The Market Environment for Trendfollowing

An evaluation of Trendfollowing in managed
futures over the past three decades

September 2019

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Description of Trading Styles:

Long-Term Trendfollowing:

A systematic style that managers adopt to take advantage of trends in markets, with positions taken for an average duration of four weeks and longer.

Non-Trendfollowing Styles

Global Macro:

A global macro approach is based on trading macroeconomic themes over multiple time frames. A Macro commodity trading advisor ("CTA") will trade looking to profit from global economic trends which include interest rates, economic policies, and currency fluctuations.

Value:

Systematic trading of interest rate yield curve differentials and changes in term structure over the medium term to long term. A Value CTA trades based on a view that contracts are not priced correctly in the current market due to expected future trends and potential.

Short-Term Systematic:

Aims to capture trends and countertrends with average durations from intraday to 10 days. A CTA will trade in and out of contracts using closely controlled methods which are designed to take advantage of pricing or arbitrage opportunities.

FX:

Foreign exchange ("FX") managers are specialist managers who develop trading strategies specifically focused on global foreign exchange markets. Such strategies may be based on price and technical factors or fundamental data.

Executive Summary

The performance of managed futures,[1] particularly trendfollowing strategies ("Trendfollowing"), has been mixed in recent years. Although returns in the industry have been strong year to date, the performance this decade has been weaker than in previous decades and has prompted many investors to ask whether something structurally has changed.

Several theories have been put forward by industry commentators and investors to explain the lower performance such as:

- "There is too much money in the space"

- "Trendfollowers are being front-run or gamed by other market participants"

- "Markets have become faster and Trendfollowers are too slow to react".

In this paper we assess these theories, evaluate the market environment for Trendfollowing and consider the outlook for the strategy.

Our conclusion is that the market environment, characterised by fewer large moves, more reversion and fewer sustained trends, is the primary explanation for lower performance in the last decade. In our opinion, an unusually benign macroeconomic backdrop coupled with extraordinary monetary stimulus may have contributed to fewer major trends in markets. Looking ahead we see several potential scenarios which may support a more favourable environment for Trendfollowing.

Assessing typical explanations for Trendfollowing performance

To set the scene, we first review the long-term performance of managed futures using data from the Barclay CTA Index[2] since 1990. Although performance in the last decade has been weaker than the previous two decades, we show that it has been within standard statistical expectations and, when we account for the lower interest rates of recent years, we have seen similarly difficult periods for managed futures trading in the past.

We then examine the growth of assets in managed futures. Some commentators have suggested that the growth of managed futures has resulted in crowded positions, which has caused degradation in performance. However, our analysis shows that, when adjusted to 13% volatility (the industry median volatility), assets managed by Trendfollowing managers ("Trendfollowers") was approximately $132bn as of 30th June 2019, which is only slightly higher than in 2008 when Trendfollowing had a particularly strong year. The growth in volumes and open interest in futures trading and the increase in the number of tradeable contracts also has to be considered. After accounting for these factors, we show that the market impact[3] from Trendfollowing strategies has likely not increased over time.

We assess the theory that Commodity Trading Advisors ("CTAs") may have been gamed by other market participants, particularly high frequency traders ("HFTs"). As anecdotal evidence suggests HFTs have been very profitable in the last decade while Trendfollowing has seen lower performance, some commentators appear to have drawn a link between the two phenomena. However, when you consider that HFTs are primarily involved in market making, extracting small spreads repeatedly trading in microseconds, we show why, in our opinion, it is not plausible that HFT trading has been the primary driver of lower returns for Trendfollowing.

To evaluate these ideas, using a statistical analysis, we look at the distribution of returns for the SG Trend Index[4] and performance in its first ten years versus its second ten years. If growth in assets in Trendfollowing, and the supposed crowding of positions, was the reason for lower performance in recent years, one would expect to see more negative performance

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1   Unless otherwise stated, the Barclay CTA Index is used to represent the managed futures industry for the purposes of this paper. A description of the Barclay CTA Index is included on page 22. Trading in managed futures is not suitable for all investors given its speculative nature and the high level of risk involved including the risk of total loss of initial investment.
2   A description of the Barclay CTA Index is included on page 22.
3   An explanation of market impact is provided in the Glossary on page 22.
4   A description of the SG Trend Index is included on page 22.

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(iii)

on the worst days for Trendfollowing as managers would suffer larger losses exiting crowded positions. However, our analysis shows this is not the case.

We then examine the idea that markets may have sped up and that CTAs may be too slow to capture the moves. To test this, we look at the performance of trendfollowing strategies across multiple time horizons using a variety of trading signals. If market moves had become quicker one would reasonably expect faster systems to show better performance in recent years relative to the past and faster systems to have outperformed slower systems recently. We find no evidence of this.

Evaluating the market environment

Our sense is that the primary challenge for Trendfollowing in the last decade has been a more difficult market environment and fewer sustained trends. To quantify how favourable the environment is, across markets and over time, we have developed several proprietary market indicators. Using these indicators, we examine the extent to which markets have experienced large moves, how frequently markets trended and the quality of those trends (i.e. was the price action choppy or persistent). The data suggests that, in the last decade, the size of the directional moves in markets has been smaller and markets have trended less frequently. In short, the market environment has been challenging for Trendfollowing relative to the past.

We also analyse the performance of our proprietary proxy Trendfollowing systems. If these systems had generated returns in recent years but Trendfollowers had struggled that may have been a warning sign of a structural problem in Trendfollowing. Instead the performance of the proxy Trendfollowing systems also supports the idea that a difficult market environment has been the primary challenge.

Why has the environment been more challenging? In our opinion, in the last ten years we have had an unusual macroeconomic and policy backdrop of slow and steady economic growth, low inflation and unprecedented monetary stimulus. The absence of an economic boom or recession in the US economy, may have contributed to fewer major trends in assets linked to the economic cycle. At the same time low inflation has, at times, enabled central bankers to dampen market moves, particularly declines in equities, by repeatedly easing monetary policy. Furthermore, low and stable interest rates may also have constrained the opportunities for Trendfollowing.

Looking ahead

While it is impossible to predict what the market environment will be going forward, we see several potential catalysts such as the risk of a pick-up in inflation, a possible shift away from relying on quantitative easing and instead greater use of active fiscal policies, which could potentially produce a more favourable market environment for Trendfollowing. The experience of the early 2000s, when the "Great Moderation" was followed by the Global Financial Crisis, has also shown that during seemingly benign macroeconomic conditions, imbalances can develop beneath the surface prompting even greater dislocations in markets when they come to the fore (the so-called Minsky moment). History has also shown that trends can also develop from random factors such as droughts, wars, geopolitical events and other factors and that the risk of any of these occurring remains a consideration for investors.

Over the last three decades Trendfollowing has at times provided the potential for strong diversification for investors, generating returns in some periods when equities were challenged. While the market environment for the strategy has not been as favourable in the last decade we think the fundamental reason for allocating to the strategy as part of a diversified portfolio remains, particularly given the current juncture of ultra-low bond yields and elevated equity valuations.

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Review of performance

The performance of managed futures and Trendfollowing in recent years has been more difficult relative to longer-term history. Although performance of the Barclay CTA Index in 2019 is positive,[5] 2018 was a particularly difficult year, one of the toughest for managed futures in decades and the performance since 2010 is notably less than in the 1990s or 2000s.

Low interest rates offer part of the explanation as performance in managed futures is driven by (1) the profit & loss from trading futures contracts and (2) the interest rate return on excess cash and margin funds. After the 2008 Global Financial Crisis, central banks brought interest rates to historic lows and this heavily impacted the return on excess cash. US 3-month interest rates averaged 0.5% since 2010, 2.7% in the 2000s and 5.0% in the 1990s. However, even after accounting for the lower interest rates, performance since 2010 has been lower than in the previous two decades.

While disappointing, it is important to recognise that performance has not been outside of statistical expectations. To demonstrate this, in Chart 1 below we show cumulative ex-interest returns for the Barclay CTA Index between 1990 and December 2009 and simulated cumulative returns for the January 2010 to June 2019 period (generated through bootstrapping estimation).[6] The chart illustrates that while performance since 2010 has deteriorated, it is within the range of outcomes an investor could have statistically expected, assuming the characteristics of the return distribution in the previous two decades are unchanged.

Table 1
Barclay CTA Index* performance by decade: Jan 1990 to Jun 2019

	1990s	2000s	2010s
Annualised Return	7.1%	5.9%	0.7%
Volatility	9.5%	7.3%	4.6%
Sharpe Ratio	0.2	0.4	0.0
Average Risk-Free Rate	5.0%	2.7%	0.5%

Source:
Abbey Capital, Bloomberg & BarclayHedge. Data is shown from Jan-1990 to June 2019. The US 3-month T-Bill is used to represent the risk-free rate. A detailed explanation of indices referenced can be found on page 22.

*   Unless otherwise stated, the Barclay CTA Index is used to represent the managed futures industry for the purposes of this paper.

Chart 1
Barclay CTA Index performance: Jan 1990 to Jun 2019 & Bootstrapped hypothetical performance: Jan 2010 to Jun 2019

Source:
Abbey Capital, BarclayHedge.

Legend:
- Ex-interest Barclay CTA Index
- Simulated Returns
- 5th and 95th percentiles
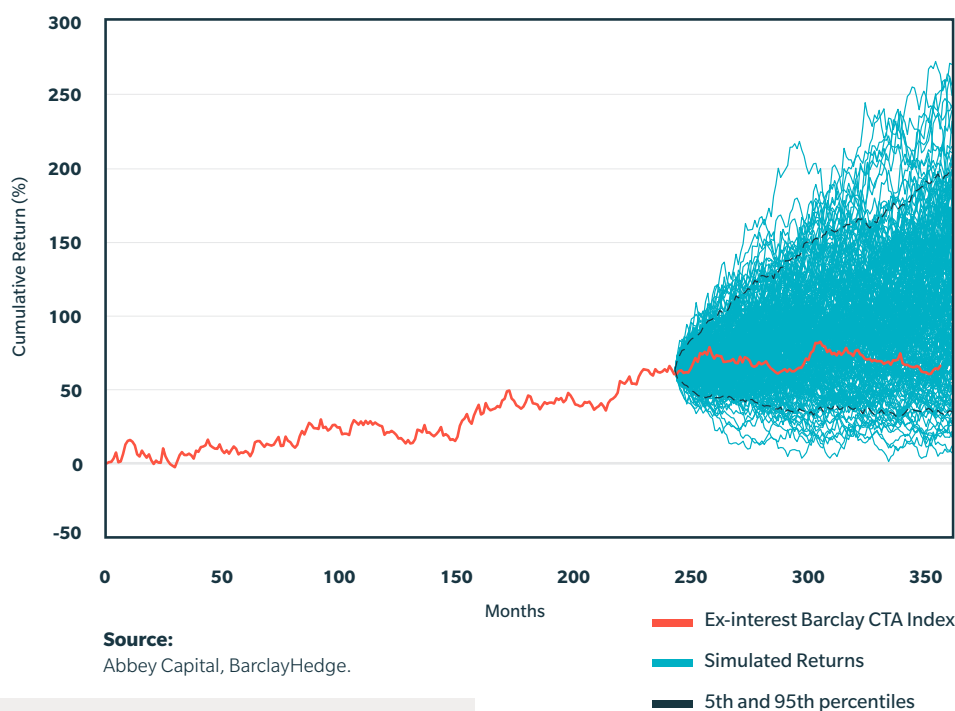
Construction Methodology:

Chart 1 shows the cumulative ex-interest returns for the Barclay CTA Index plotted in red. The ex-interest Barclay CTA Index returns are calculated using the US 3-month T-Bill as the risk-free rate and are therefore hypothetical. Simulated returns for the Jan-2010 to Jun-2019 period are generated through bootstrapping simulation and plotted in blue. The simulation is based on randomly sampled monthly returns from Jan-1990 to Dec-2009, generating 250 random return series, each one-decade long. The 5th and 95th percentiles of the simulated returns are plotted in navy.

