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GALEN BURGHARDT • BRIAN WALLS

MANAGED FUTURES FOR INSTITUTIONAL INVESTORS

ANALYSIS AND PORTFOLIO CONSTRUCTION

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Analysis and Portfolio Construction

Galen Burghardt
Brian Walls

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Acknowledgments

We want to take this opportunity to thank those who have helped us bring this book to fruition and to extend an open invitation to its readers to approach us any time with the kinds of questions we wrestle with in this book. The young people who work behind the counter at our local Potbelly's wear t-shirts that say, "Get in here before we both starve." We feel the same about questions and animated conversations. Without them, we would starve.

First, we want to thank our colleague, Leslie Richman. Leslie co-founded our manager research forums, the first of which was held in 2002 and which have been the equivalent of a research nebula. Launching these forums required a tremendous commitment from all involved because the rules were so completely at odds with the usual kind of cap intro events to which managers and investors typically would be invited. The presenting managers were not allowed to talk about their firms, their trading programs, or their track records. Instead, their marching orders were to talk about some interesting piece of research that would help everyone think more fruitfully about trading and investing.

Second, we want to acknowledge all of the managers and investors who have participated in these research forums over the past eight years. It was from these forums that we were able to glean and distill the kinds of questions that weighted most heavily on managers' and investors' minds. These forums also have given us a place to try out our work with highly motivated listeners and to learn from their comments and criticisms. We have borrowed shamelessly from their insights.

One example is the work that appears in the chapter on drawdowns. The inspiration for that research was a rough survey we took at one of our earliest conferences. We had asked everyone what they thought the most useful measure of risk was, and a very large majority replied "drawdown." This outcome produced a firestorm of protest from those managers who had been around for a long time and from those whose targeted return volatilities were relatively high. The conversations that took place around the breakfast

and dinner tables the next day provided some of the key insights that shaped our work.

Another example that we love is in Chapter 13, where you will find a scatter plot that shows past and future average pairwise correlations for groups of 10 managers. When we first displayed that scatter plot at one of the May conferences, Rishi Narang (author of *Inside the Black Box*, Wiley, 2009) wanted to know why it looked like a football. The answer to his question proved to be a huge improvement in the way we thought about past and future correlations and why one could have confidence in averages of low pairwise correlations even though one could not have much confidence in low values of any one pairwise correlation estimate.

There are many more examples, but what we want to convey here is our gratitude for the kind of open and critical minds that people have brought to our conferences and the kinds of conversations they have produced. We cannot thank these managers and investors enough for allowing us to do much of our learning in public and to benefit from any mistakes we have made. We certainly cannot thank them all by name, but they know who they are and will recognize the influence they have had on our work.

We want to thank our colleagues in research at Newedge, especially Lianyan Liu and Ryan Duncan, both of whom appear as co-authors on many of the research notes you will find listed in the bibliography. Both of them have been rock-solid and have, over the years, propelled us forward in our understanding of thorny statistical and portfolio construction problems. Their theoretical acumen combined with their capacity for dealing with huge quantities of detail and data have been a godsend for us. We also would like to thank Lauren Lei, whose work on market liquidity and transactions costs has been integral to those parts of our work dealing with costs of trading and active portfolio management.

We want to thank everyone who helped pull this volume together. Molly Dziedzic, in particular, was tireless and unfailingly good humored throughout the entire process, especially when crunch times loomed. Hal Wadsworth has been our go-to guy for publishing for years and did not let us down here. Our editors at Wiley worked wonders, too, for which we are extremely grateful.

And finally, we must say just how thankful we are to have been able to work in a corporate culture that values the pursuit of knowledge, both here at Newedge and earlier at Calyon Financial. The pressures in this world to make more money faster are extreme. So it is all the more to our colleagues' credit that they have supported us so completely and enthusiastically while we were pursuing insights into the questions addressed in this book.

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Introduction: Why Invest in CTAs?

This book is intended to be an introduction to the world of Commodity Trading Advisors (CTAs) for savvy high-net-worth and institutional investors who are looking for an edge and who are willing to invest the time and attention required to take full advantage of what CTAs have to offer.

