

# The CTA VAI™ (Value Added Index)

Update to June 2015: original analysis to December 2013

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Tim Pickering - CIO and Founder  
 Research support: Jason Ewasuik, Ken Corner  
 Auspice Capital Advisors, Calgary Canada

*CTA returns have been lackluster in recent years. This has led some observers and investors to question the value and benefits of Managed Futures within a portfolio. The CTA VAI™ (Value Added Index) was developed to demonstrate that Managed Futures consistently adds value over the long term (not only in times of financial crisis). Additionally, we will demonstrate how the CTA VAI™ can be used to implement a simple market timing strategy that can further improve portfolio performance.*

*Editor's Note: The views and opinions reflected in this paper are those of the author and do not necessarily reflect that of Auspice Capital Advisors, its affiliates, or its employees as a whole.*

## Background

Some of the reasons for adding CTA exposure are well understood: the overall low correlation to equities and the historical negative correlation at times of equity market weakness (see sidebar). This is all good, however investors often become frustrated when CTA strategies go through periods of relatively poor performance, often exiting these investments at exactly the wrong time due to behavioral biases, i.e., they sell at the bottom leaving them unprotected for the next market crash.

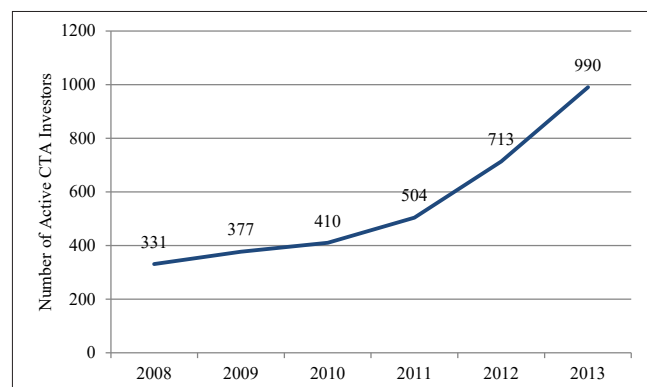
The acceptance of Managed Futures encompasses institutional and retail investors globally. In Europe, more assets have gone into CTAs than any other hedge fund strategy since 2008. This makes it the #1 most allocated to alternative strategy in Europe at almost 20% of USD \$382 billion European market.<sup>1,2</sup>

*According to Jasmin Leitner from CTA Intelligence: "...CTAs remain an important part of investor portfolios, particularly for longer-term and non-North American institutional allocators..."<sup>3</sup>*

As illustrated in Figure 1, the level of institutional investors in CTA has tripled since 2008. It is clear that this interest continues to grow even with positive performance in traditional equity markets since 2009. In North America, the focus has primarily been institutional participation at a very high level. However, in the last 5 years a rapidly gaining retail, Wealth Advisor and Registered Investment Advisors (RIA) channel is developing. This is accessed through 40 Act Mutual funds (US), ETFs, and Indexes.

**Correlations of Managed Futures:** Since 2004, the correlation of the Barclay BTOP50 Index and the S&P 500 has been 0.00 (end June 2015). During the down market of 2008, this correlation dropped to -0.65. Since the beginning of 2009, as the equity market has rallied, the correlation has moved slightly positive to 0.09.