Index and hypothetical data:

A detailed explanation of indices referenced can be found on page 22. **Please see page (i) for information about the inherent limitations of hypothetical performance results.**

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5 As at 30th June 2019.
6 See Chart 1 construction methodology for further information.

Chart 2.

Barclay CTA Index performance: 5 year rolling Sharpe ratio[7]
Dec 1991 to Jun 2019
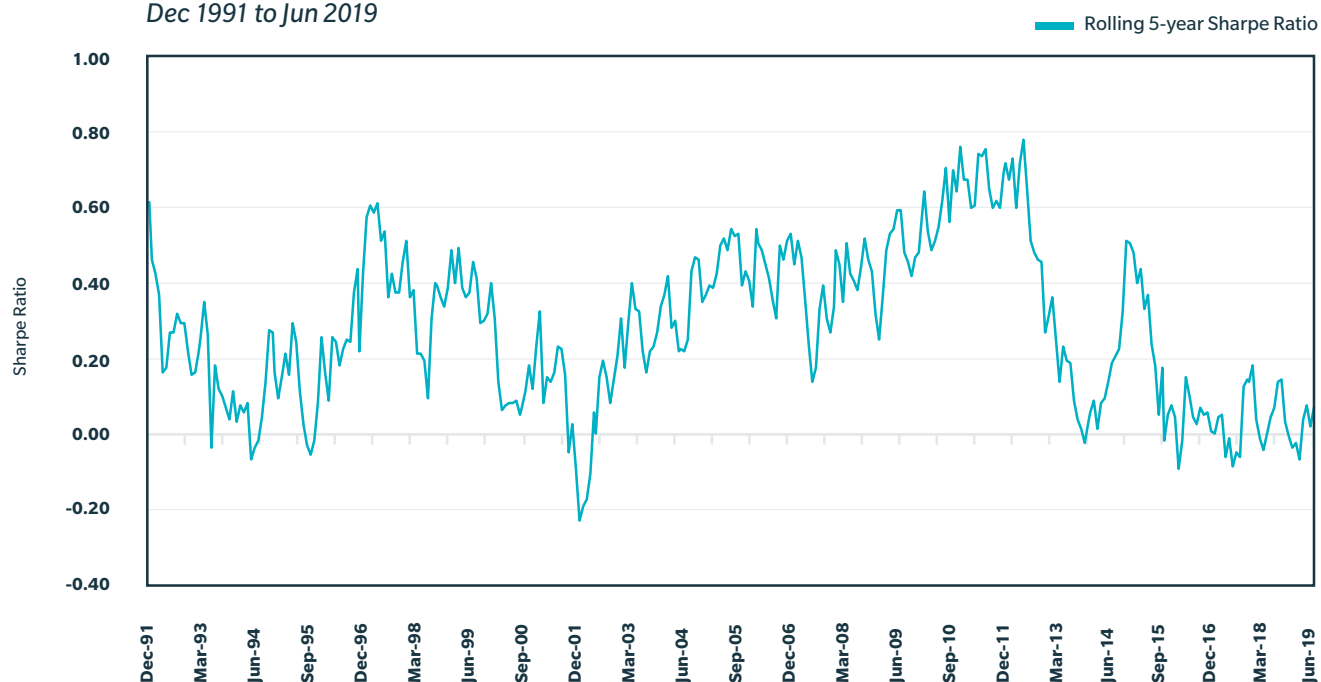
Equally, it is worth noting that we have seen similarly difficult periods for managed futures trading in the past. Looking at the rolling 5-year Sharpe ratio for the Barclay CTA Index (Chart 2) we can see that the late1990s/early 2000s were a particularly difficult period for managed futures. In that period, tough trading conditions for Commodity Trading Advisor were somewhat masked by higher returns from excess cash.

That said, the disappointing performance this decade has prompted investors and the financial media to put forward several theories to explain the lower performance.

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7 An explanation of the term "Sharpe ratio" is included in the Appendices.

Is there too much money in Trendfollowing?

One suggestion is that the shift in performance is due to the growth in assets in managed futures and Trendfollowing in particular. The argument appears to be that with more assets flowing into Trendfollowing, positions will get crowded and the resulting crowding will lead to a degradation in performance particularly when managers seek to exit positions at the same time.

Typically, such suggestions cite the increase in assets managed by CTAs. For example, data from BarclayHedge shows funds under management ("FuM") in managed futures have grown to just below $325bn in 2019[8] from circa $35bn in December 2000. However, we believe that this headline number masks important details. First, the overall FuM includes Trendfollowing and non-Trendfollowing managers. Non-trendfollowing managers are heterogeneous, pursuing diverse strategies such as discretionary and systematic macro, short-term trading and counter-trend; there is no reason to believe such managers would be consistently taking the same positions as Trendfollowers. Second, CTAs run their programs at different levels of volatility and can change their volatility over time; we believe the data should be adjusted for this effect to determine the true market impact.

To get a more meaningful estimate of Trendfollowing FuM, we split the BarclayHedge data into Trendfollowing and Non-Trendfollowing,[9] cleaned the data to ensure no duplication of programs, removed multi-manager programs and adjusted the data to a common level of volatility. Measured at the median level of Trendfollower volatility of 13%, Trendfollowing FuM is approximately $132bn as at 30th June 2019. While FuM is still higher in this decade versus the previous decade, the current level is about the same as in 2008, which was one of the strongest years for managed futures, suggesting that current FuM should not be an impediment to performance.

Chart 3.
Trendfollowers: Volatility-adjusted funds under management, adjusted to 13% volatility: Dec 2000 to Jun 2019
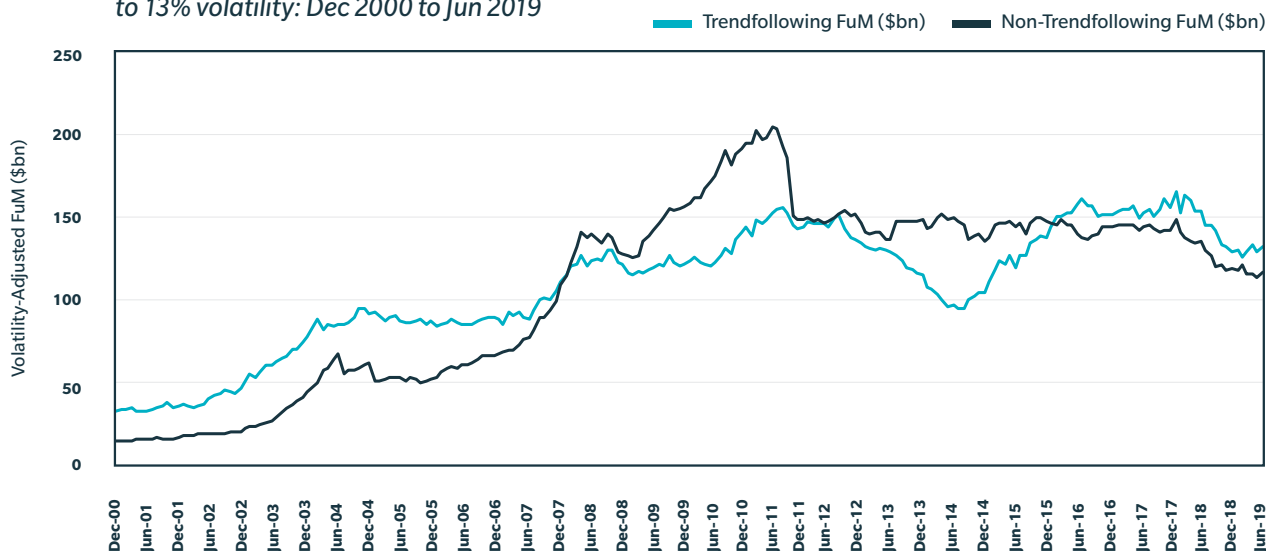
Construction Methodology:

Chart 3 shows volatility-adjusted Trendfollowing FuM and Non-Trendfollowing FuM. It was created by classifying the BarclayHedge database into Trendfollowing and Non-Trendfollowing programs; any program with a correlation of 0.5 or higher to the SG Trend Index was designated as a Trendfollowing program, while all other programs were designated as Non-Trendfollowing. Each program's FuM was volatility-adjusted to 13%, which is the median Trendfollowing program volatility in the BarclayHedge database. Thus, for example, a 10% volatility program would have its FuM adjusted by a factor of 1.3 [13%/10% = 1.3].

Hypothetical data: Please see page (i) for information about the inherent limitations of hypothetical performance results.

8 In 2019, there were 510 CTA programs in the Barclay CTA Index, a leading industry benchmark of CTA performance, with $325bn in assets under management in managed futures as at 30th June 2019.
9 Any program with a correlation of 0.5 or higher to the SG Trend Index was designated as a Trendfollowing program, while all other programs were designated Non-Trendfollowing.

Chart 4

Growth in open interest and volume across 55 futures markets: May 2001 to Jun 2019

Legend: Open Interest — Volume
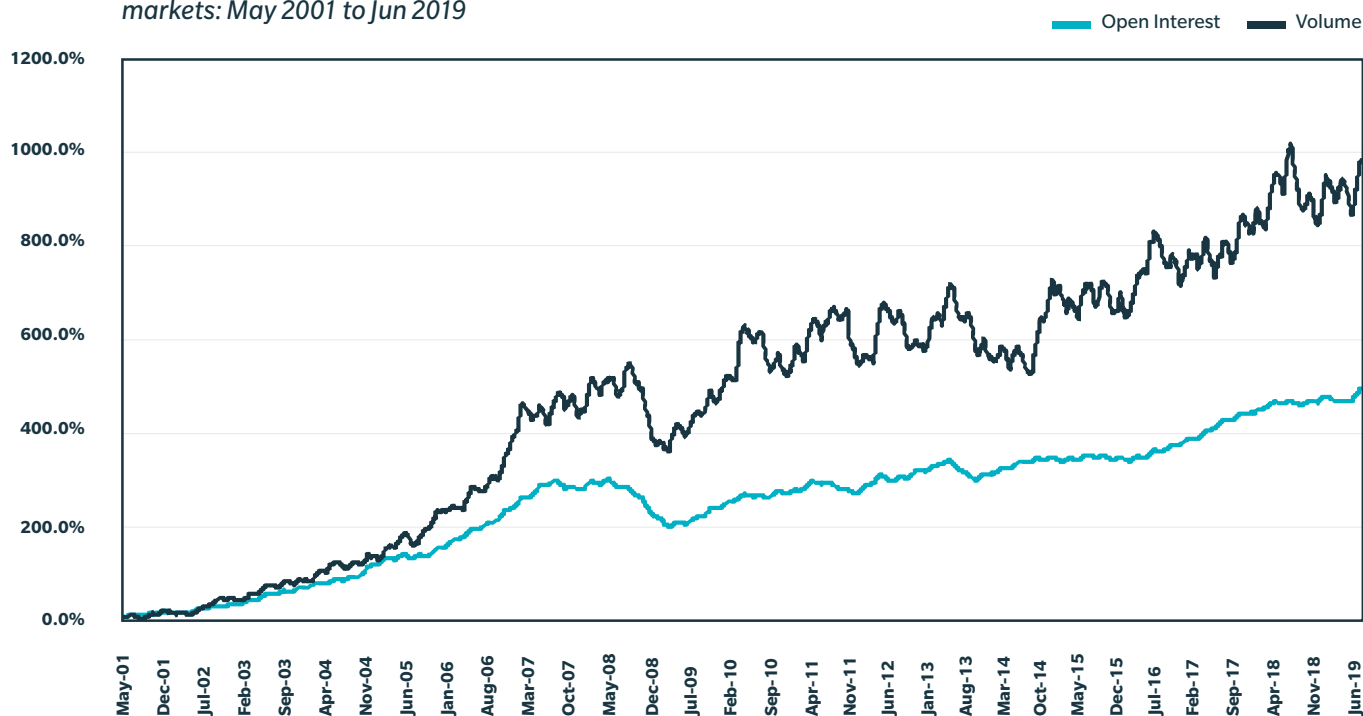
Construction Methodology:

Chart 4 shows the open interest and volume growth across the 55 markets that constitute the SG Trend Indicator. The data sample range is December 2000 to June 2019. The sample start date was chosen as this the furthest back that Abbey Capital performed its industry capacity study. Data above is shown from May 2001 as this is 100 days after the start of the sample period. For each contract we took the 100-day average open interest and volume at each point in time and calculated the growth of these averages. The charted Open Interest and Volume time series show the average growth across the markets relative to May-2001. Each market is included in the sample from the date that data is available; accordingly, not all 55 markets are used throughout the entire period.

