



**Quest
Partners** LLC

AlphaQuest CTA Research Series #3

The goal of this research series is to demystify specific black box CTA trend following strategies and to analyze their characteristics both as a stand-alone product as well as within a portfolio of typical financial instruments.

Quantitative Trend Following Strategies and Equity Risk: From Diversifier to Hedge

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I. Synopsis

The goal of this paper is to analyze the equity risk hedging capabilities of CTA Trend Following (TF) strategies and to evaluate enhancements that would stabilize their hedging characteristics to equities.

With real yields on US treasuries below zero, institutions are pushing the envelope to find new sources of return, Alpha and risk. More complex, but less liquid and less transparent, new investment conduits such as hedge funds have hidden the usually apparent equity market risk, as measured by volatility, by converting it in the form of tail risk and negative skew.

Fixed Income has been very stable in the past 30 years and not many worry or care to hedge exposure to it yet. Equities, on the other side, have had some large cycles and drawdowns, which include some over 50%. Although it is now in the form of tail risk, rather than “old fashioned” volatility, most investors would still like to hedge the residual equity risk that is now the core risk in almost every portfolio including hedge funds and fund of hedge funds. The DJCS HFI Dedicated Short Bias (Short Biased Index) has been extremely costly with a negative true Alpha of around -5.5% a year to the SP500. Timing the overall equity market on a discretionary or fundamental basis has not worked for most. Put option buying is inefficient despite the low implied volatility of the equity markets and it only rewards sporadically due to the negative skew of equities. A profitable or at least cheaper hedge would be most welcome and there still seems to be some hope that TF can effectively hold this responsibility. We will offer some enhancements that will make the correlation of TF to equities significantly negative in order to stabilize this relationship.

Despite strong performance during equity drawdowns, TF has been used (and sized) only as a diversifier in portfolios, not as a hedge. This could be due to:

- 1) A lack of model transparency and understanding,
- 2) High volatility that sometimes correlates to equities, and
- 3) Neutral rather than negative long term correlation to equities.

In this paper, we will:

- 1) Analyze the ability of TF to improve a hedge fund portfolio's risk adjusted returns and drawdowns,
- 2) Explore the increase in correlation of TF managers to equities and the reduction in their equity hedging characteristics over time,
- 3) Specifically analyze the impact of Fixed Income in TF portfolios and its role in TF hedging of equities,
- 4) Estimate the ability of TF ex-Fixed Income to hedge equity drawdowns across trading time frames and trading styles,
- 5) Explore the use of TF as a timing filter for equity indices, and
- 6) Enhance a diversified TF portfolio with covariance filtering to stabilize its ability to hedge equity risk.

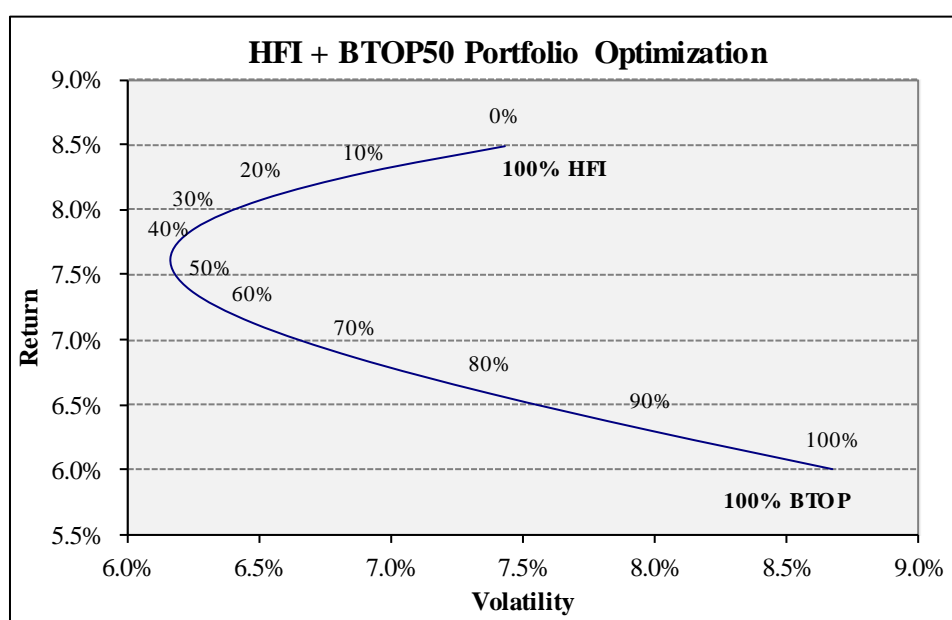
Some of our findings are:

- 1) TF has provided great returns during equity corrections in the past but the relationship has steadily declined in stability. Today, TF manager indices provide minimal value added to hedge fund portfolios.
- 2) TF managers have reduced their core style exposure and increased: equity correlated risk-on trading, longer term trading and directionally biased trading on the long side of the market.
- 3) Fixed Income has been particularly effective as part of a TF portfolio in providing cheap equity hedging. This has been even more of a factor for large liquidity-constrained CTAs with higher exposure to Fixed Income and longer term time frames. The ability of Fixed Income to continue to provide equity hedging is questionable.
- 4) TF does provide equity hedging even without Fixed Income but only in certain trading styles: intermediate term time frames and short market direction trades. Both of these are transaction cost sensitive and not easily available to large TF managers.
- 5) Equity market timing using TF has been effective, but is vulnerable to gaps and increased market negative skew.
- 6) One can use covariance filtering on TF to provide what is lacking today in TF indices: a much more focused short equity exposure that is cheap and lends itself well to enhance equity portfolio returns and risk adjusted returns. Investors who have sought the comfort of large CTAs have unknowingly compromised their exposure to these highly valuable trades.
- 7) The Alpha to equities available with this filtering methodology is unmatched in liquid financial markets. This Alpha is not only liquid, but it is also quite transparent. It is difficult to explain in the context of Modern Portfolio Theory and can be attributed to investor misinformation or misunderstanding of TF strategies. It is exploitable.

II. Hedge Funds + CTAs Portfolio Optimization

To begin the evaluation of CTAs¹ as an addition to a hedge fund portfolio, we will run a portfolio optimization. The Dow Jones Credit Suisse Hedge Fund Index (HFI) and the BTOP50² will be used to represent hedge funds and CTAs respectively. The study runs from 1994 to December 2012.

We find that the highest Sharpe Ratio is achieved through an 80% allocation to the HFI and a 20% allocation to the BTOP50. The Sharpe Ratio is ONLY improved by 5% versus using the HFI alone. The addition of the BTOP50 to the HFI reduces the drawdown by 22%.



	BTOP50	HFI	80% HFI + 20% BTOP50
Return	6.0%	8.5%	8.1%
Volatility	8.7%	7.4%	6.5%
Drawdown	-13.3%	-19.7%	-15.3%
Return/Volatility	0.69	1.14	1.24
Sharpe	0.29	0.68	0.71
Return/Drawdown	0.45	0.43	0.53
Skew	0.38	-0.17	0.13

¹ We will use the terms Trend Following (TF) managers and CTAs interchangeably throughout this paper.

² The BTOP50 Index seeks to replicate the overall composition of the managed futures industry with regard to trading style and overall market exposure. The BTOP50 employs a top-down approach in selecting its constituents. The largest investable trading advisor programs, as measured by assets under management, are selected for inclusion in the BTOP50. In each calendar year, the selected trading advisors represent, in aggregate, no less than 50% of the investable assets of the Barclay CTA Universe.

The typical allocation to CTAs within hedge fund of funds is typically below 10%. Two factors that contribute to this under-allocation are a lack of proper understanding of TF models and positive skew.

In actuality, CTA indices can be replicated, without skill, using a simple and robust strategy such as a 10 day to 100 day simple moving average crossover (MA10x100) on a risk normalized portfolio of futures and FX markets³. One would have historically achieved a correlation of around 70% to CTA indices with this simple process. With the addition of trading time frame and sector optimization this correlation can be increased to above 80%. Independently, with the addition of FX Carry or Risk-On trading, the correlation of the replicator to the CTA indices can also be increased to around 80%. Despite the ease with which most CTA strategies and indices can now be replicated, most CTAs remain heavily opaque and protective when it comes to describing their trading strategies.

Furthermore, CTA returns are positively skewed, which makes them more difficult to hold in an institutional portfolio geared towards the short term comfort of negatively skewed strategies⁴. As more and more assets are managed by institutions rather than directly by individuals, the preponderance of low volatility (easier to justify and report on) and negatively skewed strategies is increasingly apparent. Even the skew of CTA indices has steadily decreased over time.

