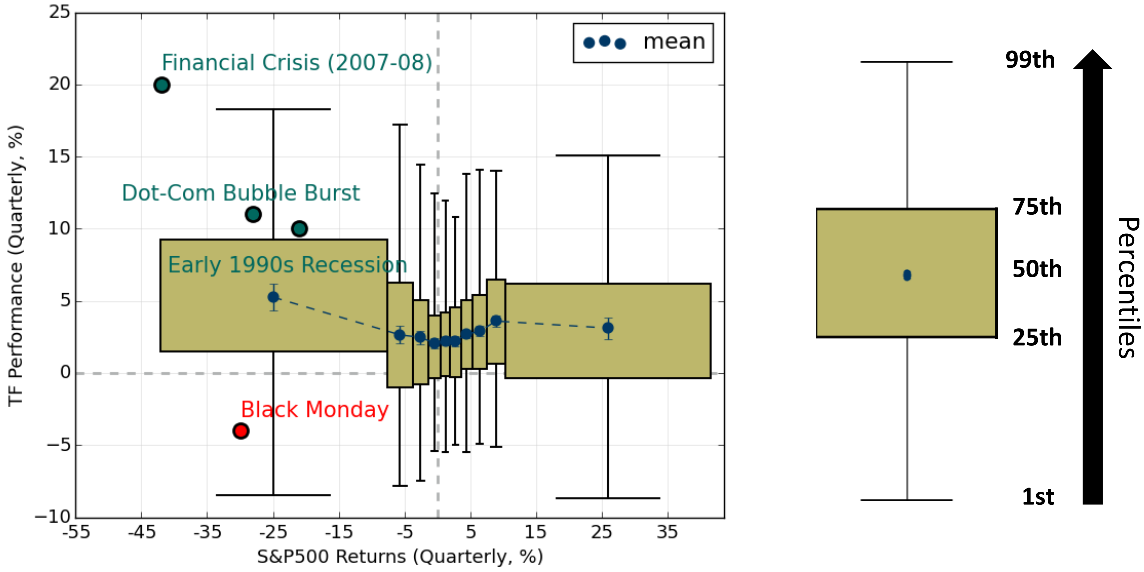
A strategy that generates profits when asset prices fall is appealing because it can provide valuable portfolio diversification at times of stress. Trend-following strategies upheld their reputation for this during the Global Financial Crisis; in 2008, when the S&P 500 Index fell 37.0%, the Barclay BTOP50 Index, which follows the performance of the largest investable CTAs[1], gained 13.6%. This perception could be misleading, though, as trend-following strategies have not profited in all market selloffs; the bouts of bond and equity market volatility in May and August 2015 offer two recent examples.

Setting anecdotal evidence aside, we used data from the past 41 years to assess how trend-following strategies have performed during market downturns. To do this, we ran a backtest of Winton's current trend-following system (WTFS) on a portfolio of markets and analysed the system's hypothetical gross performance in different market conditions, using S&P 500 futures as a proxy for 'the market'.[2]

In the figure below, we split the data equally across ten bins and calculated the mean system performance for each bin, shown as blue dots.[3] The result is often referred to as the 'pay-off function', or the expected system performance for a given market return.

[1] Trend-following is the most prominent strategy pursued by CTAs but not the only one.
[2] We carried out a similar analysis in a research brief titled *Performance characteristics of trend and non-trend trading systems,* April 2015.
[3] Both the WTFS performance and the S&P 500 futures returns were measured over a rolling quarterly timeframe. The error bars were calculated by block bootstrapping the market and system returns.

Enquiries
researchpapers@wintoncapital.com
+44(0)20 8576 5800



The blue dashed line is the pay-off function of a backtest of the current Winton trend-following system over the past 41 years. The error bars represent the standard error of the mean performance. The overlaid boxplots show the spread of performance in each bin. The green and red dots mark the performance of the system during well-known market downturns.

As the figure above shows, the outer blue points are higher and create a 'smile', which is consistent with the notion that trend-following strategies are more profitable during large market moves.[4]

The error bars represent the standard error of the mean performance. It is important to distinguish the standard error, which measures the uncertainty of the mean performance, from the overall *spread* in performance. This difference is emphasised by the boxplot which shows that the performance spread was much wider than the standard error. Focusing on the part of the boxplot below the x-axis we see that the WTFS would have incurred losses approximately 25% of the time, across different market conditions.

We also marked the WTFS returns at the time of notable market events. The strategy would have performed well during a number of past market downturns. That said, Black Monday provides a notable exception: a sudden reversal in equity- and bond-market trends was too abrupt for the system to exploit.

Our current trend-following system would have provided useful portfolio diversification during a number of past market downturns, but this has not always been the case. Sudden trend reversals, such as those experienced on Black Monday, resulted in a loss. To fully understand the characteristics of a strategy, it is important to consider not just the *average performance* in each market environment, but the *distribution in performance*.

[4] See also our research brief *Are CTAs Long Volatility?,* October 2014.

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