

2017
INSIGHTS

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Managed Futures: Risk Management in CTA Programs

HIGHLIGHTS

- How have managed futures performed relative to equities?
- How systematic trend-following works
- Model and strategy diversification
- Position sizing and volatility targeting

In a previous *Investor Insight*, we discussed the potential benefits of adding Commodity Trading Advisor (CTA) strategies, also known as managed futures, to traditional stock/bond portfolios.¹ These include:

- **Risk-Adjusted Returns**

Over the long term, managed futures have historically earned risk-adjusted returns comparable to or better than most other asset classes, both traditional and alternative, but generally with shallower peak-to-trough drawdowns than asset classes with comparable risk such as equities (or long-only commodities).

- **Diversification**

The returns of managed futures have historically displayed low correlations to stocks and bonds, as well as to other alternative asset classes, thereby providing potential portfolio diversification benefits.

- **“Crisis Alpha”**

Managed futures have the potential to earn “crisis alpha” during periods of market turmoil, as was seen during the tech crisis of 2001-02, the financial crisis of 2007-08, and more recently, this past Dec.–Jan. (2015-16) for example.

The fact that managed futures have historically experienced much shallower drawdowns than equities has perhaps not been accorded the importance it warrants. It is often said that the risk management systems employed by CTAs are among the best that have been designed. In this *Investor Insight*, we discuss how CTA programs strive to manage risk and aim for shallow drawdowns, all while seeking to earn attractive returns.

¹ “Harnessing the Potential Benefits of Managed Futures,” available at equinoxfunds.com.

Definitions of Terms found below. Definitions of Indices found on pages 11-12.

Crisis alpha is the ability to generate returns at a time of crisis.

Diversification is a risk management technique that mixes a wide variety of investments within a portfolio. The rationale behind this technique contends that a portfolio of different kinds of investments will, on average, yield higher returns and pose a lower risk than any individual investment found within the portfolio.

Drawdown is a position or portfolio is in a drawdown when it incurs a loss relative to its all-time high profit or return. For example, a portfolio that starts off at \$100 today is worth \$100 tomorrow, and worth \$99 the day after is in a 10% drawdown, because it is down \$11 from the high of \$100.

Risk-adjusted return is a concept that refines an investment's return by measuring how much risk is involved in producing that return, which is generally expressed as a number or rating. Risk-adjusted returns are applied to individual securities and investment funds and portfolios.

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MANAGED FUTURES VS EQUITIES

How have managed futures as an asset class performed relative to US equities?

Historically, since 1987, the answer to this question turns up some interesting facts.

As shown in the table and chart below, the S&P 500® Total Return Index, which we use as a proxy for US equities, has provided investors with an attractive annualized rate of return (AROR) of 10.2%. \$10,000 invested into US equities in 1987 would have grown to approximately \$182,262 through December 2016. However, these rewards did not come without a price: the annualized standard deviation (ASTD) of these returns was 15.0%. More significantly, there were two precipitous peak-to-trough drawdowns: the index lost almost 45% from its August 2000 high to its September 2002 low, and an even more staggering 51% between October 2007 and February 2009. Managed futures, on the other hand, provided a lower return of 7.64%, but with a significantly lower ASTD of 9.8%. Consequently, the reward/risk ratio for managed futures, 0.78, was higher than that for US equities, 0.68. Even more notably, the worst drawdown of the Barclay BTOP50® Index, a proxy for Managed Futures, was -13.3%; this was less severe than even the 5th worst drawdown for US equities, which was -14.7%, as shown in the table below. For comparison, we also show the performance of a hypothetical equal-weighted portfolio of US equities and managed futures, with monthly rebalancing. This portfolio outperformed the two separate asset classes on several metrics, which is a powerful testament to the fact that managed futures have a very low correlation to US equities, thereby offering significant diversification benefits when combined in a portfolio with equities and other asset classes.

The year 1987 is significant as that is the inception year of the Barclay BTOP50® Index (BTOP50), the Managed Futures Index.

1/1/1987 - 12/31/2016

Comparative Performance During US Equity Drawdowns

	S&P 500® Total Return Index	Equal-weighted Portfolio	Barclay BTOP50® Index
AROR	10.2%	9.4%	7.6%
ASTD	15.0%	8.8%	9.8%
AROR ÷ ASTD	0.68	1.06	0.78
DRAWDOWN 1	10/31/2007 – 2/28/2009	10/31/2007 – 2/28/2009	6/30/1999 – 9/30/2000
	-50.9%	-23.9%	-13.3%
DRAWDOWN 2	8/31/2000 – 9/30/2002	1/31/2001 – 9/30/2002	12/31/1991 – 4/30/1992
	-44.7%	-13.3%	-11.9%
DRAWDOWN 3	8/31/1987 – 11/30/1987	8/31/1987 – 10/31/1987	2/29/2004 – 8/31/2004
	-29.7%	-12.3%	-10.9%
DRAWDOWN 4	6/30/1998 – 8/31/1998	4/30/2011 – 9/30/2011	10/31/2001 – 4/30/2002
	-15.4%	-9.3%	-9.6%
DRAWDOWN 5	5/31/1990 – 10/31/1990	2/29/2004 – 8/31/2004	7/31/1989 – 10/31/1989
	-14.7%	-6.9%	-8.5%

Definitions of Terms found below.
Definitions of Indices found on pages 11-12.