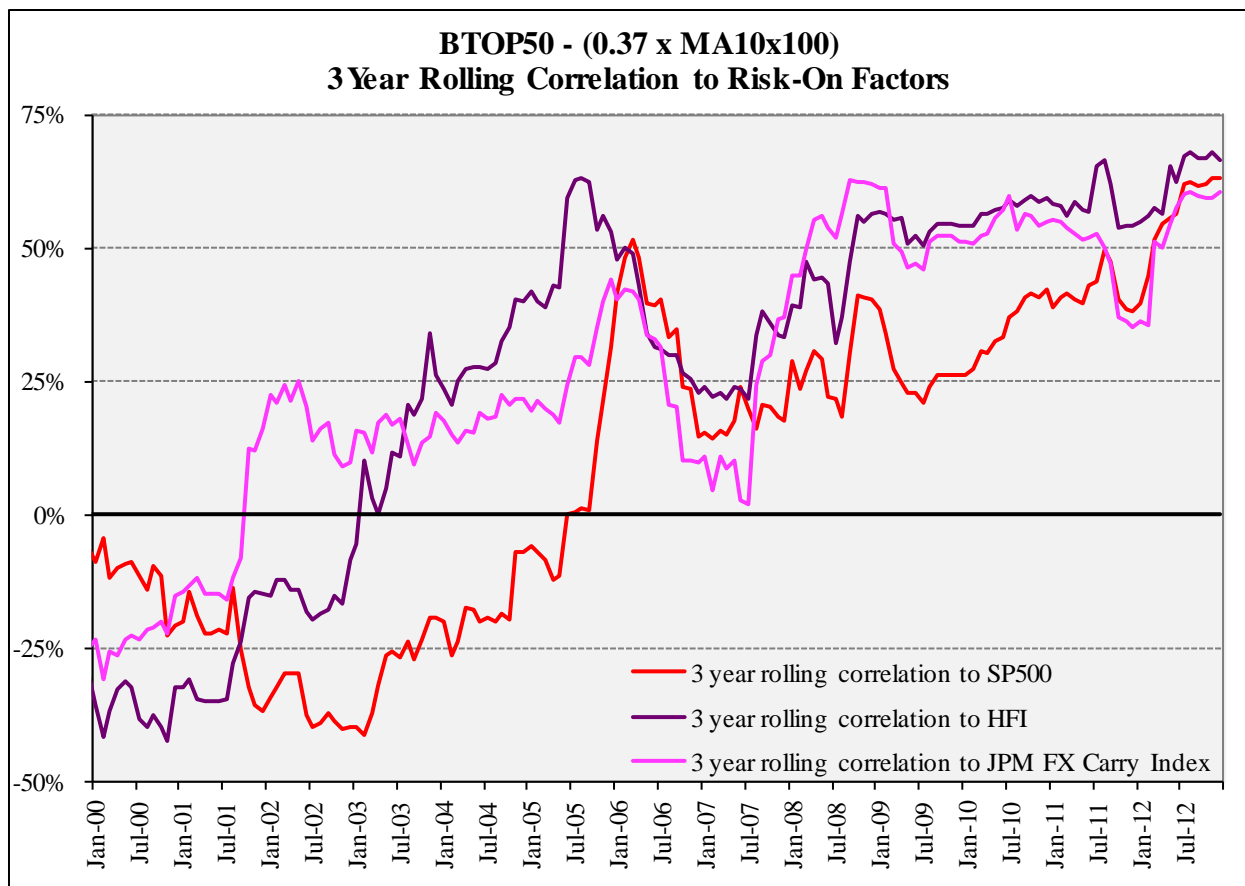
³ Please refer to our research piece called “Black Box Trend Following - Lifting the Veil” (September 2010) which provides details on the replication process.

⁴ Please refer to our research piece called “Know Your Skew – Using Hedge Fund Return Volatility as a Predictor of Maximum Loss” (June 2011) for more details on skew and related behavioral biases.

III. Increasing CTA Correlation to Risk-On Factors

Although CTAs have long been sought after for their ability to provide positive returns during risk-off environments, they have equally been shunned due to their undesirable volatility during risk-on periods. In an effort to attract the mass of CTA investors (who favor the hedging characteristics of CTAs but reject their high volatility), it seems the CTA industry has attempted to reduce its volatility. This has been achieved by reducing the exposure to their main trend following component and by increasing exposure to risk-on trading effectively reducing its equity hedging capability.

The following graph shows the rolling correlation of the BTOP50 minus its trend following component to three risk-on factors (SP500, HFI, and JPM FX Carry Index). These correlations have steadily increased over the past 10 years and now have settled at around +60%. The large CTAs that comprise the BTOP50 are effectively long the SP500 Beta, long hedge fund like strategies and long FX Carry (long high interest rate paying currencies such as emerging markets and short low interest rate paying currencies such as the major currencies).



As one would expect, the correlation of both the HFI and the carry strategy to the SP500 is moderately high at 57% and 48% respectively. Both the HFI and the carry strategy benefit from a positive yield earning characteristic that is inevitably coupled with substantial tail risk. Please refer to our second research piece

titled “Know Your Skew – Using Hedge Fund Return Volatility as a Predictor of Maximum Loss” in regards to evaluating tail risk numerically.

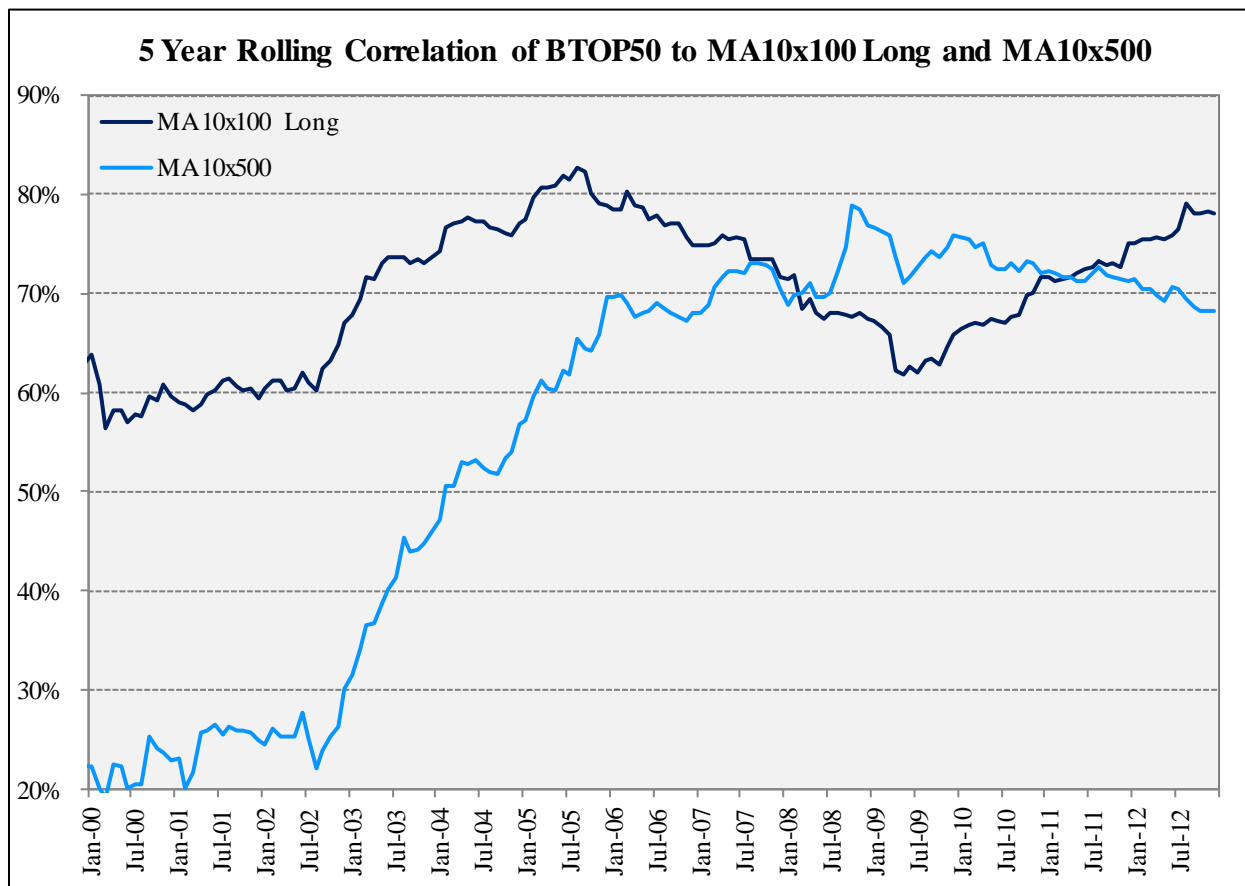
Similarly, we can see increasing BTOP50 correlation to:

- 1) long term trend, and
- 2) long market direction trades.

These optimizations could be driven by the recent outsized returns of these factors or by the quest for higher trading capacity. In our first research piece, we illustrated that the skew of long term trades and long market direction trades is near 0, which means that they have very limited capability of benefiting during stock market corrections. In comparison, some short term models have +0.7 skew and short market direction trades have a skew of +1.6, which makes them more capable of benefiting from fast trend reversals.

