

Can an Allocation to CTAs Move the Needle?

By Ronald Lagnado, Ph.D., Director—Research

Abstract

- CTA claims of being superior to other forms of risk mitigation are exaggerated because (1) the past performance has been dominated by persistent long positions in bonds over a decades-long period in which interest rates declined to effectively zero, and (2) the convexity with respect to equity moves is less effective than direct tail hedging.
- There may be a place for trend-following in asset allocation, but it is not a panacea nor a substitute for direct hedging of equity tail risk and ultimately tends to lower CAGR over time versus equities.

Managed futures strategies including trend following have garnered attention again with outstanding returns so far in 2022 after over a decade of lackluster performance. I am referring in particular to the cornerstone strategies of commodity trading advisors (CTAs). This has generated renewed claims that managed futures provide a highly cost-effective form of risk mitigation that can “move the needle” for pensions and other institutional investors with large, diversified portfolios.

CTAs and other managed futures managers specifically take long and short positions in liquid futures contracts across multiple asset classes including equities, fixed income, currencies, and commodities. Trend-following, a key component, involves buying and selling (or short-selling) assets as they rise and fall in price with the hope of extrapolating past performance. The trading signals to establish and unwind or reverse long positions are for the most part based on price action rather than fundamental data.

I recognize the merits of CTAs and their strategies in some investment settings. In the past as a portfolio manager, I have incorporated systematic strategies including both trend following and mean-reversion trading in several absolute-return investment funds. However, the allocation to these strategies requires careful consideration because of the propensity for long dry spells and painful drawdowns in sideways markets.

CTAs and managed futures are generally pitched to pension funds as a form of risk mitigation or “crisis alpha” as it is often called. It is claimed that they reliably achieve positive returns during major selloffs in stocks (and in bonds) and reduce portfolio drawdowns. A further claim is that trend-following strategies have sufficiently large positive returns over the long run so that an allocation will add value across a complete drawdown cycle. **Some proponents go so far as to assert that trend following is an insurance policy that the investor is paid to hold.**

In this paper, I examine the past and recent performance of CTAs and provide some perspective on their role in risk mitigation – specifically as an allocation added to an equity portfolio. While there have been benefits, I challenge the notion that trend following is free or negative-cost insurance against equity tail risk. I also examine how the recent performance – over a period of exceptional events last seen over 40 years ago – may be leading to distorted expectations of future performance and cost-effectiveness in mitigating equity tail risk.

Data

I collected total return data for some non-investable CTA indices and one managed futures fund.

- Barclays CTA Index with over 500 constituents and monthly returns back to 1980
- SG CTA Index with the 20 largest CTAs as constituents and daily returns back to 2000
- AQR Managed Futures Strategy Fund (AQMIX) with daily returns back to 2010

The Barclays CTA index is broad and includes many programs that are not focused entirely on systematic strategies but also apply non-systematic strategies of a discretionary nature. I included it because it provides a longer history and as a consistency check on the more concentrated but higher returning SG CTA Index.

An approach that I declined to use is to construct a proxy that replicates CTAs. This would require proposing and back-testing rules-based strategies. For example, trend following signals might be modeled based on a combination of slow, medium, and fast moving-average crossovers. Some advantages would be accessibility to historical periods limited only by the availability of price data along with detailed performance attribution for individual assets. I believe the advantages are outweighed by the arbitrary nature of the trading rules and the susceptibility to data mining.

Historical CTA Performance

Institutional investors typically apply some form of portfolio optimization – at least as a first cut at determining the asset allocation. They want to maximize arithmetic average return with a constraint on volatility, i.e., perform mean-variance optimization to maximize risk-adjusted return. Assumptions of expected return, volatility and correlation to the other assets are the necessary inputs. Traditional mean-variance optimizing investors also are concerned about the magnitude of portfolio drawdowns, but it is expressed indirectly through a penalty on volatility. A direct penalty on downside-volatility or drawdown is possible but in practice leads to allocations in traditional asset mixes that are too conservative and suffer from low returns ex post.

Consequently, mean-variance optimizers will like an allocation to CTAs when the appropriate performance assumptions are made. These assumptions are (1) CTAs perform well in crises and are conditionally negatively correlated to the other risky assets, particularly equities, and (2) the long-run expected return of CTAs is positive and equity-like in magnitude so that there will be no significant drag on long-run performance from an allocation to CTAs. The only hard evidence to extrapolate future performance is historical performance even if there is no guarantee that it will be repeated, and so I discuss it here with these two assumptions in mind.

Figure 1 shows the cumulative return of the Barclays CTA Index along with the S&P 500 total return since 1980. Three regimes are evident. In the first regime during the 1980s, CTAs produced even better cumulative returns on average than the stellar S&P 500 return during that period. In a second regime from 1990 to 2009, the CTAs delivered positive albeit more modest returns while the S&P 500 both surged in the 1990s and languished in the 2000s. Finally, in the third regime from 2010 to present, CTA performance was flat throughout most of the period until a regime break occurred beginning in mid-2020.

