



Street View

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EXECUTIVE SUMMARY

What role has momentum played in CTA performance over time? An analysis shows that macro momentum has been a consistent component of CTAs since 2004, but its influence (loading) on CTA performance remains lower than it once was. This finding highlights the importance of measuring both manager-specific and overall portfolio exposures in risk terms.

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CTA AND MACRO MOMENTUM EXPOSURE

Last month's Two Sigma Street View highlighted two aspects of the recent performance and risk characteristics of the SG CTA index.¹ First, the SG CTA index in August had a more significant long exposure to both equities and bonds than its 2000-2017 average, making it less diversifying to a 60/40 portfolio than usual. Second, only four factors—equities, bonds, energy, and the US dollar—appear to explain an unusually high share (60 percent) of portfolio risk.

The [August 2017 Street View](#) spurred several interesting dialogues with clients. One common question centered on the role that momentum has played in explaining CTA performance. Specifically, has the generic CTA manager (proxied by the SG CTA index) become less focused on price momentum and more focused on “fundamentals”? Figure 1, below, supports that hypothesis—with two important caveats.

1. **Risk factors are not generic**, so there exists no single definition or construction of momentum. For example, the horizon matters. Short-term momentum (e.g., one month) and long-term momentum (e.g., one year) frequently point in conflicting directions. The algebraic formula for calculating momentum also matters. A simple moving average will equally weight all data points within the window, and it may lead to large day-to-day fluctuations when an outlier at the tail end of the window drops out of the sample. In contrast, an

exponentially weighted moving average will appear less sensitive to past outliers but more sensitive to recent ones. The analysis in Figure 1 employs a three-month, simple rolling-mean macro momentum factor, in line with an industry standard.

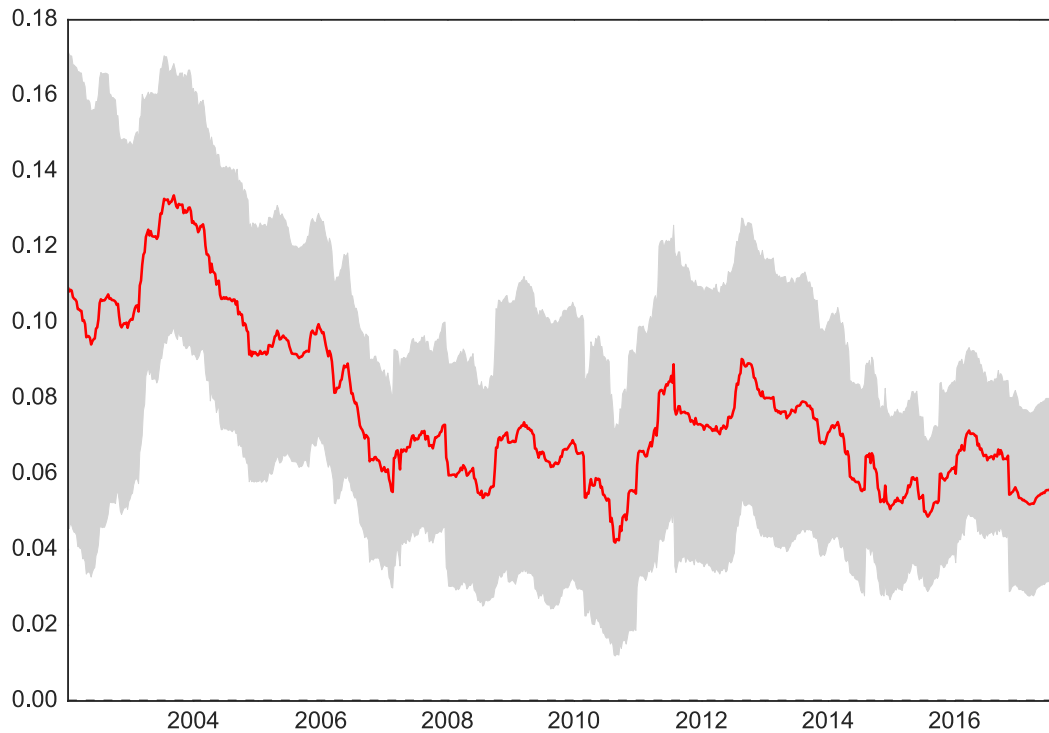
2. **CTAs often trade multiple asset classes with conflicting momentum.** An obvious example is equity and bond futures. During prolonged periods of market stress, bond momentum tends to be positive while equity momentum tends to be negative. The momentum factor in the analysis below is aggregated across the futures contracts in the Two Sigma trading universe.

