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INSIGHTS

Managed Futures and CTAs: A Smorgasbord

ALL CTA PROGRAMS ARE NOT CREATED EQUAL

Historically, over the last thirty-five or so years, the managed futures asset class has become synonymous with systematic trend-following CTA programs that actively trade futures or forward contracts. It is important to understand that not all futures-trading strategies fall under the managed futures umbrella as conventionally defined, and that even some well-known research and ratings agencies have on occasion ended up misclassifying some funds and strategies as managed futures. Conversely, some CTA programs that implement strategies other than systematic trend-following may still be legitimately classified as managed futures.

Conventionally, many market participants tend to think of a managed futures strategy as a CTA program with the following characteristics:

- The program trades in multiple global futures markets (generally ranging from around 25-50 at the low end to more than 200), diversified across **six major sectors**–*stock indexes, fixed-income (including short-term interest rates and bonds), currencies, energy, metals, and agricultural commodities.*
- Trading is primarily systematic, although some discretionary traders do exist. Systematic trading is based on quantitative models and algorithms and generally involves very little if any manual intervention or decision-making, other than in extreme situations.
- Trading is active in the sense that the models are generally run at least daily, if not more frequently, and positions are initiated, modified or closed out based on the outputs from the models.
- The strategies employed are generally based on medium-term to long-term trend-following, but may include relative value trading, counter-trend or contrarian trading, mean reversion, pattern recognition, short-term trading, etc.
- The program utilizes risk management techniques such as stop-loss orders, dynamic position sizing, volatility targeting, etc.[1]

A quantitative technique that can serve as a rough diagnostic test in evaluating futures trading programs is a correlation matrix that examines how the returns on a strategy correlate with other futures trading strategies and with recognized managed futures benchmarks such as the Barclay BTOP50 Index®. The correlation matrix for a selected sample of CTA programs and asset class indexes is displayed as an illustration on the next page.[2]

HIGHLIGHTS

Correlation Matrix
TABLE INSIDE

*A **Commodity Trading Advisor ("CTA")** is a US regulatory term for an entity that provides advice and/or services related to trading primarily in commodity or financial futures contracts and related instruments.*

***"Managed futures"** is a term used to describe trading strategies, generally managed by CTAs, which are primarily based on the concept of systematic trend-following. Trend-followers seek to determine, based on indicators or signals that they define, whether the price of an instrument is trending up or down, and establish long or short trading positions based on that determination. The entire process of generating signals, establishing trades (with stop-loss orders as insurance), and managing risk is almost entirely "systematized" using computers and algorithms.*

[1]*For more details, please see our Insight, **"Managed Futures: Risk Management in CTA Programs,"** (2016).*

[2]*Pages 2-3 display CTA programs currently accessible through Equinox Funds.*

Definitions of Terms and Indices can be found on back page.

Our sample consists of sixteen CTA programs. The first eight among these are purely or primarily trend-following. The next two programs contain some element(s) or variant(s) of trend-following. For convenience, we refer to all ten of these programs as "trend" programs hereafter. Our sample of six "non-trend" CTA programs represent other trading styles such as spread or relative value trading, short-term trading, short-term pattern recognition, and discretionary and systematic global macro. Brief descriptions of all sixteen CTA programs are presented in the notes to the right of the correlation matrix. We also include in the correlation matrix five asset class indexes that are proxies for managed futures, US bonds, long-only commodities, US stocks, and world stocks.

Overall the correlation matrix can be divided into nine blocks or parts, six of which are "distinct" and which we will discuss at some length.* We first explore the correlations of the trend programs to each other, to "non-trend" programs, and to other asset classes. Next, we look at the correlations of the "non-trend" programs to each other and to other asset classes. Finally, we look at the correlations of the asset class indexes to each other.

*A correlation matrix is symmetric about its diagonal. Each pairwise correlation coefficient occurs in two locations. Hence, in our case, three of the blocks are identical to three of the others, leaving six unique or distinct blocks to be analyzed.

Correlation Matrix (For ease of visualization, the matrix is color-coded by individual column. The lowest correlation in each vertical column is displayed in dark green, with successively higher values transitioning toward dark red.)