Figure 1
CUMULATIVE CTA PERFORMANCE
(Log Scale)

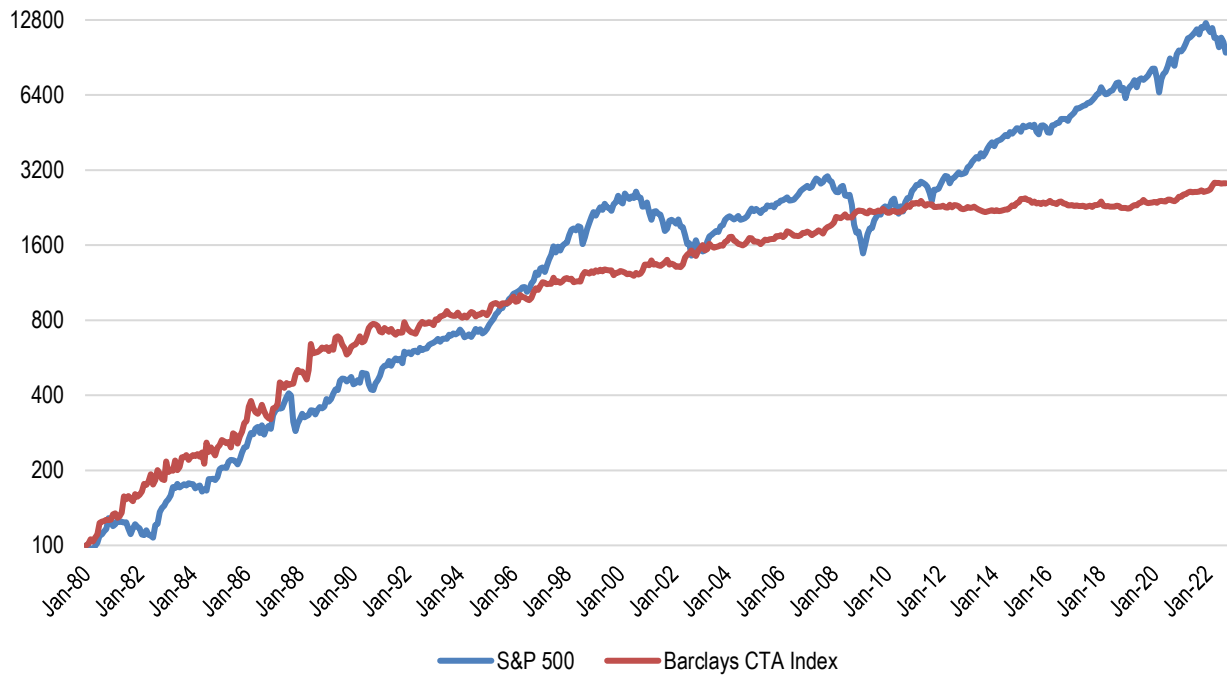


Figure 2
CUMULATIVE CTA PERFORMANCE

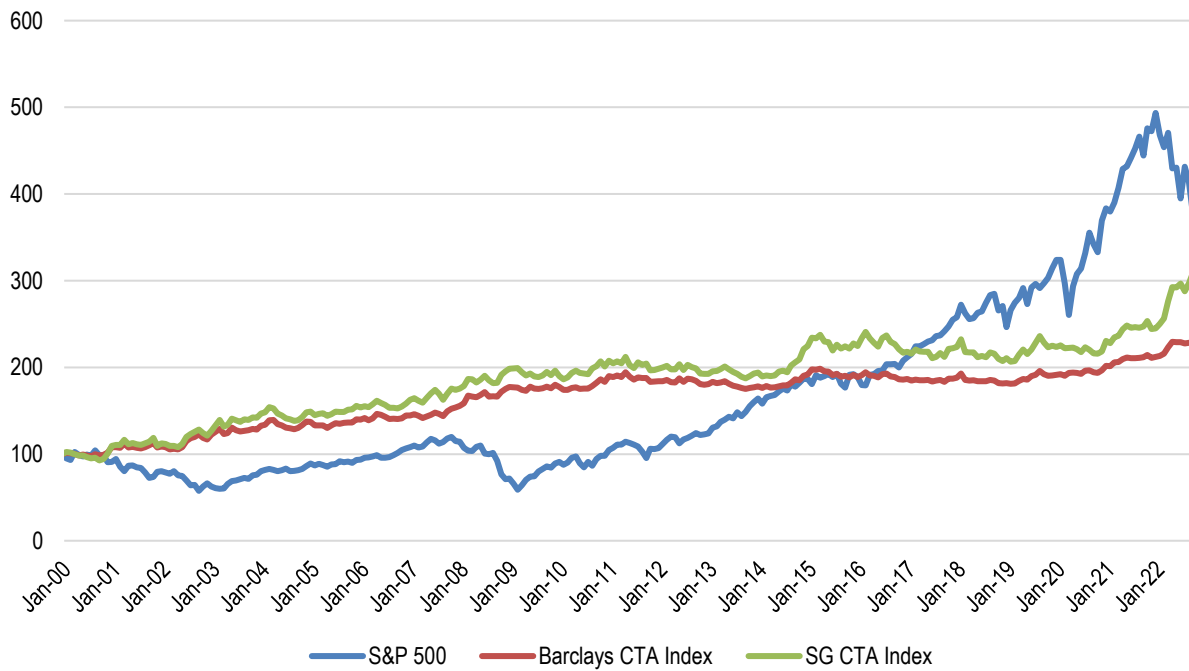


Figure 2 shows cumulative performance since 2010 for both the Barclays CTA and the SG CTA indices. Tables 1a and 1b summarize the annualized return and volatility, respectively, for various periods (also including the performance of AQMIX after 2010). The observed returns and regime shifts raise a number of questions.

Looking at Table 1a we see that the Barclays CTA index had an annualized return of 20.3% in the 1980s, good but more modest annualized returns of 7.1% and 5.9% in the 1990s and 2000s, respectively, and a dismal 0.8% for the decade 2010-2019. The SG CTA Index and the AQR Managed Futures Fund confirm this pattern of decline.

Table 1a

	Annualized Return			
	S&P 500	Barclays CTA Index	SocGen CTA Index	AQR Managed Futures (AQMIX)
1980 - 1989	17.0%	20.3%	--	--
1990 - 1999	18.2%	7.1%	--	--
2000 - 2009	-0.9%	5.9%	6.6%	--
2010 - 2019	13.5%	0.8%	1.6%	0.5%
2000 - 2021	7.5%	3.5%	4.2%	--
2000 - 2022 Q3	6.0%	3.7%	5.1%	--
2010 - 2022 Q3	11.8%	2.0%	3.9%	3.0%
2022 Q1-3	-23.9%	7.8%	26.3%	41.0%

Table 1b

	Volatility			
	S&P 500	Barclays CTA Index	SocGen CTA Index	AQR Managed Futures (AQMIX)
1980-1989	16.4%	22.2%	--	--
1990-1999	13.4%	9.5%	--	--
2000-2009	16.1%	7.3%	9.3%	--
2010-2019	12.5%	4.7%	7.9%	9.1%
2000 - 2021	15.0%	6.0%	8.5%	--
2000 - 2022 Q3	15.4%	6.0%	8.7%	--
2010 - 2022 Q3	14.7%	4.6%	8.2%	9.8%
2022 Q1-3	21.5%	4.8%	11.0%	13.2%