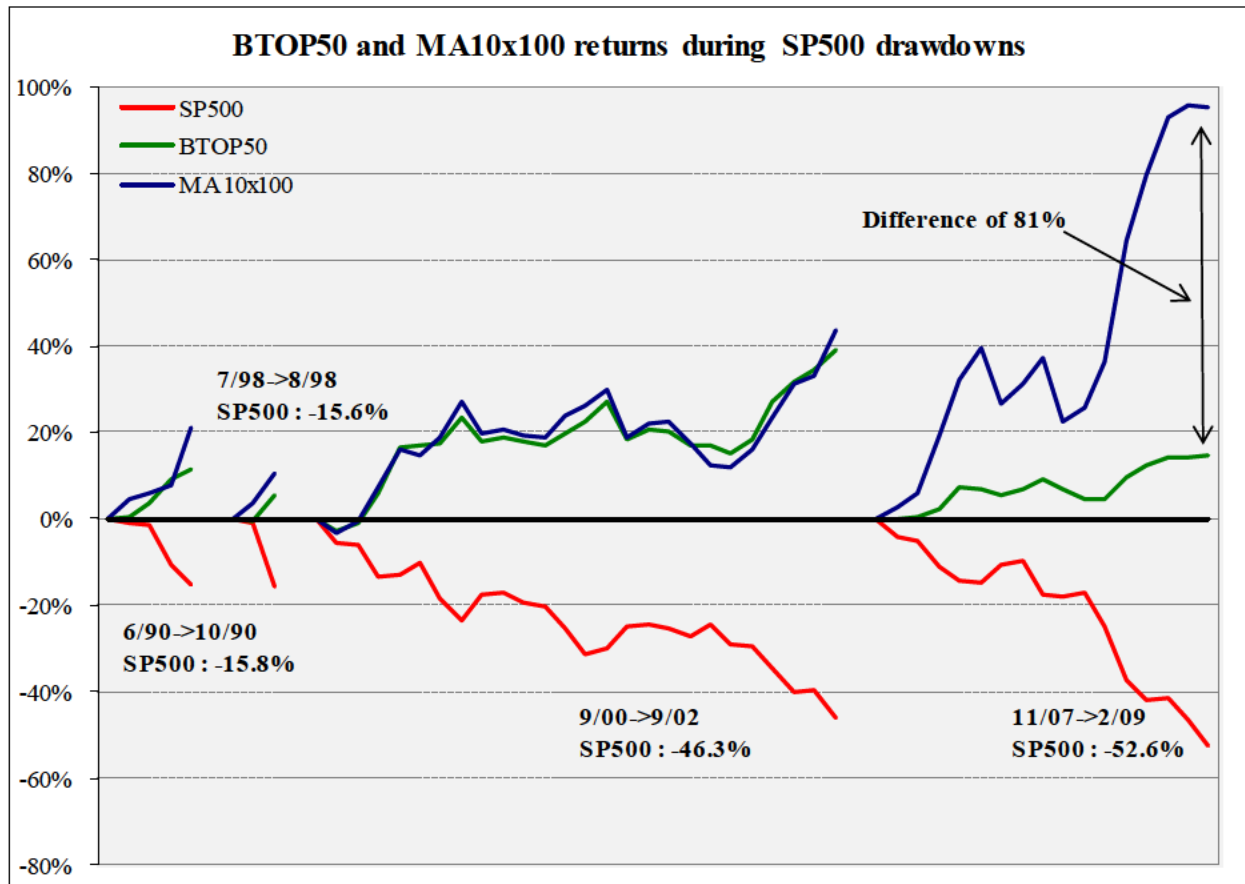
In summary, these style drifts have:

- 1) reduced transaction cost sensitivity and increased capacity,
- 2) reduced program volatility by diversifying return drivers and increased marketability,
- 3) reduced the ability to hedge equity drawdowns, and
- 4) reduced the benefits of adding the BTOP50 to a hedge fund portfolio as a hedge.





These style drifts are further confirmed by the 81% underperformance of the BTOP50 relative to its MA10x100 trend following based tracker during the 2007-2009 correction in equities.

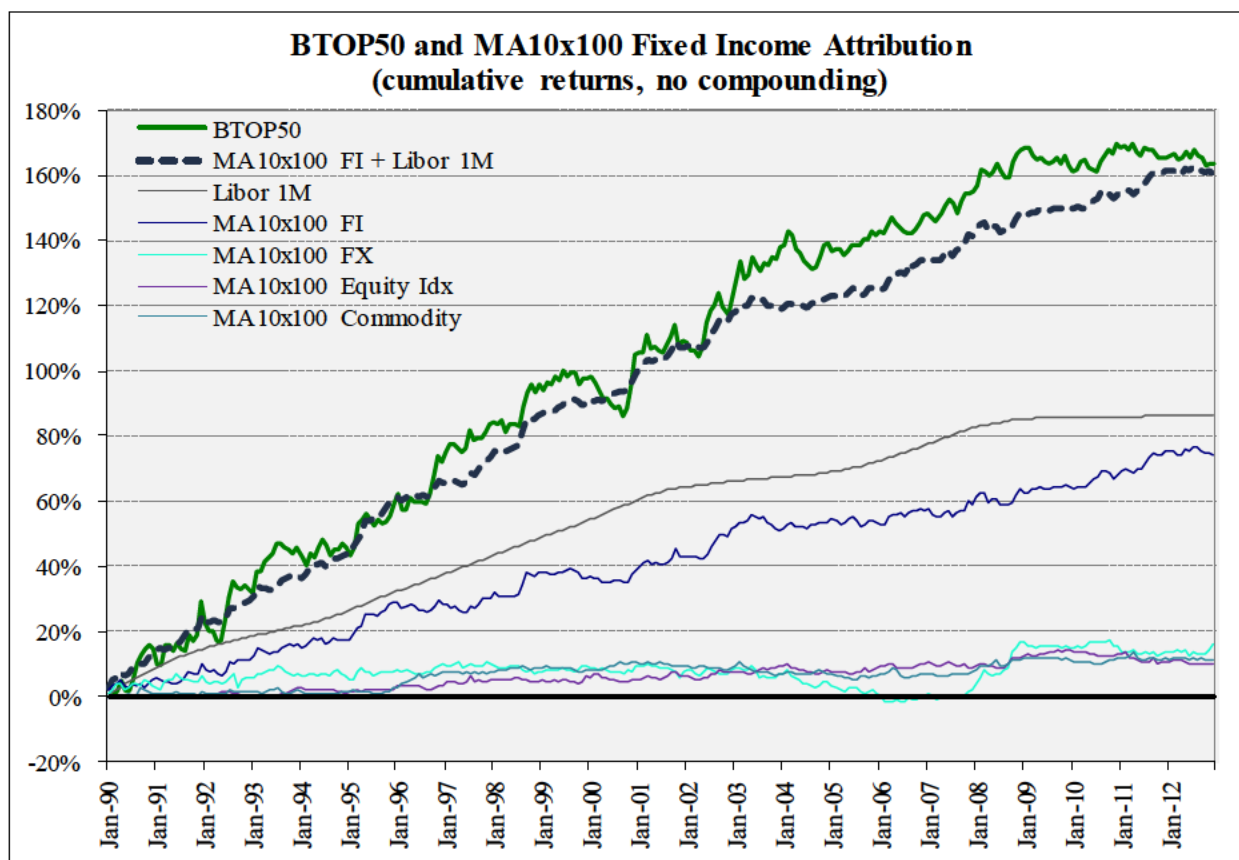


TF managers who have diversified away from risk-off trades into risk-on trades to reduce their volatility are now much less capable of hedging equity drawdowns. This new generation of large, diversified CTAs have lower volatility with no apparent cost in returns (yet) and this seems to have been a major boost in their ability to raise assets. Their incremental contribution to the risk-adjusted returns of a hedge fund portfolio is, as we have shown, near nil.

IV. Fixed Income and CTAs: a Marriage Made in Heaven?

The drop in global sovereign bond yields over the last 30 years resulted in price trends that were an ideal environment for trend following. Capital gains and positive carry jointly contributed to strong efficient trends with few reversals. Applying the previously mentioned replicator strategy of MA10x100 on the Fixed Income sector on a risk normalized basis would have yielded a Sharpe Ratio of almost 0.90, which is higher than the BTOP50's of 0.34. Also, since 1987, the established uptrends in Fixed Income further accelerated during equity corrections, which provided CTAs with outsized returns. These returns during equity corrections came without the typical delay and losses experienced by TF models as trends reverse at such a critical time in a portfolio.

A per sector factor analysis shows that close to 100% of BTOP50 returns is attributable to the Fixed Income trading and Libor (BTOP50 in green and MA10x100 on Fixed Income + LIBOR in dashed line)



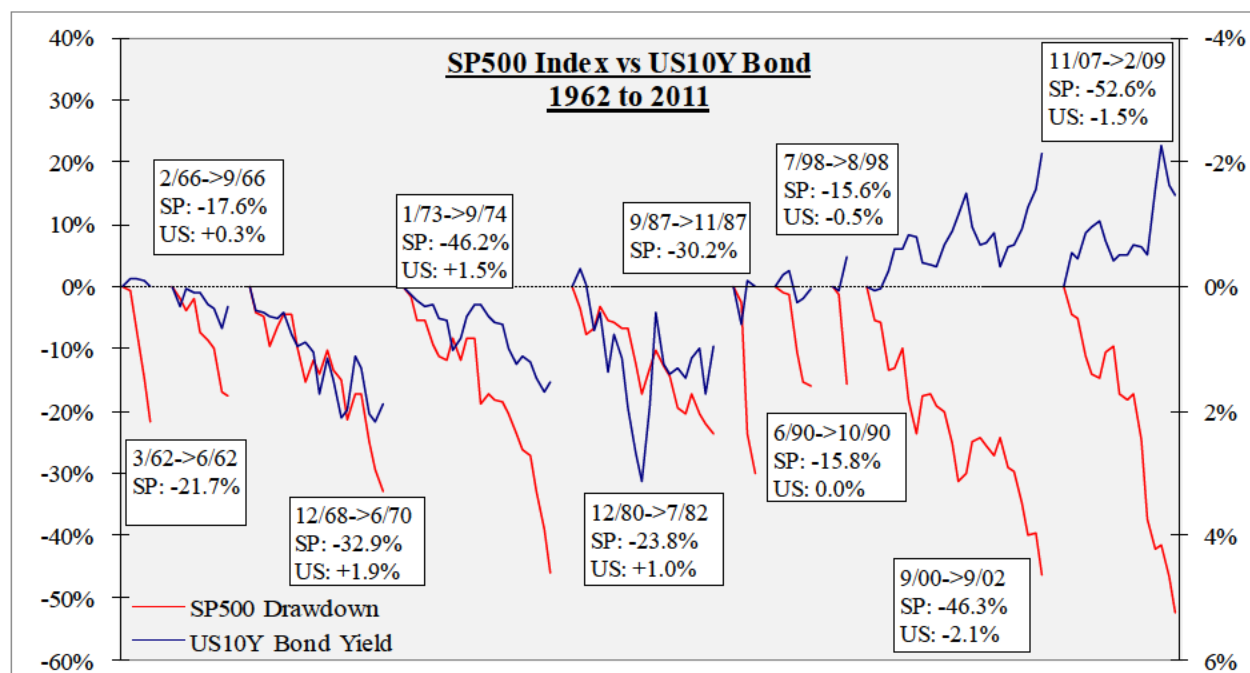
	BTOP50	Libor 1M	MA10x100 FI	MA10x100 FX	MA10x100 Equity Idx	MA10x100 Commodity
Sector Weights *		100.0%	54.3%	51.3%	29.2%	24.5%
Return	6.9%	3.8%	3.2%	0.6%	0.4%	0.5%
Volatility	9.2%	0.7%	3.6%	3.2%	1.8%	1.8%
Return/Volatility	0.75	5.68	0.88	0.20	0.24	0.26
Skew	0.48	-0.11	0.27	0.32	0.01	0.06
Correlation to BTOP50	1.00	0.10	0.52	0.49	0.34	0.30
% of BTOP50 return		55.2%	46.2%	9.2%	6.2%	6.7%

*Relative to the MA10x100 model from Lifting the Veil research piece.