With those caveats in mind, the figure shows that the beta in a regression of SG CTA index returns on a macro momentum factor fell by a statistically significant amount between 2004 and 2007, suggesting that CTAs during this period may have slightly reduced their reliance on macro momentum to drive returns. The regression uses a window of three years of weekly returns and controls for some confounding factors, like carry in commodity, foreign exchange, and fixed income futures, as well as equity exposure.² Since 2007, the beta has fluctuated by economically significant amounts (e.g., doubling between 2011 and 2013).

1 Managed by Société Générale, the SG CTA Index tracks the daily rate of return for a pool of CTAs that are open to new investment, and whose assets under management are above a certain threshold.

2 The overall explained variability (R^2) of these four factors is currently 25 percent and has reached the highest peak of about 35 percent in 2013. The main focus of this analysis is the macro momentum factor. Moreover, these results are not directly comparable with the ones shown in the August 2017 Street View, because this analysis focuses on macro style factors rather than asset-class-related risk factors.

FIGURE 1: ROLLING THREE-YEAR LOADING (BETA) OF THE SG CTA INDEX ON THREE-MONTH MOMENTUM



Source: Two Sigma and authors' computation.

POTENTIAL IMPLICATIONS

The implications of this trend (no pun intended!) may depend on the allocator. Some may find support for the seemingly healthy development that many CTA managers have become more akin to global macro managers, in that they seem to rely less on simple technical signals. Other allocators may merely be looking for an explanation for CTA performance.

Perhaps the most important takeaway, from both this chart and last month's analysis, is the importance of

measuring both manager-specific and overall portfolio exposures in risk terms. Relying on the historical reputation of a strategy type to provide portfolio-level diversification appears at best coarse and at worst misleading. In contrast, applying simple statistical tools to decompose risk into factors might provide more accurate insights, potentially enabling an asset allocator to manage her portfolio with more precision and, hopefully, greater utility.

INTERESTING TECHNOLOGY-RELATED ARTICLES

Two Sigma views itself as a technology company that applies a rigorous, scientific method-based approach to investment management. Our technology is inspired by a diverse set of fields including artificial intelligence and distributed computing. Occasionally, we read articles in the popular press that describe applications of technology that we find interesting, thought-provoking, and relevant for people thinking about improving the investment management process. Below is a subset of the articles we read this month. Please do not view the inclusion of these articles as an endorsement by Two Sigma of their viewpoints or the companies discussed therein. Two Sigma welcomes discussions (and contributions) about these and other such technology-related articles.

“AI Can Detect Alzheimer's 10 Years Before Symptoms Show Up ” by Mariella Moon

<https://www.engadget.com/2017/09/17/ai-alzheimers-early-detection/>

Researchers from the University of Bari, Italy have developed an artificial intelligence algorithm that evaluates MRI images to search for subtle patterns in the brain's topography to indicate the presence or absence of Alzheimer's disease. In trials, the algorithm was able to diagnose the disease accurately 86% of the time, as well as to detect mild cognitive impairment 84% of the time, which could enable diagnosis at a much earlier stage than had previously been possible without invasive interventions.

“Cargill's Big Data Makes Happier—and More Productive—Cows” by Mario Parker

<https://www.bloomberg.com/news/articles/2017-09-12/cargill-data-helps-farmers-make-happier-cows-that-make-more-milk>

Virtually no industry has been untouched by the revolution in data science and artificial intelligence, and agriculture is no exception. Although one may not picture herds of milk cows generating large amounts of data for quants to munge and model, large agricultural companies are increasingly using technologies like analytics, drones, and digitization to improve yields—and, they hope, profitability. In a recent example, Cargill developed a data platform that lets farmers and consultants analyze large streams of information on everything from cows' living conditions to their diets—an optimization process that has reportedly generated meaningful gains in milk productivity at a lower cost of production.

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