

Hedge Fund Style Consistency and Performance

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Abstract

Research has shown that market factors drive hedge fund returns and that certain micro (i.e., fund-based) characteristics also affect the return processes of hedge funds. Research has also shown that hedge funds can serve as both risk-diversifiers and return-enhancers when added to portfolios of traditional assets. However, these benefits may not be realized if the hedge fund manager does not remain consistent in implementing the self-declared trading strategy. This paper offers results indicating the impact of a manager's style consistency on various aspects of fund performance.

Style Consistency and Hedge Fund Performance

I. Introduction

During the past decade, considerable research has been conducted on the risk and return characteristics of hedge funds and their use in traditional asset allocation. Most of this research has been conducted using publicly available databases. In these databases, hedge fund strategy classifications have been determined, principally, by hedge fund managers themselves. One issue in hedge fund classification is that many hedge fund managers do not regard themselves as fitting into a particular, narrow investment classification. It's important to note that hedge funds have been described as skill-based investment strategies. This is due primarily to the fact that many hedge fund managers do not explicitly attempt to track a particular index or style classification. As a result, managers have greater flexibility in changing their trading style. In contrast to traditional mutual fund classification, hedge funds within a particular "fund classification" may, therefore, vary widely in terms of risk and return characteristics.

Though hedge funds do not emphasize benchmark tracking, this does not mean that the return from a hedge fund is based solely on manager skill. Hedge fund managers who manage a particular investment strategy or focus on a particular investment opportunity can be said to track that investment strategy or risk/return opportunity. Hedge fund returns within a particular investment strategy have been shown to be driven largely by a set of market factors, such as changes in credit spreads or market volatility specific to that strategy (Fung and Hsieh, 1997; Agarwal and Naik 2003; Schneeweis, Martin, and Kazemi, 2003). One can therefore think of

hedge fund returns as a combination of manager skill in processing information and the underlying return from the strategy itself.¹

Hedge funds can serve as risk-diversifiers or return-enhancers to a portfolio of traditional assets. However, these benefits may not be realized if there are significant changes in the investment styles of the hedge fund managers over time. Though there may be benefits in giving managers enough flexibility to adapt their investment style to new market conditions, there may also be costs associated with style drift on the part of managers.

Manager consistency is an important aspect of an investable hedge fund portfolio that tracks a particular strategy and results in a number of desirable portfolio features. First, style consistency ensures that the selected hedge fund managers have similar return properties and form a cohesive group. This permits one to employ a set of common, performance-monitoring and risk-control techniques. Second, research has shown that portfolios with greater style consistency among managers require a smaller number of managers to create a portfolio that reflects the underlying return and risk characteristics of that strategy (Lhabitant and Learned, 2002). Third, style-consistent managers are expected to have higher in-group correlation and thus better represent the common return and risk characteristics of that strategy. In contrast, portfolios constructed from non-style-consistent managers may have lower intra-group correlation and thus may not adequately represent the common return and risk characteristics of a style-consistent hedge fund strategy.

¹ See Schneeweis and Kazemi [2003] for various approaches to creating passive indices that are optimized to track historical hedge fund returns and strategies.

A principal issue in determining the impact of style consistency on fund performance is determining how to segment funds into style-consistent groupings. It is important to realize that any quantitative measure by itself is inadequate to ensure a grouping of managers who are style-consistent. To create and maintain a style-consistent portfolio requires not only quantitative and qualitative analysis, but ongoing due diligence and risk monitoring. In this paper we do not have the information required to ensure that a fund has met a set of standards set forth in a detailed due diligence process, or is subject to adequate risk monitoring on an ongoing basis for the period in question. Therefore, we use more generic quantitative means (correlation with a composite strategy hedge fund index) to screen managers into groups. We also provide a sample case study (Dow Jones Hedge Fund Strategy Benchmarks) in which ongoing due diligence and risk monitoring has been performed to determine style consistency of managers.²

Results show that funds with a high, common correlation with a composite strategy hedge fund index³ may have different return and risk characteristics than funds with a low correlation with the same composite strategy hedge fund index. In contrast to the style-inconsistent portfolio (e.g., low correlation with composite index), the style-consistent portfolios (high correlation with composite index) have market factor exposures that are consistent with expected exposures of the style. The potential cost of using style-consistent portfolios is that it might lead to portfolios that have higher volatility. It is expected that within each strategy, style-consistent managers

²In this paper, we use correlation screening as the principal means of determining style consistency. Other alternative grouping method such as cluster or factor analysis can be used to determine common factor consistencies. Note that additional methods such as actual and ongoing due diligence are required to determine if funds provide the consistency implied in the correlation groupings. As a result, in this analysis we do not attempt to maintain that the study captures funds which are style pure but only style-consistent relative to the relative variable which is correlation with the composite strategy index.

³ This composite is defined as an equally weighted average of three publicly available hedge fund strategy indexes: EACM, CSFB/Tremont, and Hedge Fund Research (HFR).

tend to be more homogenous. This might lead to the assumption that a portfolio consisting of style-consistent managers will have a higher volatility when compared to a portfolio consisting of a group of less style-consistent managers. But research has shown that this might not always be true (Schneeweis, Kazemi and Karavas 2003).

III. Data and Methodology

Hedge funds may be considered an asset class if they provide return and risk characteristics not easily obtained from investments in other asset classes. Academic research has shown that each of the various hedge fund strategies has common factors driving the returns in each group, but that different factors may drive the returns across different hedge fund strategies (Fung and Hsieh, 1997; Agarwal and Naik 2003; Schneeweis, Martin, and Kazemi, 2003). Within the hedge fund universe, there are numerous possible sub-classifications. In this analysis, seven commonly used hedge fund strategies are analyzed.

- **Equity Market Neutral:** Long undervalued equities and short overvalued equities, usually coordinated on an exposure basis
- **Convertible Arbitrage:** Long convertible bonds or preferred, short underlying common stock and short underlying credit risk
- **Fixed Income Arbitrage:** Yield curve arbitrage or long/short debt positions
- **Event-Driven:** Corporate transactions and special situations
- **Distressed Securities:** Long undervalued securities of companies in financial distress or operating under Chapter 11

- **Merger Arbitrage:** Long/short equity securities of companies involved in corporate transactions
- **Equity Hedge:** Long or short equities, typically with a net long bias

In this paper we use a simple method for grouping managers for similarity of trading style within a hedge fund strategy. We use managers' historical correlation with their corresponding strategy composite index to determine if the manager has implemented a style consistently through time. Using their correlation with the appropriate strategy composite index, managers are then divided into two groups: top twenty-five and bottom twenty-five.⁴

The analysis is conducted at the strategy level rather than for an overall composite index of all strategies. Industry wide indices are used in traditional asset markets to represent returns of an asset class. Similarly in hedge funds, industry wide composite indices exist and represent overall returns to the industry. Examples of overall industry composite indices include the EACM 100, the HFR Fund Weighted Composite and the CSFB/Tremont Hedge Fund Indices. Unfortunately, industry wide composite hedge fund indices that track all managers rather than style-consistent subsets, have time-varying performance characteristics that, over time, are due to changes in the characteristics of the funds reporting. As a result, for hedge funds, the past returns of these industry wide, non-style-consistent composite indices may not reflect current or future returns of the industry. It is important to note that several hedge fund indices which depend solely on managers' self-reporting or which use asset based composites, the indices may not even reflect the current importance of a particular strategy because the reporting firms and asset weights

change not as the result of changed valuation but because of the ability of certain funds to attract new investments.