There has been a significant rebound in CTA performance in 2022 amid a resurgence in inflation and the worst decline in bonds in over 40 years. Nevertheless, CTAs experienced a lost decade from 2010 to 2019 that cannot be easily dismissed in terms of future expectations. The period from 2003 through 2007 was also problematic for CTAs (along with many other active strategies that rely on high realized volatility). Of note, John W. Henry & Company--legendary in CTA circles – struggled through this period and ultimately closed a few years later.

Tables 1a and 1b show that the average return of the Barclays CTA index during the 1980s was 20.3% with a volatility of 22.2% while both the average returns and volatilities in subsequent decades were much lower. It is the ratio of return and volatility or risk-adjusted return that is important in determining a portfolio allocation. (Technically that should be marginal contribution to risk, but the return/volatility ratio is sufficient for this discussion). As far as portfolio optimization is concerned, an asset with a 20% return would not be assigned twice the weight as an asset with a 10% return when the return/volatility ratios are the same. The return/volatility ratios for the Barclays CTA index were 0.92, 0.75, 0.80 and 0.16 in the 1980s, 1990s, 2000s and 2010s, respectively. This is to say it has been on a downward trend when measured over decade-long periods. It would be a huge leap of faith (and most likely a mistake) to assign an allocation based on a high front-loaded historical return assuming a lower volatility observed in the recent past.

