Management structure and the risk of mutual fund managers

Lonnie L. Bryant
College of Charleston

Hao-Chen Liu
College of Charleston

Abstract:

This paper provides a detailed discussion of the relationship between mutual fund management structure, fund risk and performance. We utilize the unique management structures of mutual fund investment companies were a manager operates one fund (unitary fund management) or numerous funds simultaneously (multiple fund management). We implement various risk measures to analysis the impacts management structure, fund objective, fund market capitalization and other fund level characteristics have on investor wealth. Our evidence indicates that when fund managers manage multiple funds simultaneously, the risk of one of the managed funds is significantly increased, minimizing the inherit benefits of mutual fund stock diversification. Thus, all else equal, the more time that a manager devotes to an individual fund the more likely the fund will reduce its risk exposure. This increased risk exposure of the multiple management structure results in fund misclassification.

Keywords: mutual fund, management structure, risk exposure, shareholder

1. Introduction

Mutual funds have become an increasingly effective means for income generation, capital appreciation, and diversification benefits to investors. Mahoney (2004) reports the growth in the number and assets of mutual funds from 1992-2002 to be 3,824 to 8,256 and $4.432 to $4.749 billion, respectively. Mutual funds provide investors with professional money management, asset liquidity and the benefit of diversification in an attempt to gain market share. Chordia (1996), Edelen (1999), and Nada et al. (2000) argue that open-end fund investors receive not only valuation expertise but also diversified equity positions that limit risk. Investors select mutual fund objectives based on specific risk tolerances and time horizons. But how can unsophisticated investors know whether they are exposed to the appropriate level of risk for a given level of expected return. This study examines whether the management structure and other fund characteristics influence the level of mutual fund investor risk.

A portfolio manager's selection of securities should be consistent with the mutual fund's investment objective, which is stated in the fund's prospectus. In the mutual fund literature, several studies documented that mutual funds tend to be misclassified. For example, Kim et al. (2000) shows that, on average, only 46% of the mutual funds in the sample land on the same groups as the stated objectives. diBartolomeo and Witkowski (1997) document that around 40% of the equity funds are misclassified. Brown and Goetzmann (1997) find about 50% of the growth fund were misclassified. This misclassification has resulted in increased risk exposure for fund shareholder without the appropriate risk adjusted returns.

Why is such a big portion of mutual funds misclassified in their stated objectives? Several arguments can be made. For example, since investors are attracted to funds with high historical performance and the actual investing activities are not observable by investors, fund managers tend to increase their performance by investing high return securities. Also, misclassification can be a marketing tactic. Chan et al. (2002) study mutual fund style consistency. They propose that mutual fund style drift can be caused by nonperformance distortions caused by behavioral and agent reasons. A fund manager might attempt to time the performance benchmark, recover from previous loss, or follow the herd to mimic funds with successful strategies. They find that style shifting is related to poor performance, especially for the value funds. Walter and Weber (2006) find the herding behavior of mutual fund managers in Germany.

In this study, we propose a new hypothesis to explain the misclassification and risk exposure for mutual fund shareholders. We hypothesize that a fund's risk can be spilled over to other funds managed under the same fund manager which makes a mutual fund's actual objective deviate from the stated one. We study the group of fund managers who manage more than one mutual fund with different stated objectives. Therefore, if a fund manager manages a high and a low growth fund simultaneously, one of the fund's performances will deviate from the stated objective. Depending on the fund manager's risk appetite, if the manager is more risk-oriented, the conservative fund would tend to behave more like an aggressive fund. On the other hand, if the manager is more risk-averse, the aggressive fund would behave more like a conservative one. At any rate, this management style deviates from the investors risk preference as requested by the selected mutual fund objective.