	Aspect	BH-DG	Campbell	Chesapeake	KeyQuant	Quantica	QTI	WNTN	Systematica	FORT	Crabel	QIM	Emil van Essen	JE Moody	H2O	IPM	Barclay BTOP50®	S&P GSCI®	Barclays US Agg Bond	S&P 500®	MSCI World
Aspect		0.82	0.70	0.70	0.79	0.63	0.71	0.78	0.62	0.52	0.01	0.02	-0.11	0.05	-0.01	-0.01	0.84	0.02	0.17	**-0.18**	-0.14
BH-DG	0.82		**0.80**	0.68	0.76	**0.73**	**0.86**	0.80	**0.72**	0.55	0.22	0.06	-0.08	0.15	0.01	0.26	**0.89**	-0.19	0.37	0.00	0.02
Campbell	0.70	0.80		0.59	0.78	0.54	0.75	0.55	0.61	0.50	0.03	-0.01	-0.12	0.02	0.03	0.02	0.77	0.10	0.19	0.00	-0.05
Chesapeake	0.70	0.68	0.59		0.65	0.60	0.63	0.63	0.46	0.39	**-0.08**	0.04	**-0.18**	-0.03	0.08	**-0.17**	0.72	0.17	0.13	0.13	0.14
KeyQuant	0.79	0.76	0.78	0.65		0.69	0.75	**0.84**	0.68	**0.65**	0.18	**-0.15**	-0.07	0.09	-0.04	0.23	0.83	-0.09	0.44	0.16	0.15
Quantica	0.63	0.73	0.54	0.60	0.69		0.70	0.58	0.61	0.57	0.06	-0.09	-0.02	0.06	-0.05	0.02	0.70	0.08	0.18	0.11	0.14
QTI	0.71	0.86	0.75	0.63	0.75	0.70		0.78	**0.72**	**0.65**	**0.31**	0.07	-0.11	0.08	-0.12	**0.35**	0.86	**-0.34**	**0.58**	-0.15	-0.16
WNTN	0.78	0.80	0.55	0.63	**0.84**	0.58	0.78		0.57	0.54	0.01	0.08	0.00	0.01	-0.05	0.04	0.75	0.13	0.23	-0.03	0.01
Systematica	0.62	0.72	0.61	0.46	0.68	0.61	0.72	0.57		0.55	0.05	-0.03	-0.01	0.12	0.03	0.16	0.64	0.05	0.36	-0.13	-0.07
FORT	0.52	0.55	0.50	0.39	0.65	0.57	0.65	0.54	0.55		-0.05	-0.04	-0.15	0.01	-0.18	-0.03	0.51	0.12	0.56	0.06	0.11
Crabel	0.01	0.22	0.03	-0.08	0.18	0.06	0.31	0.01	0.05	-0.05		**0.14**	-0.04	0.11	0.04	0.11	0.10	0.18	0.10	0.05	0.02
QIM	0.02	0.06	-0.01	0.04	**-0.15**	**-0.09**	0.07	0.08	-0.03	-0.04	0.14		0.00	0.01	-0.09	-0.06	0.10	0.09	-0.05	-0.01	0.00
EvE	-0.11	-0.08	**-0.12**	**-0.18**	-0.07	-0.02	-0.11	0.00	-0.01	-0.15	-0.04	0.00		0.12	-0.04	0.12	**-0.11**	-0.10	0.11	-0.10	-0.13
JE Moody	0.05	0.15	0.02	-0.03	0.09	0.06	0.08	0.01	0.12	0.01	0.11	0.01	**0.12**		**0.34**	-0.07	0.06	-0.09	0.11	-0.05	-0.03
H2O	-0.01	0.01	0.03	0.08	-0.04	-0.05	-0.12	**-0.05**	0.03	**-0.18**	0.04	-0.09	-0.04	**0.34**		-0.14	0.07	-0.10	**-0.25**	0.20	0.21
IPM	-0.01	0.26	0.02	-0.17	0.23	0.02	0.35	0.04	0.16	-0.03	0.11	-0.06	**0.12**	-0.07	-0.14		0.07	-0.15	0.16	-0.16	**-0.17**
Barclay BTOP50®	**0.84**	**0.89**	0.77	**0.72**	0.83	0.70	**0.86**	0.75	0.64	0.51	0.10	0.10	-0.11	0.06	0.07	0.07		0.06	0.24	-0.07	-0.08
S&P GSCI®	0.02	**-0.19**	0.10	0.17	-0.09	0.08	**-0.34**	0.13	0.05	0.12	0.18	0.09	-0.10	**-0.09**	-0.10	-0.15	0.06		-0.03	0.17	0.24
Barclays US Agg Bond	0.17	0.37	0.19	0.13	0.44	0.18	0.58	0.23	0.36	0.56	0.10	-0.05	0.11	0.11	**-0.25**	0.16	0.24	-0.03		0.14	0.10
S&P 500®	-0.18	0.00	0.00	0.13	0.16	0.11	-0.15	-0.03	**-0.13**	0.06	0.05	-0.01	-0.10	-0.05	0.20	-0.16	-0.07	0.17	0.14		**0.89**
MSCI World	**-0.14**	0.02	-0.05	0.14	0.15	0.14	-0.16	0.01	-0.07	0.11	0.02	0.00	-0.13	-0.03	0.21	**-0.17**	-0.08	**0.24**	0.10	**0.89**	