The fund groups were created from a sample of strategy-classified hedge funds derived from a data set created from five principal public hedge fund data sets (CISDM, HFR, TASS, Tuna and Altvest). Duplicate funds were removed resulting in an overall data set. From this set, only those funds with three complete years of data were selected. The size of each strategy sample from which the funds are drawn is as follows: Convertible Arbitrage (111), Equity Hedge (708), Event-Driven (97), Distressed Securities (70), Merger Arbitrage (79), and Equity Market Neutral (138). The time period of analysis spans from January 2000 through December 2002.

IV. Results

Style Consistency:

Academic research has shown that diversified funds of funds and composite indices that do not remain style-consistent may have changing market sensitivity characteristics over time (Schneeweis et. al., 2003). In Exhibits 1 and 2, the average correlation of each set for each strategy is given. As shown, an investment product based on managers' self-classification may not provide a set of managers with common correlation to the underlying strategy. As expected, the correlation between the top twenty-five and the bottom twenty-five fund sets of managers with the composite index differ dramatically. The differences in correlation are most acute in those cases such as equity hedge where the common strategy grouping may contain a wide variation of trading strategies (e.g., long bias, opportunistic) and market emphasis (e.g., U.S.,

⁴ Results are also provided where all managers are divided into two equal size groups based on correlation with

Europe, Japan). In contrast, for merger arbitrage, where the underlying strategies may have a more common theme, the differences in the correlations are relatively small. The question is whether this differing correlation is due primarily to internal management issues, or if the differing correlation reflects fundamental differences in trading styles and market sensitivity.

It is also important to point out that since correlation is a summary measure of relative return movement, it may not reflect the commonality of returns in periods of extreme return movements. In addition, lack of correlation may simply reflect periods in which no major market factors had any major moves. It is possible that random noise may have dominated return movements across funds within a particular strategy. In Exhibit 3a through 3f, we have ranked firms by their correlation with the composite index and ranked the monthly returns by the composite index. Then we compared returns with the composite index and determined the number of months in which they both had common directional return. Similar to results for mutual funds, for months in which the common index return is close to zero, the commonality of directional return is low for all funds. In short, one should not expect funds to have common movement in periods of low return. However, in periods of high return movements (positive or negative), the commonality of directional return increases. As expected, however, the commonality of return direction is higher for the set consisting of the top twenty-five high correlation managers than the set consisting of the bottom twenty-five low correlation managers.

strategy composite index. See Appendices I and II.

Exhibit 1

Average Correlations of Top Twenty-five and Bottom Twenty five Funds with Composite Strategy Hedge Fund Indices: Funds Ranked on Composite Strategy Index (1/2000-3/2003)						
	Convertible Arbitrage	Equity Hedge	Event Driven	Distressed Securities	Merger Arbitrage	Equity Mkt. Neutral
Top 25 Funds	0.74	0.87	0.80	0.75	0.80	0.60
Bottom 25 Funds	0.25	-0.50	0.32	0.27	0.46	-0.11