**Figure 1: Number of Institutional Investors in Hedge Funds Actively Investing in CTAs 2008-2013**



Source: Prequin Hedge Fund Investor Profiles

## The Challenge

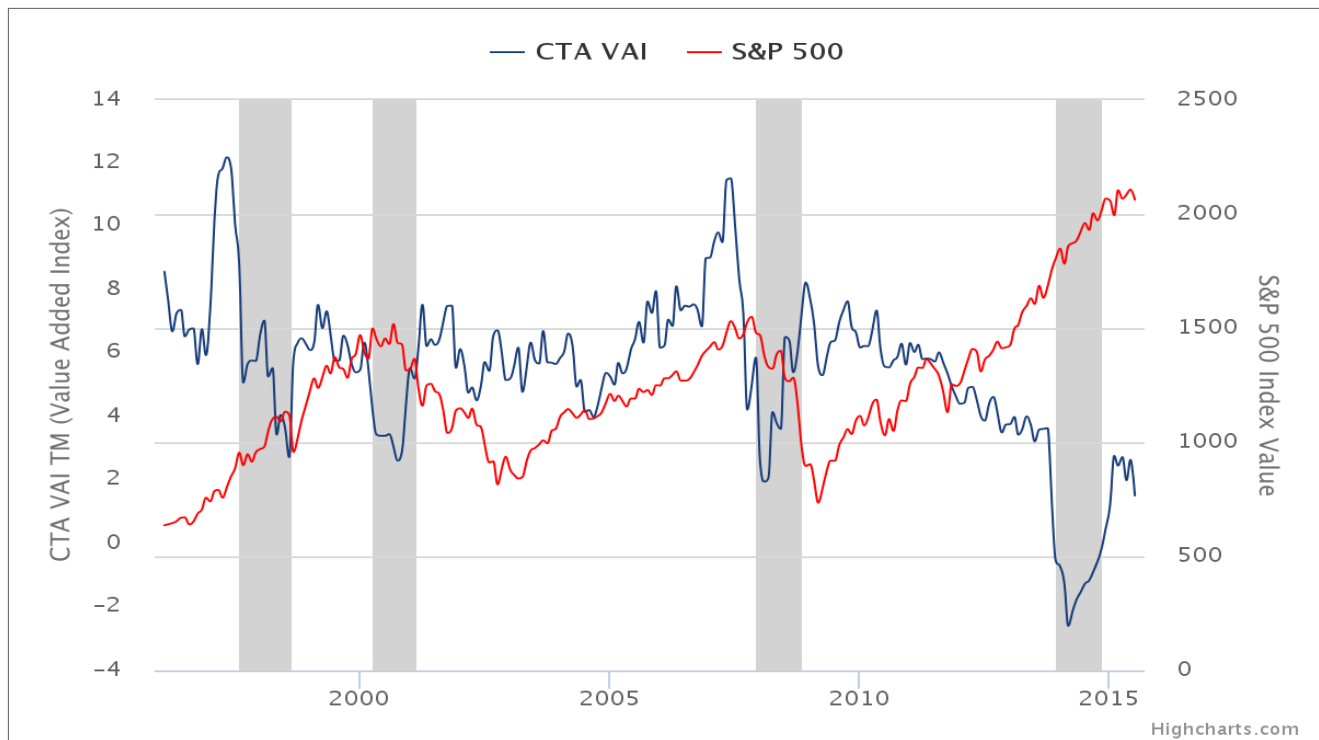
One of the characteristics of a traditional trend following CTA strategy is that it goes through periods of extraordinary gain and then also extended periods of lackluster performance. Often times these periods are modest pullbacks with many CTAs drawing down less than 25% from highs (while the stock market regularly pulls back 40-60% in comparison). The periods lacking performance often occur while the traditional equity markets are doing well (for example 2011 to 2013) which may be a perceived negative for many investors who are looking for constant gains.

directly address a common investor sentiment that CTA performance was a drag on their portfolio.

## The CTA VAI™ (Value Added Index)

The CTA VAI™ was developed to demonstrate the risk-adjusted benefit of including an allocation to Managed Futures strategies within a core equity benchmark portfolio (Figure 2). The CTA VAI™ compares the Sharpe Ratio of a portfolio that has a 10% allocation to Managed Futures versus a pure S&P 500 portfolio. The index uses an industry benchmark, the Barclay BTOP50 Index, as a proxy for Managed Futures returns. The CTA VAI™ computes the difference

**Figure 2: Risk-Adjusted Value Add of including 10% in Managed Futures**



While on an absolute basis, any investment that is performing below the average return level of the portfolio is a drag on returns, on a risk-adjusted basis this may not be the case. A non-correlated asset, even with lower absolute returns, may reduce portfolio volatility and drawdowns thereby improving the risk-adjusted performance of the portfolio over the long term.

As such, the question is whether CTA exposure should be held at all times or only added when a crisis is imminent (a very difficult thing to do). We set out to determine whether Managed Futures indeed adds value over time and if there is a timing aspect to consider that may add additional value.

The idea for the CTA VAI™ was conceived to

in Sharpe Ratios on a rolling 60 month basis. A positive number is reflective of the additive risk-adjusted benefit of using Managed Futures within the portfolio.

Figure 2 highlights that Managed Futures consistently adds value over the long term and not only in times of financial crisis or market correction. CTA VAI™ demonstrates that even in environments that are less than ideal for Managed Futures strategies, there is a risk-adjusted benefit to the overall portfolio as measured by a common risk metric.