Each pairwise correlation is based on the longest available overlapping historical time-periods. The longest time-period is from 1/1998 to 3/2016, while the shortest is from 10/2011 to 3/2016.

The CTA programs displayed in the above correlation matrix can be accessed through various strategies offered through Equinox Funds. The correlation matrix is intended to provide a wide representation of the managed futures asset class, it is not intended as investment advice. Past performance and correlation patterns are not indicative of future results.

Definitions of Terms and Indices can be found on back page.

1 The **first block** of ten rows by ten columns in the matrix shows the correlations of the ten "trend" programs to each other. Note that the correlation coefficients in this block are all relatively high, ranging from a low of +0.39 to a high of +0.89 and with an average value of +0.68, illustrating the point that trend programs tend to be quite highly correlated with each other. This sample is representative of that segment of CTA programs with which most market participants are familiar, and tend of think of as "managed futures."

2 The **second block** of ten rows by six columns shows the correlations of the ten "trend" programs to the six "non-trend" programs. Here, the correlation coefficients are much lower, ranging from −0.18 to +0.35 with an average value of +0.03. This result serves to illustrate that "all CTA programs are not created equal." "Trend" programs as a group tend to be relatively uncorrelated with "non-trend" programs; hence, allocating to both "trend" and "non-trend" programs has the potential to yield greater diversification benefits than an allocation to trend-following programs alone.

3 The **third block**, ten rows by five columns, looks at the correlations of the "trend" programs with the five asset class indexes. Here, we see first that all "trend" programs have fairly high correlations to the Barclay BTOP50 Index®, ranging from +0.51 to +0.90 and averaging +0.76. This result is not unexpected, as the index includes a large number of "trend" programs. Correlations to the other four indexes—long-only commodities, bonds, US stocks, and world stocks—are all quite low, ranging from −0.34 to +0.58 and averaging +0.08, illustrating the widely-known fact that CTA programs tend to be

uncorrelated to most other asset classes. The one minor exception to this is that correlations to the bond index are higher than to the other indexes, ranging from +0.13 to +0.58 and averaging +0.33. Bonds have been in a secular up-trend over almost the last two decades, and the returns of many CTA programs during this period have been driven by long bond positions.

4 The **fourth block**, consisting of six rows by six columns, shows that the correlations of the six "non-trend" programs with each other are relatively low, ranging from −0.14 to +0.34 and averaging +0.04. As the six programs represent a variety of trading styles, this is perhaps not very surprising. One would not expect a spread-trading program to be highly correlated to a short-term trading program, and so on. Unlike "trend" programs, which tend to have some overlap in terms of time horizons, models, etc., "non-trend" programs tend to be more diverse as a group. Again, we believe this is a point in favor of diversifying one's managed futures allocation beyond "trend."