The objective of this paper is to examine the impact simultaneous fund management has on mutual fund risk and therefore performance. Mutual fund complexes employ a simultaneous fund management structure to 1) utilize the management skills across multiple funds and 2) to minimize fund expenses. This management structure has mixed implications regarding whether managers of multiple funds will provide superior service to investors and, therefore adds to shareholder value. On one hand, the multiple fund management system reduces costs due to economies of scale (Kwan and Laderman (1999)). However focused fund objective management may produce a greater quality of service potentially increasing investor satisfaction. Since Federal Law (Regulation 9) requires that mutual funds hold no more than 10% of the fund's assets in one security, fund managers must be competent in at least 10 securities. This suggests that multiple fund managers of different objectives must be competent in more than 10 securities, which may lead to inferior performance. This inferior performance can be in the form of lower objective and risk adjusted returns (Khorana (2001)) or increase in return volatility/ risk exposure (Busse (2001)). In an industry where fund complexes compete for investor inflows based on individual fund performance (Khorana (1996)), inferior fund performance due to management structure can potentially decrease shareholder value. Thus, the intent of this study is to examine the impacts the management structure employed by the fund complex has on investor and shareholder wealth.

This paper provides a detailed discussion of the relationship between mutual fund management structure, fund risk and performance. We find that for a manager that operates multiple funds at least one of the funds would have significantly greater styledrift risk exposure than its benchmarks by an average 7 %. However, this increase in risk exposure is unaccompanied by greater risk- adjusted returns, suggesting that the multiple structure is a losing proposition for fund shareholders. These findings also imply that misclassification is a result the multiple fund management structure. Market capitalization is also directly related to the fund's investment portfolio, and our findings suggest that it impacts the fund's level of risk exposure. The other significant variables include fund turnover, the diversification of the multiple fund simultaneously managed and expense ratio.

The remainder of the paper is organized as follows. Section 2 discusses the related literature and develops the hypotheses tested. Section 3 describes the data and a sample description. Section 4 provides methodology used for analysis and preliminary statistics of the fund manager samples. Section 5 presents the empirical results of the study. We conclude this paper with a summary of our findings and their implications in Section 6.

2. **Literature Review**

Over the past several decades, there has been great debate as to the ability of mutual fund managers and the factors that influence fund performance. Jensen (1968) and Sharpe (1966) refute the ability of fund managers to beat a risk-adjusted market portfolio. Whereas Wermers (2000), Bers and Madura (2000), Dulta (2002), Grinblatt and Titman (1992), Goetzmann and Ibbotson (1994) support the notion of positive performance persistence amongst mutual fund managers. However, Lehman and Modest (1987), Grinblatt and Titman (1989, 1994), Brown et al. (1992), Elton, Gruber, Das and Hlavka

(1993), Carhart (1997), Elton et al. (1993, 1996), Manlkiel (1995) and Golec (1996) attribute abnormal performance and persistence to benchmark error and/ or the overstatement of returns resulting from survivorship bias. However, Kacpercyk et al. (2005) and Bar et al. (2006) report that factors such as fund industry concentration, family cross-subsidization, mimicking top performing funds, market timing and management structure effect fund performance. Recently, Alexander et al. (2007) hypothesize that fund managers possess the ability to value stock. They find that valuation motivated buys significantly outperformed their benchmarks by an average 2.79% in the following year. However, liquidity motivated buys underperformed their benchmarks by an insignificant 0.41% in the following year, implying that fund manager were unable to beat the market when compelled to invest excess cash from investor inflows. Thus, there is still great uncertainty as to the ability of fund managers to consistently outperform the market and the factors that impact performance.

Another controversial topic in the mutual fund literature is the managerial structure within investment companies and the impacts to investor wealth. Khorana and Servaes (1999) identify several factors that induce investment companies to establish new funds, such as economies of scale and scope, the overall level of funds invested, and the family's prior performance. Prather et al. (2004) find that the management variables are not generally related to excess returns with the exception that managers who split their efforts between several funds tend to be less successful. In analyzing funds of funds, Bertin and Prather (2008) results suggest that benefits extend beyond simple manager diversification or company diversification as better performance is achieved by those funds that specially designate and identify their managers. Baer et al. (2006) find a negative relationship between team management and fund performance; however they do not differentiate between identified and unidentified teams. Prather et al. (2004) finds that fund performance is positively related to price ratio variables and negatively related to market capitalization, expense ratio, and number of funds under management.