This is a by-product of the strength of TF returns on Fixed Income over the last 20 years AND an over-allocation to Fixed Income as justified by:

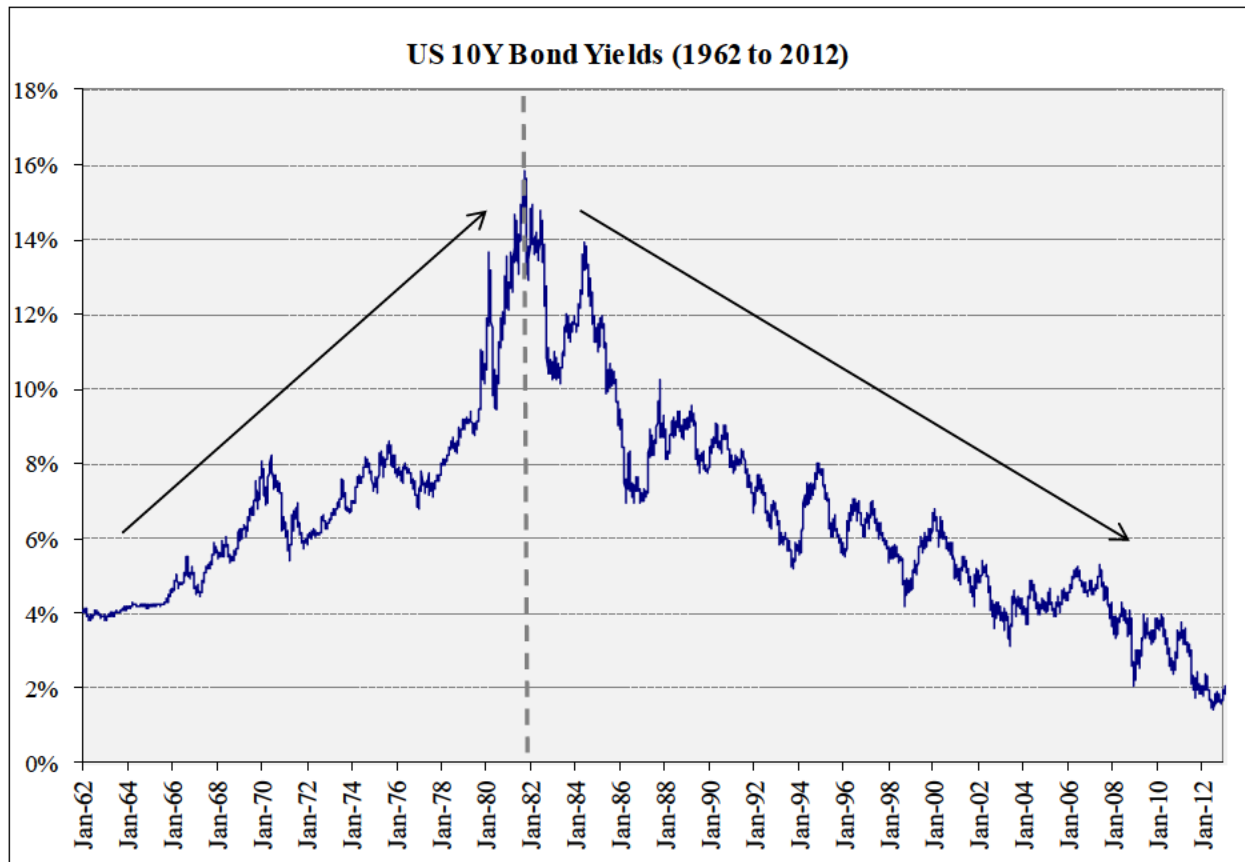
- 1) the liquidity of the Fixed Income sector (a boon for large managers),
- 2) the recent outperformance of longer term trend following models relative to the more typical intermediate term models, which indirectly exposes longer term CTA portfolios to the trending Fixed Income sector rather than the more whipsaw vulnerable equity, FX and commodity sectors, and
- 3) the outperformance of long only trading strategies, which also indirectly results in larger exposure to the up trending Fixed Income sector.

It is important to consider that Fixed Income might not always act as a hedge for equities which would imply that TF would have a more difficult time capturing shock-initiated equity trend reversals in the future. Please note that prior to 1987, Fixed Income yields actually corrected concurrently with equity corrections.

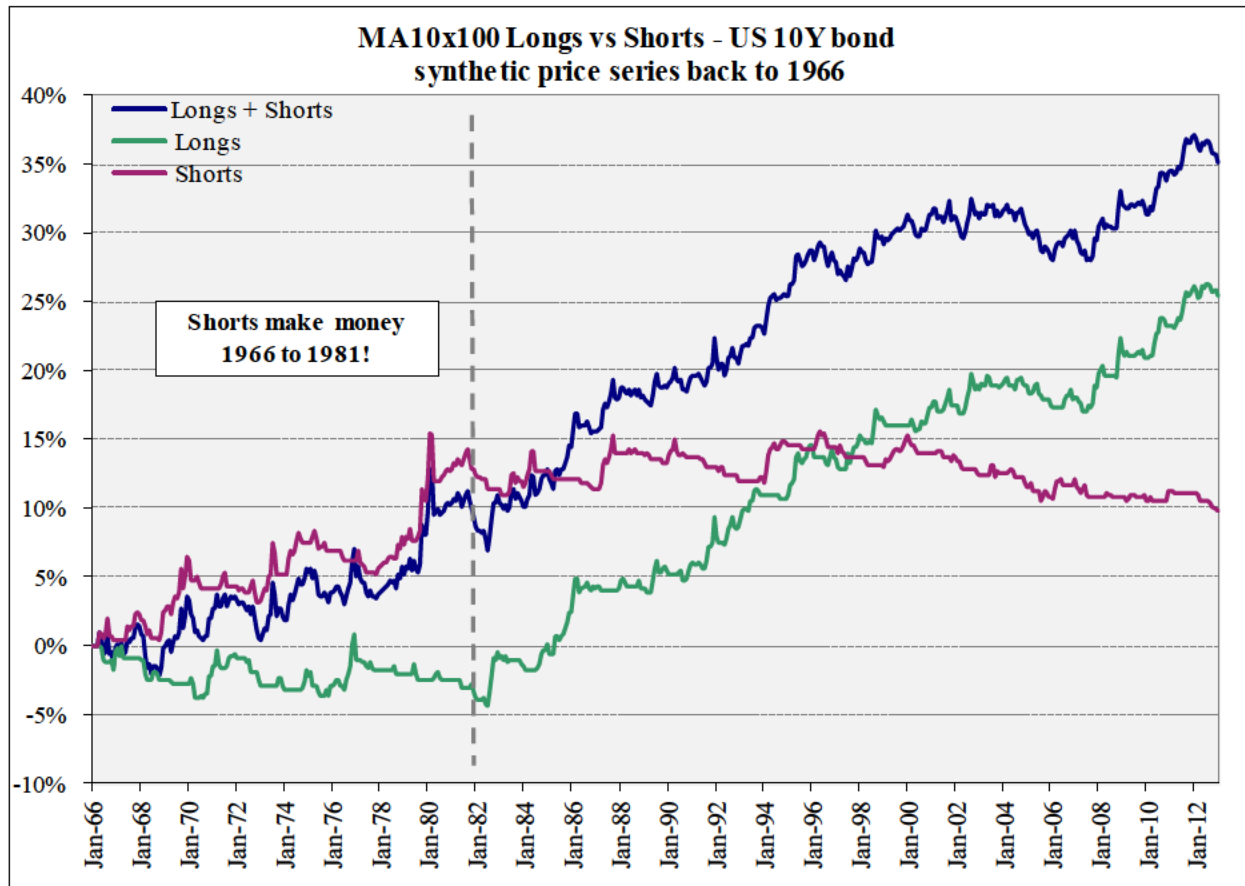


V. Can CTAs Benefit from a Fixed Income Bear Market?

With US treasury yields already down almost 90% from 1981 highs (US 10Y treasury yields dropped from 15.68% in 1981 to 1.73% as of April 2013), it is unlikely that Fixed Income continues to trend up as it has in the past 30 years.



For TF managers, a concern has been that when yields increase, the carry and capital gain components of Fixed Income will work against each other drastically increasing trend noise versus having both aligned as has been the case more recently. To test this hypothesis during increasing yield environments, we simulated the MA10x100 on a synthetic US10Y Treasury bond future going back to 1966.