5 The **fifth block** of six rows by five columns shows that the "non-trend" programs, like the "trend" programs, have low correlations to other asset classes, ranging from −0.25 to +0.21 and averaging −0.01. However, we do find one interesting and different result: the correlations of "non-trend" programs to the managed futures index are much lower than those of "trend" programs. Here, the correlations range from −0.11 to +0.10 and average 0.05, while the "trend" programs ranged from +0.51 to +0.90 and averaged +0.76. Why are these managed futures programs not correlated to their own asset class index? Does that mean they are not really managed futures programs? The "non-trend" programs we have used in our illustration do in fact possess many of the general characteristics of managed futures programs that we described earlier: they all actively trade multiple futures contracts markets and are primarily systematic (with one exception), but they are not based on trend-following. Investors need to be aware of this crucial fact: all managed futures programs are not created equal.

6 The **sixth block** of the matrix shows the correlations among the asset class indexes. Managed futures are seen to have low correlations to the other asset classes, a result that has been extensively documented and discussed elsewhere. Perhaps the point of interest here is the relatively high correlation of +0.89 between US and world stocks. It appears that, contrary to widely held beliefs, there are relatively low diversification benefits to be gained here by allocating to both these asset classes. Investors may still choose to do so, but should be aware of their high correlation.

ABBREVIATION	CTA / PROGRAM OR INDEX	BRIEF DESCRIPTION OF PROGRAM OR INDEX
Aspect	Aspect Capital Diversified Fund	Medium-term diversified trend-following
BH-DG	Brevan Howard (BH-DG) BHST Systematic Trading	Medium-term diversified trend-following
Campbell	Campbell & Co., Inc Campbell Managed Futures Portfolio	80% diversified trend-following, 20% non-trend strategies
Chesapeake	Chesapeake Capital Corporation Diversified Account	Long-term diversified trend-following
KeyQuant	KeyQuant SAS Key Trends	Medium-term diversified trend-following
Quantica	Quantica Capital Managed Futures	Medium-term diversified trend-following
QTI	Quest Partners Quest Tracker Index	Short-term to long-term diversified trend-following
WNTN	Winton Capital Management Diversified without Equities	Medium-term diversified trend-following
Systematica	Systematica Global Macro Strategy	Trend-following, enhanced carry, and sector-specific enhancer strategies
FORT	FORT Global Contrarian	Trend-anticipation
Crabel	Crabel Capital Mgmt. Crabel Multi-Product	Very short term trading, trend and non-trend
QIM	Quantitative Investment Mgmt. Global Program	Short-term pattern recognition
EvE	Emil van Essen Spread Trading Program	Discretionary spread-trading
JE Moody	J E Moody & Company Commodity Relative Value	Systematic commodity relative value
H2O	H2O Asset Management Force 10	Discretionary global macro
IPM	IPM Informed Portfolio Mgmt. IPM Systematic Macro	Systematic global macro
Barclay BTOP50®	Barclay BTOP50 Index®	Managed futures index
S&P GSCI®	S&P GSCI® Total Return Index	Long-only commodity index
Barclays US Agg Bond	Barclays Capital US Aggregate Bond Index®	US high-grade bond index
S&P 500®	S&P 500® Total Return Index	US equity market index
MSCI World	MSCI World Index	Global equity index

Definitions of Terms and Indices can be found on back page.

We wish to raise an important caveat here. While correlation coefficients may provide useful information, they should be used primarily as a rough guide. A managed futures program with a low correlation to the Barclay BTOP50 Index® may indicate one of two possibilities: first, as is the case here with the six "non-trend" programs we have used for illustrative purposes, the program is a managed futures program in the sense that most investors understand the term, but it is not based on trend-following.