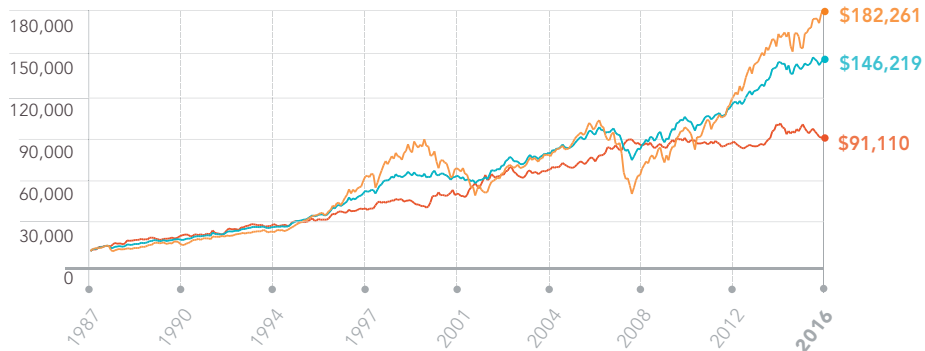
Annualized rate of return (AROR) is the geometric average return for a period greater than or equal to one year, expressed on an annual basis or as a return per year.

Annualized standard deviation (volatility) measures the degree of variation of monthly returns around the mean (average) return. The higher the volatility of the investment returns, the higher the annualized standard deviation will be.

The **correlation coefficient, r** , indicates both the strength and direction of the relationship between the independent and dependent variables. Values of r range from -1.0, a strong negative relationship, to +1.0, a strong positive relationship. When $r=0$, there is no relationship between variables x and y .

FOR ILLUSTRATIVE PURPOSES ONLY. PAST PERFORMANCE DOES NOT GUARANTEE FUTURE RESULTS. INDEX COMPARISONS HAVE LIMITATIONS BECAUSE INDEXES HAVE VOLATILITY AND OTHER MATERIAL CHARACTERISTICS THAT MAY DIFFER. PARTICULARLY, AN INVESTMENT INDEX RESULTS DO NOT REPRESENT ACTUAL TRADING OR ANY MATERIAL ECONOMIC AND MARKET FACTORS THAT MIGHT HAVE HAD AN IMPACT ON AN ADVISER'S DECISION-MAKING. IT IS NOT POSSIBLE TO INVEST DIRECTLY IN AN INDEX. INDEX PERFORMANCE DOES NOT REFLECT THE DEDUCTION OF ANY FEES OR EXPENSES.

Growth of \$10,000 invested in US Equities, Managed Futures and an Equal-Weighted Portfolio



GRAPH KEY

- S&P 500[®] Total Return Index
- Barclay BTOP50[®] Index
- Equal-Weighted Portfolio (50% S&P 500[®] / 50% BTOP50[®])

PAST PERFORMANCE DOES NOT GUARANTEE FUTURE RESULTS. THERE IS RISK OF LOSS. YOU CAN LOSE MONEY IN ANY INVESTMENT. YOU CANNOT INVEST DIRECTLY IN AN INDEX.

*Definitions of Terms found below.
Definitions of Indices found on pages 11-12.*

HOW SYSTEMATIC TREND-FOLLOWING WORKS

As background, we first discuss broadly the principles behind systematic trend-following, the approach most widely used by CTAs. **A simplified version of trend-following would involve:**

- Waiting for the price of an asset to make a move, either up or down, large enough and for long enough, to generate a signal that a new trend is potentially being established
- Entering an appropriately sized long position (in an uptrend) or short position (in a downtrend)
- Holding and managing the position until the price moves sufficiently in the opposite direction to generate a signal that the trend may potentially have ended
- Unwinding the position (and possibly setting up a new position in the opposite direction).

Equal-weighting strategy is a strategy employed that gives the same weight, or importance, to each stock in a portfolio. The smallest companies are given equal weight to the largest companies in an equal-weight index fund or portfolio. This allows all of the companies to be considered on an even playing field.

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.

Short position refers to the sale of a borrowed security, commodity or currency with the expectation that the asset will fall in value.

Stop loss order is an order placed with a broker to sell a security when it reaches a certain price. A stop-loss order is designed to limit an investor's loss on a position in a security.