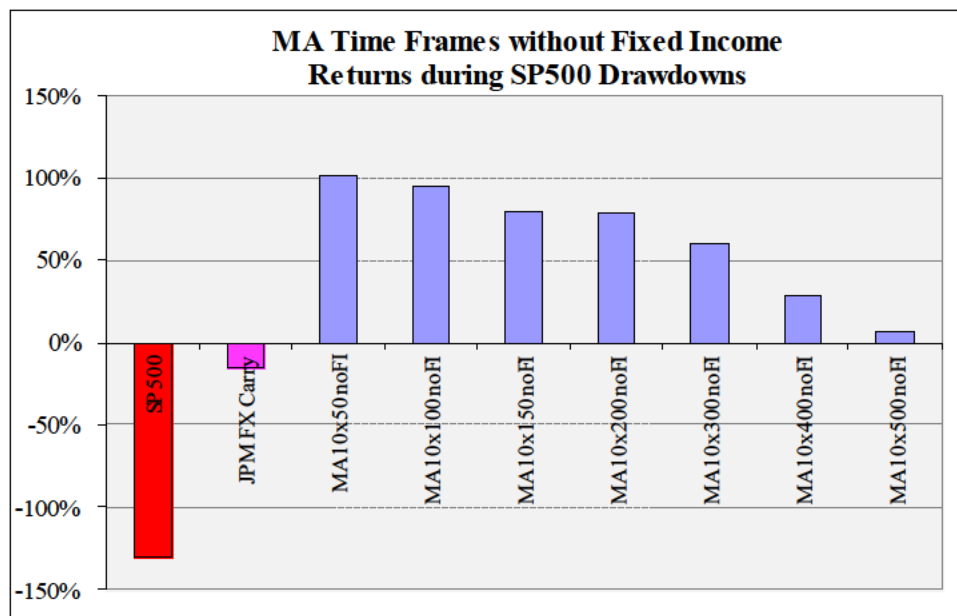
	Overall			1966 - 1981			1982 - 2012		
	Long + Short	Long	Short	Long + Short	Long	Short	Long + Short	Long	Short
Return	0.71%	0.53%	0.18%	0.50%	-0.22%	0.73%	0.84%	0.94%	-0.09%
Volatility	2.1%	1.5%	1.6%	2.6%	1.4%	2.3%	1.8%	1.5%	1.0%
Sharpe Ratio	0.34	0.37	0.11	0.19	-0.16	0.32	0.47	0.63	-0.09

We found that the volatility of capital gains component being much higher than the carry component resulted in strong profits on the short side of Fixed Income trading. The overall profitability remained constant albeit with slightly higher volatility during the Fixed Income bear market.

VI. Without Fixed Income, Can TF still Provide an Equity Hedge?

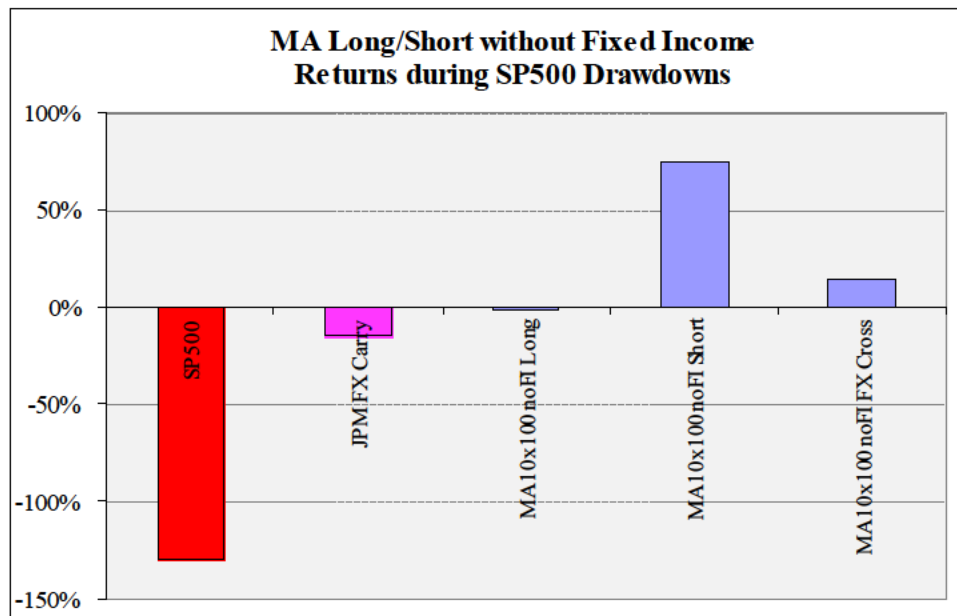
We showed that most BTOP50 returns can be explained by Fixed Income trading. Considering the precariousness of Fixed Income trends going forward, we would like to evaluate TF Ex-Fixed Income returns during equity corrections.

We ran MA10x100 style models across multiple time frames on a portfolio that excluded Fixed Income (MA10x100-XFI). As one would expect, due to the abruptness of trend reversals (negative skew) in equities, longer term time frames were not effective at capturing trends during equity drawdowns. In the longer term time frames, it is the exceptional and now unstable conditions of the Fixed Income markets that provided some hedging during equity corrections. This dependence of the hedging ability on shorter term time frames was further explored in our “Lifting The Veil” research piece. Shorter term time frames are more positively skewed and more effective at adapting to fast trend reversals that occur during equity corrections.



Similarly, when we compare the returns of the long trades versus the short trades of MA10x100-XFI, it is clear that long trades provide no protection or returns during equity corrections and that close to 100% of MA10x100-XFI returns are due to short trades. Again, as highlighted in our “Lifting The Veil” piece, the skew of short trades is around +1.66 and near 0 for the long trades.

It is important to note that on an unfiltered model such as MA10x100, shorts have made less than 5% of the profits in the past 20 years. This is assuming transaction costs for a hypothetical \$2B account size. At larger account sizes, it is likely that the larger transaction costs would have made short trades a high probability losing proposition. This would explain the slow drift away from short trades as documented previously in this piece.



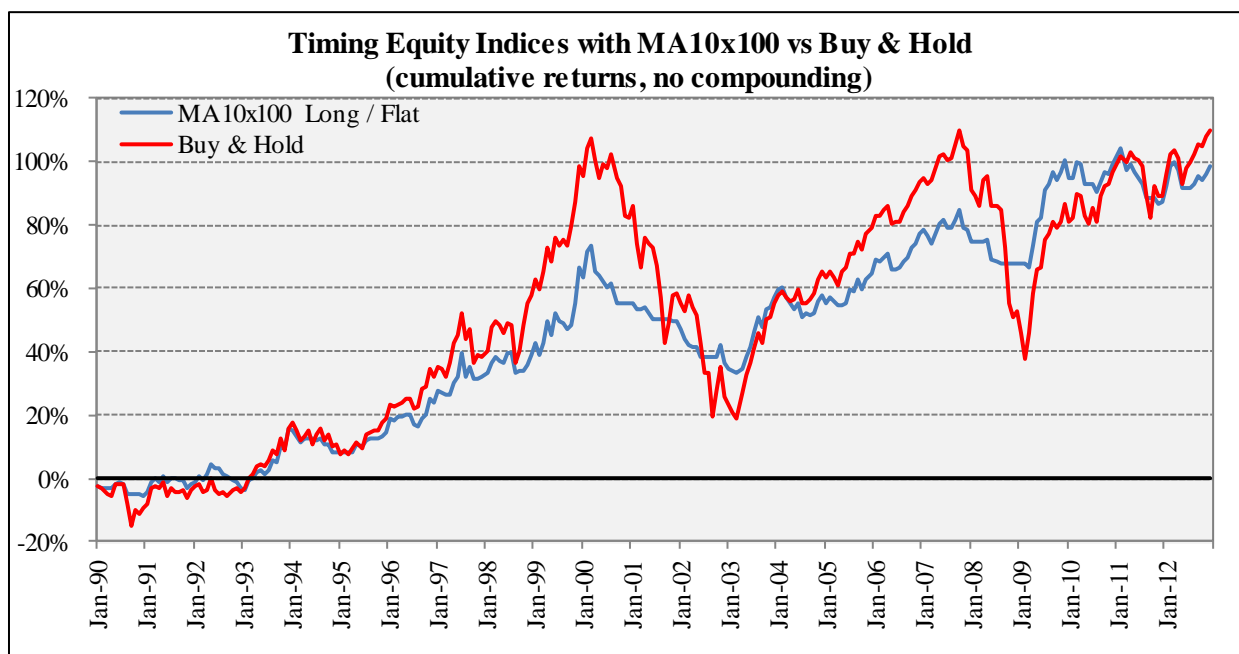
Shorter term trading and short trades are exactly what is slowly being excluded from the BTOP50 according to our rolling correlations studies. We suspect this is not only due to the low Sharpe Ratios of these factors in the recent years, but also and most importantly due to their high transaction cost sensitivity. Allocations into large CTA managers force assets into Fixed Income trading, longer term time frames and long trades.

During equity corrections that are concurrent to a flat or rising rate environment, large CTA managers (more Fixed Income, long term trading and long trades) are unlikely to provide satisfactory returns. In this type of environment, medium- and small-sized TF managers with focus on intermediate term time frames without a directional trading bias are more likely to provide substantial and much needed returns.

It is, once again, clear that using Sharpe Ratio and volatility without regard for skew as a performance measure is a misguided endeavor; in particular when it comes to all styles within the hedge fund universe.

VII. Timing equity index shorts with trend following strategies

For investors and managers in the equity space, a common question is whether one can use TF strategies to time hedges on equity indices. To illustrate the effectiveness of using TF to time hedges on equity indices, we will run MA10x100 on a portfolio of six equally-weighted stock indices (SP500, NASDAQ 100, Euro Stoxx 50, DAX, Nikkei 225 and Hang Seng). MA10x100 was applied independently to the individual indices on a Long / Flat basis and compared to Buy & Hold position (rebalanced weekly) in these indices.



	Long / Flat	Buy & Hold
Return (annualized)	3.9%	3.5%
Volatility	9.7%	16.4%
Worst drawdown	-33.9%	-62.2%
Correlation to Buy&Hold	0.70	1.00
Beta to Buy&Hold	0.41	1.00
Skew	0.28	-0.65

For the Long / Flat market timed portfolio, returns are 1.12x higher over the period, but volatility was reduced by 40% and the maximum drawdown was reduced by 45%. The Beta to the indices is cut by over 50% and the skew is now positive. These are attractive results in themselves assuming market characteristics remain the same. We will not address here the usual risks associated with market timing such as whipsaw, gap, gamma and skew risk. Nonetheless, one needs to be aware of and measured in regards to these.