Exhibit 2

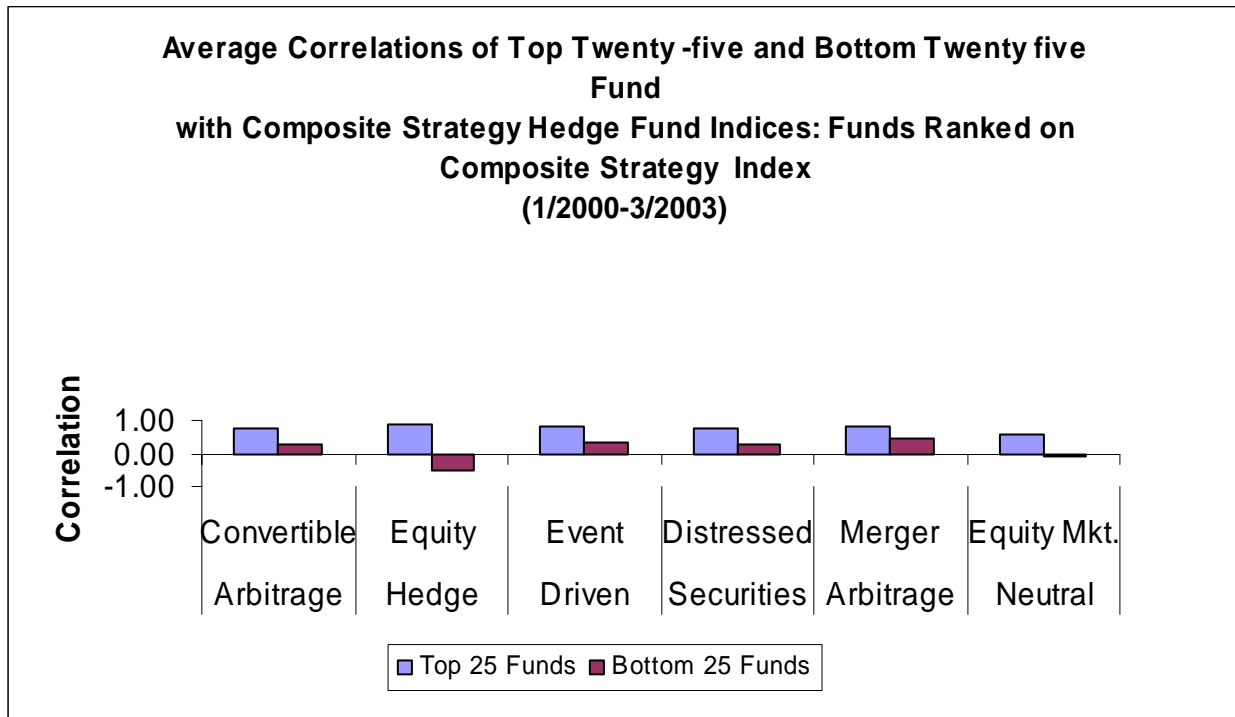


Exhibit 3a

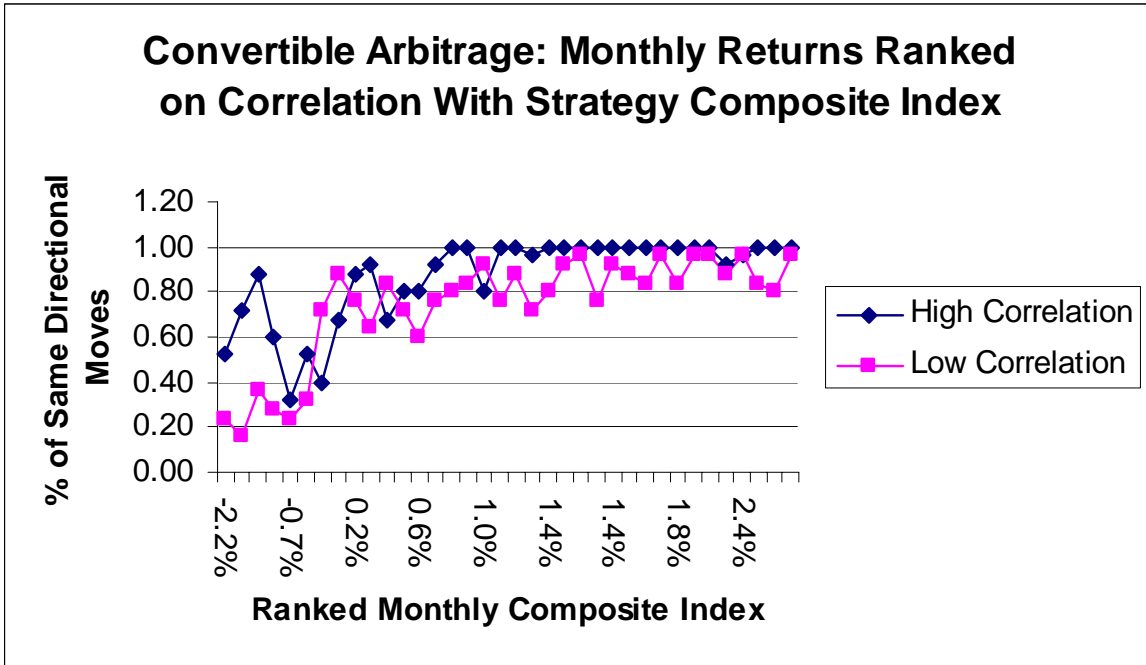


Exhibit 3b

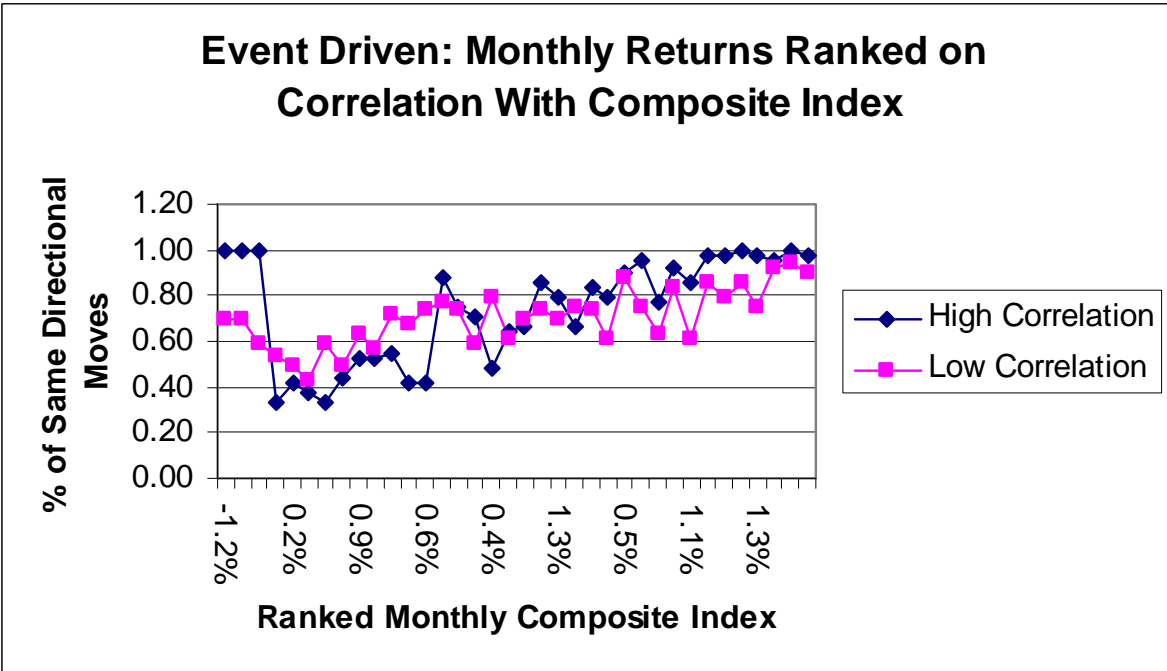


Exhibit 3c

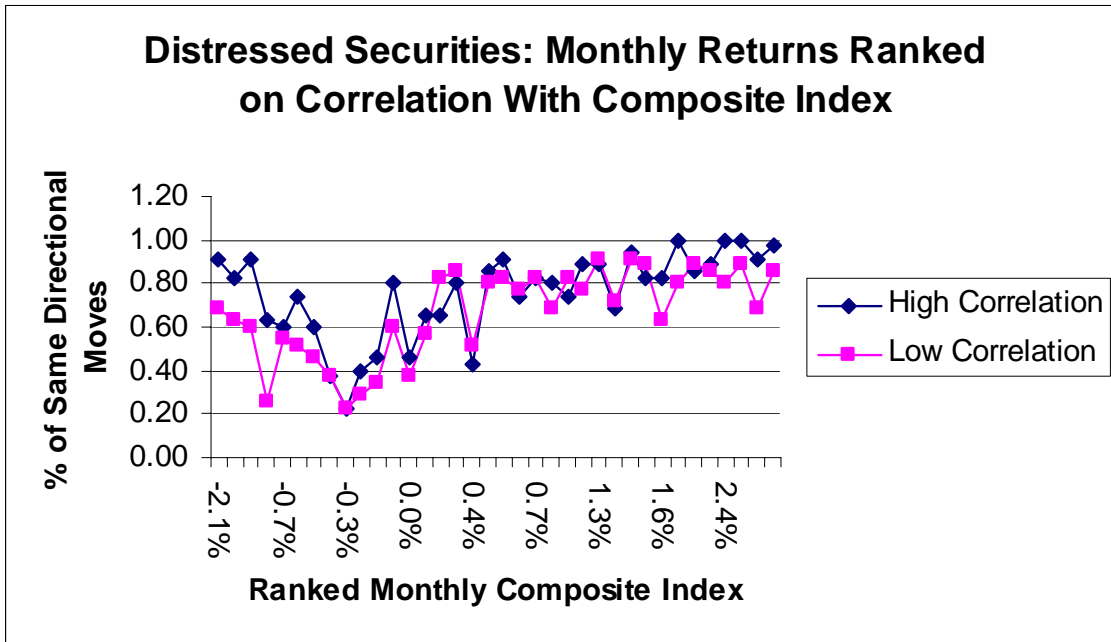


Exhibit 3d

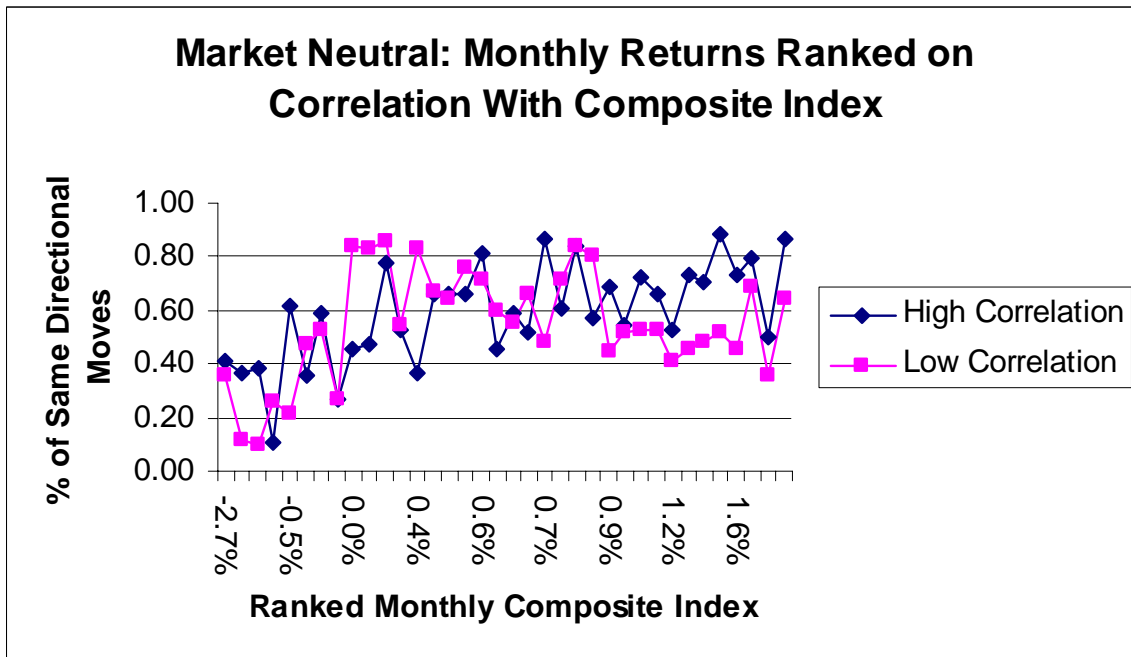


Exhibit 3e

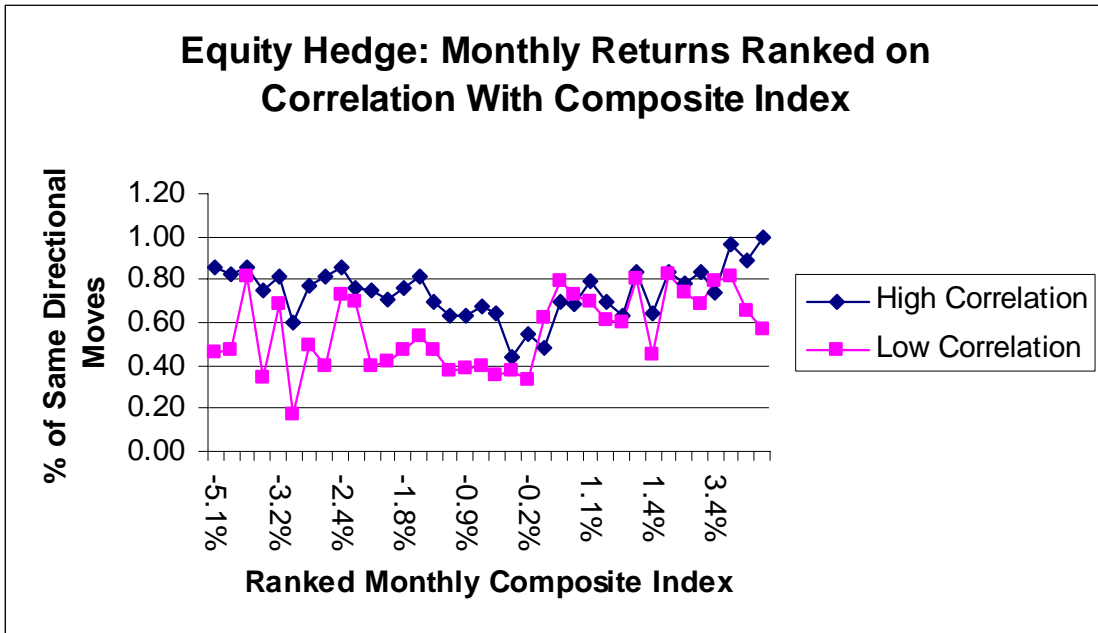
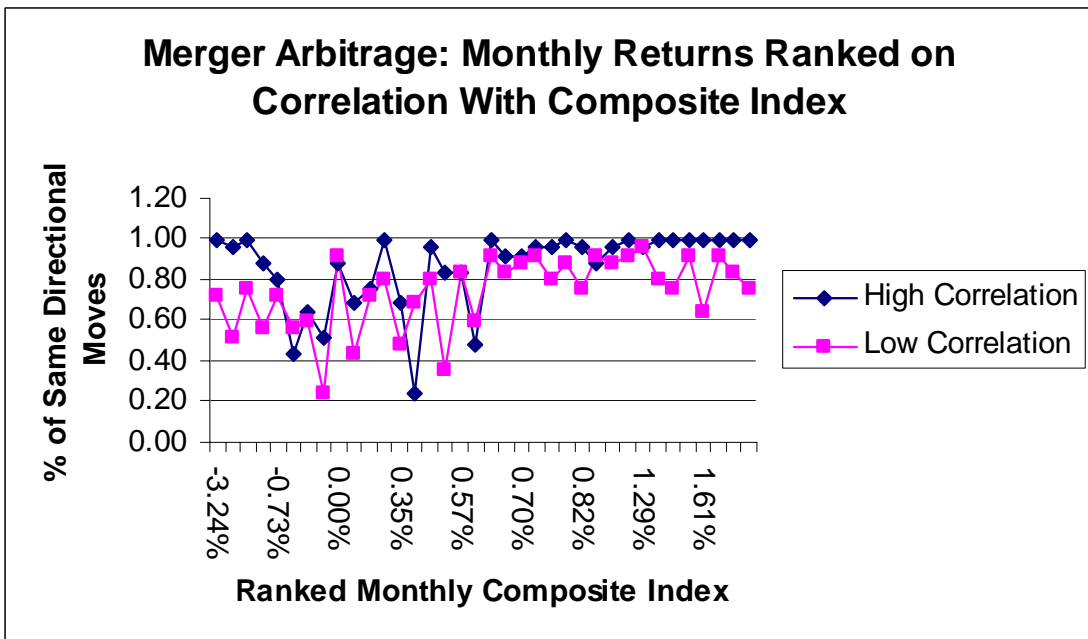


Exhibit 3f



Factor Consistency

For the investor who desires that a fund of funds or an investment retain certain risk characteristics over time, the sensitivity of a portfolio to the major market factors that drive the return of that strategy may be of primary concern. As indicated in Exhibit 4 and Exhibits 5a through 5f, the set of top twenty-five ranked funds often has differing factor sensitivities to underlying market factors than the set of bottom twenty-five ranked funds. As shown in Exhibit 4, the high correlation and low correlation determined sets often have differing correlations with market factors considered to be important in determining hedge fund strategy return. For instance, as shown in Exhibit 4, for each of the representative hedge fund strategies, the top twenty-five-fund set has higher correlations with the S&P 500 and the Lehman U.S. Corporate High Yield index than the bottom twenty-five-fund set. This is consistent with previous research that has shown that many hedge fund strategies have an equity and credit factor component in their returns. Similarly, the results in Exhibit 4 also show that the top twenty-five-fund set generally has a greater negative correlation with an equity market volatility proxy (e.g., straddle return based on the VIX).⁵ The only case in which the top twenty-five set has a greater positive correlation is for convertible arbitrage. This is consistent with a convertible arbitrage strategy which successfully hedges out equity, interest rate, and credit risk while leaving the set sensitive to the option component of the strategy (e.g., long volatility).