For the most part, the book is written for those who are persuaded that investing in CTAs promises to improve the performance of their portfolios. Before we get to the main body of the text, however, we want to make the best case we can for why you should invest. In doing so, we address these questions:

- What kind of hedge fund is a CTA?
- Do CTAs make money?
- How are CTAs' returns correlated with those on conventional assets?
- Why do CTAs make money?
- How much should you invest?
- What about the risks?
- Why are futures a good fit for pension funds and other institutional investors?

What Kind of Hedge Fund Is a CTA?

Managed futures denotes the sector of the investment industry in which professional money managers actively manage client assets using global futures and other derivative securities as the investment instruments. Managed futures managers are also known as Commodity Trading Advisors (CTAs),

> and The National Futures Association (NFA) is their self-regulatory organization. The first managed futures fund started in 1948; however, managed futures did not take off as an industry until the 1980s.*

Like most hedge funds, CTAs deal with institutional and high-net-worth individual investors who are financially sophisticated, who have specific investment requirements, and who need asset diversification. At the same time, CTAs' returns exhibit much lower correlations with those on conventional assets and so afford much better diversification than do private equity, venture capital, or conventional hedge funds. Further, CTAs provide far more liquidity.

Investors who want to invest in alternatives need to understand CTAs.

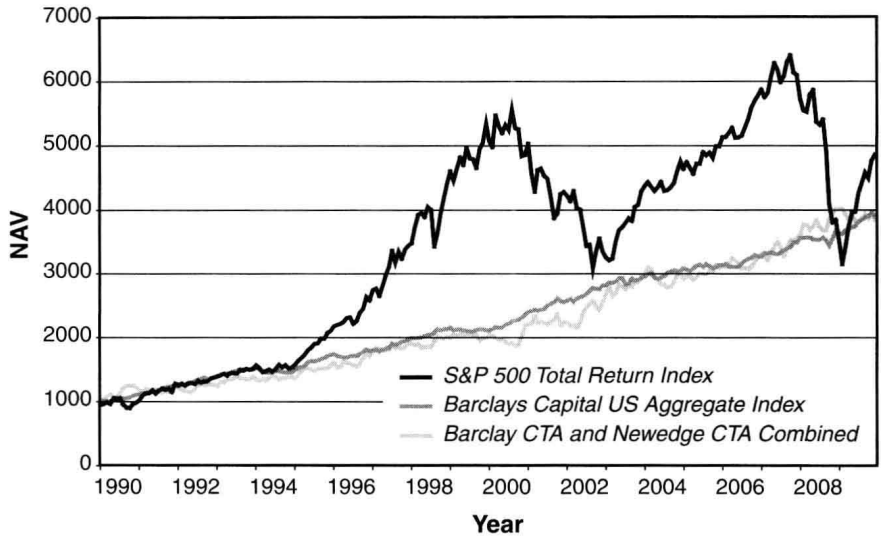
Why Do CTAs Make Money?

If CTAs did not hold out the promise of positive expected excess returns—that is, returns in excess of what could be earned by low-risk or no-risk money market investments—there would be no point in considering them as an investment outlet. In fact, the evidence on this point is fairly compelling, at least for the subset of CTAs whose returns are reflected in the Barclay Hedge and Newedge CTA indexes.

Consider the evidence provided in Exhibit I.1, which shows three net asset value series—one for the S&P 500, one for Barclay Hedge Capital U.S. Aggregate Bond Index, and one for CTAs. The CTA series has been constructed by concatenating the Barclay CTA Index from 1990 through 1999 and the Newedge CTA Index from 2000 through 2009. All three series start and end in roughly the same places, delivering average returns of around 7 percent for bonds and CTAs and 8 percent for the S&P 500. Over this period, the dollar performance of global stocks underperformed the other four investment classes by a substantial amount. The paths they followed are obviously quite different, and it will be no surprise that when we consider what the optimal portfolio weights would have been for stocks, bonds, and

*Peng Chen, et al., "Managed Futures and Asset Allocation," February 2005 working paper from IbbotsonAssociates. The authors also provide in a footnote: From a legal standpoint, CTAs must register with the Commodity Futures Trading Commission (CFTC) in according with the U.S. Commodity Exchange Act (Title 7, Chapter 1, Section 6n). Similar obligations exist for firms located outside of the United States (e.g., the Commodity Investment Regulations in Japan). CTAs are typically organized as Limited Partnerships and have offshore structures reminiscent of those created for hedge funds.

EXHIBIT I.1 Net Asset Values for Stocks, Bonds, and CTAs



Source: Barclay Hedge, Bloomberg, Newedge Prime Brokerage Research.

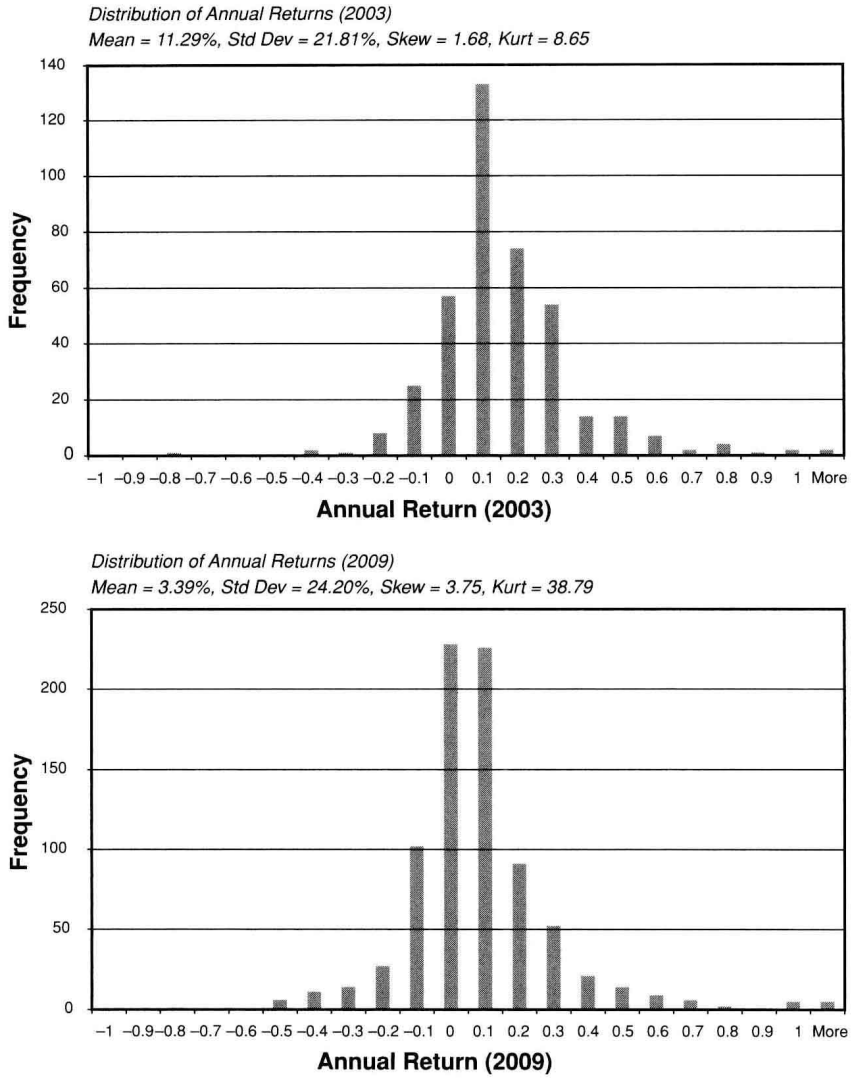
CTAs over the past 20 years, we will find that equities merited a fairly low weight, while CTAs would have been accorded a fairly high weight.

The important thing to note about this CTA series is that it represents the results of a very real CTA investment portfolio. The index, at least since 2000, has comprised CTAs who are large, open to investment, and willing to provide daily return data to Barclay Hedge, which is the index calculation agent. The index is reconstructed once a year for each calendar year. There is no backfill in these results, and no optimization. As such, there is no so-called "selection bias." And there is survivor bias only in the sense that by focusing on the largest CTAs, the index follows the fortunes of those CTAs who have been successful enough over time to persuade many investors to invest substantial amounts of money.

Of course not all CTAs will make money. There are no barriers to entry, except for the regulatory requirements that govern the industry. Anyone with an idea about how to trade can become a CTA, and we know for a fact that many spend a little time in the financial sun, and then disappear from sight.

As a rule, though, if the broad index of CTA performance has done well, one finds CTAs tend to do well. The upper panel of Exhibit I.2 shows the distribution returns for 410 CTAs who reported monthly returns in 2003, which was a good year for the index. Most of this distribution lies to the

EXHIBIT I.2 Distributions of CTA Returns (2003 and 2009)



Source: Barclay Hedge.

right of zero. The average of these returns was 11.29 percent. And of the 410 CTAs, 307 reported positive returns. The lower panel, however, shows a return distribution for the 821 CTAs who reported monthly returns for 2009, which was a decent year for the CTAs in the index. The average of these returns was positive at 3.39 percent, but of the 821 total, 432 reported losses.

Being large is no sure thing, either. Bernie Madoff convinced a lot of people to invest a lot of money in his operation, and it turned out to be a sham. But then his operation was hardly transparent.

Perhaps the toughest question we face is from investors who are new to the CTA or managed futures space and ask, rightly, why CTAs should make money. After all, investments in most hedge funds in general and CTAs in particular are not investments in conventional assets such as stocks, bonds, and real estate. Stocks, bonds and real estate represent ownership claims on real assets that generate real yields or income.

Before tackling the question, though, we would like to push back a little and point out that anyone who asks this question about CTAs or other hedge funds really has to ask the same question about any kind of portfolio manager who does not hold the world's assets in exactly the same proportions as they exist in the world. A dollar-based investor who holds only U.S.-based assets, for example, is overweighting the United States and underweighting the rest of the world. Or an active portfolio manager who varies the mix of stocks, bonds, and real estate to adapt to what he or she sees are changing economic conditions is overweighting some assets and underweighting others. In either case, the manager's contribution is a function entirely of bets made on prices—that some asset prices will rise more than others.

When viewed this way, the difference between a hedge fund and someone we would describe as a conventional, active portfolio manager is only one of degree, not of kind. The business of deconstructing assets and recombining the parts is now old hat. Salomon Brothers pioneered the practice of stripping the coupons from Treasury bonds to create customized bond portfolios. Hedge funds, which focus on strategies like long/short equity, convertible arb, and credit spreads have simply taken this idea to its logical conclusion.

So if we are going to ask why CTAs make money, we really have to ask why anyone who deviates from the world portfolio—including conventional, active portfolio managers—makes money. In fact, the literature on this question is not especially encouraging. It is not at all obvious that portfolio managers beat standard asset indexes with any regularity, or by amounts that are statistically significant.

In the case of CTAs, we have yet to hear a completely satisfactory response, but several plausible reasons merit your consideration.

For one thing, we know that asset and currency prices go through long stretches of what economists would consider mispricings. Purchasing power parity, for example, does a terrible job of explaining why currency prices do what they do. Robert Shiller and others have argued that stock prices are far too volatile. Anti Illmanen, in a marvelous series that he wrote for Salomon

Brothers, argues that investors do not earn a premium for taking duration risk in bonds beyond two years. There is a subset of academics who pursue serious research in psychological finance, and they are taken seriously. And even the late Paul Samuelson found enough merit in the idea of market inefficiencies to invest both time and money in establishing a trading firm called Commodities Corporation. Commodities Corporation in turn became the cornerstone of Goldman Sachs Asset Management's hedge fund business.*

In such a world, CTAs bring an interesting set of tools to bear. For one thing, many CTAs are systematic trend followers. In a world in which prices trend, CTAs can make money. Our own work on simple trend following models bears this out. In Chapters 4 and 5, for example, we show that a broadly diversified, volatility-weighted portfolios of futures positions driven by very simple moving average crossover and breakout models tend to make money and tend to be robust. We don't know why, and of course results like this drive people from the University of Chicago crazy, but these models worked when we published our first note on this topic in 2005, and were still working when we revisited the topic in 2010.

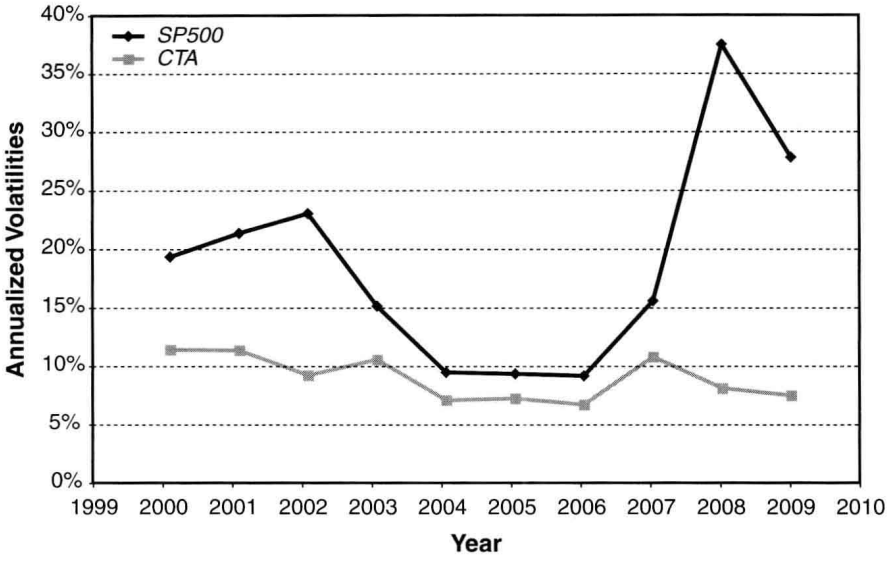
Then there is the systematic part of what they do. Systematic, or quantitative, traders are often excoriated in the press for employing "black boxes." But the black boxes are nothing more than tools that enable traders to discipline themselves and to avoid the traps and pitfalls that so often accompany discretionary trading. Rishi Narang has written a very approachable description of this part of trading life called *Inside the Black Box* (Wiley, 2009).

The CTA space is one of the few in which traders are as likely to be short as long. Shorting is anathema for many investors and portfolio managers. Worse, the world's portfolios as an aggregate are stuck with the world's assets. Someone has to own all the stocks, bonds, and real estate. Even long/short equity hedge funds tend to be long stocks. As a result, CTAs can actually make money from price decreases that long-only investors must simply suffer through.

And then, too, successful CTAs are very effective at managing risk. You will see this in the way they combine markets or trading horizons to produce a volatility of returns that allows them to retain the confidence of their investors—that is, to control their losses and to avoid unusually large

*"[Samuelson] was always interested in markets, in money markets in particular. He knew Warren Buffett, was pals with John Bogle, and when in 1968 Stanley Marsh called him away from a game of tennis to pepper him with questions, the conversation led to the founding of Commodities Corp., an early and successful hedge fund (sold to Goldman Sachs in 1997)." See Paul Samuelson's Legacy, economicprincipals.com, December 20, 2009.

EXHIBIT I.3 Past and Future CTA Volatility



Source: Bloomberg, Newedge Prime Brokerage Research.

drawdowns. CTAs' control over return volatility is in sharp contrast to the world of conventional money managers who are more or less stuck with the volatilities that the market delivers. Exhibit I.3 compares the volatility of returns on the S&P 500 with the volatility of returns for the Newedge CTA Index for 2000 through 2009. During these years, while the stock market was going through extended periods of volatility, quiet, and crisis, CTA return volatilities chugged along steadily in a range around 10 percent.

None of these arguments are likely to satisfy the truly skeptical investor, and it is not our hope to do so. At the same time, we are confident that a CTA who turned in a performance similar to that of the S&P 500 would not keep his job or his investors for long. He might have been able to raise a lot of money in the 1990s, but his performance from 2000 through 2003 would have led to substantial redemptions. And even if he managed to raise money again, his losses in 2008 would almost certainly have led to further redemptions.

How Much Should You Invest?

The answer is a surprisingly large number—or at least it can be. In the first place, as shown in Exhibit I.4, the correlations of CTA returns with those