However, the second possibility is that the program is not really a managed futures program as we and many other investors understand. For example, it may be a passive or index-like program, or it may be a long-only commodity program, or it may be purely an equity index options trading program. None of the above types of programs, in our opinion, are likely to provide investors with the potential benefits of a "managed futures ride" over the long run. While these strategies do trade futures or options on futures, investors need to make their own decisions as to whether they should be viewed as managed futures in the traditional sense of that term, given their low correlations to the managed futures index. Clearly, the term managed futures can justifiably include many different investment options. We will now take readers on a guided tour that seeks to help them understand the managed futures "smorgasbord," where we define managed futures in the conventional and generally understood sense.

[3]*For more on this topic, please see our Insight,* ***"Allocating to 'Liquid Alternatives:' Some Considerations"*** *(2016).*

[4]*Please see our Insight,* ***"Speaking of Correlation … "*** *(2016).*

Definitions of Terms and Indices can be found on back page.

MPT AND DIVERSIFICATION

Modern Portfolio Theory ("MPT") tells us that the incremental risk contributed by any asset that is being added to a portfolio is a **function of three variables.**

1. The first and most important variable is the correlation between the returns on the asset and the portfolio. Lower correlation implies lower incremental risk.
2. The second is the "stand-alone" volatility of the asset being added: the higher this risk, the greater the contribution the new asset would make to the portfolio's risk.
3. The last, and most obvious, factor is the size of the position: the larger the holding, the greater its risk contribution.

CORRELATION

According to MPT, therefore, an investor who is looking to diversify an existing portfolio should primarily evaluate potential diversifying assets or asset classes based on their correlations to the portfolio. All else equal, an asset with a lower correlation has greater potential to reduce the overall risk of the portfolio.[3]

Correlation is the property that seeks to measure how much (or how little) the returns on two assets move in lock-step with each other. Adding two return streams with low correlations to each other can result in a "smoother" or less variable return stream, which is generally viewed as less risky.[4]

Managed futures returns have historically displayed low correlations to most other asset classes, both traditional and alternative.

What is the **rationale** for this?[5]

- Managed futures returns come from six different sectors. It seems reasonable, based on what we know from Modern Portfolio Theory, that these returns would have relatively low correlations to the returns of any of the individual sectors like stocks or bonds.

- Most traditional investment strategies, such as buying stocks or bonds, or even buying commodities or real estate, seek to profit almost exclusively from upward trends in the prices of the investments. CTAs, by way of contrast, have the ability to take short positions, seeking to profit when asset prices are trending down as well as up. Over a market cycle, the average of these short and long situations leads to a low correlation.

[5]*Please refer to our Insight,* ***"Harnessing the Potential Benefits of Managed Futures"*** *(2016).*

[6]*See our Insight,* ***"Principal Component Analysis: A Tool for Analyzing and Describing CTA Programs"*** *(2016).*

Definitions of Terms and Indices can be found on back page.

WHAT DETERMINES CORRELATION?

Why do different CTA programs have different correlations with stocks or other asset classes? **We can identify some potential explanatory factors.**

TRADING STYLE

All CTA programs are not created equal. First and foremost, they can be broadly classified as systematic vs. discretionary, and trend vs. non-trend. The vast majority of CTA programs are based on systematic trend-following. However, the managed futures space includes several other trading styles: discretionary, global macro, relative value, mean reversion, pattern recognition, counter-trend, sector-specific, etc.[6] A trend-following CTA program is likely to have correlations to other asset classes that may be quite different from those of a relative value trading program.

TIME HORIZON

Across CTA programs, and particularly within trend-following programs, trading or lookback time horizons may range from short-term (2 days – 2 weeks) to medium-term (2 weeks – 2 months) to long-term (2 months – 2 years). Again, the correlation of a short-term trading program to stocks, for example, may be very different from that of a longer-term program.

SECTOR DIVERSIFICATION

While the majority of CTA programs tend to be diversified across market sectors, and trade in multiple futures markets (quite often between 25 and 200), some sector-focused programs do exist. For example, there are CTA programs that focus on only physical commodities, others that may have a risk "overweight" to energy, and some (albeit fairly small) programs that may be even more narrowly focused on, for example, mainly meats and grains. The correlations of an energy-focused program with other asset classes are likely to be quite different from those of a broadly diversified CTA trading program.