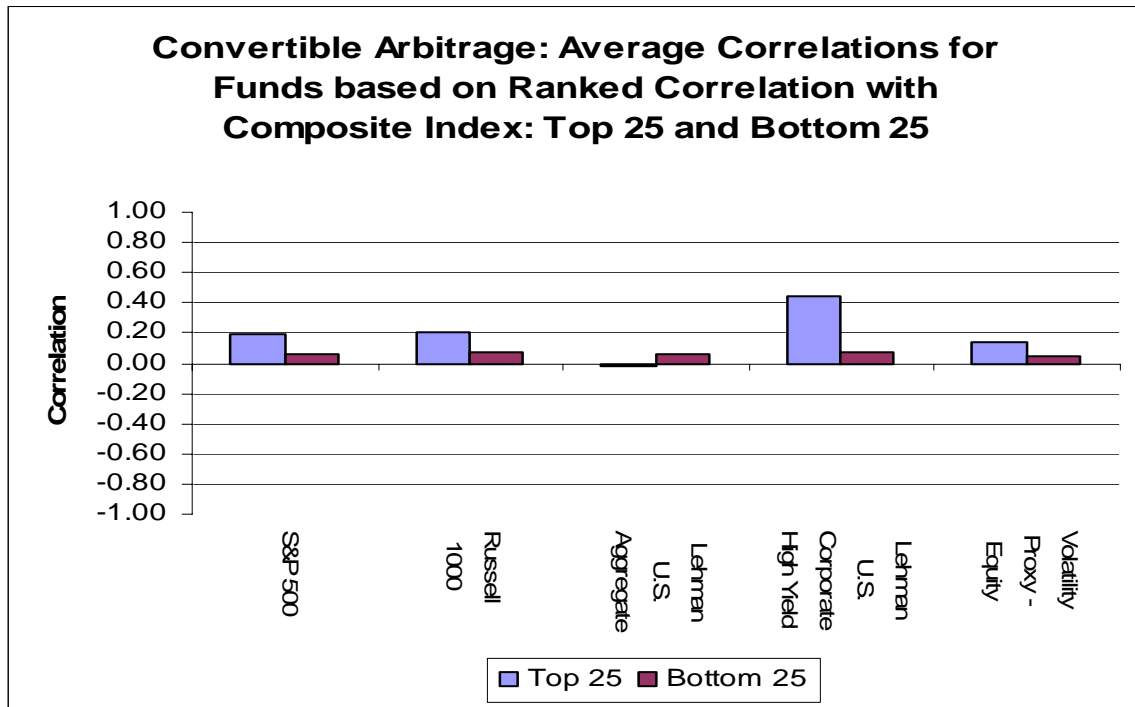
⁵The indices assume a portfolio that consists of a one-month, at-the-money equity index call option and a one-month, at-the-money equity index put option. The portfolio is bought at the beginning of each month and then sold at the end of the same month. Call and put prices are calculated using the reported implied volatilities of at-the-money calls and puts. The payoff to this strategy will depend on the difference between implied volatility and realized volatility of the underlying index. Option premiums are much less than an investment in the underlying

Exhibit 4

Average Fund Correlations (Jan 2000 - Dec - 2002)

Convertible Arbitrage	S&P 500	Russell 1000	Lehman U.S. Aggregate	Lehman U.S. Corporate High Yield	Volatility Proxy - Equity	
	Top 25	0.19	0.21	-0.02	0.44	0.14
	Bottom 25	0.07	0.07	0.06	0.07	0.04
Equity Hedge	S&P 500	Russell 1000	Lehman U.S. Aggregate	Lehman U.S. Corporate High Yield	Volatility Proxy - Equity	
	Top 25	0.27	0.34	-0.01	0.26	-0.25
	Bottom 25	-0.24	-0.28	0.06	-0.14	0.17
Event Driven	S&P 500	Russell 1000	Lehman U.S. Aggregate	Lehman U.S. Corporate High Yield	Volatility Proxy - Equity	
	Top 25	0.39	0.43	-0.03	0.60	-0.22
	Bottom 25	0.18	0.19	0.04	0.21	-0.06
Distressed Securities	S&P 500	Russell 1000	Lehman U.S. Aggregate	Lehman U.S. Corporate High Yield	Volatility Proxy - Equity	
	Top 25	0.28	0.30	-0.11	0.64	-0.16
	Bottom 25	0.11	0.13	0.01	0.16	-0.06
Merger Arbitrage	S&P 500	Russell 1000	Lehman U.S. Aggregate	Lehman U.S. Corporate High Yield	Volatility Proxy - Equity	
	Top 25	0.19	0.21	0.04	0.41	-0.19
	Bottom 25	0.09	0.10	0.04	0.18	-0.12
Equity Market Neutral	S&P 500	Russell 1000	Lehman U.S. Aggregate	Lehman U.S. Corporate High Yield	Volatility Proxy - Equity	
	Top 25	-0.29	-0.28	0.23	-0.25	0.24
	Bottom 25	0.29	0.29	-0.09	0.14	-0.09

Exhibit 5a



index. As such, the monthly percentage change in an option premium is much larger than the percentage change in the underlying security.