Investment companies market the superior performance of their "star" funds to increase fund complex inflows. Massa (1998) shows a positive spillover to other family funds from having a star fund. Nanda, Wang, and Zheng (2004) finds a positive spillover effect on the inflows of other family funds resulting from having a star performing fund without the negative effect from a poor performing fund. Nanda, Wang, and Zheng (2004) also reports that families that are more concentrated perform better. Guedj and Papastaikoudi (2004) reports that this "star" performance is more prevalent for larger fund complexes than for their smaller peers. Thus, larger fund families receive benefits from having "star" managers and funds due to the spillover into other family funds. Since managers are evaluated on past-performance and assets under management, it stands to reason that investment companies are inclined to deploy a multiple management structure to take advantage of their "star" fund managers and economies of scale.

Thus the extant mutual fund literature recognizes the existence of a superior performing 'star' fund manager and the investment companies attempt to market these funds. Employing different management structures, investment companies can effectively influence the performance of their funds. Performance can be in the form of objective and risk adjusted returns (Khorana (2001)) or changes in return volatility/ risk exposure (Busse (2001)). In relation to risk, Busse (2001) reports that managers increase risk levels or "style drift" to increase return performance following a period of poor performance.

Thus, an increase in style drift provides some indication of manager incompetence. However, Brown and Harlow (2006) find that funds with greater style drift performs better than their peers during recessions or in down markets. However mutual fund risk exposure can result for different reasons. As suggested by Busse (2001), a managers desire to generate trading profits can lead to excess risk exposure. Similarly, a manager's desire to dress-up their portfolio will result in the manager selling lowers and purchasing winners before reporting dates. In addition, unanticipated investor flows force managers to adjust their portfolios affecting the risk of the fund.

The intent of this study is to further examine the impacts the management structure employed by the fund complex has on investor risk. Finance theory would suggest that by managing a portfolio of funds with different objectives, the manager would be knowledgeable enough to diversify away unnecessary individual fund risk. To the contrary, after accounting for the market capitalization and fund objective, management structure significantly affects mutual fund risk. Funds operated within the MFM system have statistically significant more risk exposure than their peers. However, this increase in risk was not associated with increased risk- and objective adjusted returns. We find that fund risk exposure is related to the diversity in the multiple fund objectives managed as well as previous return and manager tenure. These findings suggest that senior mangers whom operate older established multiple funds take more liberties in their security selections, increasing the risk exposure of one of the funds they manage.

3. Data and Sample Description

The MorningStar database provides information regarding management structure for mutual funds thus allowing funds to be categorized as follows: funds managed by individual managers, the number of funds managed by these individual managers, and the type of fund managed. In this study, we analysis three years of mutual fund data from 1999 to 2001. There are total 14588 observations over the three year period with 4917 unique funds. A fund is included in the sample if it is a U.S. equity fund categorized by MorningStar and CRSP Mutual Fund Database and it is managed by a fund manager who has been in the industry during the entire sample period. Furthermore, to test whether risk of a fund can affect that of the other funds managed by the same manager, we separate mutual fund managers into two groups; unitary (single-fund) managers (UFMs) whom manage only one fund during the sample period and multi-risk managers (MRMs) whom manage more than one risk-category of fund in at least one of the sample years. Therefore, the number of risk-categories of funds managed by a MRM is a time variant variable. Keeping the same group of managers in the sample helps analyze the changes in the manager's behavior when the other factors change over time. The final sample size is 1619 funds operated by 430 fund managers over three year sample period.