VOLATILITY AND SIZE OF ALLOCATION

As we have tried to emphasize, the "stand-alone" volatility of an asset that is being added to a portfolio, while important, is of less relevance than correlation. The key to CTA program risk management is that an overall "vol target" is set and the program is managed in a way that seeks to achieve this target over time.

CTA risk management methods are generally based on the following broad principles:

- Diversification across sectors and markets
- Diversification across time-frames
- Diversification across models and strategies
- Position sizing and volatility target

We have already discussed the first two of these. The third, diversification across models and strategies, is an important consideration in building and managing a CTA program. Volatility targeting is the last and perhaps the key piece of the puzzle. Basically, trading positions in the program are scaled appropriately so that, on average and over the long term, the trading program delivers the target level of risk. For example, a CTA may decide on a long-term volatility target that is about the same as that of US stocks, which is about 14-16% (measured as the annualized standard deviation of returns). It is feasible to strive to achieve this target range through diversification and position size management.[7]

This philosophy recognizes that **return** is not predictable or controllable, but that seeking to manage **risk** is likely a more realistic and perhaps achievable goal for CTAs. Potential investors need to be cognizant of the fact that CTA programs target a certain level (or range) of volatility. Let us assume that an investor has actually decided to allocate to two CTA programs, one with a target volatility of 25% and the other with a target volatility of 10%. How might the sizes of these two allocations differ, if we want them to contribute roughly an equal amount of risk? Should they be inversely proportional to volatility; for example, if 5% is allocated to the lower volatility programs, should the higher volatility program have a proportionally lower allocation of 2%?

As we have discussed at length elsewhere[8], stand-alone volatility does play a role in deciding how much to allocate, but it must be analyzed in conjunction with the correlation. If the 25% volatility program has a significantly lower correlation to the existing portfolio than the 10% volatility program, an allocation significantly higher than 2% could be justified.

[7]*These and other aspects of CTA program risk management are discussed in our Insight,* ***"Managed Futures: Risk Management in CTA Programs"*** *(2016).*

[8]*See our Insight,* ***"Allocating to Liquid Alternatives: Some Considerations"*** *(2016)*

Definitions of Terms and Indices can be found on back page.

TO SUMMARIZE

> The allocation to managed futures (or any other asset) added to an existing portfolio is a function of the correlation of its returns, as well as its "stand-alone" volatility. **Ignoring either of these factors may generally lead to less than ideal results.**

OTHER FACTORS

In addition to the quantitative considerations explained above, **there are a number of other "soft" factors that we believe investors should evaluate while considering an allocation to managed futures.**

Managed futures, like hedge funds, are not a homogeneous asset class, as we have discussed above. While individual CTA programs tend to be diversified across sectors, markets, exchanges, and time-frames, even the most highly diversified program will almost certainly suffer through periods of under performance, based on unfavorable market conditions or other factors. Hence, when investors are considering an allocation to the asset class, it is our belief that they may potentially benefit from diversifying this "CTA-specific" risk.

A core allocation to a medium-term to long-term trend-following program may benefit from allocations to other trading styles and horizons, such as short-term trading, spread-

trading, or non-trend strategies. As seen in the table on pages 2-3, the wide range of differences exhibited by CTAs along the dimensions discussed above results in their returns being less than perfectly correlated with each other, thereby **offering potential benefits from investing in a diversified portfolio of CTAs rather than in just one individual CTA program.** While sophisticated institutional investors with in-house research capabilities may elect to build their own portfolio of individual CTA programs, others may choose to allocate to a multi-CTA portfolio designed and managed by specialists.

Another important "soft" factor is research. To varying degrees, managers invest in research and technology as they continue to update and refine their current trading systems and investigate additional markets and strategies to uncover new sources of potential returns. Managers who do not keep up with the times are likely to suffer performance deterioration in the long run. High quality research has been shown to explain some of the average return differences of CTA program returns.

