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ASPEN MANAGED FUTURES BETA INDEX

# Managed Futures “Crisis Alpha”, What It Is and What It Isn’t
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and

# Volatility Targeting
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## *Managed Futures "Crisis Alpha": What It Is and Isn't*[1]

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Anyone familiar with managed futures is probably aware that it was one of very few asset classes to perform well during the 2008 financial crisis. An investor looking to dig deeper into the asset class may come across the CME piece "In Search of Crisis Alpha"[2] by Kathryn Kaminski. The ability of managed futures to add value in periods when a traditional portfolio suffers substantial losses is commonly cited, but can investors expect to make money any time equities (or other traditional asset classes) suffer a drawdown? This paper offers a brief, informal look into the circumstances under which the managed futures "crisis alpha" characteristic is—and isn't—likely to add value to a portfolio.

The following table shows examples of notable equity drawdowns and compares the return of managed futures (represented by the Newedge CTA Index) to the return of equities (represented by the S&P 500 total return index):

| Period | Event | S&P 500 | Newedge CTA | Recovery |
|---|---|---|---|---|
| January 2000 through September 2002 | Tech Wreck | -42.5% | 28.4% | S&P recovers in July 2005 |
| November 2007 through March 2009 | Credit Crisis | -46.7% | 10.7% | S&P recovers in March 2012 |
| May 6-7, 2010 | Flash Crash | -4.7% | -1.5% | S&P/Newedge recover on May 12 |
| March 14-16, 2011 | Japan Tsunami | -3.6% | -2.0% | S&P recovers March 24, Newedge April 1 |

A proper understanding of managed futures crisis alpha begins with the fact that managed futures returns are largely driven by medium-to-long-term trend following. A simple consideration of what this means can indicate the kinds of tail risk that managed futures investments can help mitigate. For trend following to help protect against negative tail events, a negative trend must first form to enable trend followers to establish a "risk off" portfolio. Events out of a clear blue sky (such as a tsunami or a major automation glitch in algorithmic trading systems) do not qualify, because those events are entirely unpredictable. If, for reasons completely unrelated, managed futures systems happen to be short already when such an unpredictable event occurs, it may still be possible to make money, but for a trend follower that would simply be luck.

In our view the key to understanding the crisis alpha characteristic of managed futures is recognizing what is meant by a "crisis." In this context, a crisis is an economically-driven event involving elevated volatility and growing stress among (say) commodity, equity, interest rate, or currency markets, perhaps finally accelerated by a watershed event that would not have occurred or would not have been nearly as disastrous had it occurred in an otherwise calm, sanguine period. "Economically-driven" is a key point. Trend-following crisis alpha is at its best when markets can sense in advance that trouble may be brewing but perhaps underestimate the potential magnitude or probability of such trouble. Such has generally been the case with major market crashes characterized by long recoveries.

[1] Opinions are solely of the author and subject to change.

[2] Kaminski, Kathryn, "In Search of Crisis Alpha: A Short Guide to Investing in Managed Futures," CME Group, 5 April 2009: http://www.cmegroup.com/education/files/CME-337_Paper_CrisisAlpha.pdf.

Consider the flash crash and tsunami scenarios above. Both events occurred in the midst of otherwise upward trends for the markets (as evidenced by the directionality of Newedge returns). Though the markets reacted to the events with negative shock, the absence of preexisting exogenous stress enabled the markets to recover quickly in both cases.

In periods of market stress, negative news adds to the snowball of reversing markets, and recovery can be much slower. Lehman Brothers is a good example: Had Lehman suddenly (for entirely idiosyncratic reasons) gone out of business in, say, the late 1990s, the markets undoubtedly would have reacted negatively, but it seems unlikely that the demise of an investment bank would have resulted in a five-year drawdown at a time when the economy was strong and markets were otherwise skyrocketing. But when Lehman went out of business for reasons related to a credit crunch that had already incited concern in the market, the event confirmed the market's worst fears and the result was a true market crisis—a crisis for which managed futures was ready to offer "crisis alpha" for the very reason that the markets had already demonstrated the existence of stress and fear, enabling trend followers to get short in time. 3%-5% drawdowns may happen in a day or two, but very large drawdowns generally do not; trend-followers are much more likely to have time to get in position to profit from such drawdowns.

In summary, managed futures cannot consistently offer help against blue-sky events (e.g., "acts of God" or computer glitches); it may occasionally make money off such events, but, given the nature of trend-following, such outcomes can be attributed to lucky timing. Given the utter unpredictability of such events, the only way to be sure of profiting by them is with "insurance" positions (buying put options, for example)—but buying insurance is a strategy with negative long-run expected returns. Moreover, the value of protecting against such events is unclear to us, given that blue-sky events tend to get flushed rather quickly from the market's memory, since the consequences of such events tend to be known, contained, and unlikely to repeat. Conversely, managed futures has demonstrated long-run positive return[3] even in the absence of crises. In exchange for this positive return, managed futures sacrifices the ability to hedge against blue-sky shocks, but retains the ability to protect against sustained, economically-driven market crises.

