Active Portfolio Management across Business Cycles

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Abstract:

Investors continue to chase past returns and active portfolio management despite evidence that suggests a passive strategy is superior. Some research claims that active fund managers add alpha in recessions. Our findings suggest that alpha from active managers is isolated to a subset of the manager universe. Further, we conclude that this outperformance displays weak persistence and that there is no meaningful impact of prior superior performance in a bear market on either subsequent bull or bear market performance.

I. Introduction

Investors invest in mutual funds for numerous reasons. The investment decision may be driven by the need for diversification at a low cost or for the desire of professional portfolio management. Lack of investment knowledge, lack of time, or the allure of alpha can all potentially impact the selection of an investment manager. Active portfolio management, in a substantial amount of cases, fails to cover the higher costs it imposes on investors. Some studies, which focus on outlier performance, provide empirical evidence that the top decile of investment management performers display a skill in generating alpha (Kosowski, 2006). Parallel to this strand of literature is the question of whether active portfolio management is more likely to provide alpha in recessionary periods.

Our study is most similar to Kaushik et al. (2008) and Moskowitz (2000) and simplifies to three basic questions. Does a recessionary environment increase the likelihood that a typical retail investor can select an investment manager that provides alpha in excess of fees? If alpha exists, what is the degree of persistence across business cycles? Finally, if alpha persists across business cycles are there reliable signals that the investor can identify in advance in order to take advantage of the superior performance? We address these questions through univariate and bivariate sorts, and through a multivariate framework. Contrary to recent studies[1] related to portfolio management in recessionary periods, our study finds that active managers fail to provide the typical investor with sufficient alpha in any business cycle. Further, we find that persistence is weak across varying economic conditions and that costs appear to be the only reliable indicator of future performance.

The paper proceeds as follows. The next section examines the prior literature on active management pertaining to costs, persistence, disentangling luck and skill, and potential fund or manager attributes that signal superior performance in advance. Section III contains our hypotheses. Section IV provides detail on our sample and methodology. Section V contains the results. The last section provides discussion on the contributions of our research.

II. Literature Review

Costs of Active Management

The debate over investment manager selection hinges on whether active management can provide sufficient returns to offset the additional expenses and risks that it imposes on investors' portfolios. Recognition of these costs has led to the recommendation that most

[1] Moskowitz (2000); Fortin and Michelson(2002)

investors implement a portfolio based on simple principles of investing, including a proper balance between stocks and bonds by selecting low-cost, passive, index funds (Gruber, 1996; Cochranne, 1999; Barber, Odean and Zheng, 2005; Bogle, 2008). Recent estimates suggest the cost of active portfolio management to be near 70 basis points per year[2] (French, 2008). According to Haslem (2006), in some cases the estimates for the cost of portfolio management fail to account for all of the brokerage commissions, market makers, and other trading costs. This potential downward bias on the costs of active management is also highlighted by research that incorporates hidden expenses such as missed trades, trade impact, and trading delays account for a majority of the transaction cost (Celent, 2005). Waring and Siegel (2007) also note that expenses are the only investment variable that investors have control over[3].

Sharpe (1966) initiated the momentum for research pertaining to the value of active management. Jensen (1968), using the CAPM, and ignoring transaction costs, found the average underperformance (net returns) for active managers to be roughly 9% over 1955-1964. More recent research on active management supports the conclusions of prior research that active managers have a difficult time overcoming costs (Carhart, 1997; Phillips 2008; Fama and French, 2009). If alpha exists, the investor must still be concerned with the performance risk, style and taxes as these may change significantly following a manager change (Gallo and Lockwood, 1999). While much of the literature tout the cost of active management, some researchers have noted that tax strategies, rebalancing, and research capabilities can boost the value of active portfolio management (Bernstein, 2003). The question remains as to whether any value added can overcome the expense that these strategies generate.

Persistence of Returns

In addition to the costs and potential rewards of active management, an investor is also concerned with the consistency of alpha. Many authors have estimated the persistence of differential returns for active managers. Some researchers conclude that persistence is short-lived (Carhart, 1997; Bollen and Busse*,* 2004*).* Specifically, Carhart (1997) finds that persistence is prominent among the worst performers, short-lived for the best performers, highly correlated with expenses and turnover, and that any persistence is more a function of luck than stock- picking skill. These findings are also robust to different benchmark specification methods (Daniel, Grinblatt, Titman and Wermers, 1997).

Other studies look at style and expense categories and find that persistence is not always confined to shorter periods. Evaluating no-load growth oriented funds, Hendricks, Patel and Zeckhauser (1993) find that persistence can be seen for up to two years. Similarly, Teo and

[2] This estimate pertains to data dating back to 1980
[3] Taxes are also manageable in non-sheltered accounts

Woo (2001) sort mutual funds on style (e.g., large value, small growth, etc.) and find, contrary to Carhart (1997), that persistence for up to six years is seen and not accounted for by expense ratios, turnover, or one-year momentum.

Luck versus Skill

In the event alpha is found and persists, researchers have become interested in the endeavor to disentangle luck and skill as the determinant of alpha. Fama and French (2009), using a simulation based method to ascertain luck versus skill, found that active management lags behind passive management except for the top 3 percent of cases[4]. However, Kosowski, Timmermann, Wermers, and White (2006) provide similar analysis that demonstrates the top decile of performance can be characterized as skill-based alpha and that this outperformance persists.

While other studies have reported the inherent skill of a group of fund managers, one author cautions that superior returns are not delivered to shareholders (Pinnuck, 2003). Another study suggests that stock selection abilities are isolated to buys and that mutual fund holdings in aggregate, before expenses are subtracted; fail to outperform the universe of equities (Chen, Jegadeesh, and Wermers, 2000). Other findings suggest sufficient skill to offset costs is seen in roughly 80 percent of actively managed funds; however, those fund managers that add value capture it for themselves through fees and expenses (Berk and Green, 2004; Berk, 2005; Barras, Scaillet, and Wermers, 2009). Barras, Scaillet and Wermers (2009) note that the number of unskilled managers has increased substantially over the past 20 years, which does not bode well for those searching for alpha. Together the research suggests that any value that is available to active portfolio investors tends to be extracted through rents by the manager(s).

Returns across Style and Size

If alpha exists, persists, and is a function of skill then where might an investor find this superior performance? Prior studies have shown that many[5] active fund strategies, ranging from growth to value, subtract value from investors across most time series (Lakonishok, Shleifer, and Vishney, 1992). Using data spanning from 1965 to 1998, Davis (2001) finds no existence of positive abnormal returns across all styles, negative abnormal performance for active value managers, and short-lived persistence among the best performing growth funds. A more recent study finds that the median alpha for the active small cap universe is zero before costs, negative after costs, and displays little persistence (Davis, Tokat, Sheay, and Wicas (2008). Other researchers have found consistent outperformance from the small-cap universe

[4] The study takes random chance into account, which provides logic for the low 3 percent
[5] Yield based strategies were the only exception

of active mutual funds by roughly 500 basis points (Allen, 2005). Conversely, Standard and Poors (2009), in an Indices versus Active Funds report, concludes that the indexes outperformed funds except for the large cap value universe.

Ennis and Sebastion (2002), using Return Based Style analysis[6], find prior research methods that lead to the endorsement of active fund management for small cap equities to be flawed. In contrast to the focus on small cap equities, prior research has found that larger, less expensive, and lower turnover funds display properties for outperformance (Elton, Gruber, Hlavka, 1993; Haslem, Baker, and Smith 2008). A strand of the literature suggests that inefficiencies are more likely to arise in the small cap equity universe, yet some prominent researchers disagree with aggregate conclusions pertaining to less efficient markets. For example, Fama and French (2009b) note that equilibrium accounting[7] applies for any specified *market*[8], performance within that *market* is a zero-sum game before costs, and that any excessive outperformance of a group of active investors comes from worse than expected performance of another subset of investors. Similarly, inefficient or more volatile markets provide opportunities; however, picking the wrong manager hurts more than in more efficient markets (iShares, 2009).

Identification of Superior Management

Irrespective of the skill and persistence debate, how does the typical retail investor identify persistent skill in advance. Is it beneficial for the investor to rely on simple metrics such as price-to-earnings or price-to-book of a fund? Much of the literature discusses whether scaled price ratios[9] provide compensation for bearing risk or represent market inefficiencies (Debondt and Thaler, 1985; Cochranne, 1999; Fama and French, 2009). Fama and French (2007) find that prior changes in the price to book ratio, using data from 1963 to 2005, do not enhance return predictability and that net share issues provide better insight for future performance of equities. If the predictability of fund characteristics related to price revolves around inefficiencies, some authors have suggested that the signals move too slowly for managers to capture incremental returns (Cochranne, 1999). Other research also notes that reliance on P/E ratios is due to simplicity and reflects laziness (Abernathy, 2006).

Elton, Gruber, and Blake (1996) note that 1 and 3 year alphas convey information about future performance despite overwhelming evidence that suggests that past returns are poor

[6] Sharpe (1992)
[7] In Aggregate, Active management is a Zero-Sum Game before costs
[8] Value Stocks, Growth Stocks, Small Caps, etc.
[9] Price to Book, Price to Earnings, Dividend Yield

predictors of future performance (Carhart 1997, Fama and French 2008). Taking a unique approach, Chevalier and Ellison (1999) find that managers who attended selective undergraduate institutions, are younger, and hold an MBA are more likely to provide value that offsets the cost of fund management. Cremers and Petajisto (2008), using an active share metric[10], find that the more active funds provide an additional 150 basis points of returns to investors after costs are considered. Given the difficulty of identifying superior managers, a different tack would first be to identify characteristics of poor mutual fund managers. Jain and Wu (2000), using a select group of funds that advertise, found that post-advertisement returns were generally inferior to benchmarks suggesting that advertising may be a signal of poor active management.

The dispersion in findings points to the difficulty of identifying superior portfolio management in advance. Phillips (2008) notes that there will always be winning funds across business cycles; however, he emphasizes that identifying these funds in advance is a difficult endeavor. Research has also pointed out that there is greater opportunity for chasing alpha in inefficient markets (iShares, 2009).

Returns across Macroeconomic Environments

Another dimension of alpha [11] is whether active managers tend to add value in bad times. Cooper and Chieffe (2004) note that the ability to time markets across business cycles requires the investor to identify the market troughs and peaks within one month of occurrence, which is problematic given questions surrounding signals[12]. Moskowitz (2000), using the NBER classifications of recessionary environments, finds that active management is able to generate an additional 6 percent per year in recessions versus passive alternatives. Similar studies have also found that active management tends to outperform benchmarks when the economy is going into or pulling out of a recession (Fortin and Michelson , 2002).

Kosowski (2006) posits that managers extract rents during expansions (-1.30% per year) yet value is added in recessionary environments (4.08% per year).However, recent research notes that there seems to be inconsistent performance of active managers in bear markets[13] and that costs are difficult to overcome in any market environment (Phillips and Ambrosio, 2008). Similar results extend to the prior 2001 U.S. recession where Standard and Poor's found that the S&P Small Cap 600 Index outperformed 67% of small cap funds over the five-year period and 71% over the prior three years. The findings are mixed, but determination of

[10] Decompose returns into S&P 500 portion and Active Long vs. Active Short portion
[11] Of particular interest due to higher marginal utility of wealth in recessionary or bear market periods
[12] Dividend yields, Term and Credit Quality Interest Rate Spreads, Consumer Confidence Index, etc.
[13] Since 1970 active management failed to outperform the market in 3 of 6 bear markets

whether active management adds value in recessionary or bear market environments is highly desirable due to an increase in the marginal utility of wealth[14].

III. Hypotheses

Literature notes that superior performance does occur; however, we cannot rule luck out in these results. Further, persistence studies show that a continuation in returns is due more to momentum than stock picking ability. Thus, for any outperformance we expect to see two results:

1) Outperformance in the 2001 Bear Market is not significantly related to outperformance in the subsequent Bull Market.
2) Outperformance in the 2001 Bear Market is not significantly related to outperformance in the subsequent Bear Market.

IV. Data and Methods

Our data is confined to Domestic Open End Equity Mutual Funds. First, data is collected from Morningstar Direct on all Domestic Equity Mutual Funds. This data allows us to match mutual funds with the Morningstar Analyst Assigned Benchmark. These benchmarks are then used to calculate tracking error, which is a measure to assign funds to an active or passive subset. Next, we merge the Morningstar data with Center for Research in Security Prices (CRSP) in order to have sufficient time series of mutual fund characteristics.

Description of Data on Mutual Funds

The data in Morningstar is censored to include analyst assigned benchmarks for 10,357 share classes. The 10 benchmarks are the Russell 1000, 2000 and 3000 ETFs along with the Standard and Poor's Midcap ETFs. The ETF return data is obtained from the monthly stock data in CRSP. The historical data is then obtained by merging the Morningstar data with CRSP by the historical cusip and ticker. Due to rolling regression calculations we retrieve data from January 1999 through August 2009, which gives us 317,629 fund- month observations.

Our focus on business cycles leads to using the NBER recession indicators. The recession indicators for our sample are as follows. The first bear market in our sample ranges from March 2001 to November 2001. The only bull market extends from December 2001 through December 2007. The second bear market extends from December 2007 through the current data.

[14] Kosowski (2006)

Although our sample data begins in 1999 for rolling regressions, we censor the data for empirical analysis to those months beyond July 2000. We do this because the merge from Morningstar to CRSP yields roughly 31 share classes before July 2000. Table I shows summary statistics for our sample. The full dataset contains an average of 7389 share classes per month. The average size of funds across the full sample period is $506 million with an average expense ratio of 1.3%. Size, turnover, expenses, and loads are fairly consistent across cycles; however, the average number of share classes increases over our sample from an average of 2075 to 7306 in the latest bear market.

Methodology

Following Alford, Jones and Winkelmann (2003), we calculate tracking error for each of the mutual funds as follows:

$$\sigma^2 = \frac{\sum_{i=1}^{T}(\Delta_t - \Delta_{b,t})}{(T-1)} \qquad (1)$$

Equation 1 defines the variance of the return differential between the fund and the benchmark. Δ_t is the value weighted return for a fund month. $\Delta_{b,t}$ is the value weighted return of the Morningstar Analyst Assigned Benchmark. T represents the length of the return series. Next annualized tracking error is calculated as follows:

$$TE = \sigma_\Delta \sqrt{P} \qquad (2)$$

Equation 2, or annualized tracking error, is calculated by multiplying the standard deviation of return differential with the square root of 12 (P) from monthly returns. Passive portfolios are defined as those funds that have an annualized tracking error below 3% while the remainder of funds is classified as actively managed (Alford et. al, 2003).

We also use the four factor alphas which are calculated following Fama and French (1993). The aforementioned alphas are the intercepts of the regression across the first bear market, second bear market, and bull market as seen in Table II. Following Carhart (1997), we attempt to explain alpha in periods subsequent to the first bear market by first calculating a time-series of alphas as seen below.

$$\alpha_{it} = R_{i,t} - R_{f,t} - \beta_{i,t-1} MKTRF - \beta_{i,t-1} SMB - \beta_{i,t-1} HML - \beta_{i,t-1} UMD \qquad (3)$$

Equation 3 retains the beta coefficients from a 36 month rolling regression of excess mutual fund return on the size, value, excess market return, and momentum factors. This regression requires a fund to have at least 30 returns in each 36 month window to calculate the factor loadings. Next, the monthly alpha is calculated by subtracting all of the associated factors

and loadings from the excess market return to get alpha for fund *i* in month *t*. Last, we follow Fama MacBeth (1973) in order to estimate the regression in Table IV as seen in equation 4.

$$\alpha_{it} = \beta_0 + bx_{it} \qquad (4)$$

In equation 4, x_{it} represents the fund characteristics and a dummy indicator for prior outperformance in a bear market. We regress the time series of alphas on these fund characteristics. The fund characteristics are the mutual fund's expense ratio and turnover ratio. Both are winsorized at the 1st and 99th percentiles to mitigate the influence of outliers. Also, maximum load and size are included in the regression analysis.

V. Results

Table II presents the four factor alphas for the three different periods. These alphas represent only those alphas that are statistically different from zero and the test statistic is averaged over the decile for the given time frame. The mean monthly alpha is negative in all three time periods. This table contains the mean monthly alpha by decile. The range for both bear markets is wider than the bull market, which can be seen in Figure I. It is interesting to note that the mean monthly alpha for corresponding deciles turns negative faster in the bull market than in the other 2 bear markets. However, our multivariate results do not suggest that prior superior management in bear markets has any statistically significant impact on future outperformance.

Table III presents the four factor alpha conditioned upon the quartile of tracking error, or how active the fund is over a certain period relative to its peers. Except for the first bear market, the most passive managers have the highest positive or lowest mean monthly negative alpha. The lack of a monotonic relationship suggests that the magnitude of active portfolio management is a poor predictor of performance.

Figure II is a 3-D bar chart that displays the conditional probabilities of persistence in superior or inferior performance in subsequent bear markets. Specifically, the bars for initial rank *i* (2001 Bear market) and subsequent rank *j* (2008 Bear market) combine to represent Pr(rank j|rank i). The rankings represent the four factor alpha deciles with decile 1 representing poor performance. The sorts suggest that some of the first bear market top performers (decile 10) continue to perform well in the subsequent bear market; however, most of the conditional rankings show randomness. Further, the conditional probability of performing in the lowest decile for the second bear market based on top performance in the first bear market is greater than the probability of remaining in the top decile.

Figure III is a contingency table that shows subsequent bull market performance conditioned on 2001 bear market performance. The persistence appears stronger than in Figure

II; however, there is more than 75% turnover in performance profile from bear to bull market. Figure II and III display properties of weak persistence due to the presence of randomness.

Table IV shows the Fama MacBeth regressions of the time series of alphas on the mutual fund characteristics. Given that the contingency tables support some persistence, we test whether the relationship between alpha and past bear market alpha display a significant relationship. First we regress the Bull Market alphas on the first Bear Market Outperformers (funds with positive alpha). The FirstBear variable denotes prior outperformance and is not shown to have a statistically significant relationship with Bull Market performance. Consistent with Carhart (1997), expenses have a roughly one-for-one negative impact on performance. Panel B shows the marginal impact of initial bear market performance to also be insignificant in explaining future bear market performance.

Figure IV provides further insight into the persistence question. Whereas Figures II and III displayed the probability of improving or maintaining rank across business cycles, Figure IV shows the mean alpha an investor would have received if one invested in a decile portfolio across business cycles. The pattern resembles mean reversion as discussed in Debondt and Thaler(1985). This figure displays properties of weak persistence over the shorter time horizons.

VI. Conclusion

Prior literature notes that active management adds value in recessionary environments (Moskowitz, 2000; Kosowski, 2006). Our findings suggest that active portfolio management subtracts value, on average, from the investor in expansions and recessions. Net of fees, investors lose roughly 1 to 2 percent per year. Any outperformance decays over subsequent business cycles where the return of all prior rank categories converges to a negative mean monthly alpha of 10 to 15 basis points. Additionally, the probability of maintaining performance rank across business cycles is below 25 %, which represents over 75 % annual turnover in performance rankings. The multivariate results suggest that prior bear market outperformance is not a significant predictor of future performance in either bull or bear markets.

Further, it appears that the existence of alpha is primarily attributable to luck due to the random nature of the sorts and insignificant results in the multivariate regression analysis. Additionally, our results are similar to prior literature[15] in that expenses appear to be the only reliable predictor of future performance. The distributions of monthly alpha suggest that the wider dispersion in bear markets provides not only opportunities to achieve superior results but

[15] Carhart(1997)

also greater magnitude with respect to poor performance. Weak performance persistence across business cycles , the lack of increased availability of alpha in recessions, the absence of quality signals of future performance, and higher expenses all contribute to a concern of relying on active portfolio management under any economic cycle.

We conclude that active portfolio managers show no meaningful persistence in performance across business cycles and that this risk should be considered when determining whether a passive or active fund manager is appropriate for the investor.

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Table I
Summary Statistics for Full Sample (January 1999 - August 2009)

$Expenses_t$ is the average annual expense ratio in decimal form. $Turnover_t$ represents the minimum of aggregated sales or purchases of securities divided by the average 12-month Total Net Assets of the fund. Turnover is updated annually. $Size_t$ is the total net assets as of month end in millions of dollars. Expenses, Turnover, and Size are all winsorized at the 1st and 99th percentiles. Front_Load is the maximum sales charge in decimal format. Rear_load is the deferred sales-charge imposed on investors when withdrawing funds and usually diminishes as holding period increases. The summary statistics represent the time-series mean for each mutual fund. These statistics are based on the cross-sectional averages.

	Mean	Mdn	Std. Dev.	1st Quartile	3rd Quartile
	Panel A: January 1999 through August 2009				
All Share Classes	7389				
$Expenses_t$	0.013	0.013	0.006	0.009	0.018
$Turnover_t$	0.817	0.610	0.818	0.267	1.096
$Size_t$	506.000	53.600	1430.500	8.900	292.370
Front_Load	0.009	0.000	0.020	0.000	0.000
Rear_Load	0.009	0.000	0.015	0.000	0.014
	Panel B: March 2001 through November 2001				
All Share Classes	2075				
$Expenses_t$	0.012	0.012	0.006	0.008	0.017
$Turnover_t$	0.882	0.692	0.849	0.330	1.155
$Size_t$	685.500	85.050	1783.600	18.310	390.160
Front_Load	0.009	0.000	0.020	0.000	0.000
Rear_Load	0.009	0	0.017	0.000	0.010
	Panel C: December 2001 through November 2007				
All Share Classes	5002.000				
$Expenses_t$	0.013	0.012	0.006	0.009	0.017
$Turnover_t$	0.810	0.610	0.780	0.280	1.100
$Size_t$	501.000	62.000	1106.000	11.500	297.500
Front_Load	0.009	0.000	0.020	0.000	0.000
Rear_Load	0.008	0.000	0.014	0.000	0.010
	Panel D: December 2007 through August 2009				
All Share Classes	7306.000				
$Expenses_t$	0.012	0.012	0.006	0.009	0.017
$Turnover_t$	0.810	0.610	0.780	0.280	1.091
$Size_t$	337.000	35.000	1099.000	5.135	183.330
Front_Load	0.008	0.000	0.020	0.000	0.000
Rear_Load	0.008	0.000	0.014	0.000	0.013

Table II
Decile Portfolios of Alpha

Mutual funds are sorted on alpha. Alpha is constructed using the Fama French (1993) Four Factor Method. Bear Market 1 represents data from March 1, 2001 to November 31, 2001 (NBER, 2010). Bull Market data runs from December 1, 2001 to December 1, 2007. The second Bear Market runs from December 1, 2007 to August 1, 2009. Alpha is the intercept of the Model. A requirement of at least 9 monthly observations (length of minimum business cycle) is imposed on statistics. These alphas represent the mean monthly alpha of the decile and the average t-statistics are in parentheses.

4 Factor Model			
Portfolio	Bear Market 1	Bull Market	Bear Market 2
	Alpha (T-stat)	Alpha (T-stat)	Alpha (T-stat)
1 (High)	0.024	0.005918	0.01919
	(3.65)	(2.27)	(3.06)
2	0.013	0.0022	0.01201
	(3.50)	(1.01)	(2.6)
3	0.009	-0.00117	0.01066
	(3.42)	(-2.47)	(2.68)
4	0.005	-0.00179	0.00878
	(2.42)	(2.20)	(2.49)
5	-0.005	-0.00229	0.00501
	(-3.43)	(-2.26)	(1.77)
6	-0.006	-0.0027	-0.00697
	(-3.39)	(-2.58)	(-2.15)
7	-0.008	-0.00322	-0.01042
	(-3.29)	(-2.66)	(-2.46)
8	-0.01	-0.0038	-0.01306
	(-3.77)	(-2.65)	(-2.71)
9	-0.014	-0.00471	-0.01606
	(-3.69)	(-2.81)	(-2.56)
10 (Low)	-0.020	-0.00738	-0.02844
	(3.19)	(-3.057)	(-2.56)
Full Mean	-0.00099	-0.0018	-0.00193

Table III
Conditional Distribution of Alpha

Alpha is constructed using the Fama French (1993) Four Factor Method. Univariate sorts are conditional on the Tracking Error of the Mutual Funds with respect to the Morningstar Analyst Assigned Benchmark. Calculation of Tracking Error is based on Alfred et al. (2003) where the bottom quartile represents those funds with a more passive strategy and the top quartile represents those funds with a more active approach. Bear Market 1 represents data from March 1, 2001 to November 31, 2001 (NBER, 2010). Bull Market data runs from December 1, 2001 to December 1, 2007. The second Bear Market runs from December 1, 2007 to December 31,2008. Alpha is the intercept of the Model.

	Bear Market 1
Quartile	4-Factor α
1	-0.0051
2	0.0016
3	0.0009
4	-0.0008
	Bear Market 2
	4-Factor α
1	0.0026
2	-0.0030
3	0.0023
4	-0.0079
	Bull Market
	4-Factor α
1	-0.00172
2	-0.00217
3	-0.00194
4	-0.00190

Figure I

Distribution of Monthly α (Supplements Table II)

Alpha is the mean monthly four factor alpha. The mean alphas range from a negative 10 b. p. per month to a negative 19 b. p. per month. In annual terms the average alpha ranges from a negative 1.2% to 2.4%, which corresponds to the three business cycles denoted in the figure. The top of the box and whisker plot represents the maximum monthly alpha and vice versa. The top and bottom of the box, of the box and whisker figures, represents the 75th and 25th percentiles respectively.

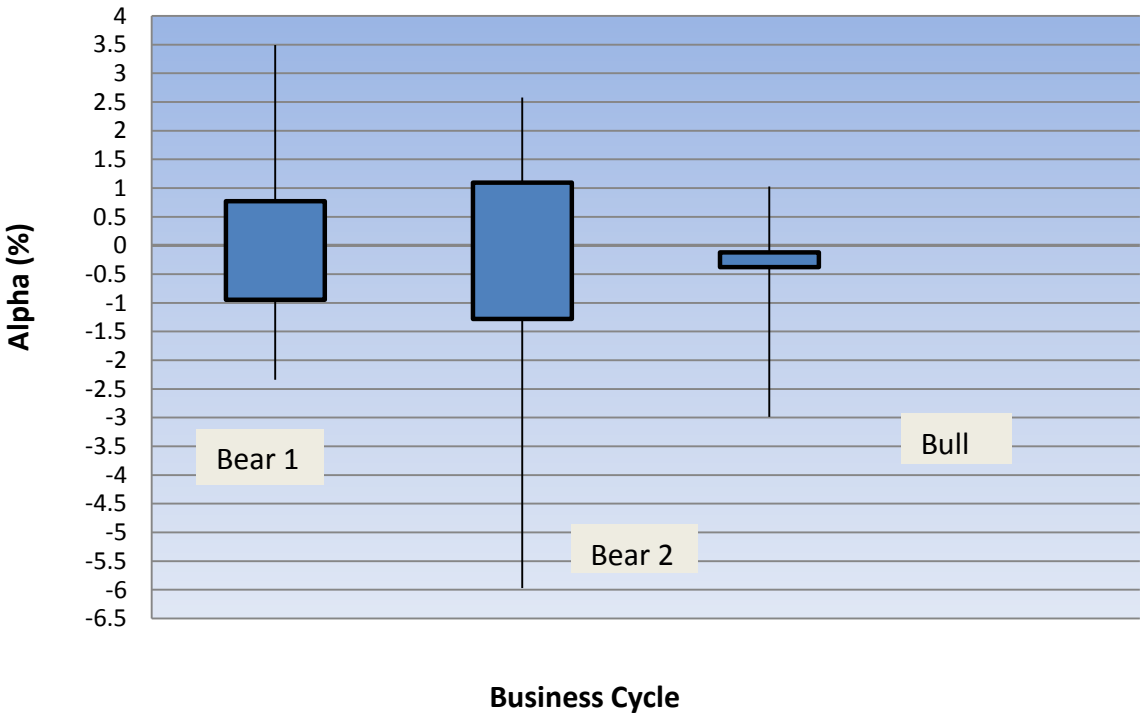

Figure II

Contingency table of initial and subsequent business cycle performance rankings

The figure represents a contingency table of initial (Bear Market 1) and subsequent (Bear Market 2) performance. The performance is measured over the entire span of each cycle as indicated by NBER (2010). The Fama French Four Factor Alpha is the metric to determine the decile rankings within each cycle. The bars for initial rank i and subsequent rank j represent Pr(rank j Bear Market 2 |rank i Bear Market 1), which is similar to Carhart (1997). Decile 1 is the lowest alpha ranking within the cycle and Decile 10 is the highest ranking alpha within the cycle. The intersection represents the probability of achieving a certain rank based on prior ranking.

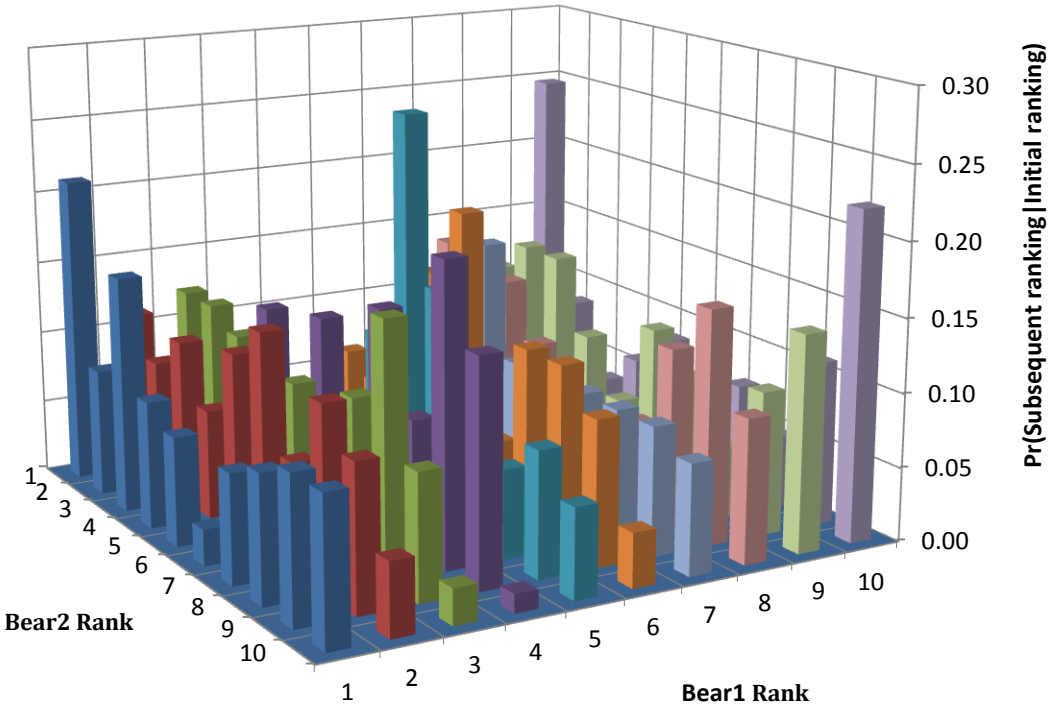

Figure III

Contingency table of initial and subsequent business cycle performance rankings

The figure represents a contingency table of initial (Bear Market 1) and subsequent (Bull Market) performance. The performance is measured over the entire span of each cycle as indicated by NBER (2010). The Fama French Four Factor Alpha is the metric to determine the decile rankings within each cycle. The bars for initial rank i and subsequent rank j represent Pr(rank j Bull Market |rank i Bear Market 1), which is similar to Carhart (1997). Decile 1 is the lowest alpha ranking within the cycle and Decile 10 is the highest ranking alpha within the cycle. The intersection represents the probability of achieving a certain rank based on prior ranking.

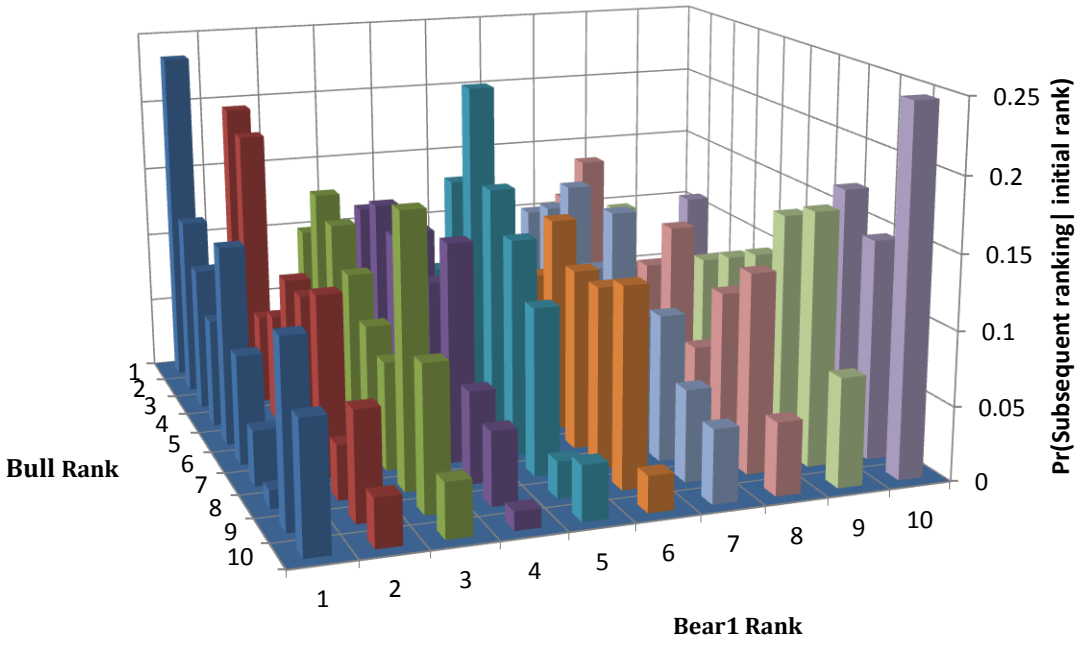

Figure IV

Post-Formation Decile Alphas

This table represents the mean monthly alphas for a given decile ranking in each business cycle. The performance is based on initial ranking in the first bear market. The performance convergence represents the average alpha that an investor would receive in each business cycle given perfect foresight for the first bear market performance. Further, performance in the second bear market and the bull market assumes that the investor continues to hold the funds that were ranked into deciles in the first bear market.

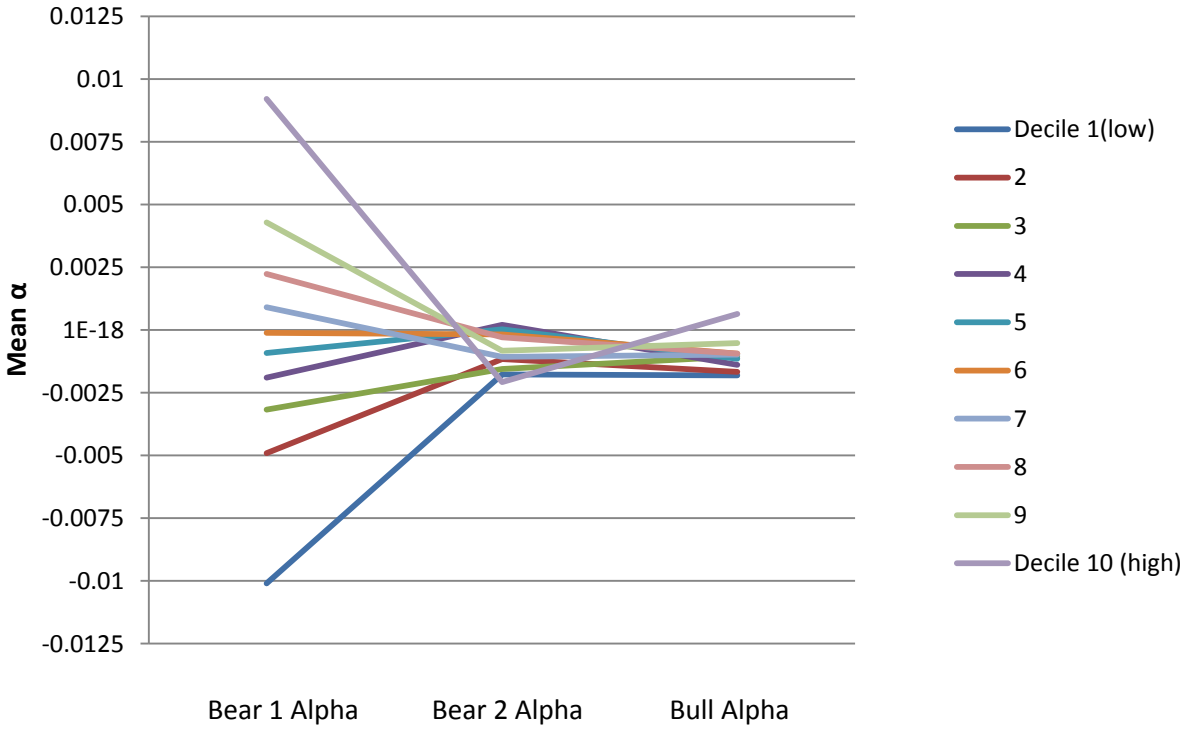

Figure V

Expenses Conditioned upon Tracking Error

Decile portfolios are formed on tracking error for each of the three distinct business cycles. The expense ratio for a given decile is the equal-weighted expense ratio. Results hold for tracking-error portfolios where expense ratio is the value-weighted mean. Expense ratio represents the average annual expenses in decimal format.

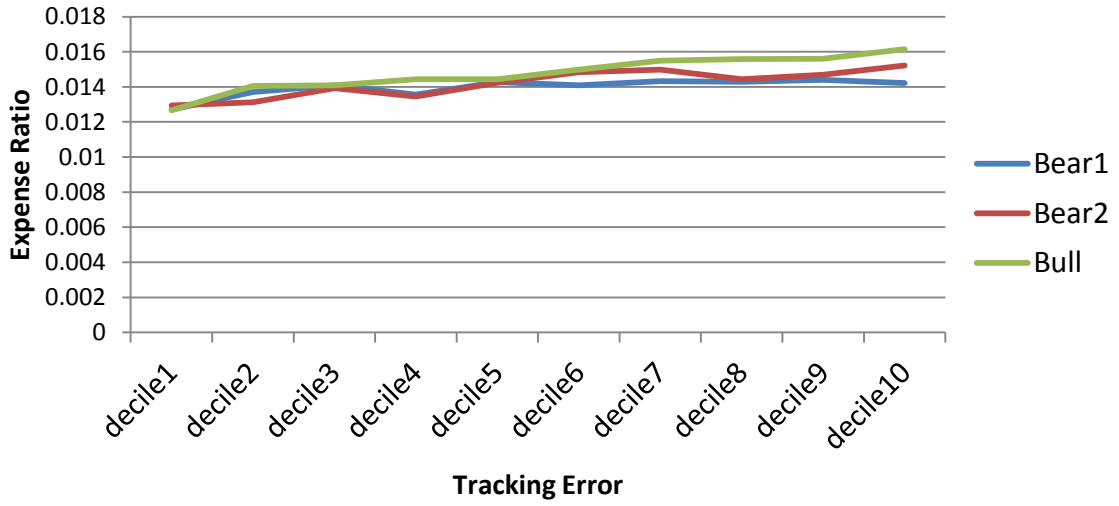

Table IV

Fama-MacBeth Regressions of Monthly Fund Alphas

The dependent variable, Alpha is calculated according to Carhart (1997) and is defined as the difference between the monthly excess fund return and the four factor loadings multiplied by the respective monthly premium. The loadings are calculated on a rolling 36 month window. The 36 month regression requires 30 observations to be included for alpha to be constructed. FirstBear is an indicator variable whose value takes a 1 when the fund had positive alpha in the 2001 bear market and 0 otherwise. Expenses are calculated as the expense ratio divided by 12 similar to Carhart (1997). Turnover ratio is also divided by 12 to align with the monthly alpha. Size is the natural logarithm of the lagged value of monthly total net assets. MaxLoad is the sum of front and deferred loads. In Panel A cross sectional regressions are estimated for the Bull Market alphas and the data ranges from January 2003 through December 2007. The front end is set to January 2003 rather than November 2001(NBER Bull Market Start Date) due to limited variation in the cross section. Panel B provides cross sectional regressions from December 2007 through August 2009 (According to NBER and data limitations) for the second Bear Market in the Sample. The coefficients and t-statistics are the time series means from the cross sectional regressions. T-statistics are in parentheses.

Panel A: January 2003 through December 2007	
	Estimate
Intercept	-0.00081
	(-2.03)**
FirstBear	0.00022
	(-0.98)
Expenses	-0.81
	(-4.42)***
Turnover	0.00045
	-0.15
Size	0.00003
	(0.18)
MaxLoad	-0.002
	(-1.07)
Panel B: December 2007 through August 2009	
Intercept	-0.0006
	(-0.27)
FirstBear	0.0005
	(0.87)
Expenses	-0.75
	(-0.85)
Turnover	0.013
	(0.37)
Size	-0.0002
	(-0.17)
MaxLoad	0.0019
	(0.56)

***,**,& *represent statistical significance at the 0.01,0.05 and 0.10 levels, respectively