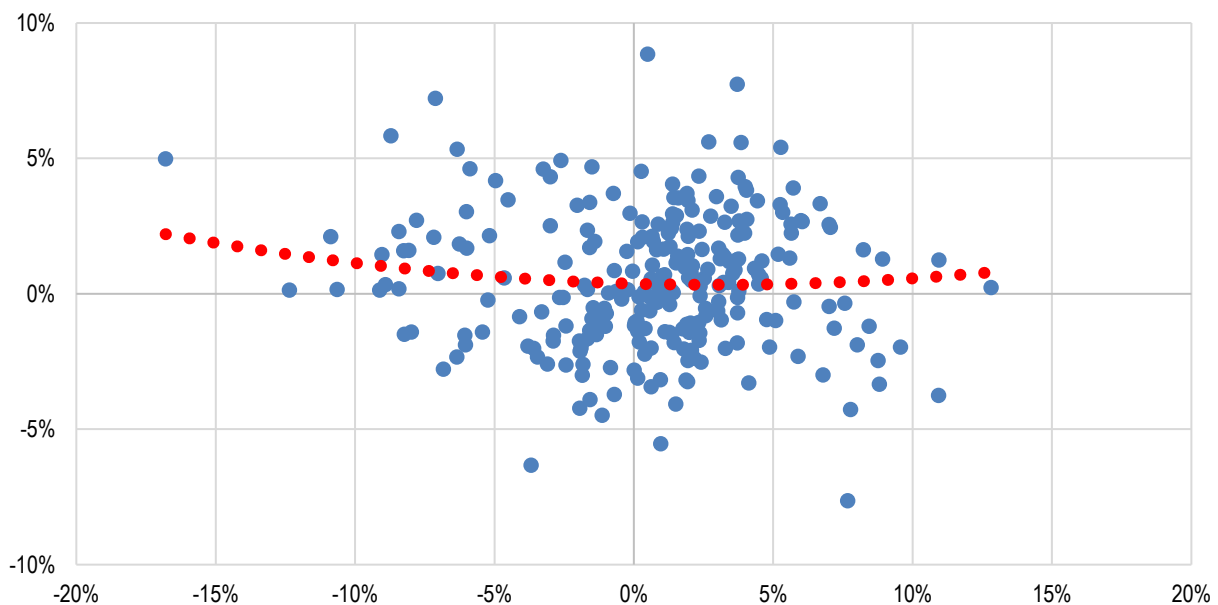
The high return in the 1980s – both absolute and risk-adjusted – was most likely an artifact and not indicative of future CTA performance. It has not been repeated in the past three decades. During the 1980s the average number of programs in the Barclays CTA index was 55, ranging from a low of 15 in 1980 to 128 in 1989. In contrast, there were 510 programs in 2020 and the average number has been about 400 over the 30-year period from 1990 to 2020. Also, roughly 80% of CTA positions in the 1980s were in volatile agricultural commodities and metals. So, a small number of aggressive managers that invested mostly in commodities and applied a lot of leverage probably accounted for that anomalous performance. After the 1980s, CTAs began diversifying into a broader range of assets and imposing more modest volatility targets. At present most of the positions are in financial futures contracts (currencies, interest rates and equities) and volatility targets are commonly in the range of 5 – 15%.

To summarize, while CTAs on average beat the S&P 500 in the 2000s, they underperformed by an enormous margin in the 1990s and 2010s. Despite the outstanding performance so far in 2022, both CTA indices underperformed the S&P 500 over the full period 2000-2022.

The poor performance in the 2010s should not be weighed too heavily in extrapolating performance. However, it cannot be ignored and the potential for CTAs to experience long dry spells and extended drawdowns should be a concern. This was likely a consequence of the massive quantitative easing by central banks shifting markets into a mean reverting regime and adversely affecting core trend-following strategies. Nevertheless, projecting forward an investor must “roll the dice” to some degree in deciding to allocate significantly to CTAs based on historical returns alone.

It is commonly portrayed that CTAs almost always deliver positive returns when equities decline—that CTA returns are conditionally negatively correlated to equities on the downside. It is also claimed that they are successful in achieving a positive conditional correlation on the upside. Figure 3 shows the monthly returns of the SG CTA Index versus the S&P 500 over the period from 2000 to 2020. The quadratic regression provides some weak evidence of the so-called CTA smile whereby CTAs have positive returns when equities have both large positive and negative returns. Nevertheless, there is considerable scatter and some bad outcomes for CTAs both as equities rise and fall.

Figure 3
SG CTA INDEX VS. S&P 500 MONTHLY RETURNS
 2000 - 2022



Linear correlation is an imperfect measure of dependence in financial markets with their inherent nonlinearity and instability. By bringing up conditional correlation I am already trying to compensate in a less than ideal way for that weakness. In view of these deficiencies, I will avoid getting bogged down with calculations of historical correlation. As correlation is a backward-looking measure anyway, I chose to proceed with a more illuminating analysis of the CTA-equity dependence by back-testing the impact of different allocations on portfolio performance.

CTAs as Mitigators of Equity Risk

At Universa, we believe that CTAs or any risk mitigating strategy – as an allocation to an equity portfolio – are best evaluated in terms of the impact on the distribution of portfolio returns and most importantly on the long-run compound annual growth rate (CAGR) of the portfolio.

Simply looking at average portfolio volatility – the risk proxy of choice in Modern Portfolio Theory (MPT) – is not sufficient.

CAGR as the key metric is discussed extensively in the book *Safe Haven: Investing for Financial Storms* by Mark Spitznagel. To summarize the key points, in order to maximize CAGR, the risk mitigating strategy should add convexity and reduce the large drawdowns that accompany equity market crashes but not introduce excessive drag in rising markets. This is not a matter of maximizing expected return without constraint which maximizes risk of ruin. Nor is it a matter of maximizing the risk-adjusted arithmetic average return as in mean-variance optimization which I contend makes the investor poorer in the long run. There are those who disagree and those who agree with this contention, and I would argue that the latter camp includes such notable investors as Edward Thorp and Warren Buffet. Readers who are categorically opposed and unwilling to consider this idea with an open mind can stop here.