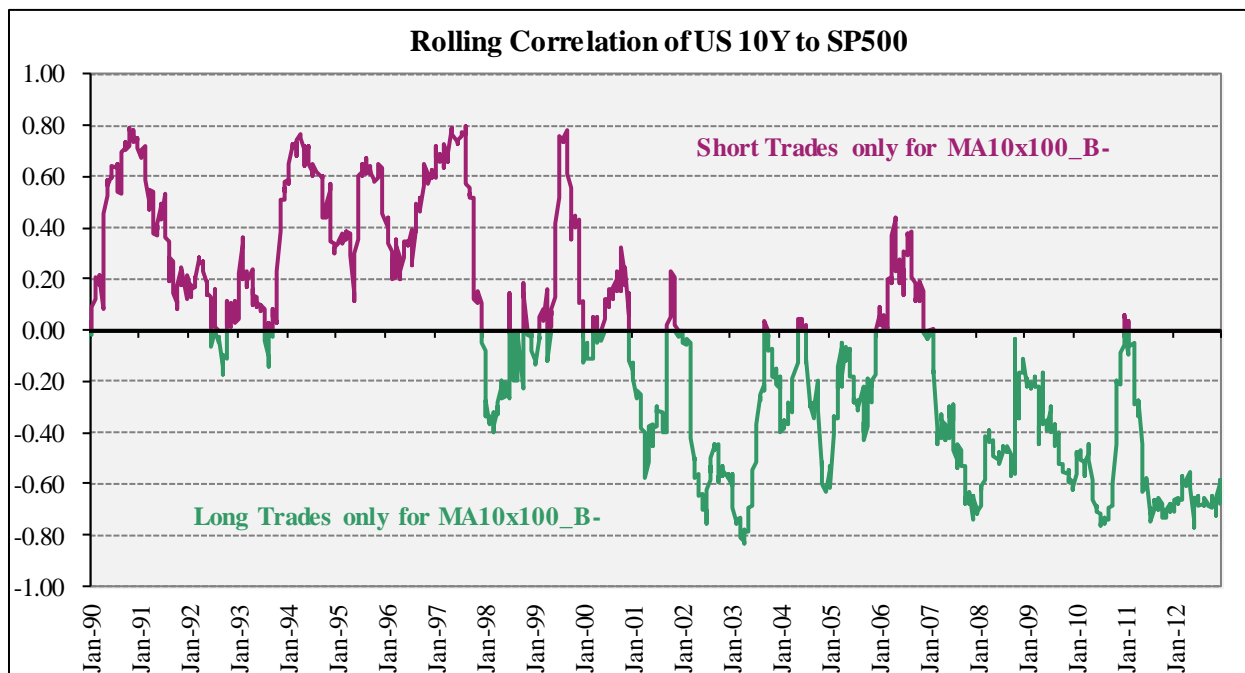
There is some value to equity index timing with TF, but let's continue our exploration into more attractive ways to hedge...

VIII. Enhancing the typical trend following CTA to get a real hedge

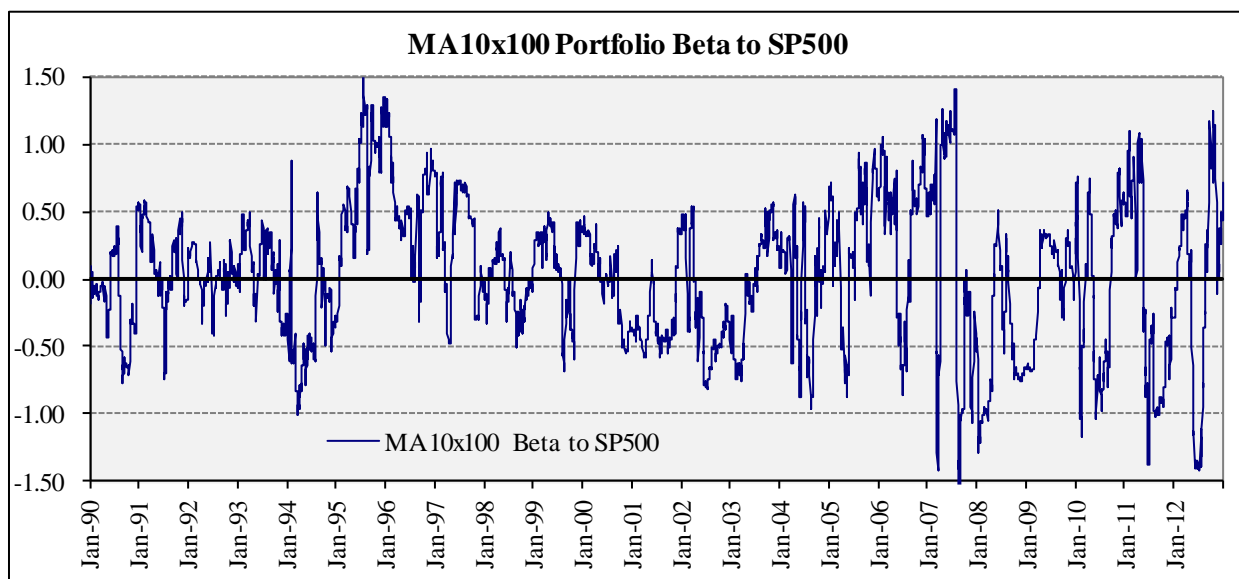
So far, we have found that the large and popular TF managers / CTAs that comprise the BTOP50 have lower volatility but with less of the SP500 hedging potential due to their diversification into risk-on, carry related and/or long SP500 Beta trades. They are also trading more long term and more longs than their peers. A large percentage of their SP500 hedging potential comes from trading Fixed Income. Fixed Income is vulnerable to market regime shifts. The classical TF strategies such as the MA10x100 (unbiased towards the recently outperforming factors of Fixed Income, longer term trading and long trades) seem to have more stable SP500 hedging potential but with a larger volatility. Investors have chosen the now large, lower volatility managers despite the substantial loss in equity hedging potential and instability of future returns due to Fixed Income dependence. In order to customize TF strategies towards the most efficient equity hedging potential and the least amount of undesirable volatility, we propose splitting MA10x100 trades into two complementary components:

- 1) MA10x100_B- (B-) only takes trades which have negative correlation to the SP500 at trade entry.
- 2) MA10x100_B+ (B+) only takes trades which have positive correlation to the SP500 at trade entry.

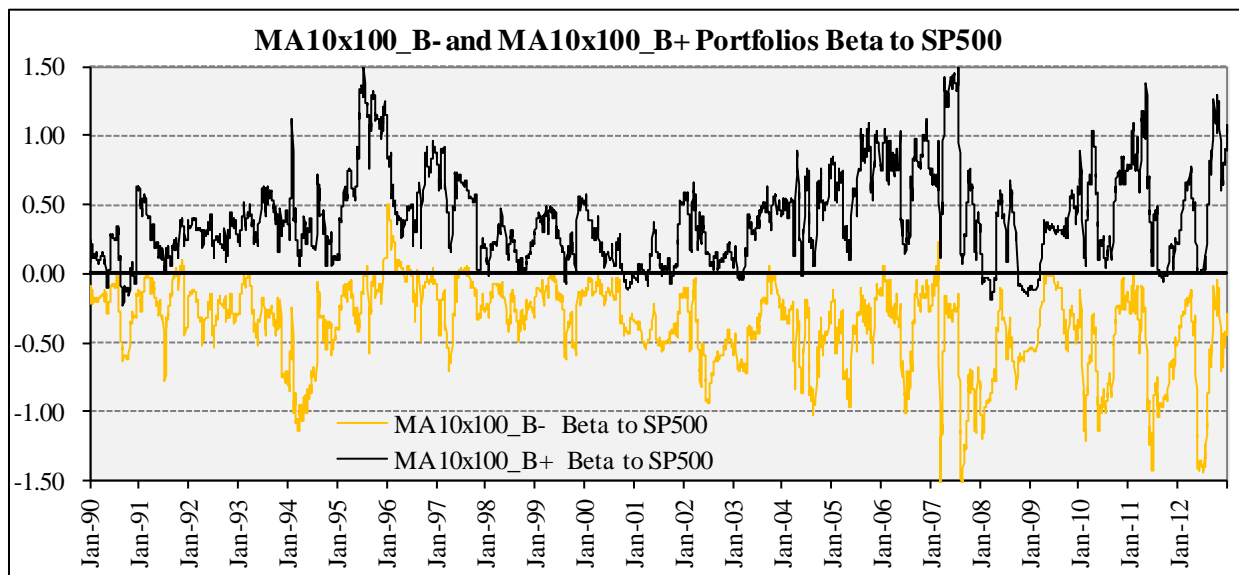
We will have particular interest in the B- trades; trades that have negative rolling correlation to the SP500 at trade entry. As an example, below we look at the rolling correlation of the US 10Y Bond to SP500:



During positive correlations periods (in red), we will only take short trades in the US 10Y Bond. During negative correlation periods (in green), we will only take long trades in the US 10Y Bond.