This last point highlights a crucial issue regarding CTA performance: because the performance of trading systems can degrade over time, individual CTA performance is likely to be non-stationary in the long-run. This issue underscores the need for investors to continually monitor performance and to remain alert for changes in trading levels, investment strategies, markets traded, and risk management techniques. It also suggests that a static approach is unlikely to provide meaningful answers. A multi-CTA portfolio should be reviewed and evaluated periodically, based on ongoing, rigorous due diligence. If investors do not have the requisite in-house capabilities, they may be well-advised to seek the assistance of "outside specialists."

CONCLUSION

We have tried to make the case that the managed futures space is not homogeneous. While most market participants are accustomed to thinking about the managed futures space as consisting of systematic trend-following programs that trade actively in global futures markets, we illustrate here that "non-trend" programs, which we also consider as managed futures, have low correlations to "trend" programs as well as to a managed futures index. Consequently, extending one's allocation to include such "non-trend" managed futures may provide additional diversification benefits beyond "trend" programs alone. In other words, a well-designed portfolio of CTA programs may provide significant diversification benefits to a traditional portfolio. We have also tried to emphasize the importance of looking at all the relevant variables in deciding to which programs to allocate, and how much to allocate: correlation and volatility are both important, but so are other "soft" factors.

To what might we attribute these **potential diversification benefits of the asset class?**

Research shows that CTA returns depend on a multitude of factors including trading approach, markets, sectors and time-frames traded, risk management techniques, and quality of research. These factors may vary widely across CTA programs, but they have generally produced return patterns with low correlations to traditional asset classes, thereby offering the potential for benefits from diversification.[9]

We also point out that CTA programs may evolve and change over time. Periodic and rigorous due diligence is required in order to gather information that may be both helpful and necessary in allocating to managed futures, and in updating and rebalancing portfolios over time.

[9] *See our Insight,* ***"Harnessing the Potential Benefits of Managed Futures"*** *(2016).*

Definitions of Terms and Indices can be found on back page.

APPENDIX

DEFINITIONS

Contrarian, unlike trend-following models, which generate buy (sell) signals in the early stage of an upward (or downward) trend, contrarian models generate buy (or sell) signals at the end of the turning point of a downward (or upward) trend.

Correlation is measured on a scale from 1.00 to -1.00. [1.00] Investments with high correlation tend to rise and fall together. [0.00] Non-correlated investments tend to move up and down with no relation to one another. [-1.00] Investments with negative correlation tend to move in opposite directions.

Counter-Trend Trading is a type of swing-trading strategy that assumes a current trading trend will reverse and attempts to profit form that reversal.

Discretionary spread trading is a trading approach that uses fundamental analysis of underlying economic factors. A spread tracks the difference between a long and short position. In spread trading, risks move beyond price fluctuation to risks that involve the difference between two or more sides of a spread.

Diversified trend is a strategy that encompasses all three horizons – short, medium, and long-term.

Dynamic position sizing describes an approach where the trader adjusts their position size based on the quality of the trade and based on their historic success.

Enhanced carry strategies aim to benefit from diversified carry signals while seeking to mitigate drawdowns through a dynamic risk management approach.

Global macro is a strategy that trades equity, bond, currency and commodity markets based generally on global macroeconomic developments. Within the global macro category, systematic macro strategies use mathematical or computer models to identify trends and select investments, in contrast to discretionary macro strategies, which use primarily fundamental analysis.

Long Position refers to the buying of a security such as a stock, commodity or currency, with the expectation that the asset will rise in value.

Long-term trend is a strategy that uses long-term indicators and averages, general five months or longer.

Mean Reversion Models or **Strategies** are trading models that assume prices will eventually return to a long-term average level.

A Medium-term Trend Following or **Momentum Trading Strategy** seeks to capitalize on momentum or price trends across global asset classes by taking either long or short positions when a trend is determined to have been established. The strategy is applied using a medium-term time-frame of generally between one to six months.

Modern Portfolio Theory (MPT) is a theory on how risk-averse investors can construct portfolios to optimize or maximize expected return based on a given level of market risk, emphasizing that risk is an inherent part of higher reward.

Pattern recognition is defined as the categorization of input data into identifiable classes via the extraction of significant futures or attributes of the data from a background of irrelevant detail.