Figure 4
CUMULATIVE RETURN OF S&P 500 / SG CTA PORTFOLIOS
Monthly Rebalancing

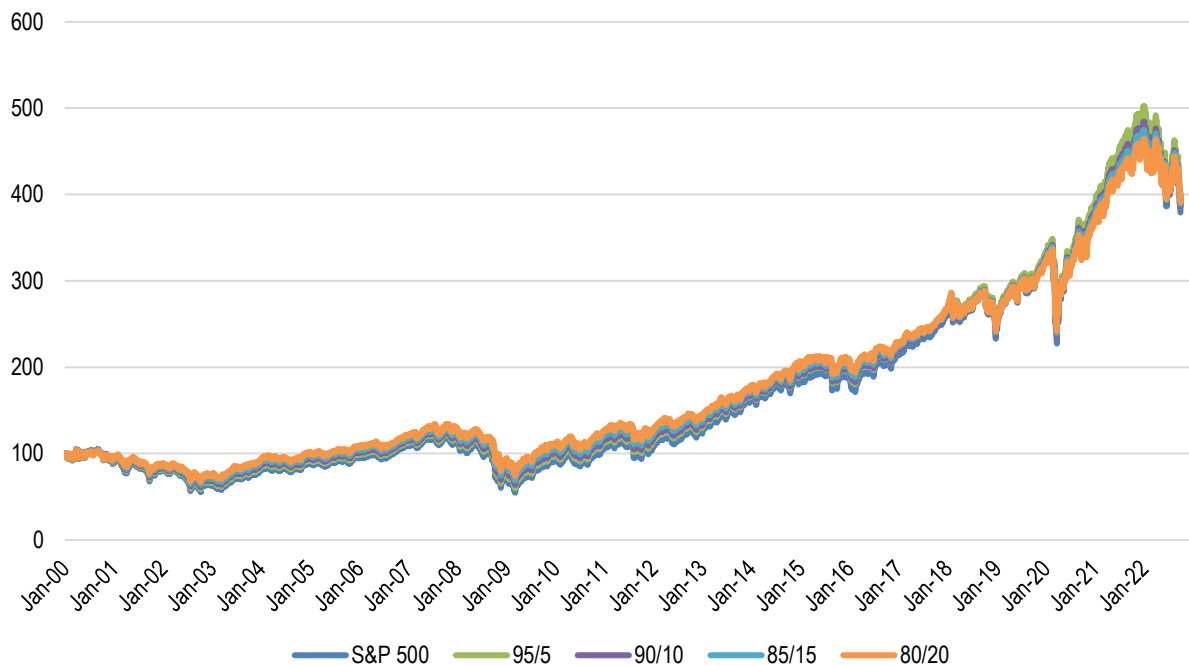


Figure 4 shows the impact on cumulative return for an S&P 500 portfolio including allocations of 5%, 10%, 15% and 20% to the SG CTA Index from January 2000 to September 2022. These portfolios are rebalanced monthly and transaction costs are neglected. Annualized returns and volatilities for various time periods are summarized in Tables 2a and 2b, respectively. (These results were calculated using daily return data.)

Table 2a

	Annualized Return					
	S&P 500	SG CTA	S&P 500 / SG CTA			
			95/5	90/10	85/15	80/20
2000 - 2009	-0.9%	6.7%	-0.2%	0.1%	0.6%	1.0%
2000 - 2021	7.6%	4.2%	7.6%	7.4%	7.3%	7.2%
2000 - 2022	6.34%	4.97%	6.45%	6.38%	6.39%	6.38%
2010 - 2021	15.1%	2.1%	14.5%	13.9%	13.2%	12.6%
2010 - 2022	12.5%	3.6%	12.1%	11.7%	11.3%	10.9%

Table 2b

	Volatility					
	S&P 500	SG CTA	S&P 500 / SG CTA			
			95/5	90/10	85/15	80/20
2000 - 2009	21.8%	8.6%	20.6%	19.4%	18.2%	17.1%
2000 - 2021	19.3%	8.1%	18.3%	17.3%	16.3%	15.3%
2000 - 2022	19.4%	8.1%	18.4%	17.4%	16.4%	15.4%
2010 - 2021	16.9%	7.6%	16.1%	15.2%	14.4%	13.6%
2010 - 2022	17.3%	7.7%	16.5%	15.6%	14.8%	14.0%

An allocation to CTAs in the 2000s was beneficial in reducing drawdown in both the Dotcom Bubble Collapse and the Global Financial Crisis. The CAGR for the period 2000-2009 was -0.9% for the S&P 500. For a portfolio with a 95% allocation to the S&P 500 and a 5% allocation to CTAs, CAGR was improved by 70 bp per annum to -0.2%. The CAGR was improved further by increasing the CTA allocation reaching 1.0% for a 20% allocation, an improvement of 190 bp per annum.