The growth in assets traded by CTAs must be viewed in the context of the substantial growth in trading in futures generally. Across 55 major futures markets[10] we estimate open interest has grown by over 450%, and volumes by over 950%, since May 2001, which is greater than the growth in Trendfollowing FuM. CTAs also now have more markets to trade. Markets such as carbon emissions,

power and coal trading and some emerging market currencies were either not liquid enough to trade or not in existence 10 years ago. So the greater assets in managed futures have been spread across a larger number of contracts. Both factors suggest that the market impact from Trendfollowing may not have increased.

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10 Please also see the section entitled Market Data Sample in the Appendices for a description of how these 55 futures markets have been used in this paper.

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Are CTAs being gamed by other traders?

Another common assertion for the lower performance of Trendfollowing in recent years has been that CTAs may have been gamed by other market participants. The assertion is that faster-moving participants, such as high frequency traders, may be able to anticipate Trendfollowers' trades, trade ahead of them and generate gains by closing out positions when Trendfollowers trade.

However, HFTs are primarily involved in market making and scalping the market. To game a Trendfollower by trying to anticipate buying and selling flow, a HFT would likely have to take market risk for a number of hours if not longer; HFTs typically hold trades for milliseconds.

More generally, there have always been market makers in futures markets such as locals/floor traders so the profit being taken out of the market by market makers is nothing new. If anything, trading spreads and costs have declined, over time, with electronification of trading. Trading in cash equities and arbitraging between securities and ETFs offers more opportunities for HFT than futures trading as there are multiple trading locations in equities versus just one exchange in futures markets.

It is also important to bear in mind that CTAs have an incentive to try and game their own programs to improve performance i.e. if trading ahead of the anticipated flow was a profitable strategy then it would make sense for CTAs to adopt such strategies and effectively anticipate their own trades.

If CTAs were being systematically gamed by other market participants or if higher FuM was causing Trendfollowers to have greater market impact, it should be evident in slippage.[11] Based on the information and data provided by the underlying CTAs that Abbey Capital allocates to, we have not seen any deterioration in slippage. If anything, the trend has been for slippage to come down over time. **Indeed, when Newedge first developed the Newedge Trend Indicator[12] in 2000, slippage per trade was assumed at $50 per trade. In 2015 it was revised down to $25-$35 per trade, reflecting lower trading costs.**

CTAs have different ways of measuring slippage and an accurate measurement of it requires knowledge of the actual signals generating individual trades, which CTAs obviously will not disclose. An alternative way of assessing whether Trendfollowers may be in crowded trades or are being gamed is to look at the distribution of returns for Trendfollowers. The argument is that with too much money invested in Trendfollowing, positions become crowded and managers could realise large losses exiting positions due to crowding. Equally, if CTAs were being gamed when trading, this should be evident in performance during days with more trading.

Trendfollowers typically trade more frequently on days with negative performance rather than positive performance. Negative days for a Trendfollower, by definition, will be characterised by corrections or reversals of trends with managers often reducing or closing out positions. On positive days, the trends continue and managers typically maintain positions. Therefore, if higher trading costs, from the growth in assets or gaming, were significant drivers of the reduced returns in Trendfollowing, one would expect to see more negative performance on the worst days for Trendfollowers in recent years relative to the past.

To examine this, we analysed the daily returns of the SG Trend Index since inception, volatility adjusted each calendar year returns to the long-term realised volatility of the index,[13] and ranked the returns in each period. We then plotted the average return in each percentile in the first period versus the average return in each percentile in the second period to assess whether there was a degradation in performance on the worst days in the second period. Chart 5 (page 7) plots the data.

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11 Slippage measures the difference between the actual price realised at execution and the signal price which triggers the buy/sell decision.
12 The Newedge Trend Indicator is now called the SG Trend Indicator. For a description of the SG Trend Indicator please see page.
13 We volatility-adjust on a calendar year basis as the constituents of the index change annually potentially leading to a different volatility profile of the index from year to year.

Chart 5.

Adjusted SG Trend Index: First half versus second half of track record, percentile volatility-adjusted returns: Jan 2000 to Jun 2019

$$y = 1.0193x - 0.0002$$
$$R^2 = 0.9986$$

First Half: Average Volatility-Adjusted Returns by Percentile (%)

Second Half: Average Volatility-Adjusted Returns by Percentile (%)
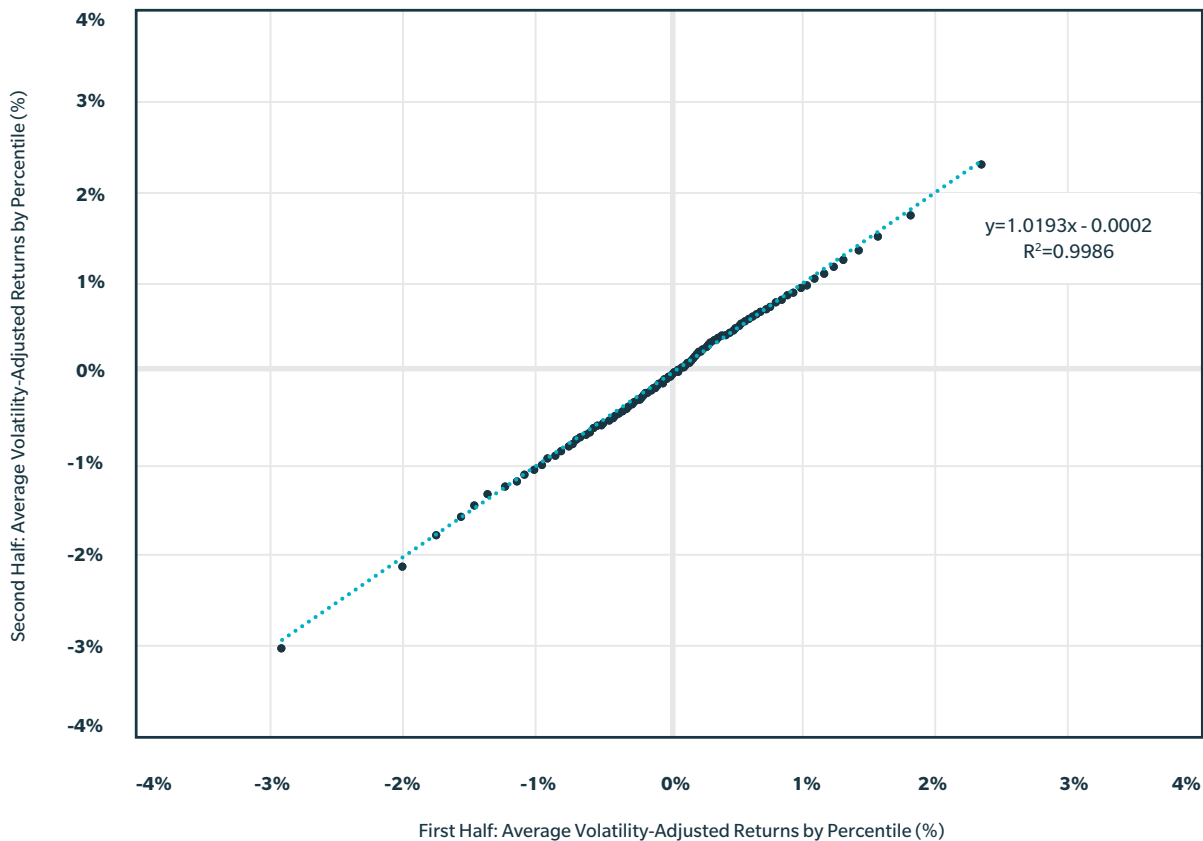
Source:
Abbey Capital, Bloomberg.

Construction Methodology:

Chart 5 plots volatility-adjusted returns, averaged by percentile to compare the first half and second half of the SG Trend Index's track record. The SG Trend Index returns are risk-adjusted each year to a common volatility of 13.4% – which is the full period volatility (Jan-2001 to Jun-2019). The risk adjustment is based on annual volatility, so that each year's daily returns would have the same volatility of 13.4%. This risk-adjustment methodology is necessary because the SG Trend Index is reconstituted each year in January, and so an adjustment is necessary for an accurate comparison between the first and second half of the track record. Each period's returns are ranked into percentiles, and the average risk-adjusted return for each percentile is calculated. These averages are then plotted to compare the first and second halves of the track record.

Hypothetical data: Please see page (i) for information about the inherent limitations of hypothetical performance results.

If the second period was exactly the same as the first period, the trendline would be at a 45° angle (the regression equation would be y=1.0x) and all points would be on the line. Instead, Chart 5 shows that the returns in the second period are lower than the first period.

Looking at the distribution of the returns the lower left quadrant shows that the most negative returns in the second period are not noticeably more negative than the first period (some dots are above the line and some are below). In fact, the average daily return in the lowest 5% of days in the second period is only 0.07% lower than the first period, which is statistically insignificant.[14]

In our opinion this is further evidence that there is no notable "crowding effect" in Trendfollowing or that CTAs are being systematically gamed.

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14 We also performed a Kolmogorov-Smirnov (K-S) test to determine whether the second period distribution is drawn from the same sample as the first period distribution and found that the two distributions are not significantly different from each other. The K-S test is a nonparametric test used to check if two samples have the same distribution, without making any assumptions about the type of distribution or its parameters. The test statistic is the largest difference between the cumulative distributions of the two samples; its behaviour is largely independent of the underlying data distributions.

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Have market trends become faster?

A third common explanation for the challenging performance of Trendfollowing is the suggestion that markets have changed and become faster such that typical medium-term and long-term Trendfollowers are too slow to capture the moves when they arise.

This assertion appears to be driven by observation of a small number of market moves rather than a systematic review of all of the main futures markets. For sure, the moves in US equities in February and December of 2018 were quick and the recovery in January 2019 was also notable for its speed. However, CTAs trade across multiple markets and many of these markets have exhibited relatively muted moves and no notable "speeding up". For example, gold has traded in a broad range with declining volatility for much of the last five years, while the rise in US yields through the Federal Reserve tightening cycle has, if anything, been slower and more controlled than in the past.

If the reason Trendfollowers had suffered poor performance was due to speed, then one might expect to see better performance of fast Trendfollowing systems relative to slow Trendfollowing systems in recent years.

However, looking at the performance of our proxy Trendfollowing systems of various hold periods since 1990 (see Table 2, page 9), we can see that in general there is no notable improvement in the performance of short-term systems in recent years. In fact, the stronger performance has been in the 1990s. The data also highlights that the more medium-term systems have performed better over time.

"in general there is no notable improvement in the performance of short-term systems in recent years."

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Table 2.

