CHAPTER II

REVIEW OF LITERATURE

The academic literature on hedge funds has increased greatly in recent years, as the funds have become more popular and better quality data on individual hedge funds and strategy indices has become more available.

We focus here on the literature regarding the distribution of hedge fund returns, its portfolio implications of non-normal return distributions, the drivers of hedge fund returns and their predictability.

2.1 Methods and Results of Amenc (2002)

This study builds on the work of Amenc et al (2002), which assessed the predictability of hedge fund returns using ten variables (in their differenced, lagged and average forms), including 3 month T-bill yield, dividend yield, default spread, term spread, changes in implied volatility, market volume, oil price, U.S. and world equity returns, and changes in currency exchange rates, all variables that have been identified in previous studies of either traditional or hedge fund returns.

Amenc et al. (2002) finds that a subset of six variables, in conjunction with lagged index returns, can be used for predicting the CSFB/Tremont indices. Specifically, they identify the three month moving average of the U.S. equity returns, crude oil price, change in the T-bill rate, changes in the VIX, market volume, and three month moving average of the MSCI World Index ex U.S as the explanatory variables. Six of the nine indices have some level of predictability and the return on a tactical style allocation exceeds that of an equally-weighted benchmark.

Further, Amenc(2002) using tests on serial correlation (specifically the Hurst exponent) finds significant serial correlation for most of the hedge fund indices and therefore include the lagged return in the model as a potential regressor.

2.2 Portfolio Construction: Alternatives to Mean-Variance Optimization

Markowitz (1952) is generally recognized as providing the framework for the current theory of asset allocation. In his much-cited work, he divided the asset allocation process into two parts. The first part began with the observation and experience of securities distributions with the end of determining beliefs about the future performance of securities. In the second part, the author considered how one could translate beliefs about securities distributions into portfolio allocation decisions. Although the focus of much of the work is on the second part, after assuming knowledge of the future performance of securities, the first part is flexible enough to incorporate the use of tactical asset allocation. As noted in Harvey et al (2004), Markowitz at page 91, explicitly recognizes that skewness would render a mean-variance allocation sub-optimal.

Favre and. Galeano (2002) built on earlier work on asset allocation in a modified VaR framework, and utilized a Cornish Fisher expansion to take account of skewness and kurtosis. They found that constructing a portfolio without taking into account skewness and kurtosis underestimates the portfolio risk, measured by a modified VaR, by 10% to 40% depending on the level of historical return.

Bacmann and Pache (2004) evaluate the effects of non-normality on portfolio selection by performing portfolio optimization on a mix of 10 strategy-specific hedge fund indexes and an index intended to proxy for a commodity futures fund. Using a skewness-and-kurtosis-adjusted parametric VaR model, they find mean-variance portfolios usually overweight indices with negative skewness and high kurtosis relative to their alternative.

Cremers,, Kritzman, and Page (2004) apply both mean-variance and full-scale optimization to form portfolios of hedge funds, given a wide range of assumptions about investor preferences. If investors have power utility, they find that higher moments of hedge funds do not meaningfully compromise the efficacy of mean-variance optimization. However, this is not the case if preferences are either bilinear or S-shaped because investors with bilinear utility dislike kurtosis and investors with S-shaped preferences are attracted to kurtosis as well as negative skewness.

Lamm (2003) applies common portfolio optimization techniques to the hedge fund strategy allocation problem employing Duarte's general model, which views portfolio optimization as a single problem from which other techniques fall out as special cases. Like Favre and. Galeano (2002), the author also examines the Cornish-Fisher expansion as an efficient and promising methodology when applied to hedge fund strategies. The author finds that asymmetric optimization techniques tend to prefer more positively skewed and low kurtosis hedge fund strategies such as market neutral, equity sector, rotational, and systematic macro in lieu of strategies such as distressed debt.

Although this research has suggested that skewness and kurtosis are important considerations, there is a lack of agreement on the utility preferences of investors (and preferences may indeed vary among investors).

2.3 Foundations of Tactical Asset Allocation

A large amount of work on mostly traditional assets has suggested that expected asset returns and possibly variances and covariances may be predictable. In the United States, Keim and Stambaugh (1986) found that the spread between the yields on low grade corporate bonds and one-month Treasury bills was of some value in predicting financial returns in both the stock and bond markets. Campbell and Shiller (1988) found that dividend ratios are useful in predicting the equity premium. Fama and French (1989) found that the default and term spread are helpful in forecasting expected returns.

This work has been extended to markets outside the U.S. in work by Bekaert and Hodrick (1992), Ferson and Harvey (1993,1995), Harvey (1995), and Harasty and Roulet (2000).

2.4 Nature of Hedge Fund Returns

Waring and Siegel (2005) have been the most vocal in suggesting that hedge funds are not simply alpha generators, but, depending on the strategy, derive a portion

(and sometimes a large portion) of their return from exposure to a series of market-related factors, including equity indices, credit spreads, and volatility. Similarly, Gehin and Vaissie (2005) conclude that hedge funds cannot be defined solely as absolute return vehicles since there is exposure to beta-type risks. Jaegar and Wagner (2005) determined it is difficult to decompose hedge fund returns into alpha and beta components, since the beta return can come from multiple sources. Amenc and Martinelli (2004) discovered that long short equity managers do not actively manage their market exposure.

2.5 Work on the Drivers of Hedge Fund Returns

A number of researchers have considered the drivers of hedge fund returns. Fung and Hsieh (1997) found that the first five components of a principal components analysis explain 45% of the cross sectional variation. They label the factors based on which funds correlate with the components and call the factors trend following, global macro, long-only, trend following-currencies, and distressed.

Naik and Agarwal (2000) use trading strategy, location, and leverage factors to evaluate a hedge fund's return. A very few option strategies explain more than half the variation of hedge fund returns. Non-directional strategies have higher loading to trading strategy factors, while directional strategies load more to locational factors.

Mitchell and Pulvino (2001) find that risk arbitrage results are positively correlated with market retuns in severly depreciating markets, but are uncorrelated with market returns in flat and appreciating markets.

Fung and Hsieh (2001) find that a portfolio of Treasury bills and lookback straddles over 26 markets (equities, bonds, currencies, and commodities) explain better the return patterns of trendfollowing Commodity Trading Advisors than linear factor models. In Fung and Hsieh (2002), the authors apply their Asset Backed Style (ABS)

approach to fixed income funds. ABS factors include long only, positive spread, trendfollowing, and convergence.

Lui and Longstaff (2004) use a similar approach to the swap spread strategy. Excess returns are compensation for bearing risk, not arbitrage profits. The strategy has exposure to priced risk that are common to stock index, banking secor equities,and corporate bonds.

Agarwal, Fung, Loon and Naik (2004) analyzed Japanese convertible bonds using three asset backed style factors: positive carry, volatility arbitrage, and credit arbitrage to explain the returns of four convertible arbitrage hedge fund indices.

Finally, Christianson, Madsen, and Christianson (2004) extract five hedge fund strategies following Fung and Hsieh (1997) using Principal Components Analysis. They confirm the importance of using non-linear factors.

The recent work of Fung and Hsieh has been particularly influential in this area, as they attempt to model the underlying return drivers for each strategy. This has the promise of evaluating more subtle changes in the opportunity set and risk and return for each strategy.