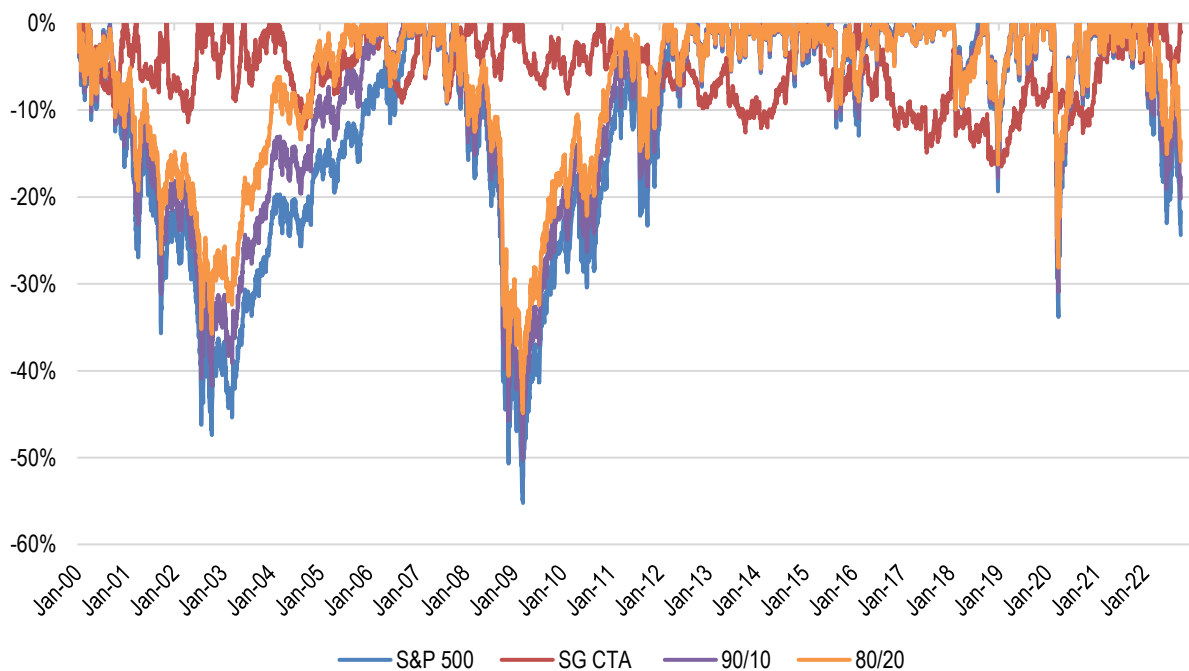
However, a CTA allocation resulted in a substantial drag on performance in the 2010s. The CAGR of the 95/5 portfolio from 2010 to 2021 was worse than the S&P 500 by 60 bp per annum and continued to get worse as the allocation to CTAs was increased, resulting in an

80/20 portfolio underperforming by 250 bp per annum. Even with the 21.1% return of the SG CTA Index in the first three quarters of 2022 when the total return of the S&P 500 was -20%, any allocation to CTAs resulted in a lower CAGR over the period beginning in 2010.

Consequently, over the full period from 2000 through the first three quarters of 2022, the impact of an allocation to the CTAs has been a wash – with nearly identical CAGR for any of the allocations shown in Table 2a.

To be fair an allocation to CTAs has had a favorable impact on portfolio drawdown during major equity selloffs. However, from Figure 5 we see that improvement was not remarkable in the major crises of the 2000s until the CTA allocation was 20% or more. Furthermore, regardless of the allocation there would have been a negligible benefit in the Covid Pandemic selloff of 2020. Bear in mind that maintaining a 20% allocation in the 2010s would have created a 250 bp annual drag on performance. Also, Figure 5 reveals that CTAs themselves have experienced moderate drawdowns of long duration unrelated to major equity selloffs.