[3] From its inception in January 2000 through March 2013, the Newedge CTA Index's annualized return was 5.41%. The Barclay CTA Index reports only monthly returns but has a much longer history; from January 1980 through March 2013, the Barclay CTA Index's annualized return was 10.61%. (Source: BarclayHedge.)

# Volatility Targeting

## Introduction

The long-run annualized volatility of the Aspen Managed Futures Beta Index's model (Aspen MFBI) has been about 9.8%. Unlike many competing models, Aspen MFBI is not designed to target any particular volatility level, but instead is allowed to become more or less volatile as market conditions evolve and as the available opportunity set becomes more or less favorable. The reasons for this design decision are exemplified by the following two cases:

In the fourth quarter of 2008, as an accelerating financial crisis caused equity markets around the world to plunge, the Aspen MFBI model returned 28.8%. Had the model been tuned (with perfect foreknowledge of model volatility) to achieve its historical 9.8% annualized volatility during that unstable period, it would instead have returned only 5.7%, decimating the "crisis alpha" offered by the model.

In November, 2012, market volatility was low and trend-following signals were weak. The Aspen MFBI model returned -0.2%, with intra-month annualized volatility of only 3.4%. Had the model been tuned to achieve its historical 9.8% annualized volatility, the losses still would have been minor, at -0.8%, but the model's internal leverage would have averaged just over 5-to-1. That is nearly twice the highest leverage ratio ever seen in the actual Aspen MFBI model, and would have represented a hidden "cliff risk" for a vol-targeted version of the index, prevailing calm notwithstanding.

## What is Volatility Targeting?

Volatility targeting is an increasingly common technique in the managed futures world, wherein a given managed futures model is levered up or down in order to maintain a pre-selected volatility target. The goal of volatility targeting is to reduce the "heteroscedasticity" of the model—i.e., reduce the tendency for volatility to evolve over time—thus smoothing the model's volatility profile.

**It should be noted that volatility targets are applied ex ante**. In other words, model weightings in a volatility targeted system are applied based on a best guess of the near-term forward-looking volatility, typically derived from a measurement of recent underlying market standard deviations and correlations, and applied to the current basket of positions. The ex post volatility that is actually achieved will inevitably differ from the volatility target, especially in times when underlying market volatility spikes or diminishes rapidly. (The vol-targeted Aspen MFBI numbers presented in the bullet points in the introduction are idealized figures that assume the model could have known in advance the exact amount of leverage to use to achieve the 9.8% volatility target in the given periods.)

In addition to offering investors what seems to be a smoother ride, volatility targeting is also heralded as a means to improve the stand-alone risk-adjusted return of a trend-following model. While it is not immediately clear why this should be so, empirical testing does seem to support the conclusion that measures like the stand-alone Sharpe ratio of a trend-following model may be improved if a volatility target is applied successfully.

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## Why Aspen MFBI Does Not Target Volatility

Why, then, does the design of the Aspen Managed Futures Beta Index not employ a volatility targeting technique? The answer is due to the role of managed futures in a portfolio context, particularly in high volatility environments; and the hidden risk of high leverage in low-volatility environments.

### Managed Futures as Crisis Insurance

The primary reason investors add managed futures to their portfolio is that managed futures tends to have very low long-run correlation to traditional asset classes, and thus can be a high-quality diversifier.[4] Moreover, even greater value can be added in the form of "crisis alpha"—the tendency of managed futures to be strongly negatively correlated to traditional assets during extended periods of market stress.[5]

While the former characteristic (near-zero long-run correlation) may be retained by a volatility-targeting trend-following program, the latter characteristic (strong crisis alpha) may be substantially compromised. The reason? "Crisis" periods are almost surely—indeed, almost by definition—periods of high market volatility. This means that a volatility-targeting strategy will be designed to reduce exposures in such periods, relative to the non-vol-targeted base exposures. As a consequence, whatever crisis alpha may be offered by the underlying program will necessarily be muted by the imposition of the volatility target.

The first bullet point in the introduction illustrates this phenomenon. Because underlying market volatilities were abnormally high during the 2008 crisis period, a fully successful volatility target would have reduced the positive Aspen MFBI returns by more than four-fifths, just at the time when investors would most have needed managed futures to come to the aid of their traditional portfolios.

Of course, as noted above, the near-term spike in market volatility likely would not have been fully predicted by an actual volatility-targeting overlay, such that the actual ex post volatility (and return) in that period would have been higher than that of the idealized vol-target model, but in the context of model design that is more a limitation than an intended feature of vol-target design.

### Levering Up in Low-Vol Periods

The opposite side of the coin is the need for a volatility targeting model to apply extra leverage to achieve the vol target in a quiescent market environment. The second bullet point in the introduction gives an example of this phenomenon, where the low volatility of the true Aspen MFBI model would have required levering up the underlying portfolio to over 5-to-1 in order to achieve the volatility target in November, 2012. Conversely, the maximum leverage ever actually experienced within Aspen MFBI was just over 2.6-to-1.