Annual performance (%) of hypothetical proxy Trendfollowing systems with hold periods of 5 to 40 days: 1990 to 2018

Hold Period (Days)

Years	5	5	7	8	9	10	13	14	15	16	17	18	20	22	23	24	24	26	28	30	30	30	31	31	33	34	35	35	36	36	40
2018	-23%	-8%	-18%	6%	-15%	1%	-11%	-8%	0%	-13%	-4%	-15%	-11%	-11%	1%	-13%	-11%	-9%	9%	5%	-10%	6%	-16%	10%	5%	-4%	-5%	-5%	-6%	-1%	-2%
2017	-32%	-28%	-32%	-7%	-17%	-21%	-14%	-18%	-12%	-6%	-3%	-18%	-15%	-18%	-7%	-17%	-11%	-10%	-7%	-18%	-12%	-4%	-20%	-5%	-9%	-2%	-8%	-24%	-22%	10%	-10%
2016	1%	-7%	-9%	2%	-21%	-5%	-23%	10%	-15%	-17%	13%	-18%	-15%	8%	-20%	-28%	5%	21%	13%	-5%	-17%	1%	-11%	5%	7%	2%	-9%	-5%	5%	-4%	-10%
2015	-52%	-52%	-44%	-37%	-27%	-29%	-33%	-24%	-34%	-34%	-12%	-35%	-21%	-12%	-35%	-39%	-11%	-7%	-16%	-28%	-30%	1%	-31%	7%	-2%	7%	-24%	-28%	-27%	8%	-20%
2014	-26%	-18%	4%	-8%	2%	6%	6%	13%	9%	-5%	24%	-9%	30%	44%	0%	-2%	35%	42%	28%	-8%	18%	5%	-6%	19%	37%	43%	15%	-11%	-7%	35%	38%
2013	-22%	-32%	-20%	-22%	-21%	-22%	-12%	-9%	-17%	-9%	-8%	-17%	-16%	-11%	-14%	-10%	0%	3%	2%	-17%	-14%	-4%	-14%	-5%	-5%	13%	-5%	-15%	-13%	23%	-4%
2012	-22%	-20%	-11%	-15%	-15%	-11%	-9%	-6%	-9%	-13%	-8%	-6%	-16%	-21%	-9%	-4%	-15%	-6%	-18%	-4%	-10%	-6%	-2%	-7%	-2%	1%	-13%	-2%	3%	-2%	-16%
2011	-1%	-14%	-25%	-11%	-27%	-26%	-28%	2%	-17%	-20%	-3%	-17%	8%	9%	-20%	-22%	7%	6%	2%	-20%	-14%	1%	-25%	-2%	-1%	-9%	-11%	-21%	-20%	-1%	-10%
2010	-10%	-5%	6%	1%	2%	14%	10%	11%	8%	7%	1%	6%	19%	0%	11%	6%	14%	1%	10%	5%	3%	-1%	0%	16%	22%	27%	8%	0%	2%	26%	14%
2009	-16%	-11%	-14%	-13%	-13%	-7%	-10%	-5%	-15%	-10%	-1%	-13%	6%	9%	-12%	-9%	7%	0%	2%	-8%	-7%	-4%	-12%	1%	-7%	-5%	-2%	-13%	-14%	-5%	6%
2008	5%	7%	30%	15%	14%	48%	31%	63%	35%	29%	53%	51%	60%	51%	48%	53%	54%	43%	45%	48%	82%	37%	61%	43%	29%	35%	64%	52%	48%	29%	68%
2007	-4%	-15%	3%	-9%	-16%	11%	0%	-6%	0%	3%	-8%	21%	14%	-1%	9%	-9%	10%	15%	12%	7%	-9%	7%	0%	9%	5%	6%	-10%	-4%	-20%	27%	-1%
2006	-3%	-22%	-24%	-28%	-22%	-22%	-28%	3%	-21%	-32%	-7%	-20%	10%	20%	-22%	-11%	0%	13%	6%	-20%	-3%	18%	-7%	20%	13%	11%	3%	4%	9%	5%	13%
2005	-21%	-23%	5%	-12%	-5%	10%	-10%	0%	-12%	-9%	3%	-13%	6%	19%	-4%	-6%	6%	-2%	6%	-3%	-6%	13%	-14%	12%	12%	11%	-8%	-15%	-17%	24%	-6%
2004	-25%	-18%	-11%	-10%	-6%	-13%	-17%	13%	-18%	-11%	9%	-21%	7%	-3%	-19%	6%	-5%	-9%	-3%	-1%	8%	-6%	3%	5%	17%	26%	3%	-2%	4%	17%	2%
2003	0%	0%	-6%	4%	1%	25%	-6%	6%	-7%	3%	6%	5%	14%	22%	14%	13%	22%	12%	20%	17%	8%	29%	14%	27%	29%	31%	7%	27%	20%	25%	9%
2002	5%	2%	-1%	-2%	15%	16%	13%	33%	15%	16%	30%	13%	32%	31%	12%	21%	28%	20%	19%	14%	28%	20%	29%	15%	20%	37%	32%	33%	40%	35%	41%
2001	-18%	-16%	-1%	-17%	-31%	10%	-10%	17%	-8%	-4%	-4%	7%	4%	8%	-1%	15%	5%	15%	29%	15%	17%	35%	26%	38%	37%	50%	8%	19%	16%	44%	7%
2000	-36%	-20%	5%	-19%	-4%	8%	1%	3%	2%	-3%	8%	1%	19%	29%	-2%	9%	20%	8%	15%	8%	16%	18%	-3%	21%	14%	4%	11%	0%	-2%	13%	22%
1999	0%	-2%	7%	-3%	-6%	-3%	-4%	-15%	-3%	-3%	4%	-9%	6%	8%	-5%	-12%	13%	8%	2%	-5%	-16%	6%	-14%	1%	1%	5%	5%	-12%	-16%	2%	11%
1998	21%	17%	53%	3%	4%	50%	35%	33%	46%	36%	17%	44%	29%	54%	39%	47%	52%	38%	49%	36%	32%	58%	36%	61%	53%	53%	25%	26%	28%	60%	27%
1997	-19%	9%	10%	1%	0%	44%	20%	13%	24%	25%	19%	29%	17%	12%	37%	23%	1%	16%	27%	36%	23%	62%	32%	49%	63%	76%	24%	16%	15%	77%	28%
1996	14%	12%	19%	15%	0%	7%	5%	24%	15%	10%	42%	4%	38%	38%	5%	12%	27%	39%	33%	6%	32%	46%	14%	39%	59%	52%	37%	32%	22%	44%	43%
1995	-2%	-17%	-14%	-12%	-25%	30%	-10%	17%	-18%	5%	23%	23%	29%	22%	18%	24%	19%	9%	23%	22%	25%	23%	30%	21%	35%	23%	34%	39%	32%	17%	35%
1994	-11%	-17%	-17%	-15%	-35%	0%	-15%	-12%	-19%	-13%	-8%	22%	7%	9%	-2%	5%	-7%	-13%	-17%	1%	4%	-10%	15%	-12%	-9%	3%	2%	2%	2%	-8%	5%
1993	1%	10%	7%	-5%	-17%	35%	-3%	41%	11%	10%	25%	16%	23%	45%	18%	19%	57%	46%	56%	11%	34%	51%	35%	52%	47%	55%	30%	43%	33%	35%	26%
1992	-8%	2%	-1%	0%	-3%	29%	7%	20%	0%	0%	9%	18%	2%	-1%	11%	29%	-1%	-7%	3%	13%	28%	7%	28%	11%	7%	32%	14%	22%	19%	30%	12%
1991	-9%	10%	23%	11%	6%	22%	30%	33%	22%	28%	14%	26%	28%	22%	31%	21%	28%	29%	28%	19%	15%	33%	14%	4%	6%	40%	21%	29%	22%	32%	
1990	19%	39%	44%	33%	24%	49%	33%	89%	42%	39%	39%	38%	12%	17%	54%	44%	42%	59%	44%	60%	70%	17%	46%	4%	8%	1%	61%	50%	53%	8%	42%

Construction Methodology:

Table 2 shows a return grid of simulated annual performance of 31 hypothetical trendfollowing systems, with an average hold period of 5 to 40 days. This hold period range is chosen to specifically show the performance of faster trendfollowing models. Hypothetical returns are shown on an annual basis from 1990 to 2018, with the colouring of the cells conditional on performance. The darkest blue colouring highlights the strongest performance, while the darkest red colouring shows the worst performance. **Please see page 23 for further information on the trendfollowing proxy returns used in this chart.**

Hypothetical data:

These results are based on simulated or hypothetical performance results that have certain inherent limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading. Also, because these trades have not actually been executed, these results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. Simulated or hypothetical trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to these being shown.

Please see page (i) for further information about the inherent limitations of hypothetical performance results.

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9

Has a more difficult market environment been the driver?

If these factors have not caused the lower performance, then what accounts for it? In our opinion, the obvious candidate is the market environment; Trendfollowers require a particular set of conditions (i.e. the existence of trends in markets)[15] to generate performance.

A casual observation of price charts can often be informative as to whether an individual market has exhibited a trend. However, to quantify how favourable the environment is across several markets, and over time, we have developed a number of proprietary market indicators.

As there are a number of factors which will influence the market environment for Trendfollowing including the size of the market moves, the choppiness of the market moves and whether volatility is increasing or decreasing, none of the indicators individually will offer a full explanation. Table 3 below highlights that each indicator has its own merits and drawbacks but taken together the indicators can paint a picture of the environment.

Table 3.
Market Indicators and Proxies of Trendfollowing performance[16]

		Indicator/Signal	Advantage	Disadvantage
Market Indicators	**Size of market movement**	Average risk-adjusted change across markets	Highlights the size of the moves across future markets	Trendfollowing performance depends on the nature of the price move as well as the size of the move
		Number of markets experiencing a 1-standard deviation ("SD") move		
	Percentage of time trending	Percentage of markets in a trend over time	Highlights how often futures markets have been in a trending state	Doesn't tell you the size of the moves on the days when the market is trending vs reversing
		Average length of trend		
	Quality of trends	Directional Efficiency	Gives information as to whether the market movement is generally in the direction of the major trend	Doesn't give a sense of the likely size of exposure and profitability of Trendfollowing
		Reversal		
Trendfollowing Proxies	**Performance of proxy Trendfollowing systems**	Market momentum	Measures how a Trendfollower would likely have performed given a particular market environment	Must make assumptions about lookback period for volatility and correlation and risk allocation methodology
		Moving average crossover system		
		Breakout models		

Source:
Abbey Capital.

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15 A description of the Market Trending Phases is provided in the Glossary on page 22.
16 Note that the average risk-adjusted change across markets, average length of trend and reversal indicator are not displayed individually in this paper, however these indicators are used for the rankings in Table 5.
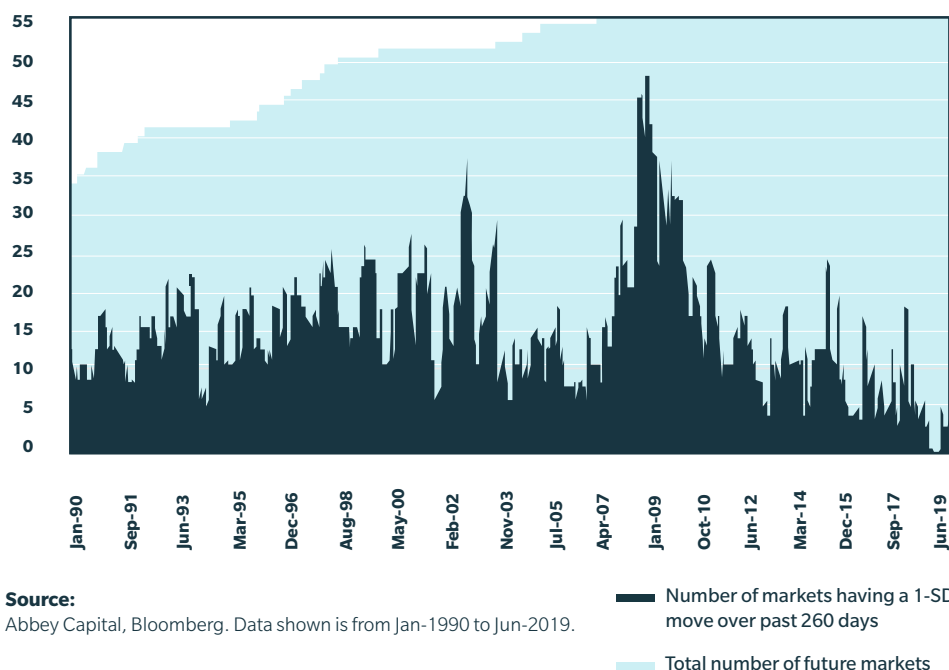

Size of market move

At the simplest level Trendfollowing will tend to do well when there are large directional moves in markets. Larger moves will offer Trendfollowers the opportunity to get into a position and profit from the move. We assess this by looking at the average absolute changes across major futures markets and the number of futures markets exhibiting 1-standard deviation[17] moves in a given time period.

Chart 6.