Exhibit 5b

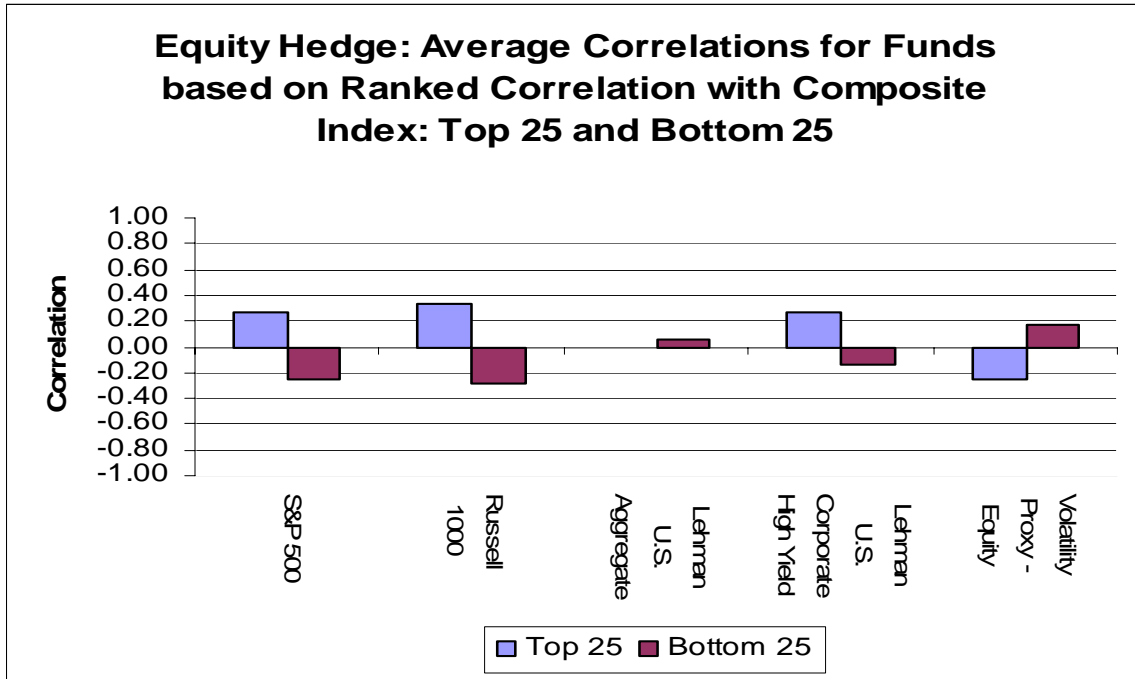


Exhibit 5c

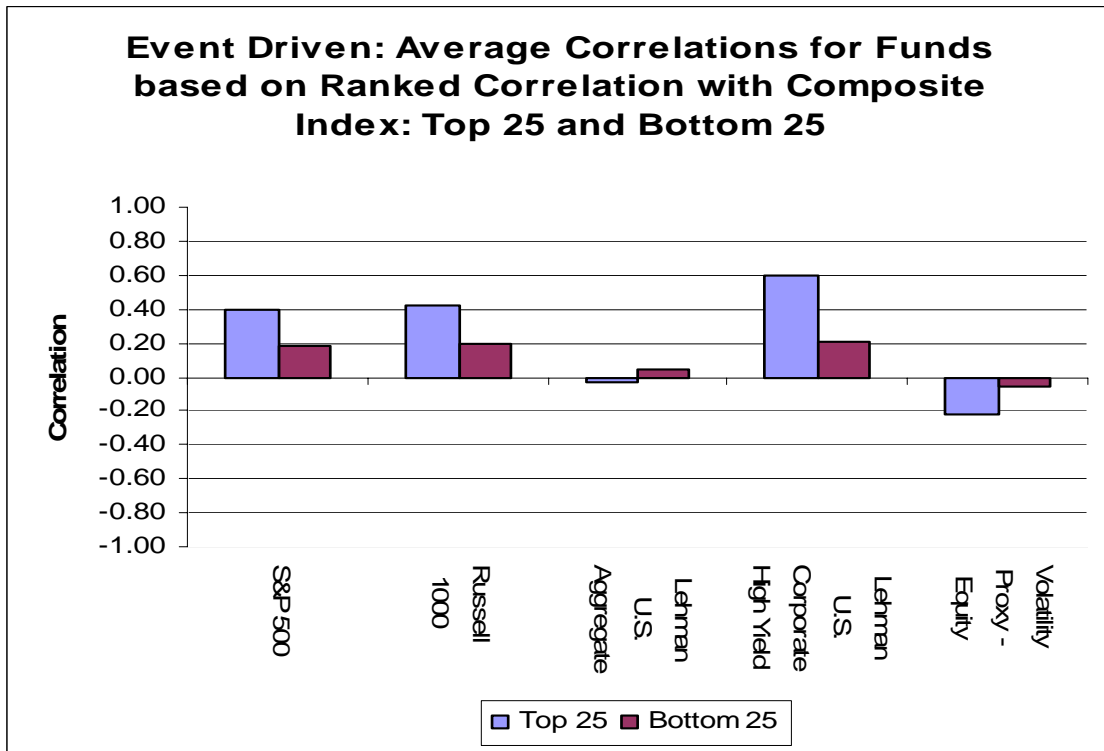


Exhibit 5d