To separate mutual fund managers into UFMs and MRMs, we classify each fund managed by a manager as a *high-risk* or *low-risk* fund based on the fund groups categorized by CRSP Mutual Fund Database (see Appendix A1). These objectives are identified by Source Standard and Poor's Micropal. For the purpose of this study, we keep only U.S. equity funds including *AG (Aggressive Growth), BL (Balanced), GI (Growth and Income), IN (Income), and LG (Long-term Growth).* A fund is a *high-risk* fund if the fund's objective is *AG (Aggressive Growth) or LG (Long-term Growth)*;

otherwise a fund is a *low-risk* fund. If mutual fund performance is partly due to manager's ability to minimize risk exposure, then management structure should have an impact on the results. Alternatively, if the unitary fund management structure and the multiple fund management structure have similar risk exposure, then performance risk differentials should be negligible.

The total number of fund managers in the sample is 430 of which 368 are unitary fund managers and 62 are multi-risk managers. Table 1 provides the number of funds managed by a manager. Most of the managers (82%) operate one fund and about 18% of managers operate more than one fund given a year. Table 2 lists the number of funds in the sample by year. The total number of funds in the sample is 1619 which consists of 1182 funds being unitarily managed and 437 funds managed by multi-fund managers. There is a steady increase in the number of managers in both samples, suggesting that there are merits and benefits of both types on management structures.

Table 1 – Number of funds managed by a manager

	Number of funds							Number of
Year	1	2	3	4	5	6	7	managers
1999	369	42	14	4	1	0	0	430
2000	352	58	13	5	0	2	0	430
2001	339	66	16	5	1	1	2	430
Percentage	82.2%	12.9%	3.3%	1.1%	0.2%	0.2%	0.2%	100%

Table 2 – Number of funds by year

	Number of funds		
Year	Total	UFM	MRM
1999	516	382	134
2000	539	392	147
2001	564	408	156
Total	1619	1182	437

4. Methodology

4.1

Estimating the managerial structure-risk relationship, we control for the determinants of risk previously identified in the literature, such as past performance, size, age, expense ratios, and manager tenure (see, e.g., Khorana, 2001, Chevalier and Ellison, 1997, Sirri and Tufano, 1998, and Nanda, Wang, and Zheng, 2000). As in Khorana (1996), we use the objective and category-adjusted returns as separate performance measures. We measure abnormal returns as the difference in returns between the objective sample and the equal-weighted fund style category to which the fund belongs. For example, the style category-adjusted return for fund *i* during month *t* is:

$$RAR = [\prod(1 + R_{i,t}) - 1] - [\prod(1 + R_{o,t}) - 1] \quad (1)$$

where $R_{i,t}$ is the return for fund *i* in month *t*, and $R_{o,t}$ is the equal-weighted return of all funds in fund *i*'s category in month *t*. The average category-adjusted return during month *t* is calculated as

$$RAR_t = \frac{1}{N}\sum RAR_{i,t} \quad (2)$$

where N equals the number of funds that have a multiple fund management or unitary fund management structure. Finally, the cumulative category-adjusted return over *k* event months is simply the sum of RAR *t*,

$$CRAR_{t,t+k} = \sum RAR_t \quad (3)$$

As demonstrated in Table #, funds within the same category have different investment objectives and exposed to different risk factors. Thus, we construct a performance measure that uses the equal-weighted average of all funds with the same investment objective as the benchmark, OAR. The use of the objective-adjusted performance measure is consistent with the argument put forth by Morck, Shleifer, and Vishny (1989) that firms make their managerial replacement decisions based on the industry benchmarks. The advantage of this benchmark is that it better controls for risk than the broader style category-based benchmark. However, both calculations measure fund performance relative to other managers in the peer group.