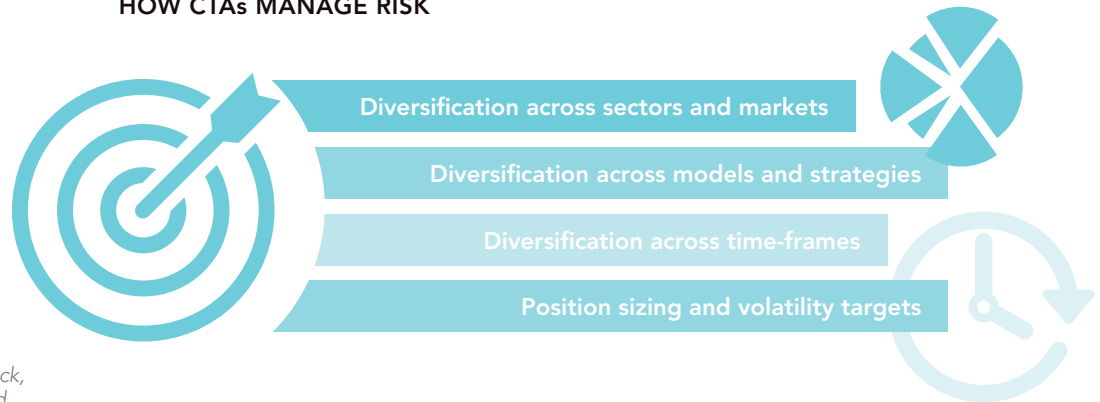
A **systematic trading strategy** (also known as Quantitative) employs computer-driven, mathematical models to identify when to buy or sell an instrument according to rules determined before a trade is made, generally with little or no human intervention once a mathematical formula has been entered.

Trend-following 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.

Risk management is relevant and important at every stage of this process. Initially, risk management is used to determine the appropriate size of the position, taking into account various portfolio and market factors. Next, risk management may dictate that the trade be closed out early and at a small loss if, before a trend in the direction of the trade gets established, the price reverses enough to trigger a stop-loss order. Finally, risk management is also involved when the position is unwound profitably when the trend ultimately reverses after running for a while. If the trend does run, risk management may call for the position to be resized along the way to reflect market conditions (such as increases in overall or market-specific volatility, higher inter-market correlations, or unusually sharp price changes). In addition, trailing stop loss orders are generally used to potentially protect a part of the unrealized gains, also a risk management feature.

One feature that distinguishes managed futures from most other asset classes is that both long and short positions can be established and traded, depending on the direction of the trend. This ability is what enables managed futures to earn potential returns in both rising and falling markets, and also helps to smooth out the return stream and experience shallower drawdowns.

HOW CTAs MANAGE RISK



² Further refinement, such as splitting agricultural futures into grains, livestock, and softs, or metals into industrial and precious, is also possible. See the table on page five, in which sample markets traded are listed by sector.

³ Other CTAs may use different proprietary definitions of trend, such as risk-adjusted momentum. The ultimate goal, however, is common across CTAs: to seek to profit from trending markets in either direction while seeking to manage risk prudently.

Definitions of Terms found below.
Definitions of Indices found on pages 11-12.

Discretionary trader is a discretionary CTA trades futures, forwards and options contracts without relying on a computer system to make trading decisions. Generally, discretionary managers use a combination of fundamental and technical inputs to make their trading decisions for each market.

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.

Short position refers to the sale of a borrowed security, commodity or currency with the expectation that the asset will fall in value.

SECTOR AND MARKET DIVERSIFICATION

Managed futures as a strategy are geographically diversified (CTAs generally trade markets all around the globe) and are also diversified across sectors and markets. Generally, the range of tradeable futures contracts are classified into two main sectors, **financials and physical commodities**. The financial sector comprises equity index futures, fixed-income futures, and currency futures. The physical commodity sector includes energy futures, metal futures, and agricultural commodity futures.² Within each of the six sectors, CTA programs trade a number of different markets, often numbering anywhere from around fifty to as many as a couple of hundred. Examples of markets are: Nikkei 225, US 10-year Treasury, Euro/Yen, Gold, Corn, WTI Crude, etc.

Sometimes, a program may trade the same commodity on more than one exchange (e.g., Copper on the London Metal Exchange (LME), as well as on the Chicago Mercantile Exchange (CME)), or may trade contracts on the same commodity with multiple expiration dates (e.g., December Corn and March Corn). CTAs may also trade what are known as “synthetic markets.” For example, long positions in two equity indices such as the Japanese Nikkei 225 and the German DAX may be established, based on an up-trend in each, but a CTA may also look at the difference between the two. If the Nikkei 225 is trending up stronger than the DAX, a CTA may set up a position that is long the Nikkei and short the DAX. This may be in addition to separate long positions in each index.³

It is worth exploring why CTAs trade so many different markets. There are two main reasons: **seeking profitable trends and seeking to mitigate risk**. As we have discussed, unlike a fundamental or discretionary trader who establishes positions based on predictions of where asset prices are headed, systematic trend-following is a reactive trading strategy. Positions are generally entered only after a trend appears to have been established. This is necessarily unpredictable in the sense that there is no way to forecast reliably which markets will trend, when they will trend, and how profitable those trends will be. Historically, only a fraction (generally ranging from about one-third to one-half) of all the trades entered by a trend-following program eventually turn out to be profitable. The profits on these trades must be enough to