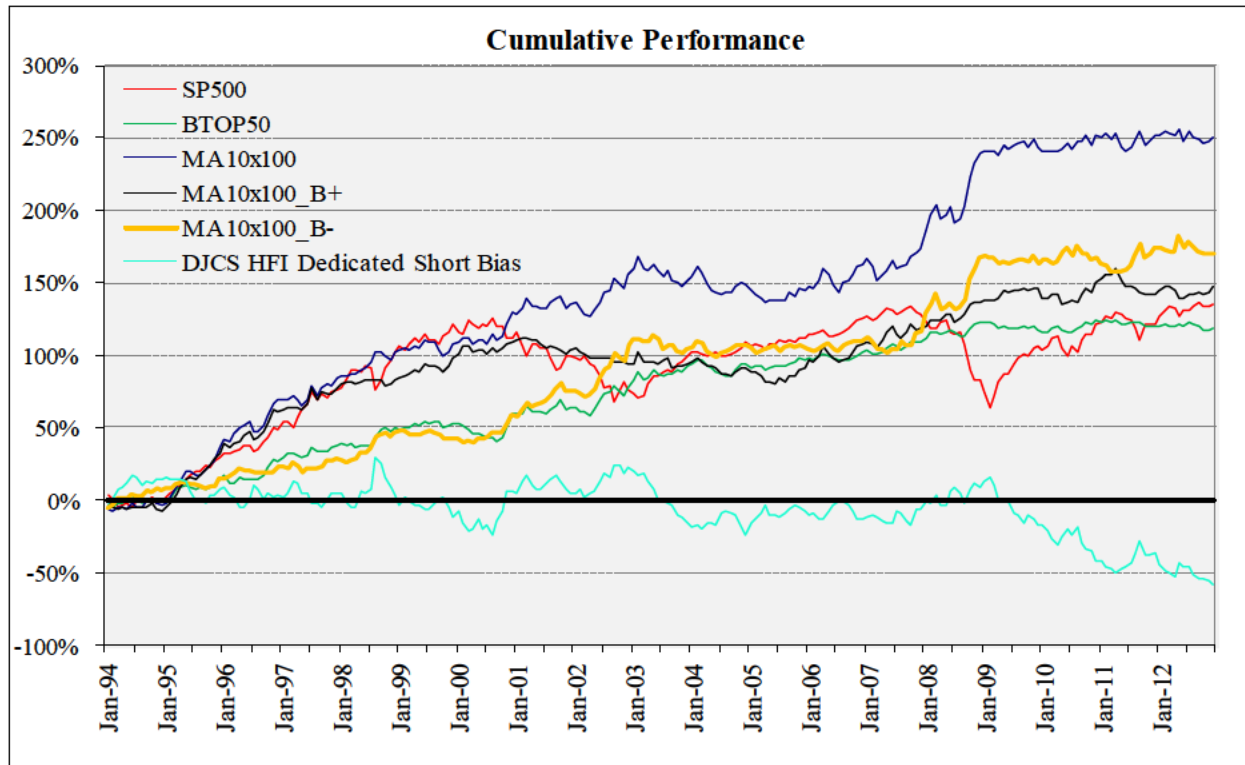
The MA10x100 portfolio Beta to the SP500 is highly sporadic and one can see that it can go as high as +1.5X long the SP500 and as low as -1.5X short the SP500. It is clear that diversified TF can be substantially long equity market Beta. This is not attractive as the typical hedge fund portfolio is already typically long equity Beta and equity tail event risk. Considering that it can take weeks for MA10x100 models to flip from long to short during equity corrections that follow strong equity market uptrends, it is clear that TF can miss catching large equity corrections in relatively common circumstances.



In comparison, the Beta of the MA10x100_B- portfolio remains negative. This makes MA10x100_B- a much more stable equity hedge than the overall MA10x100.



IX. Performance Characteristics of the trend following based B+ and B- Portfolios (and Short Sellers)



	SP500	BTOP50	MA10x100	MA10x100_B+	MA10x100_B-	DJCS HFI Dedicated Short Bias
Return	6.1%	6.0%	12.6%	7.4%	8.5%	-4.4%
Volatility	15.4%	8.7%	15.8%	10.6%	12.0%	16.8%
Drawdown	-52.6%	-13.3%	-28.3%	-28.0%	-16.5%	-65.8%
Return/Volatility	0.39	0.69	0.80	0.70	0.71	-0.26
Return/Drawdown	0.12	0.45	0.45	0.26	0.52	-0.07
Skew	-0.66	0.38	0.09	0.02	0.45	0.69
Correlation to HFI	0.57	0.20	0.12	0.50	-0.29	-0.50
Beta to HFI	1.18	0.22	0.22	0.70	-0.48	-1.16
Alpha to HFI	-3.3%	1.5%	8.1%	0.4%	7.5%	-2.0%
Correlation to SP500		-0.13	-0.22	0.32	-0.56	-0.76
Beta to SP500		-0.07	-0.23	0.21	-0.44	-0.84
Alpha to SP500		2.7%	9.8%	3.4%	6.2%	-5.7%
Rtn during SP500 drws	-114.4%	58.8%	149.7%	8.4%	156.9%	118.4%

Historically, B- trades benefitted from the volatility expansion that accompanies stock market corrections and the B+ trades benefitted from long term slow trends that tend to reverse abruptly.

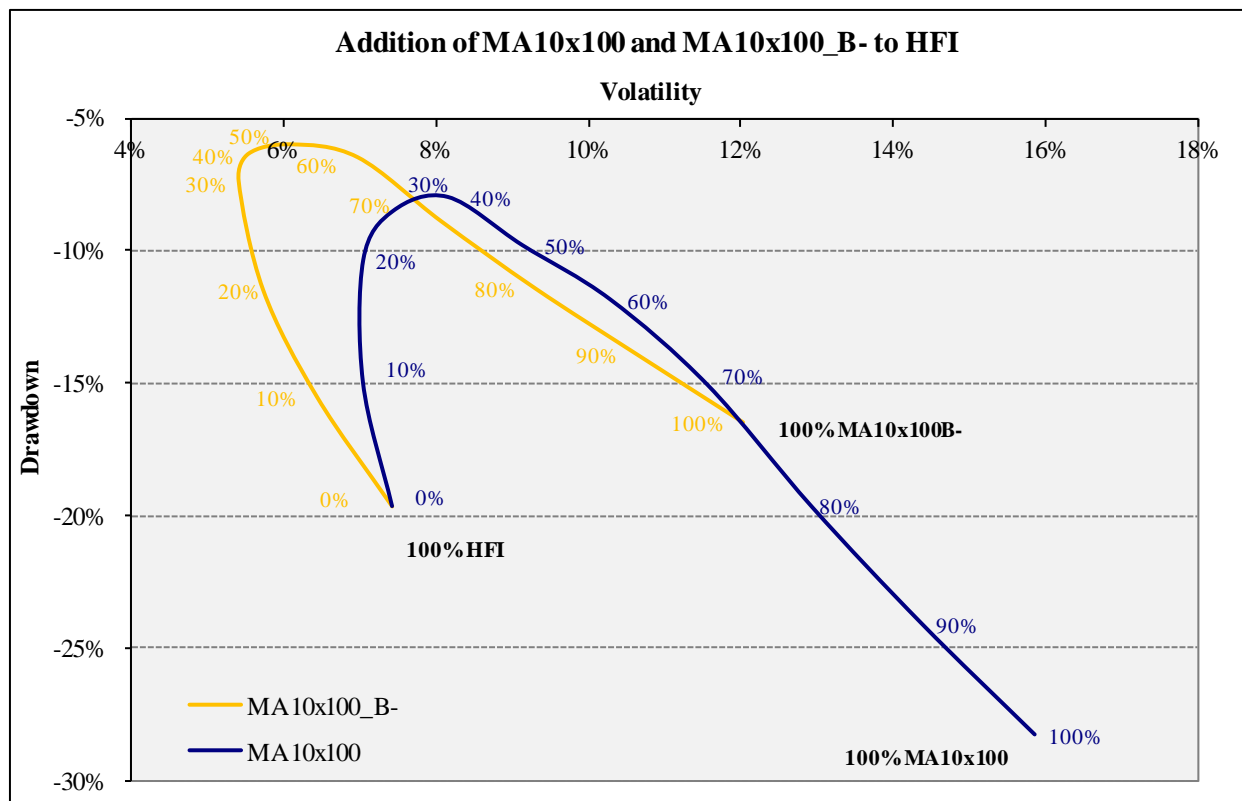
The returns of the B- portfolio during SP500 drawdowns is 156.9% vs. only 8.4% for the B+ portfolio. The B- portfolio has higher returns than the Short Biased Index during equity drawdowns with only one quarter of the drawdown.

The much lower correlation of the B- portfolio to the SP500 and the HFI result in much less unwanted volatility in the hedging process. The MA10x100_B+ Beta to HFI is +0.70 vs. -0.48 for the MA10x100_B-

Based on these simulations, the B- portfolio is a true hedge with significant Alpha and most importantly, highly positive expected returns.