To compute the tracking error, I follow Ammann and Zimmermann (2001), and use the square root of the non-central second moment of deviation according to the following equation,

$$TE_i = \sqrt{((\sum_{t=1}^{n}(R_{i,t} - R_{bench,t})^2/(n-1))} \quad (6)$$

where $R_{i,t}$ denotes the return of the tracking fund in time *t*, $R_{bench,t}$ the return of the pre-determined benchmark portfolio in period *t*, and *n* is the sample size.

To calculate the tracking-error and style-drift variables, I first classify each fund according to the Morningstar investment style grid. I then selected a benchmark for each fund based on the above classification. Following Brown and Harlow (2006), I selected the Russell group of style benchmarks, which are available online from the Frank Russell Company. As in Chan et al. (2002) we take the absolute difference in the factor loadings from a regression of a fund's returns on the Fama-French factors over consecutive sub-periods. I regress each fund's returns over the last 12 months on the benchmark returns and take 1-R^2 as the measure of style-drift.[1] Thus there are four risk exposure variables utilized in this study; Fama/ French style-drift, Russell Style-drift, 12 month Tracking-Error and 24 month Tracking-Error

[1] There are several broadly similar approaches to estimating style-drift. Brown and Harlow (2006) use the standard deviation of differences in returns relative to a benchmark that reflects the investment style of the fund and 1-R^2 from a regression of the fund returns on the benchmark. Chan et al. (2002) take the absolute difference in the factor loadings from a regression of a fund's returns on the Fama-French factors over consecutive sub-periods. Amman and Zimmerman (2001) take the standard deviation of the residuals from a regression of the fund's returns on the returns of its benchmarks. Brown and Harlow (2006) find that the results are not sensitive to the approach taken.

4.2

We conduct the analysis in two ways. Similar to Jain and Kim (2006), we first use the funds managed by the UFMs as a benchmark to match each one of the funds managed by the MRMs with a fund from the unitary fund group using a matched score defined as follows:

$$\sum_{i=1}^{N}\left(\frac{X_i^{Sample}-X_i^{Match}}{\left(\frac{X_i^{Sample}+X_i^{Match}}{2}\right)}\right)^2 \qquad (5)$$

where i is the matching criteria; $i \in$ {Year, Category. NAV}, X_i^{sample} is the value of one of the i^{th} matching criteria for the fund managed by a multiple fund manager, X_i^{match} is the value of one of the i^{th} matching criteria for the fund managed by a unitary fund manager.

The selected matching criteria includes the year, fund objective, and the size of the fund measured by the net asset value. Using Equation (5), the match score is computed by finding the closest matched attributes between the fund managed by a multiple fund manager and the fund managed by a unitary fund manager. The smaller the score, the better the fund is matched. We examine the mean and median differences of NAV (Net Asset Value), Fund Age, and Manager's Tenure between the funds managed by UFMs and MRMs. We find no significant differences between these two groups of funds. Therefore, the sample is well matched Table 3 reports the results of the matching score methodology.

MFM fund vs. UFM fund characteristics

T-test and Wilcoxon signed-ranked test are used to test the mean and the median differences between the multi-risk funds and the matched funds, respectively. Both tests show no significant differences between the means and medians of the sample and match funds.

Table 3- Matching Score Results

		Multi-Risk Fund		Unitary Fund	
Fund characteristics	Obs.	Mean	Median	Mean	Median
NAV (in million)	437	547	89.6	538	91.8
Fund Age (in year)	437	9.75	5.42	9.52	6.33
Manager's Tenure (in year)	437	5.54	4	5.84	5

For each fund managed by a MFM, we construct a style-differential variable, *Style Differential*, which measures the difference in each one of the style deviation measures between the sample and match funds.

$$Style\ Differential_i^k = Style\_deviaiton_i^{Sample} - Style\_deviation_i^{Match} \qquad (6)$$

where $Style\ Differential_i^k$ is the difference in style deviation measure *k* between the sample and match fund *i, where* $k \in \{ffstyledrift, russelstyledrift, trackingerror12mo, trackingerror24mo\}$, $Deviation_i^{Sample}$ is one of the style deviation measures of the sample fund *I*, $Deviation_i^{Match}$ is one of the style deviation measures of the match fund *i*.