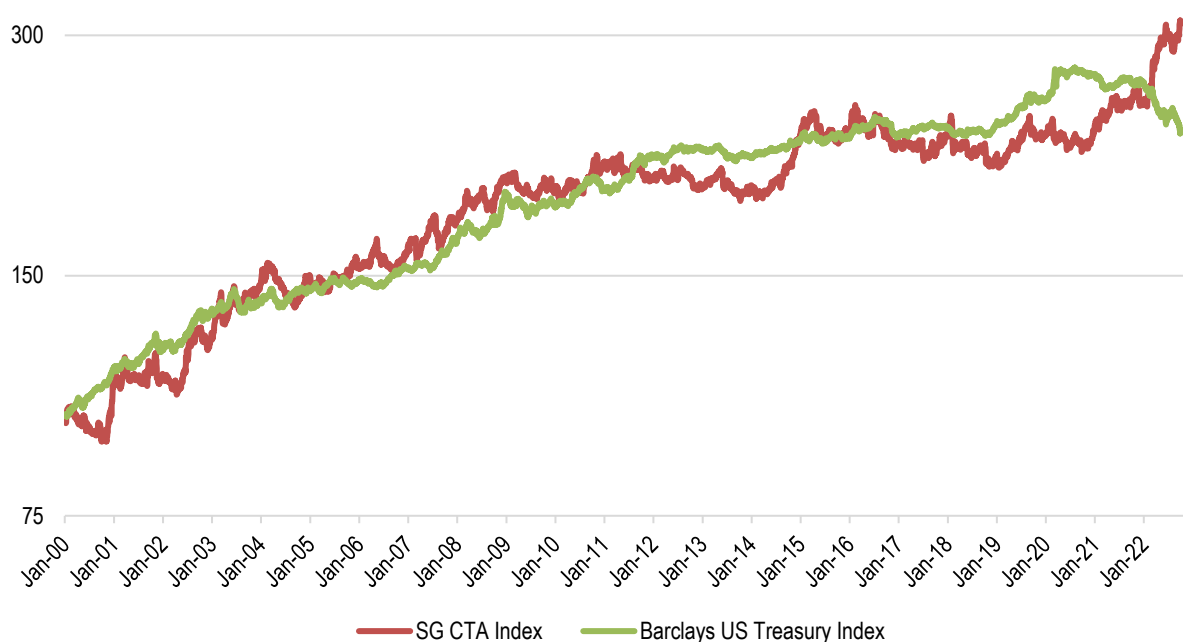
Figure 5
DRAWDOWN OF S&P 500 / SG CTA PORTFOLIOS
Monthly Rebalancing



It is also illuminating to compare CTAs and bonds in terms of their diversification benefits relative to equities. Figure 6 shows the cumulative return since 2000 for the SG CTA Index and the Bloomberg Barclays US Treasury Index. The CTA Index has essentially mimicked the broad US Treasury index, albeit with more volatility and some notable divergences. The biggest divergences appear in 2014 and 2021-2022. In 2014 CTAs capitalized on the sharp

decline in oil prices and a strengthening US Dollar. In 2021-2022 CTAs have benefited from a combination of long positions in the US Dollar and commodities and short positions in bonds.

Figure 6
CTA AND US TREASURY RETURNS: 2000-2022
(Log Scale)



The comparison of CTAs and US Treasury bonds in Figure 6 is remarkable. It seems that CTAs have generated a significant portion of their profits in the past by persistent long positions in fixed income. This goes back much further than 2000 as interest rates declined almost without interruption since inflation peaked and Paul Volcker raised the federal funds rate to almost 20% in the early 1980s.

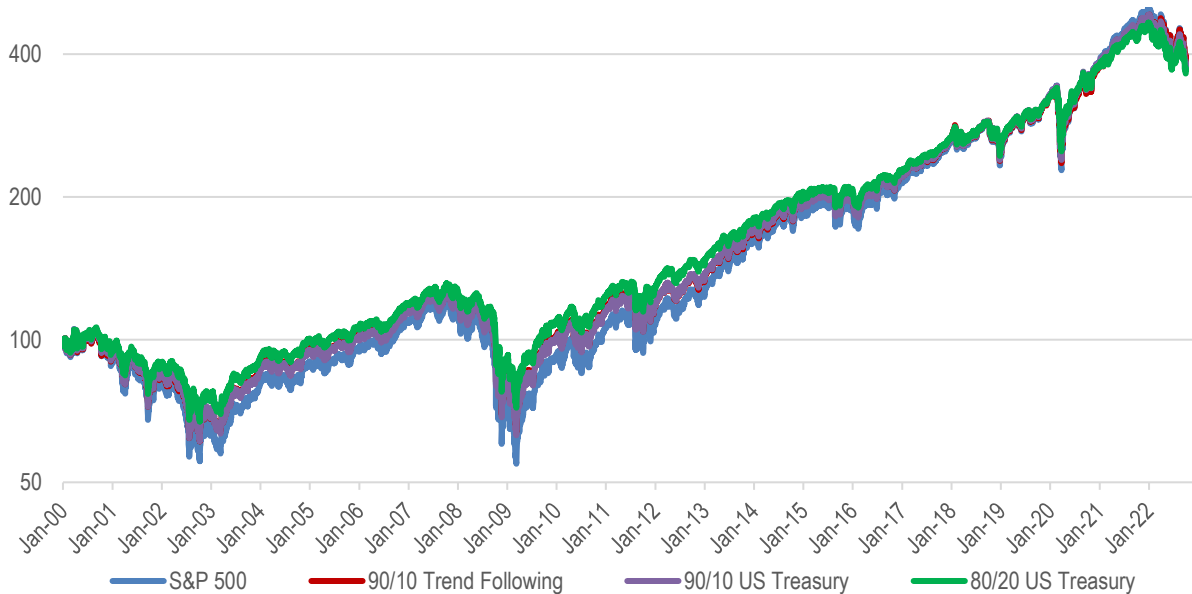
Niederhoffer and Weddepohl (2014)¹ discuss the relationship between CTA and bond performance in detail and point out that long positions taken by CTA gains came not only from bond appreciation but also the positive carry earned from bond futures while the yield curve has been upward sloping throughout most of the period. Eventually the return engine came to a halt as central banks brought bond yields close to and in some cases below zero after the Global Financial Crisis. This is reflected in the flattening of the cumulative return for both the CTA and US Treasury indices after 2010. They also speculate that CTAs will have a harder time going forward if interest rates reverse course and rise steadily over a protracted period. It is inherently more difficult to profit from shorting rather than going long bond futures since yield curves are typically inverted for very short periods of time. To be fair, though, they did