Relative value trading is a method of determining an asset's value that takes into account the value of similar assets. Calculations used to measure the relative value of stocks include the enterprise ratio and the price-to-earnings ratio.

Short Position is a position whereby an investor sells borrowed securities in anticipation of a price decline and is required to return an equal number of shares at some point in the future.

Short-term trading refers to a futures trading methodology that generally holds its positions for less than three months. Trading decisions are based on multiple trading strategies that may include a trend-following methodology as well as pattern recognition, spread trading, discretionary, contrarian and/or other approaches.

Standard Deviation is a statistical measure (single number) that sheds light on historical volatility. A volatile investment will have a higher stand deviation, while the more stable investment will have a lower standard deviation.

A **Stop-loss** is a stop order for which the specified price is below the current market price and the order is to sell.

Systematic (also known as Quantitative) employs computer-driven, mathematical models to identify when to buy or sell an instrument according to rules determined before a trade is made, generally with little or no human intervention once a mathematical formula has been entered.

Trend anticipation is the act of investors choosing investments that have performed well within another portfolio in anticipation that the trend will continue.

A **Trend-Following Strategy** seeks to capitalize on momentum or price trends across global asset classes by taking either long or short positions as a trend is underway. Price trends are created when investors are slow to act on new information or sell prematurely and hold on to losing investments to long. Price trends continue when investors continue to buy and investment that is going up in price or sell an investment that is going down in price.

Volatility is a measure of fluctuation in the value of an asset or investment. Lower volatility improves the stability and lowers the risk of an investment portfolio.

A **volatility targeting approach** uses dynamic asset allocation to achieve a stable level of volatility in all market environments by taking advantage of the negative relationship between volatility and return as well as the persistence of volatility.

INDEX DESCRIPTIONS

Investors cannot directly invest in an index and unmanaged index returns do not reflect any fees, expenses or sales charges.

Commodities: S&P GSCI® Total Return Index– is widely recognized as a leading measure of general price movements and inflation in the world economy. It provides investors with a reliable and publicly available benchmark for investment performance in the commodity markets.

Equities: S&P 500® Total Return Index– Widely regarded as the best single gauge of the US equities market, this world-renowned Index includes 500 leading companies in leading industries of the US economy

Fixed Income: Barclays Capital US Aggregate Bond Index®– covers the USD denominated, investment-grade, fixed-rate, taxable bond market of SEC-registered securities. The index includes bonds from the Treasury, Government-Related, Corporate, MBS, ABS, and CMBS sectors.

Global Equities: MSCI World Index– A free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets.

Managed Futures: Barclay BTOP50 Index®– The Index seeks to replicate the overall composition of the managed futures industry with regard to trading style and overall market exposure.

A WORD ABOUT RISK

THE PURCHASE OF A MANAGED FUTURES INVESTMENT INVOLVES A HIGH DEGREE OF RISK. SPECIFICALLY, YOU SHOULD BE AWARE THAT, IN ADDITION TO NORMAL INVESTMENT RISKS, MANAGED FUTURES INVESTMENTS ENTAIL CERTAIN RISKS, INCLUDING, IN ALL OR SOME CASES:

- MANAGED FUTURES OFTEN ENGAGE IN LEVERAGING AND OTHER SPECULATIVE INVESTMENT PRACTICES THAT MAY INCREASE THE RISK OF INVESTMENT LOSS.
- MANAGED FUTURES CAN BE HIGHLY ILLIQUID.
- MANAGED FUTURES ARE NOT REQUIRED TO PROVIDE PERIODIC PRICING OR VALUATION INFORMATION TO INVESTORS.
- MANAGED FUTURES MAY INVOLVE COMPLEX TAX STRUCTURES AND DELAYS IN DISTRIBUTING IMPORTANT TAX INFORMATION.
- MANAGED FUTURES ARE NOT SUBJECT TO THE SAME REGULATORY REQUIREMENTS AS MUTUAL FUNDS.
- MANAGED FUTURES OFTEN CHARGE HIGH FEES

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