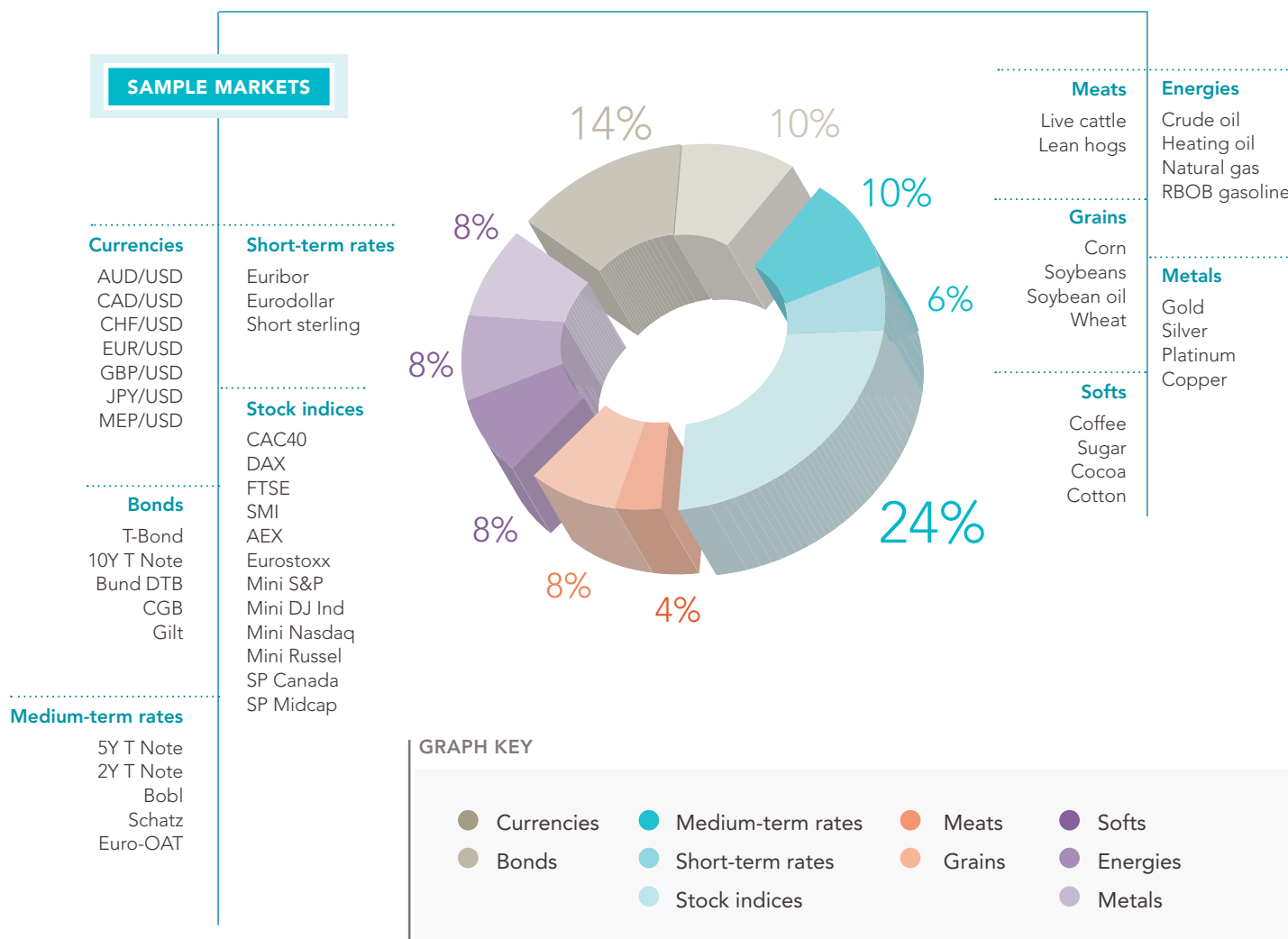
make up for the small losses incurred on all the trades that get stopped out because of early trend reversals. It is not possible to “cherry pick” a few markets and hope that all will be well.⁴ A program that only trades a small number of markets will end up being far too risky, with very “lumpy” returns. For these reasons, therefore, a successful trend-following system needs to be able to trade multiple markets. It is not only an issue of searching for return, but also of mitigating and seeking to manage risk.

The chart below shows the risk allocation for a hypothetical but reasonably typical CTA program that trades 50 markets. The sectors and markets traded are listed for illustrative purposes. Note that the allocations shown are risk-based; as we emphasize in a later section, “market values” or “notional values” of futures contracts can be meaningless at best and misleading at worst, especially when compared across different sectors.

⁴Of course, issues such as picking markets with sufficient liquidity, and the complexity added by trading 200 markets rather than 50, needs to be addressed.

Definitions of Indices found on pages 11-12.

HYPOTHETICAL Sector Risk Allocation



MODEL AND STRATEGY DIVERSIFICATION

It is possible for a CTA to build a trading program using just one simple trend model, such as a **“moving average crossover.”**⁵

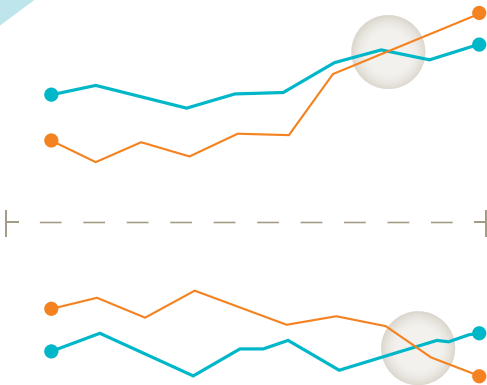
Moving average crossover models are fairly easy to understand (and, consequently, to build): calculate two averages of a historical time-series of closing prices, one with a shorter window than the other. An example might be a 5-day moving average (called the faster) and a 60-day moving average (the slower). A signal is generated whenever the faster average crosses the slower one. A cross from below indicates an uptrend, and a long position is initiated. Subsequently, when the opposite cross occurs, it signals the end of the up-trend and the beginning of a down-trend. The long position is closed out and a new short position is established.