Number of markets experiencing a 1-standard deviation move:
Jan 1990 to Jun 2019

	1990s	2000s	2010s
Average annual number of 1-SD moves	15.5	19.8	12.1
Average number of markets available	42.5	52.7	55.0
Percentage of markets with a 1-SD move	36%	37%	22%

Source:
Abbey Capital, Bloomberg. Data shown is from Jan-1990 to Jun-2019.

■ Number of markets having a 1-SD move over past 260 days

■ Total number of future markets

Construction Methodology:

Chart 6 shows the number of markets experiencing a 1-standard deviation move over each previous 260-day period. Annual price moves for the 55 markets that constitute the SG Trend Indicator are used. The absolute value of the 260-day price move is calculated and the chart shows a count of how many markets experienced at least a 1-standard deviation move (a market with 21% volatility would have a 1-standard deviation move of 21%). The number of markets that experienced a 1-standard deviation move and the number of available futures markets are plotted. Each market is included in the sample from the date that data is available; accordingly, not all 55 markets are used throughout the entire period.

Chart 6 shows the number of futures markets in which the absolute 260-day return is greater than 1-standard deviation.[18] It is clear there have been fewer large moves in the last decade relative to the 1990s or the 2000s. As of the end of December 2018, one market had experienced a 1-standard deviation move over the previous 260 days versus 44 markets for the same period in 2008. Also, the percentage of markets experiencing a 1-standard deviation, 260-day move is notably lower since 2010 versus the two previous decades. (Note that the number of futures markets with data available increased over the years, hence it is important to look at the percentage reading).

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17 A description of standard deviation is provided in the Glossary on page 22.
18 We examine 55 futures markets. In the 1990s and early 2000s some of the futures markets were not yet in existence so no data is available. Please also see the section entitled Market Data Sample in the Appendices for a description of how these 55 futures markets have been used in this paper.

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Percentage of time trending

However, large moves themselves do not necessarily guarantee strong performance for Trendfollowing. Markets could move but be very choppy (for example, moving up 8%, then down -6%, then up 8%) and in such a situation it may be difficult for a Trendfollower to maintain the position and profit from the moves.

For that reason, it may be informative to assess the percentage of time markets are trending. We do this in two ways (1) by classifying whether a market is in a trend, consolidation or correction phase by reference to the price and moving averages[19] and (2) by measuring the duration of trends for a typical trading strategy (such as a 20-120 day moving average crossover).[20]

Chart 7.
Percentage of markets trending versus decade averages: Jan 1990 to June 2019
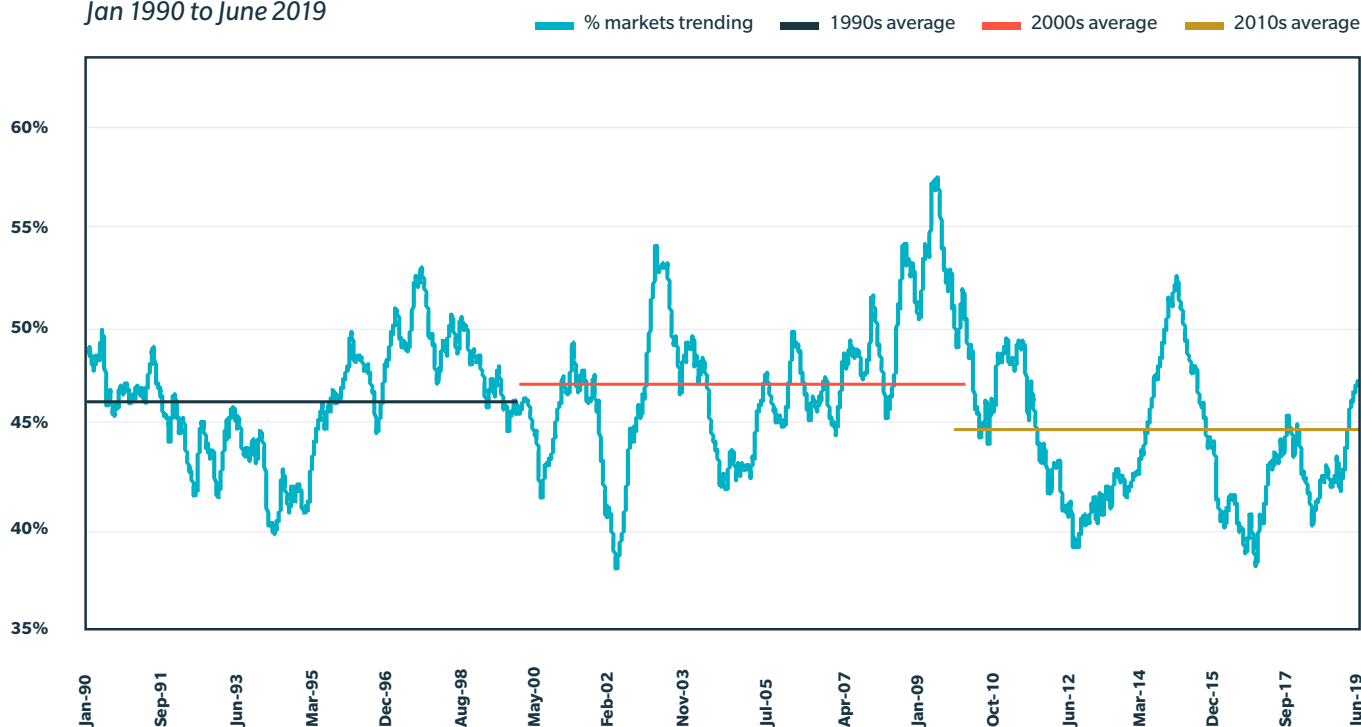
Source:
Abbey Capital, Bloomberg. Data shown is from Jan-1990 to Jun-2019.

Construction Methodology:

Chart 7 shows the 260-day average percentage of markets trending versus each decade's average percentage of markets trending. The 55 markets that constitute the SG Trend Indicator are analysed and categorised as either (i) Trending, (ii) Consolidating / Reversing, or (iii) No Trend. The results are aggregated (sector-averaged) to calculate the percentage of markets in each phase. The decade averages are simple averages of the 260-day measure within each decade (1990s, 2000s, 2010s to Jun-2019).
A description of Market Trending Phases is provided in the glossary on page 22.

Chart 7 shows the percentage of markets trending over time and the average in each decade. We can see that the percentage of markets in a trending state in recent years has been lower and the average since 2010 is below that of the 1990s and 2000s.

Of course, this also does not tell the whole story as the indicator doesn't tell you how much directional movement there is on the trending days versus the non-trending days.

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19 A description of the Market Trending Phases is provided in the Glossary on page 22.
20 Research from Societe Generale has indicated that a 20-120 day moving average cross strategy (which has about an 80-day average hold period) was most representative of the trading of Trendfollowers. Therefore, unless otherwise stated, we use this system as the default trading system when analysing trending phases in this paper.

Quality of trends[21]

A third approach to measuring the market environment is to quantify the efficiency of the price movement from the perspective of a Trendfollower. A price move with fewer reversals will make it easier for a Trendfollowing system to hold a position and will be more efficient. Two ways of looking at this are (1) Directional Efficiency ("DE"), which measures how much of a price move is in the direction of the major trend and (2) a cross-market reversion indicator which measures how much reversion rather than directional movement there is in a given price move.

Looking at the DE, we can see that the price moves across the 55 main futures markets have generally not been favourable for a Trendfollowing strategy in recent years.[22] Again, this indicator, by itself, does not tell the whole story as it fails to give any consideration to how much exposure a CTA may have to each market. Obviously, it matters greatly to a Trendfollower that the price move is in the direction of the trend on a day when exposures are elevated versus a day when the exposure is low.

Taken together, the market indicators highlight that the recent decade has produced a market environment characterised by smaller market moves and fewer sustained market trends.

Chart 8.

Cross-market Directional Efficiency:
Jan 1990 to June 2019
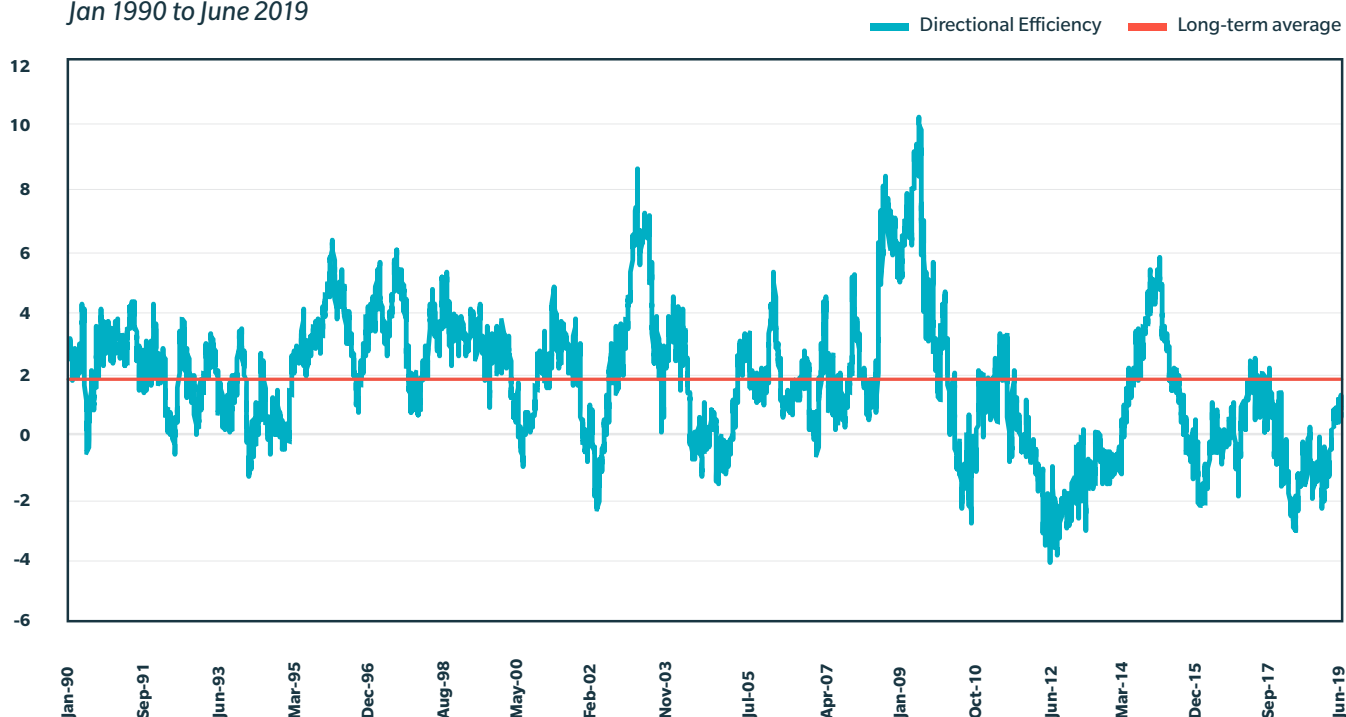
Source:
Abbey Capital, Bloomberg. Data shown is from Jan-1990 to Jun-2019.

Construction Methodology:

Chart 8 shows 260-day average cross-market directional efficiency. **Please see page 23 for an explanation of the Directional Efficiency indicator.** The study assesses each contract constituent of the SG Trend Indicator individually, before sector-averaging the results to derive the cross-market indicator. The long-term average is also plotted for illustrative purposes, calculated from Jan-1990 to Jun-2019.

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21 See the Appendices for the information and assumptions used in this document regarding Directional Efficiency.
22 Please also see the section entitled Market Data Sample in the Appendices for a description of how these 55 futures markets have been used in this paper.

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Table 4.

Annual performance (%) of hypothetical proxy Trendfollowing systems:
1990 to 2018

Trendfollowing proxies

An alternative approach to evaluating the market environment for Trendfollowing in a given period is to examine the hypothetical performance of ("Trend proxies"). We assess the performance of moving average crossover breakout and momentum systems[23] over different time periods.

In our opinion, the benefit of looking at Trend proxies is that they more closely resemble the actual trading of Trendfollowers, take into account how CTAs allocate risk across sectors and incorporate volatility and correlation into their programs. Looking at the Trend proxy performance paints a similar picture to the indicators; performance has been more difficult in recent years.