**Definition:** “The CTA VAI™ (pronounced [ Vi ]) measures the risk-adjusted benefit of including 10% Managed Futures in a benchmark equity portfolio on a rolling 60 month basis.”

## Long Term Added Value

Over a rolling 60 month period, the index has been mostly positive illustrating that whatever the current performance of the CTA benchmark, there is an additive long term risk-adjusted benefit to including Managed Futures within a portfolio. 60 months is used because we believe this is a period that captures both up and down cycles in the equity market. Including 10% CTA in the portfolio has added value in rising and falling equity markets, crisis and normal times.

**Table 1: CTA VAI™ Examples**

Rolling 60 months ending	90% S&P 500 / 10% Barclay BTOP50 Sharpe Ratio A	S&P 500 Sharpe Ratio B	CTA VAI™ = (A-B) X100	Barclay BTOP 50 Index Sharpe Ratio (for reference)
Dec. 2002	-0.05	-0.10	5.59	0.69
Dec. 2004	-0.18	-0.23	5.84	0.72
Dec. 2006	0.45	0.35	9.87	0.90
Dec. 2008	-0.24	-0.32	7.73	0.93
Dec. 2010	0.07	0.01	6.44	0.81
Dec. 2012	0.01	-0.03	3.74	0.29
Dec. 2014	1.02	1.01	1.39	0.48

**Detailed Methodology:** The CTA VAI™ is calculated taking the Sharpe Ratio, on a rolling 60 month basis, of a portfolio including 90% S&P 500 and 10% Barclay BTOP50 Index (rebalanced annually) minus the Sharpe Ratio of the S&P 500 only multiplied by 100. Example: Dec. 2002:  $-0.05$  minus  $-0.10 = 0.05$  multiplied by 100 = 5.59. See Table 1 for examples.

## Historical Performance

The 90/10 portfolio has improved the return with significantly less risk. (See Table 2.) Since 1996 to June 2015, the Sharpe Ratio of the 90/10 portfolio has outperformed the Sharpe Ratio of the S&P 500 portfolio by 14%. The 90/10 portfolio has also had 11% less volatility, 11% lower drawdown and 2.2% (or 12 bps per annum) more annualized return than the S&P only portfolio.

## Timing CTA Allocations

Observing the CTA VAI™ (Figure 2), it becomes apparent that periods of under and over performance tend to occur historically. This led to the discovery that timing and dynamically adjusting the exposure to CTA using the CTA VAI™ could further improve portfolio performance.

**Table 2: Portfolio Improvement with 10% Managed Futures**

Jan. 1996 to Jun. 2015	S&P 500	Barclay BTOP 50 Index	90/10 Portfolio	Improvement to S&P 500 portfolio
Annualized Return	6.4%	5.6%	6.5%	+2.2%
Standard Deviation	15.3%	8.4%	13.6%	+11.2%
Sharpe Ratio	0.42	0.67	0.48	+14.3%
MAR Ratio	0.12	0.42	0.14	+16.7%
Largest Drawdown	52.6%	13.3%	47.0%	+10.5%
Correlation to S&P 500	1.00	-0.11	1.00	NA

Historically, when the CTA VAI™ has dislocated the most from the S&P 500 (4 grey sections in Figure 2), it has been a valuable time to add CTA exposure. In 1998, 2000, 2007, and 2013 when the CTA VAI™ dipped under 4 and the spread was the greatest, the next 36 months the Barclay BTOP50 Index gained an average of 60%.

*Historical gains: the Barclay BTOP50 Index produced (within 36 months) +22.9% of July 98, +143.2% of September 2000, +13.0% of January 2008, and 10.2% of February 2014 (to June 2015).*

While this analysis considers optimal timing, it illustrates there could be a beneficial way to time an investment in Managed Futures. Moreover, consider that when the CTA VAI™ has been under 4, the traditional (equity) market has been performing reasonably well.

## Dynamic Allocation

Looking at Figure 2, we can see that the index moves between low and high periods of risk-adjusted benefit. To exploit this, we created a methodology to move the CTA allocation from the fixed 10% in the CTA VAI™ base case to higher and lower levels. The concept is to be opportunistic: increase CTA exposure when it is adding the least benefit and other parts of the portfolio are outperforming and then reduce this when CTA is outperforming, i.e., buy low, sell high.

Next, we have plotted the CTA VAI™ on a relative scale using a Percentage Ranking method over 36 months. The choice to rebalance is based on the recent performance to identify periods of under or over-performance and then the

dynamic allocation is applied to try to improve the portfolio performance. The percentage ranking used is 90/10: buying when the performance drops below the 10th percentile and selling above the 90<sup>th</sup>.

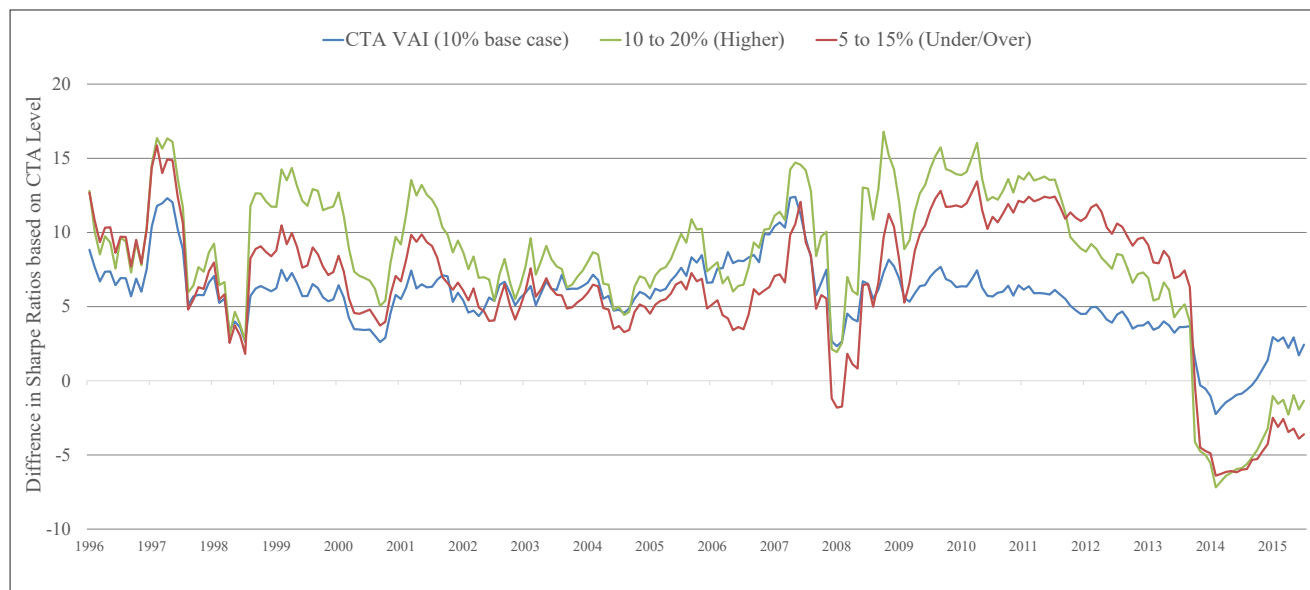
Hence, if the CTA VAI™ is in the top 90% of results for the last 36 months, the allocation shifts the weight lower. Similarly, if in the bottom 10% of CTA VAI™ values, the allocation is shifted higher.

We have chosen two weighting scenarios to compare against the 10% CTA VAI™ base case.

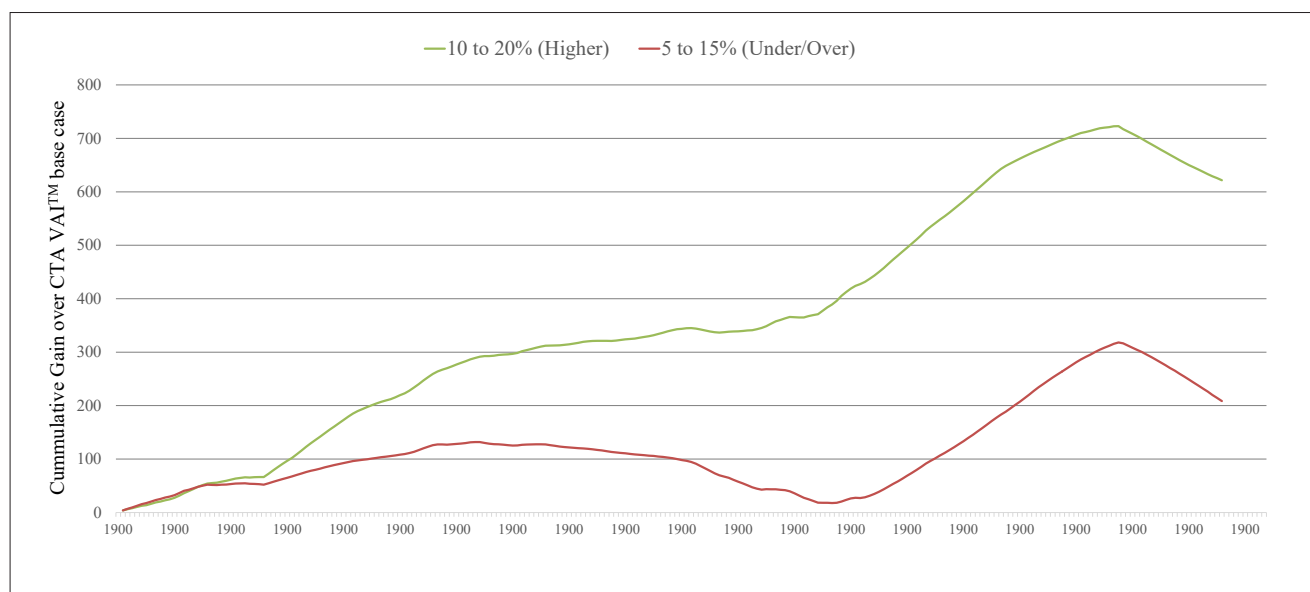
1. 10% or 20% (only move to a higher level maximum 20%)
2. 5% or 15% (toggle between 5% and 15% on either side of 10% base case)

The results are plotted in Figure 3 and 4. Figure 3 shows the CTA VAI™ values with each weighting scenario. Figure 4 shows the cumulative gain over the CTA VAI™ base case.

**Figure 3: CTA VAI™ with Dynamic Allocation**



**Figure 4: Cumulative Gain versus CTA VAI™ (10 % base case)**



## Result of Dynamic Allocation

Comparing the results in Figures 3 and 4, clearly illustrates that there is a value to dynamic allocation. Both of the weighting scenarios add value overall, but there are some differences and revelations.

Starting with the simplest change, 10 to 20%, we can see there is a gain that exists on almost all time-frames since 1996. If we then look at the absolute gain over the CTA VAI™ base case on multiple discrete historical time periods as outlined in Table 3, we observe that the gain is significant: 47.0% on all data since 1996, and even higher since 2008. This is in line with other academic research, that shows better risk-adjusted results for a portfolio that can include allocations up to 20% in CTA. In this case the gain is significant over the static 10% allocation, getting over 60% increase in the CTA VAI™ level since 2008. We have included since 2009 to illustrate that during a challenging period for CTA the dynamic weighting method has had a positive impact.

**Table 3: Gain of Dynamic Weighting vs. CTA VAI™ (10 % base case)**

Weighting Scenarios	Gain Since 1996	Gain Since 2008	Gain Since 2009
10-20%	47.0%	68.5%	65.8%
5-15%	16.1%	47.0%	60.0%

Secondly, the underweight and overweight scenario of 5-15% illustrates a gain and the highest recent level in Figure 3, but with some additional information. Over the long term since 1996, the gain is not as high, at 16% improvement (Table 3). However, since 2009, it is a 60% improvement. Yet, it is the only method that falls below the CTA VAI™ 10% base case and actually goes negative for a period of time prior to 2009 as illustrated in Figure 3. One brief period in 2007/2008, it is significantly underperforming the base case. The cumulative gain illustrated in Figure 4 shows this underperformance clearly.

While the 5-15% method makes intuitive sense and also quantitatively beneficial long term, it appears to come with a risk. The risk is that the benefit of underweighting is overshadowed by the risk of not having enough CTA exposure. This means that there is likely a level that is too low to be beneficial long term and timing becomes a risk versus an opportunity.

This highlights that having Managed Futures exposure is especially critical when the performance has been lackluster and the CTA VAI™ is at a low level.

## Summary

The CTA VAI™ provides the investor with important information regarding the relative performance of CTA and a benchmark equity index and clearly demonstrates the long term benefits of the inclusion of CTA in the portfolio.

Additionally, the CTA VAI™ can be used to time allocations to Managed Futures in a way that can improve the risk-adjusted performance of the portfolio.