¹ Niederhoffer, R. and C. Weddepohl, 2014, "CTAs and Rising Interest Rates: Is the Party Over?" R.G. Niederhoffer Capital Management, Inc.

not raise the possibility that CTAs might capitalize on interest rates rising as fast and as far as they have in 2022.

It is interesting to compare CTAs and bonds directly as a portfolio allocation. Figure 7 shows the cumulative return of a 10% allocation to CTAs into an S&P 500 portfolio along with 10% and 20% allocations to US Treasury bonds. In terms of CAGR, the 10% CTA allocation had virtually identical performance to a 10% US Treasury allocation and underperformed the 20% US Treasury allocation up to about 2018. Despite the strong recent performance of CTAs, the 90/10 portfolios with CTAs and US Treasury bonds basically finished in a dead heat.

Figure 7
TREND-FOLLOWING VS US TREASURY BONDS
AS A RISK MITIGATOR
2000 - 2022



Conclusions

CTAs acquired a reputation as an effective strategy for mitigating risk in the 2000s, a turbulent period for equities. At that moment the reputation was deserved if one overlooked the substantial opportunity cost imposed by a CTA allocation in an equity portfolio in the 1990s. That opportunity cost was again realized as average CTA performance was flat (with some peaks and valleys) throughout the 2010s. Hence, to the question originally posed, "Are CTAs a free or negative-cost insurance policy against equity risk?", I would answer no.

Clearly, CTAs have performed well in 2022 as the bond market collapsed. They have protected against drawdowns in both equities and bonds in a rare period marked by the largest spike in inflation in over 40 years. This performance is now looked upon as evidence that CTAs can be beneficial when equities suffer a slow and protracted downward grind as

opposed to a crash. However, I contend that the performance of CTAs in 2022 has come not from being short equities but being short bonds and long the US dollar – which is effectively the same trade in this environment—along with some commodity exposure.

Nevertheless, the tail wind of declining interest rates that had driven much of CTA performance for decades has for the time being come to an end. They have capitalized admirably on the recent interest rate shock, but if we enter a long period of slowly rising or even flat rates, it will be more challenging for CTAs to profit.

The crucial metric to judge a risk mitigation strategy as protection against equity tail risk is the impact on the long-run portfolio CAGR. Notwithstanding 2022, CTAs have not exhibited a significant improvement over bonds in the past. To Universa, that is problematic as our stance has always been that bonds are not a cost-effective tail hedge.

Whatever the observed or claimed benefits of CTAs has been, the central question for an institutional investor is how much of an allocation will **move the needle**. Even the best performance observed during the crisis periods of the 2000s suggest that a CTA allocation substantially larger than 10% would be required just to have a meaningful reduction in drawdown. Yet this would have exposed the fund to a huge performance drag in the following decade and ultimately no improvement in CAGR. Are such large allocations desirable or even feasible at a large pension fund? Is it opening the door to some other yet to be seen risk? Furthermore, even if a large allocation to CTAs lowers volatility and possibly raises risk-adjusted return at the cost of lowering CAGR, what is the long-term benefit?

Important Disclosures

This document is not intended to be investment advice, and does not offer to provide investment advice or sell or solicit any offer to buy securities. Universa does not give any advice or make any representations through this document as to whether any security or investment is suitable to you or will be profitable. The discussion contained herein reflects Universa's opinion only. Universa believes that the information on which this document is based is reliable, but Universa does not guarantee its accuracy. Universa is under no obligation to correct or update this document.

Neither Universa nor any of its partners, officers, employees or agents will be liable or responsible for any loss or damage that you may incur from any cause relating to your use of these materials, whether or not the circumstances giving rise to such cause may have been within Universa's or any other such person's control. In no event will Universa or any other person be liable to you for any direct, special, indirect, consequential, incidental damages or any other damages of any kind even if such person understands that these damages might occur.

The information shown in Figures 1 through 7 and Tables 1a through 2b is purely illustrative and meant to demonstrate at a conceptual level the differences among types of investment strategies or assets. None of the information shown portrays actual or hypothetical returns of any portfolio that Universa manages.