If the Trend proxies were indicating positive performance for Trendfollowing which was not being achieved by CTAs, that may be a warning flag of a structural problem with the space (e.g. in theory this could happen if slippage was substantially greater than we assume in our models). However, this is not the case.

	Model Type								
	Momentum			**Breakout**			**Moving average crossover**		
	20-Day	60-Day	260-Day	20-Day	60-Day	120-Day	5-40 Day	10-80 Day	20-120 Day
2018	1%	-4%	-1%	5%	-7%	-1%	-13%	-7%	-2%
2017	-21%	-3%	10%	-18%	-2%	-11%	-17%	-11%	-9%
2016	-5%	13%	-4%	-5%	10%	12%	-28%	-3%	7%
2015	-29%	-12%	8%	-28%	-5%	-6%	-39%	-21%	-4%
2014	6%	24%	35%	-8%	46%	43%	-2%	15%	51%
2013	-22%	-8%	23%	-17%	-6%	4%	-10%	-9%	-8%
2012	-11%	-8%	-2%	-4%	-10%	-9%	-4%	-9%	-13%
2011	-26%	-3%	-1%	-20%	-3%	5%	-22%	-10%	2%
2010	14%	1%	26%	5%	2%	14%	6%	10%	5%
2009	-7%	-1%	-5%	-8%	7%	2%	-9%	1%	9%
2008	48%	53%	29%	48%	59%	51%	53%	60%	55%
2007	11%	-8%	27%	7%	-9%	15%	-9%	-10%	9%
2006	-22%	-7%	5%	-20%	10%	5%	-11%	5%	19%
2005	10%	3%	24%	-3%	3%	8%	-6%	-6%	5%
2004	-13%	9%	17%	-1%	5%	-1%	6%	4%	8%
2003	25%	6%	25%	17%	9%	27%	13%	8%	18%
2002	16%	30%	35%	14%	42%	30%	21%	32%	33%
2001	10%	-4%	44%	15%	-4%	8%	15%	6%	2%
2000	8%	8%	13%	8%	3%	23%	9%	9%	25%
1999	-3%	4%	2%	-5%	14%	14%	-12%	6%	20%
1998	50%	17%	60%	36%	11%	70%	47%	20%	44%
1997	44%	19%	77%	36%	20%	10%	23%	28%	11%
1996	7%	42%	44%	6%	42%	38%	12%	38%	41%
1995	30%	23%	17%	22%	34%	24%	24%	33%	39%
1994	0%	-8%	-8%	1%	6%	-3%	5%	7%	2%
1993	35%	25%	35%	11%	27%	55%	19%	37%	31%
1992	29%	9%	30%	13%	-3%	0%	29%	11%	3%
1991	22%	14%	22%	28%	15%	19%	31%	28%	25%
1990	49%	39%	8%	60%	37%	25%	44%	57%	33%

	Average Annual Return								
2010s	-10%	0%	11%	-10%	3%	6%	-14%	-5%	3%
2000s	9%	9%	21%	8%	13%	17%	8%	11%	18%
1990s	26%	19%	29%	21%	20%	25%	22%	27%	25%

Source:
Abbey Capital, Bloomberg.

Construction Methodology:

Table 4 shows the annual performance of 9 hypothetical trendfollowing systems each year from 1990 to 2018 as this is a study of full calendar years only. There are three model types shown: momentum, breakout and moving average cross over. For each model type, there are three different model speeds chosen (therefore, totalling 9 hypothetical trendfollowing systems), in order to give a broader view of trendfollowing performance over time. The darkest blue colouring highlights the strongest performance, while the darkest red colouring shows the worst performance. **Please see page 23 for further information on the trend proxy system methodology and page 22 for a description of moving average crossover, breakout and momentum systems.**

Hypothetical data:

These results are based on simulated or hypothetical performance results that have certain inherent limitations. Unlike the results shown in an actual performance record, these results do not represent actual trading. Also, because these trades have not actually been executed, these results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity. Simulated or hypothetical trading programs in general are also subject to the fact that they are designed with the benefit of hindsight. No representation is being made that any account will or is likely to achieve profits or losses similar to these being shown. **Please see page (i) for further information about the inherent limitations of hypothetical performance results.**

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23 A description of moving average crossover, breakout and momentum systems can be found in the Appendices.

Table 5.

Annual rank of proprietary Abbey Capital market indicators and Trend proxies: 1990 to 2018

Comparing the indicators versus performance

Taking both the indicators and the proxies together, ranking them by the best year and comparing them versus the actual performance of the Barclay CTA Index we can see that both the indicators and the proxies are consistent with the reduced performance.

	Size of Move*	Percentage of Time Trending*	Trend Quality*	Trend Proxy Performance	Barclay CTA Index Rank	Barclay CTA Index Performance
2018	28	26	28	24	29	-3.2%
2017	27	21	22	28	19	0.7%
2016	26	28	26	21	24	-1.2%
2015	28	20	29	29	26	-1.5%
2014	22	7	6	9	11	7.6%
2013	17	26	19	25	25	-1.4%
2012	23	29	23	26	27	-1.7%
2011	25	21	27	27	28	-3.1%
2010	12	10	17	15	12	7.0%
2009	2	11	12	22	20	-0.1%
2008	1	3	2	1	2	14.1%
2007	18	6	21	19	10	7.6%
2006	23	17	10	23	15	3.5%
2005	21	15	16	17	17	1.7%
2004	15	18	20	18	16	3.3%
2003	5	1	7	11	8	8.7%
2002	3	7	1	7	4	12.4%
2001	13	24	23	14	18	0.8%
2000	6	13	9	13	9	7.9%
1999	4	16	4	16	23	-1.2%
1998	15	3	15	2	13	7.0%
1997	8	1	8	6	5	10.9%
1996	7	5	3	5	7	9.1%
1995	10	11	5	8	3	13.6%
1994	10	25	13	20	21	-0.7%
1993	8	18	10	4	6	10.4%
1992	20	21	23	12	22	-0.9%
1991	18	7	13	10	14	3.7%
1990	14	14	18	3	1	21.0%

Source:
Abbey Capital, Bloomberg. Data is shown from Jan-1990 to Dec-2018 as this is a study of full calendar years only. The colouring in the table is based on ranking. The best rank (1) will have the darkest blue, while the worst rank (29) will have the darkest red.

In short, the data suggests the primary reason for the tough performance in recent years has been fewer large moves and fewer sustained trends across futures and FX markets.

*Size of Move averages the rank for Average Absolute Risk-Adjusted Move and Percentage of Markets Experiencing a 1-SD move. Percentage of Time Trending averages the rank for Percentage of Markets Trending and Average Trend Length. Trend Quality averages the rank for Directional Efficiency and the Reversal Indicator. Trend Proxy Performance is the annual rank of the average return across the 9 hypothetical trendfollowing proxy systems shown on Table 4. **Please see page 23 for further information on trend proxy system methodology. A description of the Barclay CTA Index can be found on page 22.**

Hypothetical data:

Please see page (i) for information about the inherent limitations of hypothetical performance results.

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Why have there been fewer sustained trends?

Trends can develop in markets due to many diverse reasons and the timing of the occurrence of major trends tend to be somewhat random. Our data shows that in some years there have been strong moves and sustained trends across several markets whereas in other years there have been few trends. The development of major trends can sometimes be traced to major economic events (such as the Global Financial Crisis) and policy shifts (e.g. ECB easing in 2014) but in other cases they have been driven by more idiosyncratic events (e.g. the decline in soybeans in April and May of 2019 linked to swine flu in China). It is possible that the recent decade has just, due to chance, had fewer events which have been significant enough to generate sustained trends.

That said, some features of the macroeconomic and policy environment may also offer insight as to why we have seen fewer trends. For one, the macroeconomic backdrop has been more stable in the last decade versus the 1990s and 2000s. The global economy since 2010 has, to an extent, been dealing with the after-effects of the Global Financial Crisis. Headwinds of deleveraging, coupled with long-term challenges such as demographics has resulted in a long but steady economic upswing.

Chart 9.

US Quarterly GDP growth annualised: Jan 1990 to Jun 2019

1990s: +7.0% / -3.6%   2000s: +7.5% / -8.4%   2010s: +5.5% / -1.1%
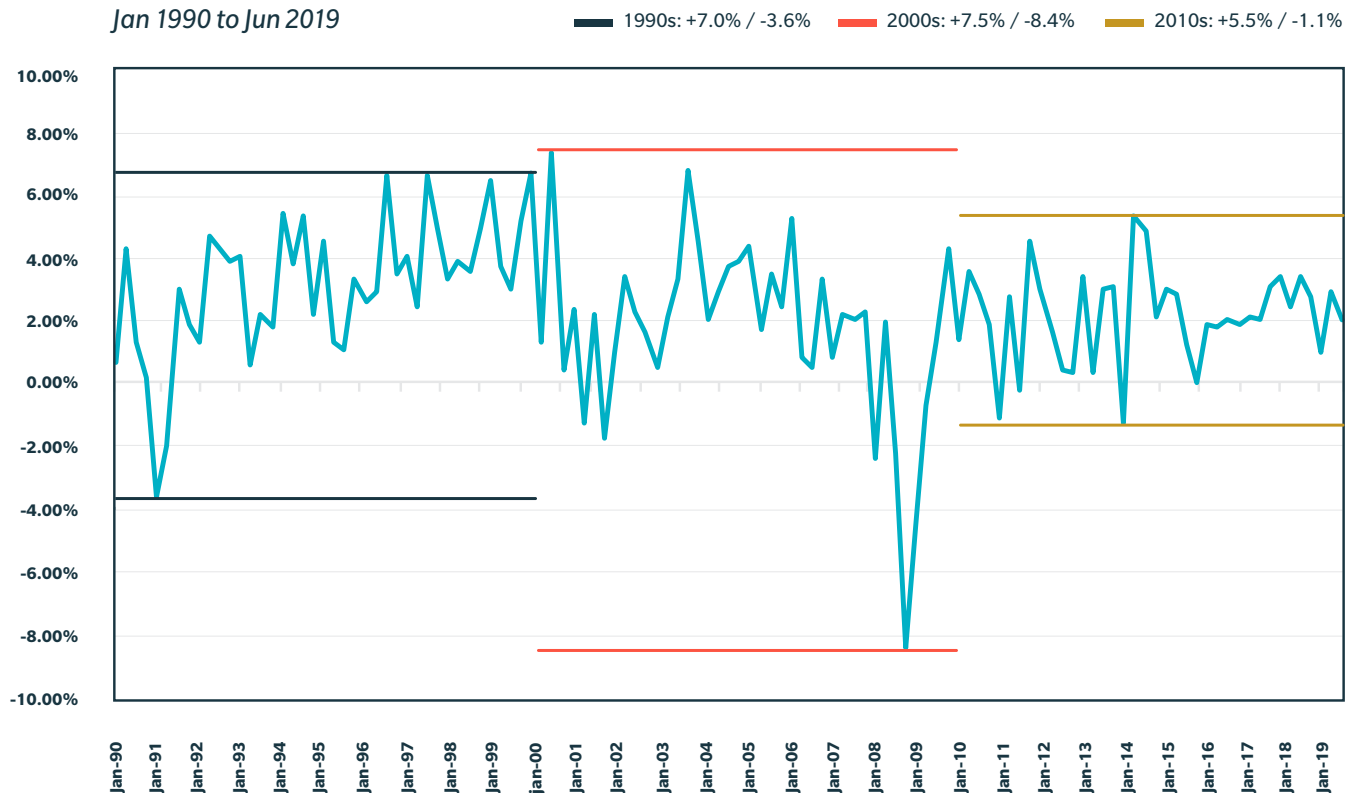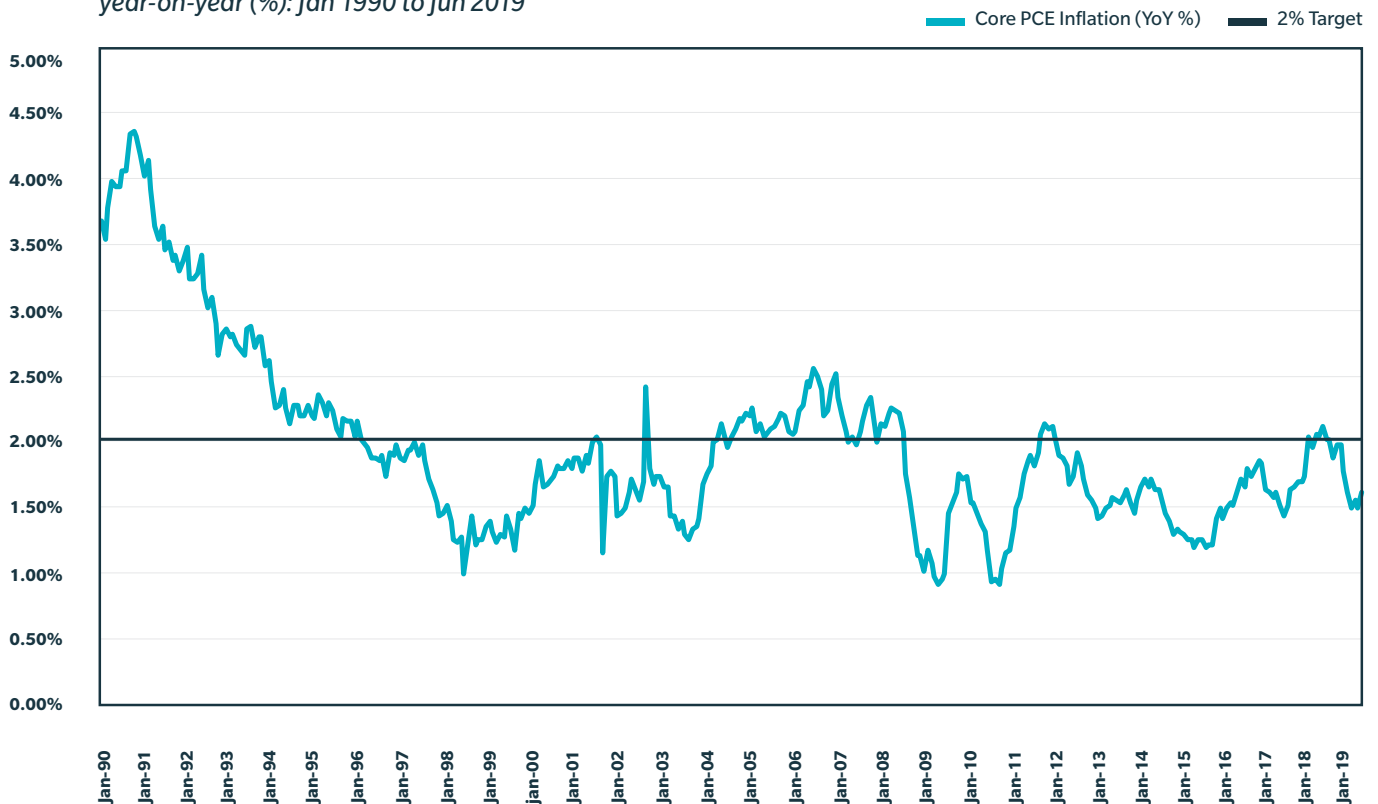