X. HFI Volatility and Risk Reduction

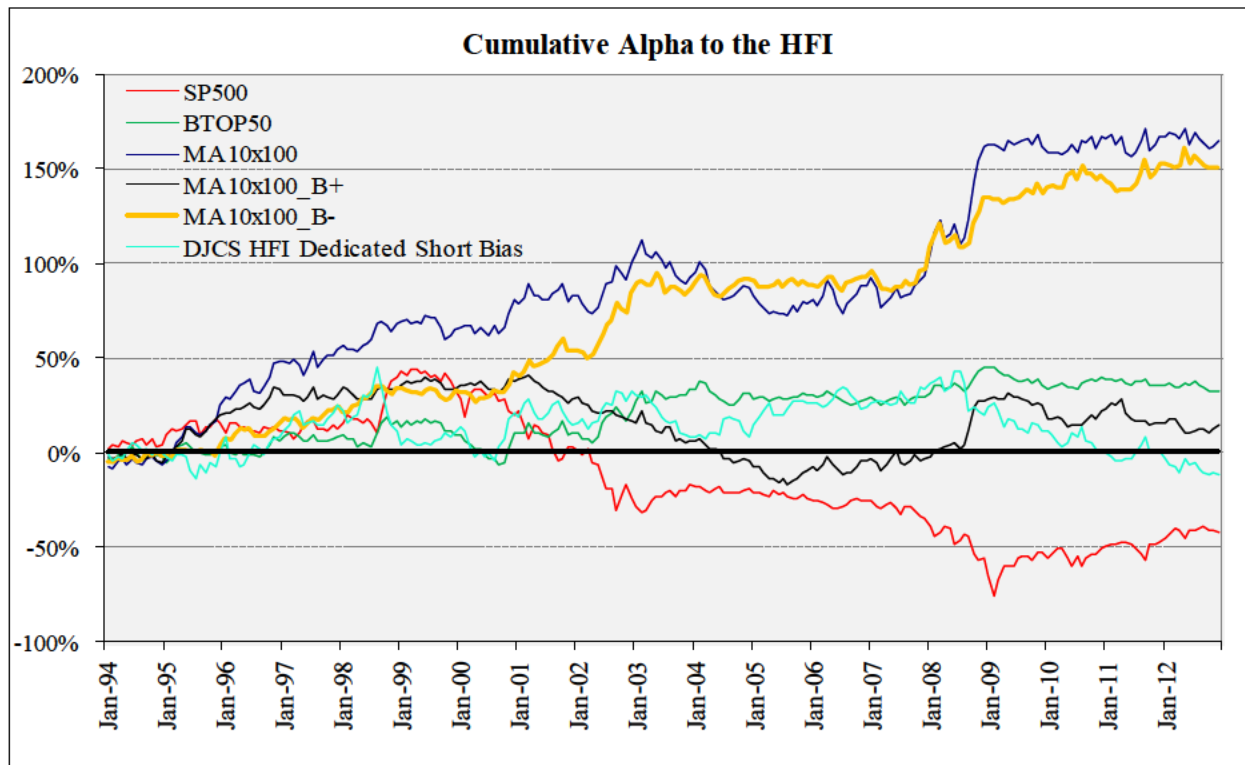
The B- addition to the HFI reduces the volatility by 27% and the drawdown by 62%. An MA10x100 addition to the HFI does not affect volatility and reduces the HFI drawdown by 56%. If one is looking for a true hedge that is stable from a correlation perspective and can reduce volatility, the B- portfolio is vastly superior.





XI. Cumulative Alpha and Information Ratio to HFI: Get Paid to Hedge

Over 90% of the Alpha of the MA10x100 to the HFI comes from the B- portfolio. The information ratio⁵ of the B- portfolio is 0.65 vs. only 0.05 for the B+ portfolio and -0.14 for the Short Biased Index. The information ratio of the B- portfolio is higher than the overall MA10x100. The Alpha of Short Biased Index to the HFI is -2% per year vs. +7.5% for the B- portfolio.



	SP500	BTOP50	MA10x100	MA10x100_B+	MA10x100_B-	DJCS HFI Dedicated Short Bias
Alpha to HFI	-3.3%	1.5%	8.1%	0.4%	7.5%	-2.0%
Volatility of Alpha to HFI	12.7%	8.5%	15.7%	9.2%	11.5%	14.4%
Drawdown of Alpha to HFI	-72.6%	-22.7%	-34.2%	-44.8%	-12.2%	-50.9%
Information Ratio to HFI	-0.26	0.17	0.52	0.05	0.65	-0.14
Alpha to HFI / Alpha Drw	-0.05	0.06	0.24	0.01	0.61	-0.04

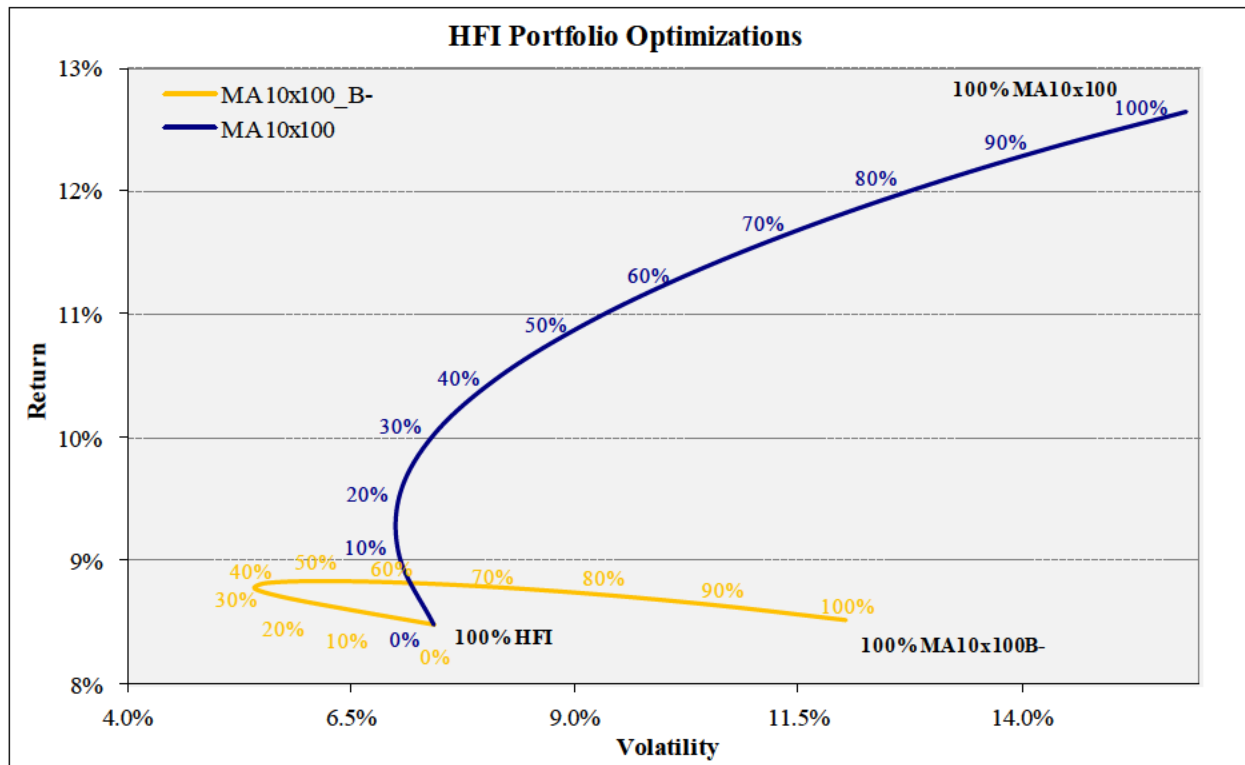
⁵ Information ratio is the ratio of annualized Alpha to its standard deviation.

XII. HFI Portfolio Optimizations

The optimal HFI and B- portfolio reduces the volatility of the HFI by 27% with a slight improvement in returns. It is a true hedge. It improves the Sharpe Ratio of the HFI by 45%.

The overall MA10x100 improves the Sharpe Ratio of the HFI by 30%, but a significant reduction in volatility is not possible.

Historically, neither the BTOP50 nor the Short Biased Index have helped to improve the Sharpe Ratio of the HFI Portfolio in any relevant manner.



	HFI	MA10x100_B-	MA10x100	70% HFI + 30% MA10x100_B-	70% HFI + 30% MA10x100
Return	8.5%	8.5%	12.6%	8.8%	10.0%
Volatility	7.4%	12.0%	15.8%	5.4%	7.4%
Drawdown	-19.7%	-16.5%	-28.3%	-7.4%	-8.5%
Return/Volatility	1.14	0.71	0.80	1.62	1.35
Sharpe Ratio	0.68	0.42	0.58	0.98	0.88
Return/Drawdown	0.43	0.52	0.45	1.19	1.18
Skew	-0.17	0.45	0.09	0.14	0.21
Correlation to HFI		-0.30	0.10	0.76	0.76

XIII. Conclusion

The BTOP50 and large TF managers are today in an opaque place from a style perspective. We showed that they appear to have:

- 1) Reduced their exposure to TF,
- 2) Increased the time frames of their models,
- 3) Increased long biased trading,
- 4) Increased their exposure to Fixed Income trading, and
- 5) Increased their exposure to risk-on trading such as
 - long equity Beta,
 - long hedge fund Beta and
 - long FX Carry.

Other than the increase in exposure to Fixed Income, all of these style drifts have had the effect of reducing their ability to hedge equity drawdowns and reducing their positive skew. Their remaining ability to hedge equity drawdown relies primarily on Fixed Income and can be further eroded if the Fixed Income environment becomes less cooperative. This is highly likely as yields have come down about 90% in the past 30 years and have relatively little room to come down further. These style drifts could have been the result of investor demand for lower volatility, a chase of recent return drivers, or an attempt at increasing capacity.

By focusing on managers who trade the intermediate term time frame without directional bias and without overweight exposure to Fixed Income, investors can improve their chances of having outsized returns during equity corrections. Positive Skew is an important measure of a manager's ability to hedge equity corrections.

Timing equity indices with TF has provided value relative to buy-and-hold historically. This value, however, is sensitive to whipsaw, gap and skew risk.

Moving oppositely from the style drifts experienced in the BTOP50, we propose a covariance filter on TF trades to accept only trades that have negative covariance to equities. The resultant TF portfolio has:

- 1) low and significantly negative correlation to equities and hedge funds,
- 2) the ability to reduce the volatility of equity and hedge fund portfolios, an attribute not available to classical trend following and much less the large TF managers, and
- 3) positive returns and significantly positive Alpha and information ratios to equities and hedge funds - get paid to hedge!

It is counter to portfolio theory and behaviorally inefficient that both investors and TF managers have drifted away from these trades over the recent years. The simplicity, liquidity, transparency, returns, positive Alpha and risk reduction characteristics of these filtered TF trades are unmatched in the hedge fund universe.