The CTA VAI™ is a tool that illustrates these benefits in an objective way. It is up to you as an investor or advisor to find the right product(s) and manager(s) to fulfill your needs no matter what level of assets or sophistication.

### Terms and Definitions for CTA VAI™

Sharpe Ratio is calculated by subtracting the risk free rate from the rate of return for a portfolio and dividing the result by the standard deviation of the portfolio returns. Risk free rate = 0%.

MAR Ratio is calculated by subtracting the risk free rate from the rate of return for a portfolio and dividing the result by the largest drawdown.

Managed Futures benchmark is the Barclay BTOP50 Index.

S&P 500 Price Returns is the portfolio benchmark.

The CTA VAI™ is calculated using a rolling 60 month period. Monthly data is used to calculate the CTA VAI™ and the allocation to Managed Futures is rebalanced on an annual basis.

More information: [www.auspicecapital.com](http://www.auspicecapital.com)

### References:

<sup>1</sup>Stenbrugge, Donald A. 06/07/11. “Investor demand for CTAs is on the rise, says Agecroft Partners.” HFMweek.

<sup>2</sup>Vasan, Paula 11/20/12. “Institutional Investors Crowd into Active CTA Market.” aiCIO

<sup>3</sup>Leitner, Jasmin 10/31/13. “CTA investor appetite remains healthy despite drop, says report.” CTA Intelligence.



## Question and Answer Session

Tim Pickering

### **Question: Why does the index use Sharpe to measure risk-adjusted performance?**

**Answer:** We have chosen to use the Sharpe Ratio because it is one of the most commonly accepted measures of risk/return. Moreover, within the retail community, one of the most rapidly growing areas of CTA interest, it is simple and well understood.

We recognize the failings of Sharpe – it is most definitely not perfect and arguably there are better choices, especially to measure CTA risk. Moreover, it rewards strategies that generate small gains consistently, but have the risk of large losses – for example from selling option premium or “short vol”. We know the risk of these strategies is a very deep or catastrophic drawdown (example: LTCM). However, this is the opposite of many CTA strategies, where it is synthetic long optionality generating a thousand small papercuts before significant and less frequent big gains – but with less chance of deep drawdowns. Sharpe rewards the short vol strategy and impairs the long vol strategy. As such, it may be more appropriate for liquid investments with normally distributed returns.

Having said this, we feel it gives an adequate measure of risk in terms of industry understanding, and given the index uses a simple portfolio of S&P exposure as the base case, it makes sense to use it here.

### **Question: Do all non-correlated assets provide increased risk-adjusted performance?**

**Answer:** It depends. A non-correlated asset must also provide controlled and understandable risk. By combining non-correlated assets, investors can get the proverbial “free lunch”. However, what is unique to CTA/Managed Futures, is that it typically produces a low or slightly negative correlation long term and a stronger negative correlation at times when traditional asset classes are falling. Thus right when it is needed most, Managed Futures provides what is commonly referred to as “Crisis Alpha”.

### **Question: Are Investors adding to CTA in this environment?**

**Answer:** Yes. We are seeing growing interest from both retail and institutional investors. This was illustrated in Figure 1.

*Per Madeleine Stretton, of Prequin in the Hedge Fund Spotlight: “We have seen a year-on-year increase in the number of Institutional investors investing in CTAs since 2008... institutional investors are continuing to allocate to CTAs.”<sup>4</sup>*

However, we believe the way investors access CTAs is changing. There is demand for different delivery mechanisms (ETF, Indexes, low cost 40 Act Mutual funds) and core-satellite approaches. There is demand for multiple strategies from the same manager that serve different purposes in niche and across the alpha, alternative beta, and beta return continuum.

### **Question: Is the CTA VAI™ overly simple?**

**Answer:** Yes! The CTA VAI™ illustrates two things without the introducing any outside factors: Does allocating to CTA benefit a portfolio long term? Yes. Is there a timing aspect to adding the strategy? Yes. The reason the S&P 500 was chosen is simplicity. Moreover, the reason Sharpe was chosen is simplicity. Both of these parts of the analysis can be made infinitely more complicated to suit the investor’s needs. However, the critical point is made at the most basic level.

### **Reference:**

<sup>4</sup>Stretton, Madeleine October 2013. “Institutional Investor Activity in CTAs.” Hedge Fund Spotlight, Prequin.