But just as it is unnecessarily risky for a CTA to trade only one market, it can also prove sub-optimal to use only one simple model to generate signals. It is comparable to a stock-picking analyst who uses only one dividend discount model to evaluate companies, rather than a broader set of measures or models. One potential drawback of the simple moving average crossover model is that it is always in the market, either long or short. This may result in getting “whipsawed” significantly when markets trade sideways for long periods of time, without establishing trends in either direction. A potential fix might be to add another model to the trading program, such as a “breakout” strategy. A simple example is a model that goes long (short) if today’s closing price is higher (lower) than the highest (lowest) closing price during the last 50 days. The long (short) trade would be closed out when the price is at a new 25-day low (high), as this would be taken to indicate the end of the trend. Thus, there would be times when no position is held, pending a new breakout. The breakout model would generate signals at different times than the moving average crossover model, and would therefore diversify some of the risk.

However, both the models described are still trend-following models. A CTA who desires even further diversification of “model risk” might incorporate suitably designed “counter-trend” models into the trading program. Counter-trend models can be designed broadly in **two ways**:

In the direction of the dominant trend: the counter-trend model enters when the main trend-following model is stopped by an early trend reversal, and it exits before a new signal is generated by the main model.

Against the dominant trend: the counter-trend model seeks to predict the top or bottom of the prevailing trend. For example, when the main trend-model has remained long and as the up-trend persists for a long period, the counter-trend model may generate a short signal, predicting that the up-trend may reverse soon.



⁵ In such a case, the CTA would likely at least be diversified across multiple time-frames, as discussed in the next section.

Definitions of Terms found below.
Definitions of Indices found on pages 11-12.

Dollar cost averaging is a strategy in which an investor places a fixed dollar amount into a given investment on a regular basis.

Countertrend strategy is a trading strategy where an investor attempts to make small gains through a series of trades against the current trend. It is also known as “counter-trend trading”.

Model risk is a type of risk that occurs when a financial model used to measure a firm’s market risks or value transactions does not perform the tasks or capture the risks it was designed to.

Whipsaw is a condition where a security’s price heads in one direction, but then is followed quickly by a movement in the opposite direction. The origins of term is derived from the push and pull action used by lumberjacks to cut wood with a type of saw with the same name.

TRADE

TRADE

Often, relative to trend-following models, counter-trend models tend to have “tighter stops:” they are quicker to get out of positions. They also tend to have higher “hit ratios”—a larger fraction of trades is profitable—but the profit per trade is usually smaller. Thus, they can be helpful in diversifying “model risk” in a program that contains purely trend models.

Trend-following programs may also elect to diversify into non-trend strategies such as carry trades, for even greater diversification. At some point, the CTA may need to decide whether the program is so diversified across models and strategies that it needs to be called a “multi-strategy program” rather than a “trend-following program.”

TIME-FRAME DIVERSIFICATION

Another dimension along which CTA programs diversify is the length of the time-frame they employ to generate signals. This is also referred to as the “**lookback period.**” For the breakout model described earlier, the historical time period used to generate trading signals is the 50 day lookback period. CTA programs are often classified, based on the range of lookback periods they employ across their models, as short-term (up to about four weeks) intermediate-term (from about four weeks to about four months) or long-term (greater than about four months). Sometimes, the average holding period of trades is used, which often tends to correspond roughly to the lookback period.

As an example, the 5-60 day moving average crossover model described earlier could be supplemented by a 10-120 day model. The two models would signal entries and exits at different times, although they would generally pick up on the same broad overall trends. The “faster” 5-60 model would tend to get in and out of trades more quickly. Which model would perform “better” over a period cannot be predicted, as it would depend on the pattern of price movements. However, we can say with some confidence that, on average and over sufficiently long sample periods, the performance of the two models is very likely to be less than perfectly correlated, and hence may provide diversification.

How do longer-term models perform compared to shorter-term ones?

Because shorter-term models tend to get “whipsawed” more, longer-term models generally yield better risk-adjusted returns. However, short-term returns may display more positive skew (i.e., the probability of more extreme negative returns is lower) and lower correlations to asset classes such as equities.

POSITION SIZING AND VOLATILITY TARGETING⁶

We have left the most important aspect for last. The key to CTA program risk management is the method by which an overall risk target is set and managed. In discussing this, we will also try to shed some light on the “notional trading level,” which can be a somewhat elusive concept.

“LOOKBACK PERIOD”

An exotic option that allows investors to “look back” at the underlying prices occurring over the life of the option and then exercise based on the underlying asset’s optimal value. This type of option reduces uncertainties associated with the timing of market entry.

⁶The discussion here is based partly on Andreas Clenow’s book, “Following the Trend.”