Source:
Abbey Capital, Bloomberg.

Economic growth has been unspectacular with some economists arguing that secular stagnation[24] may be the new norm. For example, Chart 9 shows US GDP growth has been less variable than in the 1990s or in the 2000s and indeed, according to data from the National Bureau of Economic Research, the US economy has not yet had a recession in the 2010s, the first decade this has occurred since data began in 1854.

Inflation has also been very stable for much of this decade. After the Global Financial Crisis inflation fell sharply and central banks responded to the decline in core inflation with quantitative easing ("QE"). However, since 2011, US core inflation has been very stable and below the Federal Reserve's ("Fed") 2% target allowing the Fed to be slow and gradual in adjusting interest rates and allowing the Fed to pivot away from monetary tightening when equities

declined in early 2016 and Q4 2018. Low and stable inflation has supported traditional assets but may also have contributed to fewer major moves in financial and commodity markets.

Chart 10.

US Core Personal Consumption Expenditures ("PCE") Index price deflator year-on-year (%): Jan 1990 to Jun 2019

Core PCE Inflation (YoY %)   2% Target

Source:
Abbey Capital, Bloomberg. The 2% target refers to the Federal Reserve's target rate of inflation.

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24   For example, see Summers, L (2016) The Age of Secular Stagnation. Foreign Affairs.

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The Global Financial Crisis prompted central banks to cut interest rates aggressively, while the slow economic upswing and lack of inflationary pressures has allowed policymakers to either keep interest rates at exceptionally low levels or raise them very gradually. We have not seen significant interest rate cycles in the last decade unlike the 1990s and the 2000s. Central banks have also been keen to minimise the market impact of policy decisions by being gradual and giving extensive forward guidance regarding policy. This has directly limited the trading opportunities for CTAs in interest rate futures but may also have contributed to more muted directional movement in markets such as fixed income and currencies.

Chart 11.

1-year Change in Official Interest Rate of ECB/Bundesbank, Bank of Japan and Federal Reserve: Dec 1990 to Jun 2019

ECB/Bundesbank   Federal Reserve   Bank of Japan
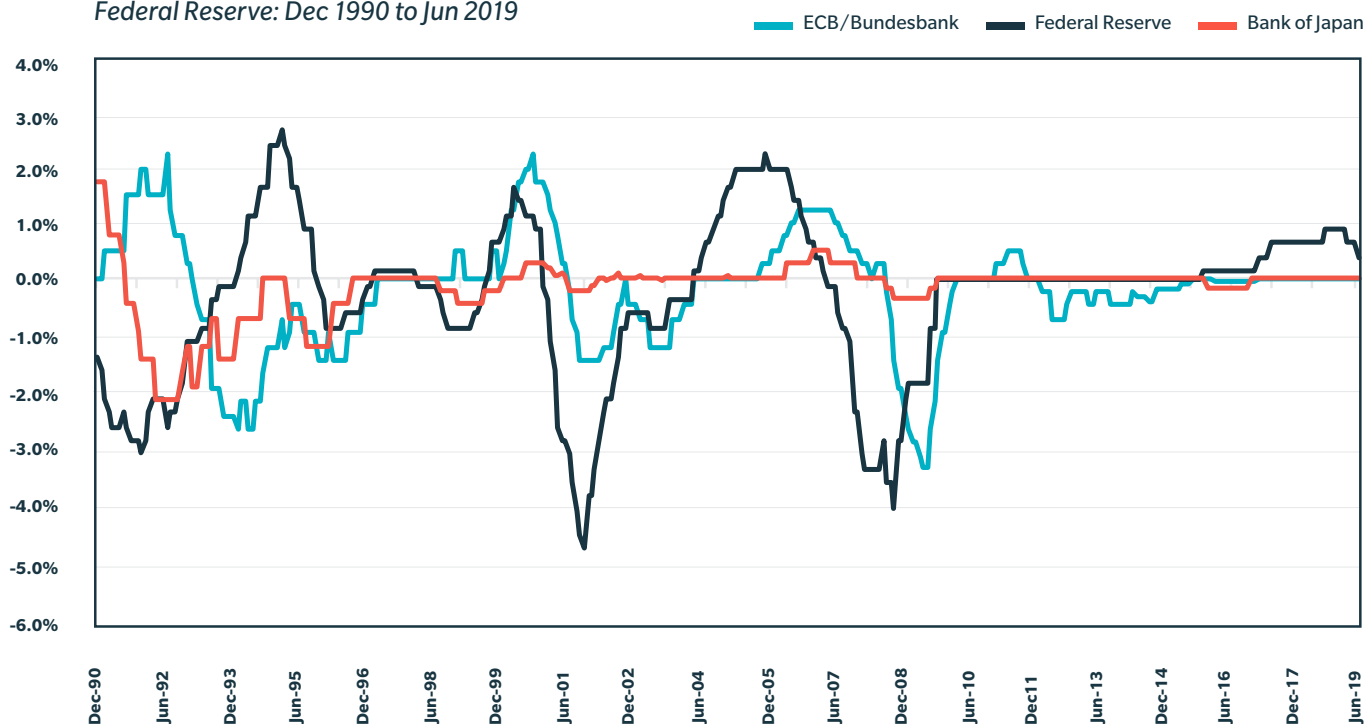
Source:
Abbey Capital, Bloomberg. The data sample is Jan-1990 to Jun-2019, which is consistent with Chart 10. Data above is shown from Dec-1990 as the chart shows the 12-month rolling changes. The European Central Bank (Bundesbank prior to 1999), Federal Reserve and Bank of Japan were selected as the most influential central banks over this period.

As interest rates have been constrained by the zero bound,[25] central banks have adopted a range of unconventional monetary policies including QE and forward guidance. This has resulted in a substantial increase in the balance sheets of the major central banks.

Economists are split regarding the impact of QE on the economy[26] and equally it is difficult to categorically assess the impact of QE on financial markets. For example, the introduction of QE by the ECB in 2014 coincided with a strong trend in European bonds and the EUR that year. However, the stated aim of QE has been to reduce risk premia and this, along with the lower macro volatility, may have contributed to low volatility in fixed income markets in the last decade.

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25   Zero bound is the term used in monetary policy when central banks lower interest rates to zero and are forced to use unconventional monetary policies to further stimulate the economy.

26   For example, see Greenlaw et al (2018) A Skeptical View of the Impact of the Fed's Balance Sheet.

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What might prompt greater directional movement in markets?

Looking ahead, while it is possible that the current environment characterised by lower volatility in macro variables and few sustained trends continues, in our opinion, there are reasons for believing that at some point the environment will change.

First, economic growth in the US, in particular, has been unusually stable in the last decade with no major booms and no recessions. While it is possible that this goldilocks scenario continues, based on longer-term history, we believe that it would be prudent to expect more variability in economic conditions going forward. Greater fluctuation in GDP growth may lead to greater directional movement in assets linked to the business cycle like industrial commodities, equities and bonds.

Second, low inflation in recent years has made it relatively easy for central banks to respond to increases in market volatility and tightening of financial conditions by easing policy. However, if inflation were to increase it may create more of a policy dilemma for central banks should equities decline in an environment where inflation was accelerating.

Third, the low level of market volatility and macro volatility may be leading to a slow and gradual increase in imbalances. The experience of the early 2000s and Global Financial Crisis has shown that macro stability can ultimately lay the seeds for an increase in market volatility (i.e. a "Minsky moment") as low volatility may engender complacency and encourages risk taking.

Many economists and think tanks have voiced concerns over the imbalances which are currently developing in the global economy, so the current stability may not be a guide to future market conditions.[27]

Fourth, quantitative easing and central bank balance sheet expansion, have been important components of policymaking in the last decade and may have contributed to the lower market volatility. More recently, the Fed has shifted from QE to quantitative tightening, the European Central Bank ("ECB") stopped buying assets and the Bank of Japan ("BoJ") has bought assets at a reduced rate resulting in balance sheet reduction across the major central banks. QE may be less of a theme in markets going forward, particularly as the economic impact of the measures taken to date remains disputed.[28]

"The experience of the early 2000s and Global Financial Crisis has shown that macro stability can ultimately lay the seeds for an increase in market volatility (i.e. a Minsky moment) as low volatility may engender complacency and encourages risk taking."

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27 For example, see IMFBlog Sounding the Alarm on Leveraged Lending, November 2018.
28 For example, see Greenlaw et al (2018) A Skeptical View of the Impact of the Fed's Balance Sheet.

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If there is less use of QE going forward, then the onus may fall on fiscal policy as the primary tool for macroeconomic demand management. The recent increase in influence of Modern Monetary Theory[29] highlights the shift in thinking amongst some politicians and economists about the need for more active fiscal management. Greater use of fiscal policy, particularly debt financed policy, could lead to higher fiscal deficits and greater volatility in fixed income markets, particularly if central banks are not active buyers of bonds.

Chart 12.