We compare each one of the style deviation measures of the sample fund with that of the match fund using the one with the highest *Style Differential*. The reason of keeping only one fund managed by a MFM in given a year is that we hypothesize that the high (low) risk fund managed by a multiple fund manager can be affected by the low (high) risk funds. Therefore, not all funds by a MFM would have high style drift. If we pool all funds managed by a MFM, we will not see the difference between the sample and match funds; the style-drift of the high and low funds would be cancelled out. Therefore, we test the mean difference between the sample and match funds using all style deviation measures and the results are presented in the results section.

Second, we use a random effect panel data model to test if managing MFM funds increases the style deviation of these funds.. In our sample, we define a MFM as a manager who manages more than one fund in at least one of the sample years. We include fund level and manager characteristics to estimate the following equation (see Appendix A2 for the description of each variable).

$$\begin{aligned}\text{Style Deviation}_{i,j} &= a_0 + a_1\text{Previous Return}_{i,j} + a_2\text{Turnover}_{i,j} + a_3 NAV_{i,j} + a_4\text{Manager Tenure}_{i,j} \\ &+ a_5\text{Fund Age Year}_{i,j} + a_6\text{Expense Ratio}_{i,j} + a_8\text{High - Low}_{i,j} + a_9 Multiple \\ &+ a_{10}\text{Year1999} + a_{11}\text{Year2000} + e_i \qquad (7)\end{aligned}$$

where *i* is for mutual fund *i* and *j* is year, $j \in \{1999, 2000, 2001\}$

This analysis helps us see both the cross sectional and time series effects of managing multilpe funds on the fund's style deviation. If a manager simultaneously manages both high-risk and low-risk funds, then at least of one of the funds would tend to have higher style deviation than the average fund within the objective.

5. Results

5.1 Matched Sample Analysis

The results of the matched sample analysis are presented in Table 4. In all four measures of style deviation, the highest style differential sample funds managed by MFMs on average have significantly higher style deviation than the match funds when the MFMs managed both high- and low-risk funds while the difference is not statistically significant for the same group of managers who managed only a single category of funds in a year.[2] In addition to the style deviation measures, we also show the turnover ratio of the same groups of funds in Table 4. The funds managed by MFMs show significantly higher trading activity than the match funds during the year when the manager operates multiple funds.

The "High-Low" column represents the mean style deviation for the funds managed by the MFMs during the year when the managers managed both high and low-risk funds while the

[2] The only exception is under the russelstyledrift. The mean difference is significant at the 10% level.

"Single" row represents the mean style deviation for the funds managed by the same group of managers during the year when the manager operates the same fund. The significance level of the mean difference between the sample and match funds is indicated by 'a' (at the 1% level) and 'c' (at the 10% level) next to the mean under the *'Match'* rows.

Table 4 – Sample funds vs. match funds

	MFM Sample	UFM Match
Fama/ French style-drift	0.1265	0.0570[a]
Russell style-drift	0.2793	0.1171[a]
12 Month tracking-error	6.3180	4.9510[a]
24 Month tracking-error	6.1797	5.0730[a]
Turnover Ratio	98.2326	41.8721[a]

5.3 Panel Data Analysis

In this section, we present the results of the panel data analysis. In the sample, we include the UFMs and MRMs. UFMs are the managers who consistently manage only one fund during the entire sample period while the MRMs are the managers who manage at least a high and low risk funds simultaneously during the sample period. Therefore, we study how the management structural change affects a fund's style deviation. Using four measures of style deviation for the funds managed by a MFM, we only keep the one with the highest style deviation. We use a categorical variable *High-Low* to capture the MFMs behavioral change which equals 1 if a MFM manages both high- and low-risk funds in a year and 0 if a MFM manages single category of funds in a year. The results are shown in Table 5.