**Definitions of Terms found below.
Definitions of Indices found on pages 11-12.**

A **carry trade** is a strategy in which an investor borrows money at a low interest rate in order to invest in an asset that is likely to provide a higher return. This strategy is very common in the foreign exchange market.

⁷ This may be computed as a simple average or as an exponentially-weighted average.

Definitions of Terms found below.
Definitions of Indices found on pages 11-12.

Average True Range (ATR) is a measure of volatility introduced by Welles Wilder in his book: *New Concepts in Technical Trading Systems*.



The instruments traded by CTAs are, for the most part, exchange-listed futures contracts and foreign currency (FX) forward contracts. As mentioned earlier, markets traded by most CTAs are spread out across financial and physical commodity futures, and within those broad groups, into six sectors. This extensive opportunity set displays a wide cross-section of risk: for example, Nikkei 225 Index contracts tend to display much greater day-to-day price volatility than US 10-year Treasury Bonds, which are in turn much more volatile than short-term interest rates such as 90-day Australian Bank Bills. How does a CTA who wants to trade all three of these balance their risks? Virtually all CTA programs use what can be described as “equal risk” weightings. In other words, the relative size of a futures position will be inversely proportional to that market’s volatility.

The measure of volatility used by many CTAs is the “Average True Range” (ATR). **True Range is defined using today’s High and Low prices, as:**

$$\text{True Range} = \text{Today's High} - \text{Today's Low}$$

However, if yesterday’s Close was higher than today’s High or lower than today’s Low, the formula becomes:

or

$$\text{True Range} = \text{Yesterday's Close} - \text{Today's Low}$$

$$\text{True Range} = \text{Today's High} - \text{Yesterday's Close}$$

In other words, the True Range is the largest of the three values computed.

$$\text{True Range} = \text{Max}$$

$$[\text{Today's High} - \text{Today's Low}, \text{Yesterday's Close} - \text{Today's Low}, \text{Today's High} - \text{Yesterday's Close}]$$

The average of the last 20 days’ True Ranges, say, is called the 20-day ATR.⁷

Each futures position in a CTA program is initially sized **using the following formula** (or some slight variant thereof):

$$\text{Number of contracts} = \frac{[(\text{Account Size}) \times (\text{Expected Impact})]}{[(\text{ATR}) \times (\text{Point Value in } \$)]}$$

WHERE

- **ACCOUNT SIZE** is the amount allocated to the strategy,
- **EXPECTED IMPACT** is the theoretical average daily impact of the position on the Account Size; this is the key parameter that needs to be set by the CTA,
- **ATR is the AVERAGE TRUE RANGE** measured over a suitable window, determined by the CTA,
- **POINT VALUE** is the profit/loss on one futures contract when the price of the underlying moves by one full point; it is a function of how the futures exchange specifies the contract.

As a numerical example, consider a \$10M account. Assume that the CTA has decided that 0.50% is the appropriate value to use for the Expected Impact. This means that each position in the portfolio, on average, would have an impact on the \$10M account of \$50,000. If the ATR for Gold, say, happens to be 20, and the Point Value for Gold is \$10, then we can calculate that the initial number of Gold contracts to buy is 250. Proceeding in this fashion, we can calculate the initial position size for each market the CTA decides to trade in the program.

In order to illustrate the general process CTAs use, we make a number of simplifying assumptions. First, we ignore the fact that the ATR is not constant, but will change as market volatility changes. The initial position size for Gold next year would be smaller if the ATR increases because the Gold market becomes more volatile. Generally, CTAs may also adjust and manage ongoing position sizes as volatility changes.

Second, it appears that we have calculated the appropriate initial position size for Gold independently of all the other markets that are being traded. In fact, that is not the case. The value chosen by the CTA for the Expected Impact parameter implicitly reflects the fact that markets are not perfectly correlated.

This brings us to the crux of the issue:

How much **overall risk** is associated with this futures portfolio?

It is difficult to answer this question analytically. There is no way to predict exactly which markets will be trending at any given time, how volatile they will be, and how correlated they will be to each other. All these factors will play a role in determining the portfolio volatility at any point in time.

One answer to the question is found by back-testing the trading strategy and measuring the returns generated. Suppose the annualized standard deviation of returns turns out to be 8%. This is about half the historical volatility of the S&P 500® Index, and the CTA may decide that this is a level of risk that will appeal to investors. It is important, of course, to emphasize that investors should not look only at volatility; Modern Portfolio Theory (MPT) tells us that the covariance with the rest of the investor's portfolio is actually the important factor.

Let us call this specific program the CTA's "1X" trading program.⁸ Now what if the CTA believes that some investors would prefer to invest in a program that offers an annualized volatility of 12%? In that case, the program would simply be scaled up by a factor of 150%. The number of Gold contracts to trade would go from 250 to 375, and

⁸ Let us pause and ask another question: *To what is an investor who allocates \$10M to this program being exposed? If the investor were to invest \$10M in a fund (unleveraged) that trades stocks, for example, the fund manager would in general look to buy \$10M worth of equities. A CTA, by way of contrast, may buy 250 Gold contracts, sell short 5 Corn contracts, buy 1000 EUR/USD contracts, and so on. The total notional contract value of all the contracts bought and sold will generally bear no resemblance to \$10M. It is likely, in fact, to be much higher, especially if a large number of short-term interest rate contracts are in the portfolio. The \$10M investment simply serves as a reference level. It tells the CTA how many contracts of each type to buy or sell short.*

**Definitions of Terms found below.
Definitions of Indices found on pages 11-12.**

Modern Portfolio Theory (MPT) is a theory on how risk-averse investors can construct portfolios to optimize or maximize expected return based.