Size of Balance Sheet and 12-month change in Balance Sheet: ECB, Bank of Japan, Federal Reserve and People's Bank of China: Jan 2003 to Jun 2019

Total ($bn) ━━━ 12-month change ($bn) ━━━
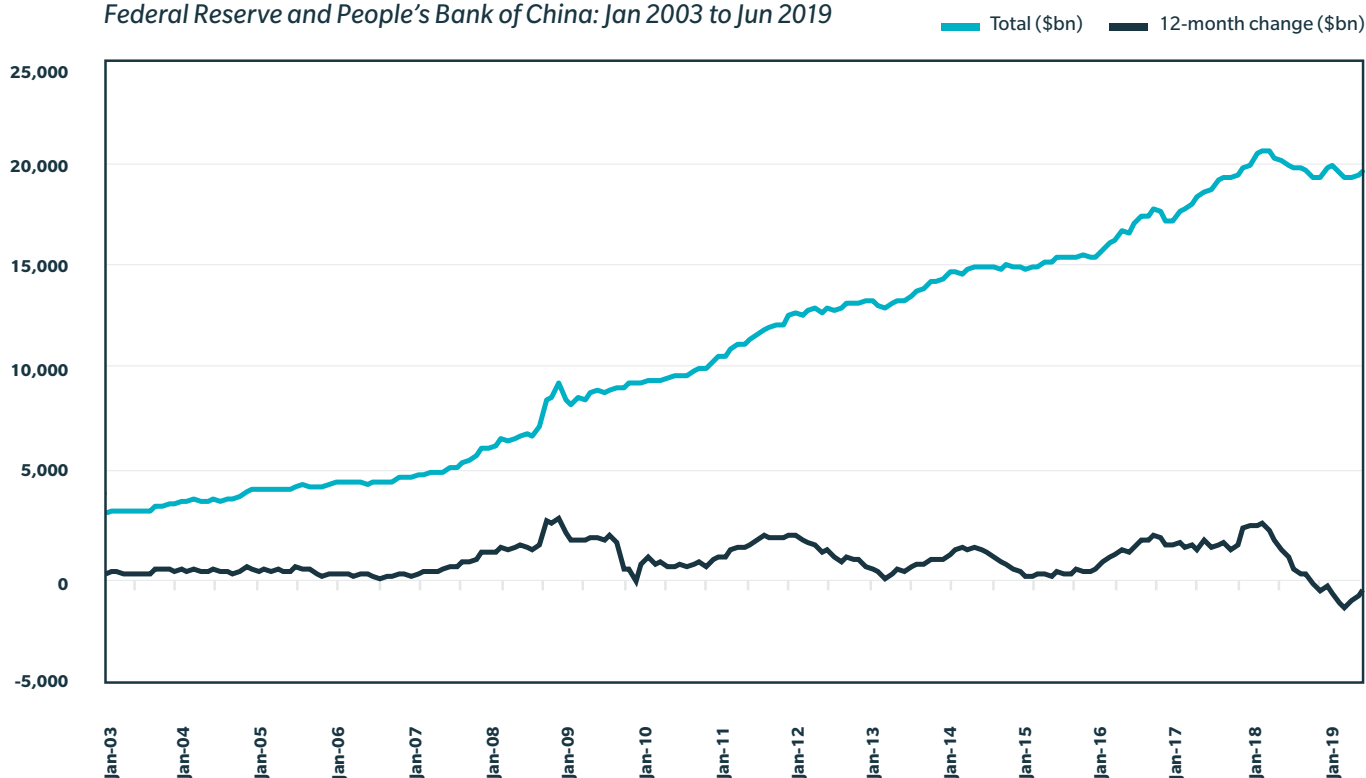
Source:
Abbey Capital, Bloomberg.

Construction Methodology:

Chart 12 shows the combined sum of the balance sheets of the US Federal Reserve, the European Central Bank, the Bank of Japan and the People's Bank of China ("PBOC"). The rolling 12-month change in combined balance sheet is also shown on the chart. Complete data for the PBOC balance sheet is only available from January 2002. As a result, all data is shown from January 2003 to allow for the rolling 12-month change to be plotted.

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29 Modern Monetary Theory is a non-traditional macroeconomic theory supposing that monetary sovereign nations cannot go bankrupt, because debts can be paid off by simply printing more money. As a result, these governments can use fiscal policy to stimulate the economy without concern over a large deficit. One major risk with Modern Monetary Theory is a breakout in inflation due to excessive spending, which would need to be combated by increases in private sector taxes.

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Conclusion

The performance of managed futures and Trendfollowing in recent years has been below longer-term levels. While disappointing, the returns have not been outside standard statistical expectations and we have seen difficult periods in the past.

Several theories (such as the growth of assets, the possibility of CTAs being gamed and a possible speeding up in market moves) have been put forward to explain the disappointing performance but based on our analysis, these theories are not supported by data.

In our opinion, the most compelling explanation is that the market environment has been characterised by fewer major moves and fewer sustained multi-month trends than in previous decades and we see evidence of this in our proprietary market indicators and proxy Trendfollowing systems.

Why there have been fewer major trends in markets, is more difficult to address categorically. Historically, major trends have tended to occur episodically, with several major moves occurring in some year and relatively few in other years. The lower number in recent years may just reflect normal statistical fluctuation.

However, we believe that the macroeconomic and policy environment has been unusual in the last decade relative to history and it seems plausible that the fewer trends in markets may have been related to more muted volatility in macro variables, less variability in interest rates and monetary policy expressly aimed at reduced risk premia.

Looking ahead, while it is impossible to predict what the market environment will be going forward, we see several potential catalysts which, in our opinion, could produce a more favourable market environment for Trendfollowing. Although macroeconomic conditions are currently benign and supportive of traditional assets, the experience of the early 2000s has shown us that a prolonged expansion may encourage the development of imbalances and excesses which could ultimately lead to large dislocations in markets. Trends can also develop from random factors such as droughts, wars, geopolitical events and the risk of any of these occurring remains a consideration for investors.

Over the last three decades, investors have typically allocated to Trendfollowing as a diversifying strategy with the aim of generating uncorrelated returns and diversification from equities. The correlation between managed futures, and Trendfollowing in particular, with equities over the long term is close to zero and the drivers of returns for Trendfollowing (namely the existence of sustained tends in markets) is fundamentally different to the drivers of equity returns.

While the market environment for the strategy has not been as favourable in the last decade we think the fundamental reason for allocating to the strategy as part of a diversified portfolio remains, particularly given the current juncture of ultra-low bond yields and elevated equity valuations.

Appendices

Glossary

Standard Deviation
Standard deviation is a measure of the amount of variation in a dataset. A higher (lower) standard deviation is indicative of a more (less) disperse dataset.

Sharpe ratio
Sharpe ratio is a measure of risk-adjusted return. The measure subtracts the risk-free rate from the annualised performance of the asset or fund and divides by the realised annualised volatility. A higher (lower) Sharpe ratio is seen as indicative of stronger (weaker) risk-adjusted performance.

Market Impact
Market impact is the unintended effect that a trader has on market prices when entering or exiting a trade. Typically, a large buy order would move the market price higher, while a large sell order would move the market lower.

Market Trending Phases
1. *Trending*
A futures market is Trending if the fast moving average is between the price and the slow moving average.

2. *Consolidating/Reversing*
From a Trending phase, if the price moves between the fast and slow moving average, the futures market is Consolidating. The market is Reversing if the slow moving average is between the price and the fast moving average.

3. *'No Trend'*
If the moving averages cross when the system is in a Reversing phase, the system will enter a No Trend phase once the price crosses either of the moving averages.

Moving Average Crossover
A moving average ("MA") crossover system uses moving averages with different lookbacks to give buy (sell) signals on a price series. For example, a 20-120 moving average crossover would generate a buy (sell) signal if the 20-day MA crosses above (below) the 120-day MA.

Breakout
A breakout system would look for prices moving through support levels (rolling price floors) and resistance levels (rolling price ceilings) to generate buy/sell signals. These rolling price floors and ceilings can be based on various different lookbacks.

Momentum
A momentum trading system would base its buy (sell) signals on whether the current price is higher (lower) than the price X-days ago. For example, a 20-day momentum strategy would generate a buy signal if the price today is higher than the price 20-days ago.

Slippage
Slippage measures the difference between the actual price realised at execution and the signal price which triggers the buy/sell decision.

Indices Overview

Barclay CTA Index
Start Date: Jan-1987
The Barclay CTA Index is an equal weighted index which is representative of the performance of the managed futures industry. There are currently 510 programs (as at 30 June 2019) included in the Index and it is rebalanced annually. To qualify for inclusion in the Barclay CTA Index, an advisor must have four years of prior performance history.

SG CTA Index
Start Date: Jan-2000
The SG CTA Index is a daily performance benchmark of major CTAs; it calculates the daily rate of return for a pool of CTAs selected from the larger managers that are open to new investment. Selection of the pool of qualified CTAs used in construction of the index is conducted annually.

SG Trend Index
Start Date: Jan-2000
The SG Trend Index is designed to track the 10 largest trend following CTAs (by AUM) and be representative of the trendfollowers in the managed futures space. The index is equally weighted and rebalanced annually.

SG Trend Indicator
Start Date: Jan-2000
The SG Trend Indicator is a market based performance indicator designed to have a high correlation to the returns of trend following strategies. The indicator employs a set of 55 futures markets covering equity, currency, interest rate, bond, energy, metal and agricultural markets. Refer to the Societe Generale website for a full list of the contracts.

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Market Data Sample

Overview

Studies shown in this paper that utilise futures contract prices are all based on the same sample. The sample contract set is defined by the 55 futures markets that constitute the SG Trend Indicator. The contracts cover sectors such as equities, fixed income, currencies and commodities. Each contract is included in the sample from the date that data is available; accordingly, not all 55 contracts are used throughout the entire period. Data was sourced from Bloomberg.

Proxy Trendfollowing Systems

Assumptions

The trend proxy returns for the momentum, breakout and moving average crossover models shown in this paper, in particular in Tables 2, 4 and 5, are based on the following assumptions:

❯ The performance of the hypothetical trendfollowing systems is calculated based on the prices of a diversified set of 55 futures markets, defined as the constituents of the SG Trend Indicator

❯ Each contract is included in the sample from the date that data is available; accordingly, not all 55 markets are used throughout the entire period

❯ Signals are determined by closing prices and positions are generated assuming perfect execution i.e. signal price = trade price

❯ $10 slippage on new trades

❯ No interest income included in the Trend proxy system returns

❯ Positions are re-sized/rebalanced monthly except when the signal indicates a change in direction from the current position

❯ The systems assume FuM of $500m

By construction, all of the hypothetical trendfollowing systems are designed to achieve a 15% volatility over time, however actual realised volatility can vary over time and across models.

Directional Efficiency

Information and Assumptions

The directional efficiency ("DE") measure is an adaptation of Kaufman's Efficiency ratio, which measures the persistence in direction of a price action. Kaufman Efficiency ("KE") is calculated as the net change in price over a period, divided by the sum of the absolute daily price moves. Thus, a ratio of 1.0 implies that the market has moved upwards every day, while a ratio of -1.0 implies a series of only downward moves.

DE differs from KE in that it defines a price move as 'favourable' or 'unfavourable' through how prices moved with respect to a specified trading system. In this paper, DE is calculated using a 20-120-day simple moving average crossover system, and a 260-day lookback period. A 20-120 day moving average crossover system is used in this paper as its implied holding period is empirically descriptive of Trendfollowers across the managed futures space.

If the trading system signals a short position on a given day, the sign of that day's price move is reversed, reflecting that positive price moves are now undesirable and vice versa. If the trading system has a long position, the sign of that day's price move remains unchanged. After this adjustment, the calculation proceeds as per KE, i.e. the sum of the net total price moves divided by the sum of absolute price moves.

A positive DE value indicates that prices have typically continued in the direction of the trend and a negative DE value indicates that prices have reversed against the prevailing trend. A value close to zero indicates that a market is likely trading within in a range or a market in which a trend has been followed by a reversal of similar magnitude. The DE measure will have values between +1 (good conditions for a trendfollowing system) and -1 (negative conditions for a trendfollowing system).

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