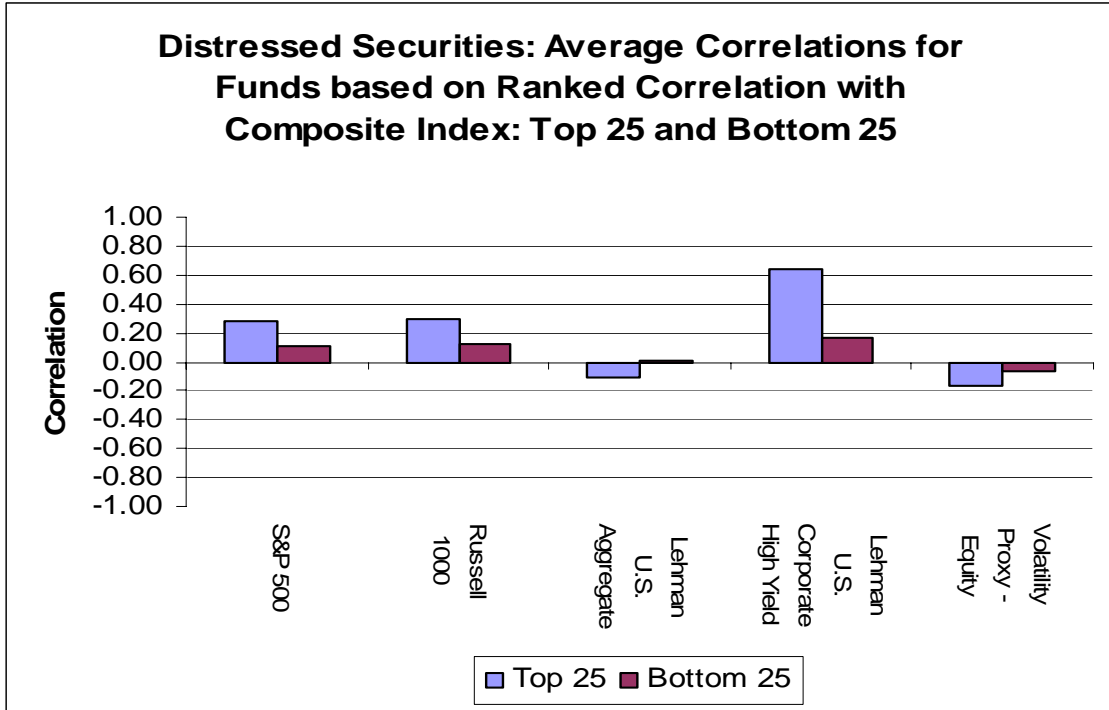


Exhibit 5e

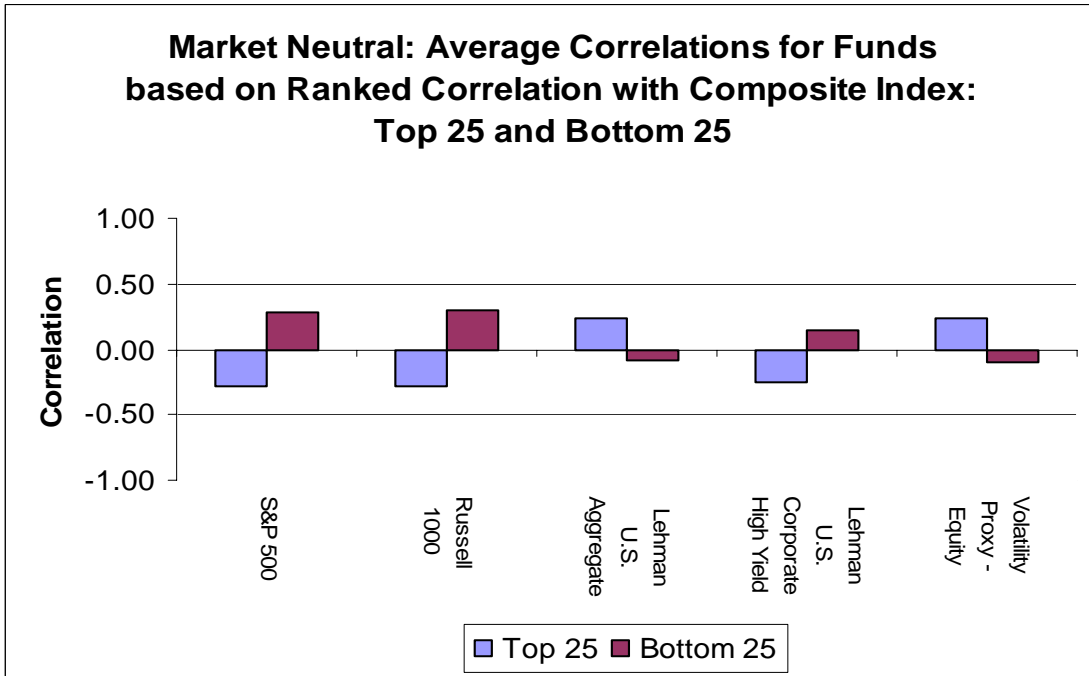
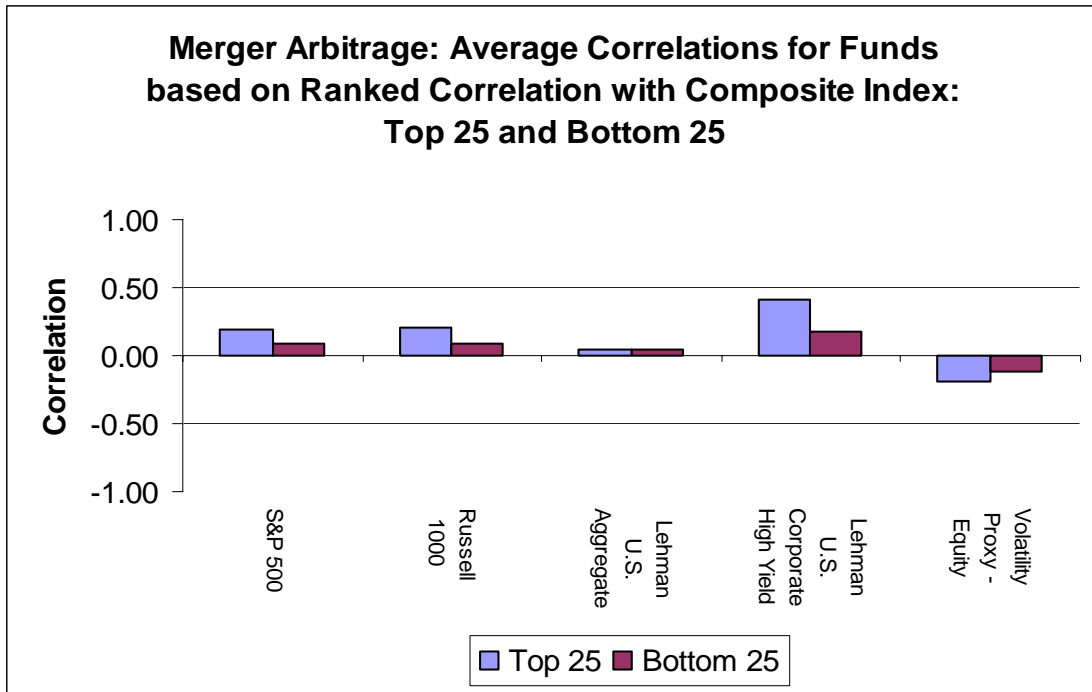