⁹ It is important to note that, unlike an equity hedge fund that can provide a leveraged 150% exposure to stocks by borrowing 50%, the 1.5X program, while riskier than the 1X program, does not borrow or use leverage in the same sense as an equity hedge fund. It simply uses approximately 1.5 times the margin the 1X program uses.

Definitions of Indices found on pages 11-12.

likewise for the remaining markets. The CTA can offer two program “flavors” to investors: the original “1X” program, or the new program, which would be designated as “1.5X” to denote its higher level of volatility and risk. Note that the expected reward to risk ratio for the two programs should be almost identical, allowing for differences due to trading costs and other market imperfections.⁹ In a perfect market, an investor could allocate 10% of her portfolio to the 1.5X program, or 15% to the 1X program, and achieve virtually similar end results.

These, then, are the techniques that CTAs use in seeking to manage risk at the portfolio or program level: positions are scaled appropriately so that, on average over the long term, the trading program seeks to deliver the appropriate expected level of risk. Different versions of the same program can be offered to investors with different risk appetites. Probably more explicitly than other money managers, CTAs also recognize the fact that volatility changes over time, and they factor this into their management of risk by using dynamic risk measures such as the ATR. Their philosophy also recognizes that return is not predictable or controllable, but that seeking to manage risk is likely a more realistic and perhaps achievable goal.

SOME ADDITIONAL FACTORS

While expounding on the four major tenets of CTA risk management, we glossed over several technical details in the interest of simplifying the narrative. We now discuss these briefly.

Trade Entry and Exit: In response to signals generated by their models, most CTA programs do not put on, or take off, trades in as simplistic a manner as we have described above.

Many programs use filters in deciding whether to initiate a trade. As an example, a long trade may be initiated only when the longer-term trend is up. In other words, if a market has been trending down for the last several weeks, but a buy signal is generated by a short-term breakout model, the program may not jump in immediately, allowing for the fact that this uptrend within the longer downtrend is transient and may soon reverse. Similar filters may be used when exiting an established position.

Another strategy followed by some CTAs is to scale into or out of positions gradually rather than at one time. For example, if the program calls for buying 250 Gold contracts, perhaps half that quantity might be bought today, and the remaining half over the next week or two, if the trend that generated the signals persists and does not reverse. The thinking here is that, if the signal did reverse and a stop-loss order was triggered, the loss incurred on the unsuccessful trade would only be about half as much as on a full position. This is similar to the way an investor “dollar-cost averages” into an investment, although the rationale is slightly different.

Both initial and ongoing position sizes may also be scaled up or down to reflect changes in market conditions. For example, the 250 Gold contract trade may be scaled down if, for example, the correlations between gold and other precious metals like platinum and palladium were higher than their historical norms. Platinum and palladium positions would also get scaled down. The logic here is that normal-sized positions would carry more risk in the current environment than they would under more normal conditions. In a similar fashion, position sizes may be scaled up or down as a function of other market conditions besides correlations and volatility; some CTAs

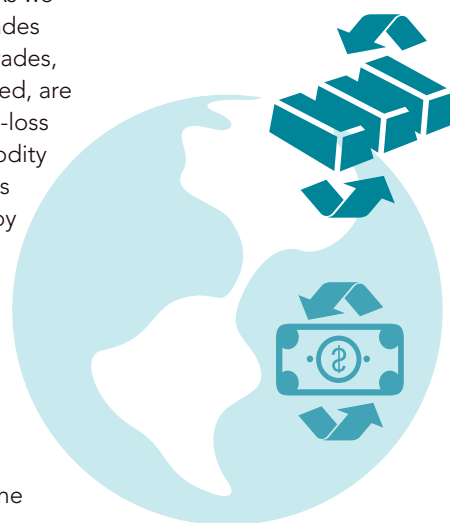
make use of “trendiness indicators” to measure the prevalence and strength of trends across multiple markets, and scale positions up or down based on these indicators.

Finally, stop-loss orders are a crucial component of virtually every single CTA program. Stop orders that are put in place when a position is initiated are intended to take the program out of the trade in the event that the trend reverses soon afterwards. As we discussed, as many as one-half, to two-thirds, of a trend-following program’s trades may be closed out at relatively small losses in these situations. The remaining trades, which are held for longer periods because a favorable trend has been established, are also potentially protected by the use of trailing stops. While these are also stop-loss orders, they are dynamic: their limit price is moved up as the underlying commodity price trends higher. In this way, the program seeks to manage the maximum loss that would be incurred if the trend were to reverse sharply and suddenly, thereby endeavoring that the entire unrealized gain on the position (known as open trade equity) is not surrendered.

CONCLUSION

The surprisingly shallow drawdowns historically exhibited by managed futures relative to other asset classes such as equities, which have yielded comparable returns, have been the focus of our analysis. We have tried to explain how the rigorous systems put in place by most CTAs seek to manage risk and mitigate the drawdowns of their trading programs.

CTA programs look for trends in multiple markets and seek to earn attractive risk-adjusted returns that have relatively shallow drawdowns, and relatively low correlations with most other asset classes. CTAs tend to be systematic traders for the most part, and their trading programs are built using time-tested and robust models that seek to remove emotion from the decision-making. Likewise, their overall risk management is systematic, focusing on diversification and position size management coupled with the use of stop-loss orders, seeking to deliver a targeted level of volatility to end investors.



*Definitions of Terms found below.
Definitions of Indices found on
pages 11-12.*

*A **trailing stop** is a stop order that can be set at a defined percentage away from a security's current market price.*

APPENDIX

INDEX DESCRIPTIONS

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

Amsterdam Stock Exchange (AEX) is founded in the early 1600s with the founding of the Dutch East India Company (VOC), whose shares are considered the oldest in the world. In September, 2000, the Amsterdam Stock Exchange merged with the Brussels Stock Exchange and the Paris Stock Exchange to form Euronext Amsterdam.

Barclay BTOP50 Index® (BTOP50): The 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 index does not encompass the whole universe of CTAs. The CTAs that comprise the index have submitted their information voluntarily.

CAC 40 is the French stock market index that tracks the 40 largest French stocks based on market capitalization on the Paris Bourse (stock exchange).

Chicago Mercantile Exchange (CME) is the world's second-largest exchange for futures and options on futures and the largest in the US. Trading involves mostly futures on interest rates, currency, equities, stock indices and a small amount on agricultural products.

DAX is a stock index that represents 30 of the largest and most liquid German companies that trade on the Frankfurt Exchange. The prices used to calculate the DAX Index come through Xetra, an electronic trading system. A free-float methodology is used to calculate the index weightings along with a measure of average trading volume.

Dow Jones EURO STOXX 50 is a market capitalization-weighted stock index of 50 large, blue-chip European companies operating within eurozone nations. The universe for selection is found within the 18 Dow Jones EURO STOXX Supersector indexes, from which members are ranked by size and placed on a selection list.

E-mini is an electronically traded futures contract on the Chicago Mercantile Exchange that represents a portion of the normal futures contracts. E-mini contracts are available on a wide range of indexes such as the Nasdaq 100, S&P 500, S&P MidCap 400 and Russell 2000.

FTSE is a company that specializes in index calculation. Although not part of a stock exchange, co-owners include the London Stock Exchange and the Financial Times.

London Metal Exchange (LME) is a commodities exchange in London, England, that deals in metal futures. Contracts on the exchange include aluminum, copper and zinc. Trading on the LME can be done in three main ways: through open outcry, a telephone system between member companies or the LME Select, an electronic trading platform. The LME is a non-ferrous exchange, which means that iron and steel are not traded on the exchange.

APPENDIX CONTINUED

INDEX DESCRIPTIONS

Medicare Supplementary Medical Insurance (SMI) is a health insurance sold by private insurance companies meant to top up an original Medicare plan. Medicare supplementary medical insurance, commonly known as Medigap, covers additional healthcare costs that may not be covered under the traditional Medicare plan, such as emergency room services and ambulatory surgical procedures.

Nasdaq is a global electronic marketplace for buying and selling securities, as well as the benchmark index for US technology stocks. Nasdaq was created by the National Association of Securities Dealers (NASD) to enable investors to trade securities on a computerized, speedy and transparent system, and commenced operations on February 8, 1971. The term "Nasdaq" is also used to refer to the Nasdaq Composite, an index of more than 3,000 stocks listed on the Nasdaq exchange that includes the world's foremost technology and biotech giants such as Apple, Google, Microsoft, Oracle, Amazon, Intel & Amgen.

Nikkei is short for Japan's Nikkei 225 Stock Average, the leading and most-respected index of Japanese stocks. It is a price-weighted index comprised of Japan's top 225 blue-chip companies on the Tokyo Stock Exchange. The Nikkei is equivalent to the Dow Jones Industrial Average Index in the U.S. In fact, it was called the Nikkei Dow Jones Stock Average from 1975 to 1985.

Russell 2000 Index is an index measuring the performance approximately 2,000 small-cap companies in the Russell 3000 Index, which is made up of 3,000 of the biggest US stocks. The Russell 2000 serves as a benchmark for small-cap stocks in the United States.

S&P 500 Mini is a derivative contract representing a designated fraction of the trading value of a standard S&P futures or options contract. Designed to expand the group of investors that could afford them, the S&P 500 Minis trade and act much like their pricier peers: the contracts are cash settled, follow the same expiration schedule and trade on the same stock exchanges.

The **S&P 500® Total Return Index** is 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. Although the S&P 500® focuses on the large cap segment of the market, with approximately 75% coverage of US equities, it is also an ideal proxy for the total market.

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Specifically, you should be aware that, in addition to normal investment risks, managed futures investments entail certain risks, including, in all or some cases:

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- Managed futures can be highly illiquid.
- Managed futures are not required to provide periodic pricing or valuation information to investors.
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