[4] For more information, request a copy of Aspen's "Ultimate Diversifier" whitepaper.
[5] For more information, see the CME whitepaper "In Search of Crisis Alpha" at http://www.cmegroup.com/education/featured-reports/in-search-of-crisis-alpha.html, and request a copy of Aspen's "Crisis Alpha: What it Is and Isn't" research note.

Market volatility tends to be somewhat "sticky," meaning that periods of relatively high or low volatility tend to last for weeks to months at a time, with periods of transition in between. Such stickiness is precisely why a vol-targeting model is possible, since observations of recent volatility will usually give a decent estimate of near-term future volatility (in fact, such near-term stability is much more reliable with recent volatility than it is with recent return). Near-term persistence of a low-volatility environment is why, for example, the returns for the idealized vol-targeted MFBI 1.5x model in November, 2012 appeared quite manageable (just a 0.8% loss for the month), despite the elevated leverage ratio. In fact, such persistence is so common that it is possible to go through multiple low-volatility cycles without once encountering an unexpected volatility spike. Yet the risk of such a spike exists nonetheless. A sudden market shock, perhaps caused by a natural disaster or the unforeseen bankruptcy of a large corporation due to gross mismanagement, could drive volatility upward very rapidly, exposing the levered portfolio to substantial "cliff risk" or "tail risk" before it has the opportunity to react to the volatility jump by reducing leverage levels.

Making matters worse, as discussed in Aspen's research note "Crisis Alpha: What It Is and Isn't," such "blue sky" shocks are at best a 50/50 proposition for trend following profitability—and perhaps even worse than that, since low volatility regimes tend to be associated with risk asset uptrends. Moreover, some models seek to maintain volatility targets that are well in excess of MFBI 1.5x's long run 9.8% annualized standard deviation, and as a result they will actually accept far higher leverage ratios during quiet markets. One managed futures mutual fund even reported its gross notional exposure peaking at about 19-to-1. With that much leverage, a mere 5% adverse move in the unlevered underlying positions would be enough to wipe out nearly the entire capital base of the fund. While such an adverse move may be unlikely, it is not impossible. In our view such tail risk is unacceptable, even if it proves to be masked ex post by a continuation of the prevailing low volatility backdrop.

But if large losses are a concern, the reader may wonder why the MFBI model is allowed to hold steady or even increase overall exposure during high-risk market periods, as discussed in the previous section. The reason is that it requires relatively little leverage. This means that downside tail risk is still contained, even though volatility is high. For example, at MFBI 1.5x's max historical leverage of just over 2.6-to-1, a 5% adverse move in the unlevered underlying positions would produce a 13% loss for the model—certainly painful, but nowhere near as devastating as the tail risk in a 19-to-1 portfolio.

Notably, the abnormal run of persistently low backdrop market volatility that has prevailed in the post-Great Financial Crisis era would have the tendency to result in consistently elevated leverage levels for volatility targeting models. This has the consequence of increasing the odds of running into a negative "cliff" event, simply by increasing the percentage of time that such models are exposed to the inflated leverage that introduces cliff risk.

For Aspen MFBI, on the other hand, because leverage is not increased when backdrop volatility is low, the post-GFC low-vol environment has tended to result in model volatility that is mostly below the index's long-run average. Such an outcome is intentional in model design, since Aspen MFBI derives its volatility from the markets, rather than targeting volatility directly.

## Conclusion

The design of the Aspen Managed Futures Beta Index is focused on its role as a portfolio diversification tool. This means that stand-alone risk-adjusted return metrics are less important than the characteristics of the model in a portfolio context. In practice, this means enabling the model to maximize its diversification potential—with special focus on providing crisis alpha during extended periods of market stress—without embedding hidden downside tail risks. Such goals are accomplished by allowing MFBI's volatility to vary up and down with the volatility of underlying markets and the favorability of the available opportunity set, rather than targeting a fixed, pre-determined volatility level.

## *Important Disclosures*

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## *Benchmarks & Indices*

*The Aspen-MFBI is constructed using a quantitative, rules-based model designed to replicate the trend-following and counter-trend exposure of futures markets by allocating assets to liquid futures contracts of certain financial and commodities futures markets. The Index therefore seeks to reflect the performance of strategies and exposures common to a broad universe of futures markets, i.e., managed futures beta.*

*"Newedge CTA Index" is a widely recognized managed futures performance benchmark comprised of a pool of the largest CTAs open to new investment.*

*"S&P 500" are represented by the S&P 500 Index, a widely recognized index of 500 large-cap US stocks.*

*These benchmarks are unmanaged and do not represent the attempt of any manager to generate returns on an investment. These benchmark indices do not include transaction costs, fees, and other expenses. An investor cannot invest directly in an index.*