Exhibit 5f

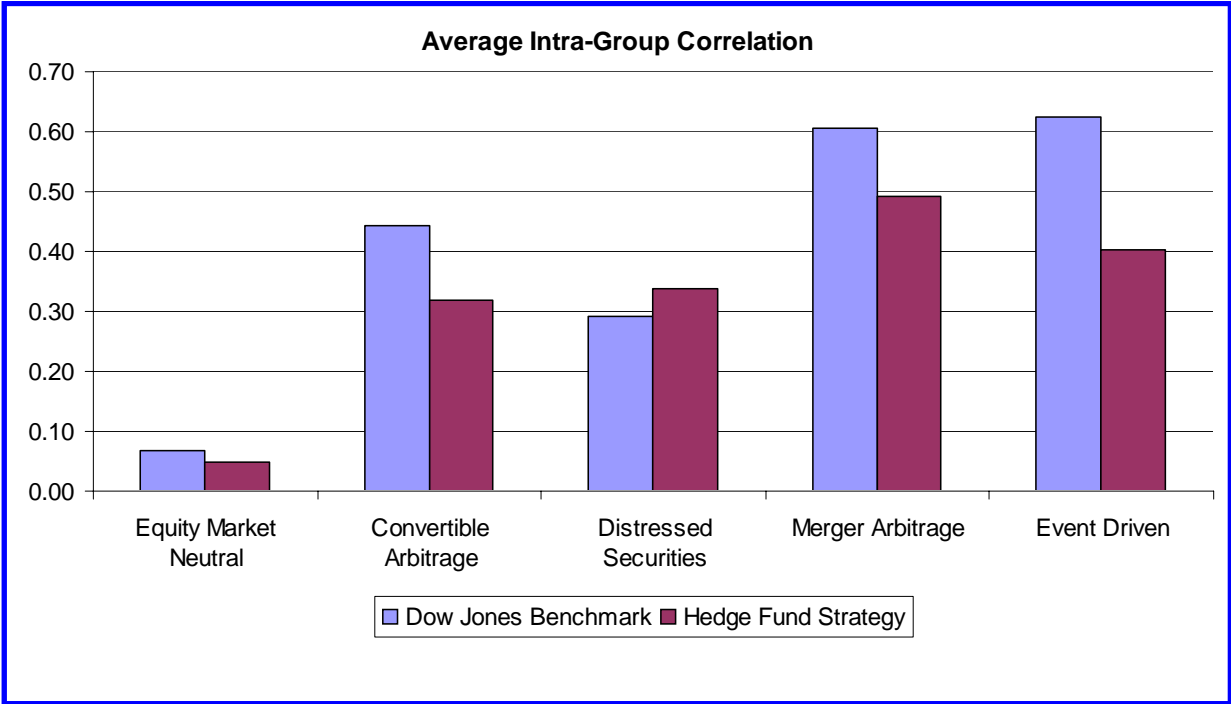


Case Study

In the above analyses, fund consistency was determined based on a simple correlation test. It was pointed out that simple correlation tests might not provide full style-consistency in that additional qualitative analysis is often required to track the fund. In addition, the above results have a potential survival and selection bias since analysis of the database includes current funds which have met our criteria (full reported data for period of analysis) ex post but whose data may not have existed within the database during the testing interval. In this section, we use a case approach with a single example, the Dow Jones Hedge Fund Strategy Benchmarks. The Dow Jones Hedge Fund Strategy Benchmarks were created and monitored to remain style-consistent.⁶ Exhibit 6 displays the average intra-group correlation of the style-consistent Dow Jones Hedge Fund Strategy Benchmarks and the average intra-group correlation of the portfolios of the managers who self classified themselves within a particular strategy grouping. Consistent with style consistency, the Dow Jones Hedge Fund Strategy Benchmarks have a higher average intra-group correlation than managers who self-classified themselves within a particular strategy grouping. With the exception of the distressed securities strategy, the intra-group correlations for the Dow Jones Hedge Fund Strategy Benchmark managers are greater than those for the managers not screened for style consistency. The similar intra-group correlation for the distressed securities strategy may reflect the diversity of holdings within that strategy.

Exhibit 6

⁶ This analysis is only indicative of other hedge funds of funds that maintain a style pure focus. Additional research on the individual funds within those funds of funds may provide similar results.



Summary

Recent research on factors affecting hedge fund performance has shown that fund returns are affected by their exposures to various market factors, as well as certain characteristics of the funds themselves (e.g., size, age, leverage, etc.). Hedge funds can serve as both risk-diversifiers and return-enhancers when added to portfolios of traditional assets. However, these benefits may not be realized if the hedge fund manager does not remain consistent in implementing the self-declared trading strategy. This paper offers some basic results that indicate the impact of style consistency on various aspects of fund performance.

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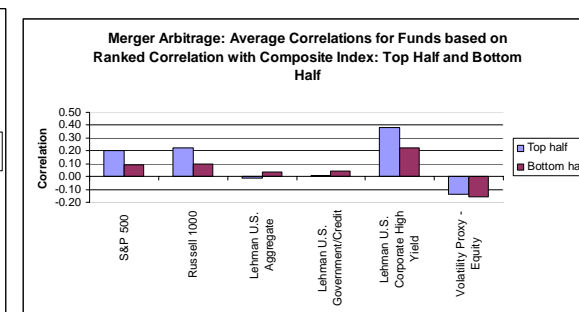
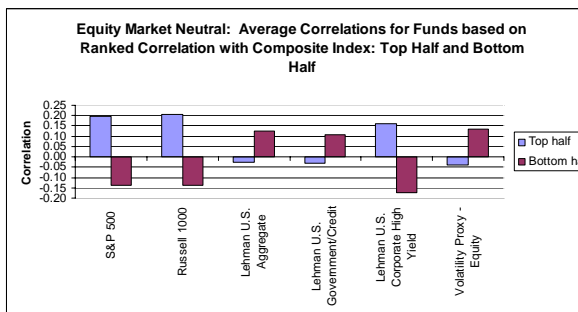
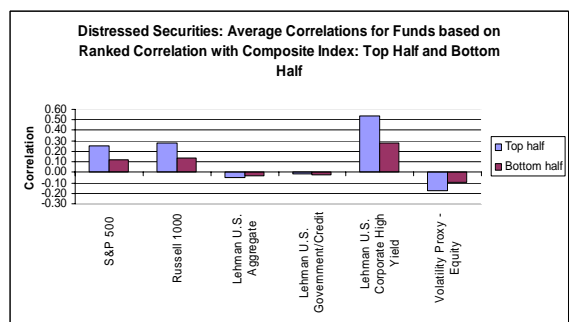
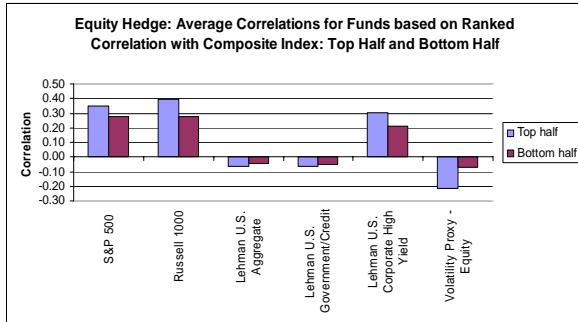
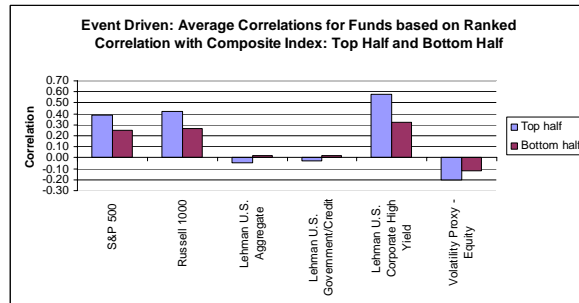
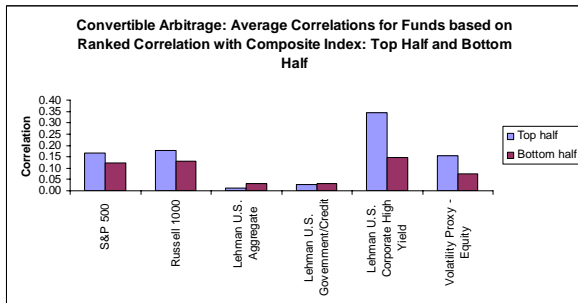
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Appendix 1 Average Correlations for Funds based on Ranked Correlation with Composite Index: Top Half and Bottom Half

Strategy	Index	S&P 500	Russell 1000	Lehman U.S. Aggregate	Lehman U.S. Government/Credit	Lehman U.S. Corporate High Yield	Volatility Proxy - Equity
Convertible Arbitrage	Top half	0.17	0.18	0.01	0.03	0.35	0.15
	Bottom half	0.12	0.13	0.03	0.03	0.15	0.07
Equity Hedge	Top half	0.35	0.39	-0.06	-0.07	0.30	-0.21
	Bottom half	0.28	0.28	-0.04	-0.05	0.21	-0.07
Event Driven	Top half	0.39	0.42	-0.05	-0.03	0.58	-0.20
	Bottom half	0.25	0.26	0.02	0.02	0.33	-0.12
Distressed Securities	Top half	0.25	0.28	-0.05	-0.01	0.54	-0.18
	Bottom half	0.12	0.14	-0.04	-0.03	0.28	-0.09
Merger Arbitrage	Top half	0.21	0.22	-0.01	0.01	0.38	-0.14
	Bottom half	0.09	0.10	0.04	0.04	0.22	-0.16
Equity Market Neutral	Top half	0.20	0.21	-0.03	-0.03	0.16	-0.04
	Bottom half	-0.14	-0.14	0.12	0.11	-0.17	0.14



Appendix II:

