Do You Need More than One Trend Following CTA?

Marc E Levitt
SVQuant

Introduction

Measuring risk the traditional way, as the variability of periodic returns, suggests little benefit to employing more then a small handful of CTAs with the same trading style, e.g. trend following. When risk is defined as end-of-period *wealth* variability, risk reduction can be substantial when the number of advisors is increased. This finding is relevant to selecting and managing a portfolio of CTAs especially in the context of plan sponsors who are more concerned with the variability of wealth over a given horizon based on their liabilities. This is of great importance to the industry if managed futures plan to expand into the pension fund and institutional investor arena. Other applications of our results include building commodity pools or fund-of-funds and that of selecting portfolios of trading systems. It highlights that standard techniques in modern finance, i.e. Markowitz mean-variance optimization, may not always be the most appropriate approach.

Alternate Measure of Risk

The most commonly used measure of risk in finance is the time series standard deviation (TSSD) of returns. This model assumes that risk can be quantified as variance over short horizons and investors are adverse to these short-term fluctuations. TSSD helps form the backbone of modern portfolio theory. By using TSSD efficient frontiers can be constructed, portfolios determined, and Value-at-Risk (VaR) measured.

Alternatives to TSSD have been suggested in the context of equity portfolios by Radcliffe (1994) who suggests focusing on the dispersion of ending-period wealth over long time horizons. He points out managers can realize periodic returns that have the same time series standard deviation and be correlated but their terminal wealth may be quite different if manager ability is unequal. Terminal wealth or terminal wealth short fall is of great concern to plan sponsors who have a duty to meet their long-term obligations. TWSD measure of risk might be more appropriate to this class of investor giving their investment horizon.

Data

The data for this study comes from publicly available CTA databases which contain monthly returns as submitted by advisors. Most data was collected from the TraderScan database, www.traderscan.com, although other databases and sometime CTA websites were also used. The databases were searched for traders or programs that are classified as diversified trend following programs. While the CTA programs need not be global in the markets traded a majority were. Twenty-two advisors were chosen based on having at least 5-years of return data and over $10 million under management. Actual CTAs ranged in money under management from the minimum to well over $700 million.

Methodology

The methodology used in this paper is to construct portfolios by simple simulations. Portfolios ranging from 2 to 10 advisors are constructed by sampling without replacement from the universe of CTAs. A portfolio is constructed from the selected CTAs with rebalancing done monthly and quarterly. The procedure is repeated 500 times, yielding 500 sample portfolios for the given number of CTAs each with their corresponding terminal wealth. The standard deviation of these 500 terminal wealth values were calculated, yielding the TWSD. Also calculated was the time series standard deviation for the portfolio and it was averaged over the 500 portfolios, giving TSSD.

Simulation Results

The table below presents the simulation results for the monthly rebalancing simulation. Similar results were achieved for the quarterly rebalacing.

Number of Managers	TSSD	TWSD
1	6.14	34.91
2	5.47	23.12
3	5.23	19.62
4	5.10	15.10
5	5.07	13.87
6	4.92	11.31
7	4.94	10.92
8	4.87	9.81
9	4.86	9.14
10	4.83	7.80

As expected, very little reduction in variance of returns (TSSD) is achieved after adding more then 3 managers. The total reduction going from a one manager portfolio to a 10 manager portfolio is less then 1.31% in monthly standard deviation, for a 21% reduction based on a single manager portfolio. The terminal wealth column tells a more striking story. The reduction in variance of terminal wealth is 27.11%, for a 77% reduction based on a single manager portfolio!

Assuming normality holds, the mistake made by a plan sponsor can be great if simpler TSSD type measures are used to construct a portfolio. For example, by the time 4 managers are added to a portfolio most of the available gain in TSSD is achieved, 6.14% -> 5.1%, but there is still a 5% chance we can have a 25% shortfall in our expected CTA allocation return. If we use the TWSD risk measure a sponsor might choose a portfolio with more then 4 CTAs, e.g. 10. This will then give a 5% chance of having less then a 13% shortfall in the expected CTA allocation return.

Conclusions

This paper will show that even for well diversified trend following CTAs it make sense to diversify with as many managers as logistically possible. This is crucial if terminal wealth variability is of concern for the investor or fund manager. Concentrating on periodic returns, as is done in most MPT environments, fails to fully show the advantage of using multiple managers over more then a handful. This is most glaring when managers themselves are well diversified and highly correlated as with trend following CTAs. Further applications of this work include assembling a portfolio of trading systems.