The coefficients of *High-Low* are positive and statistically significant across all style deviation measures. The results are consistent with our hypothesis that if a manager manages more than one fund risk category, at least one of the funds that he/she manages will have higher style deviation. The insignificant coefficients of *Multi* show that the high deviation is not a result of a fund manager's tendency in taking inappropriate level of risk but instead is resulted from the fact that he/she managed different risk categories of funds.

Consistent with Brown, Harlow andStarks (1996) we find that multiple fund managers tend to have a larger style-drift following a year of inferior preference. This suggests that underperforming multiple fund managers increase their risk exposure in an attempt to increase their fund's performance. Similarity, the positive and statistically significant tracking-error variable suggests that MFM are attempting to increase fund performance by deviating from the fund's state objective. The positive relation between the tracking-error and previous performance can be explained by the fact that managers are compensated and recognized for their ability to outperform the benchmarks.

Other variables also explain the style deviation. The positive and significant coefficient of *Turnover Ratio* implies that actively managed funds on average would deviate more from its stated objective. The positive and significant coefficient of *Manager Tenure* shows that a younger manager would manage the funds more carefully to meet the fund's objective while an older fund manager is more likely to deviate from the objective. A negative coefficient of Fund Age shows that an old fund deviate less from its objective even though the coefficient is significant at the 10% level under (1) and not significant for the other three measures.

Table 5 – Panel Data Analysis (Fixed Effect vs. Random Effect Models)

Panel A: Fixed effect model

	(1) Fama/ Fench Style-drift	(2) Russell Style-drift	(3) 12 Month Tracking-error	(4) 24 Month Tracking-error
Prev. 1yr Return	-0.0001	-0.0005	0.0034	-0.0012
	(1.27)	(2.10)*	(1.80)+	(0.82)
Turnover Ratio	-0.0001	0.0001	0.0017	0.0017
	(0.89)	(0.46)	(1.47)	(1.94)+
NAV	-1.00e-06	2.02e-07	-5.36e-06	4.76e-05
	(0.47)	(0.05)	(0.15)	(1.70)+
Manager Tenure	0.0013	0.0008	-0.0709	-0.0521
	(0.77)	(0.22)	(2.23)*	(2.13)*
Fund Age	-0.0005	-0.0006	-0.0114	-0.0087
	(0.91)	(0.52)	(1.17)	(1.16)
Expense Ratio	0.0187	-0.0040	0.0345	-0.0701
	(4.15)**	(0.17)	(0.18)	(0.48)
High-Low	0.0301	0.0939	0.7850	0.6579
	(1.65)	(2.34)*	(2.32)*	(2.41)*
year1999	0.0697	0.1196	-2.4854	-1.2139
	(11.25)**	(9.24)**	(23.35)**	(14.66)**
year2000	0.0534	0.1373	-0.0312	-0.8640
	(8.97)**	(10.94)**	(0.31)	(10.99)**
Constant	0.0527	0.1583	7.3363	7.1986
	(3.48)**	(3.42)**	(19.84)**	(25.15)**
Observations	1136	1097	1081	1077
Num of Manager	425	409	407	407
R-squared	0.22	0.20	0.60	0.34

Absolute value of t statistics in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Panel B: Random Effect Model

	Fama/ Fench Style-drift	Russell Style-drift	12 Month Tracking-error	24 Month Tracking-error
Prev. 1yr Return	-0.0002	-0.0007	0.0055	0.0003
	(1.84)+	(3.03)**	(2.95)**	(0.23)
Turnover Ratio	0.0001	0.0003	0.0030	0.0028
	(2.55)*	(3.96)**	(3.88)**	(4.35)**
NAV	-1.06e-06	-2.10e-06	-8.93e-06	2.08e-06
	(1.62)	(1.61)	(0.59)	(0.16)
Manager Tenure	0.0051	0.0102	-0.0346	-0.0304
	(6.12)**	(6.03)**	(1.86)+	(1.93)+
Fund Age	-0.0006	-0.0010	-0.0058	-0.0061
	(1.81)+	(1.45)	(0.82)	(1.05)
Expense Ratio	0.0158	0.0350	0.0746	0.0595
	(6.18)**	(4.63)**	(0.86)	(0.79)
High-Low	0.0341	0.0824	0.7388	0.6204
	(2.09)*	(2.37)*	(2.36)*	(2.42)*
Multi	-0.0079	0.0101	-0.3704	-0.3183
	(0.47)	(0.29)	(0.99)	(0.98)
year1999	0.0752	0.1344	-2.4408	-1.1880
	(13.50)**	(11.55)**	(25.19)**	(15.59)**
year2000	0.0570	0.1490	-0.0524	-0.8801
	(9.86)**	(12.30)**	(0.52)	(11.40)**
Constant	0.0199	0.0299	6.8605	6.8165
	(2.19)*	(1.48)	(30.86)**	(35.52)**
Observations	1136	1097	1081	1077
Num of Manager	425	409	407	407

Absolute value of z statistics in parentheses
+ significant at 10%; * significant at 5%; ** significant at 1%

Conclusion

While previous literature helps us understand the replacement-performance relationship of mutual fund managers (Khorana (1996, 2001)), we know little about how the managerial structure of mutual fund complexes influence manager behavior. This study is the first to identify fund management structures that have a significant impact to the risk exposure of the funds.. In addition, this study identifies the potential conflict fund complexes encounter when attempting to maximize shareholder value at the expense of investors.

This study provides a comprehensive and integrated examination of mutual fund management structure by analyzing a large set of mutual funds and a thorough list of

fund-specific characteristics. Given the varying performance of different mutual funds and the conflicting findings of prior research, the purpose of this present study is to identify specific factors linked to overall fund performance. We find that the management structure that mutual fund complexes employee have a significant effect on the risk exposure of the individual fund managed. On average, a multiple fund management structure, where a fund manager operates multiple funds simultaneously, has a 7% increase in objective style-drift risk exposure than the unitary fund management structure. However, this increase in risk exposure is not accompanies by an increase in fund performance.

Contrarily, we report that the tracking-error for the multiple fund management sample is positivily correlated with the previous performance of the fund. This findings suggest that managers under the MFM structure employ an increase risk exposure strategy to increase fund performance. This explanation is consistent with the notion that managers are compensated for their ability to outperform the benchmarks of their objectives and are willing to increase fund risk to achieve this superior performance. The results further indicate that older and established funds and fund managers are more likely to increase risk exposure. Our research has implications for the structural design of mutual fund investment companies and the regulation of this industry.

In conclusion, a large portion of mutual fund excess performance is idiosyncratic and remains unexplained by fund characteristic variables. However, once an investor settles on a general investment objective, the expected fund performance can be significantly improved by choosing those funds that are managed by a manager that operates a single fund.

References:

Alexander, G. J., Cici, G. and Gibson, S., 2007, Does Motivation Matter when assessing Trade Performance? An Analysis of Mutual Funds, The Review of Financial Studies, 20, 125-150.

Baer, M., Kempf, A. and Ruenzi, S., 2006, Team Management and mutual funds, CFR Working Paper No. 05-10, University of Cologne.

Bers, M. K. and Madura, J., 2000, The performance persistence of closed-end funds, Financial Review, 35, 33-52.

Bertin W.J. and L. Prather, 2008, Management Structure and the Performance of funds of mutual funds, Journal of Business Research, 1-6.

Bertin W.J., Henker, T., and L. Prather, 2004, Mutual fund characteristics, managerial attributes, and fund performance, review of Financial Economics, 13, 305-326.

Brown, Stephen J., and Geotzmann, William N., 1997, “Mutual fund styles”, Journal of Financial Economics, 43, 373-399

Brown, K. and W. Harlow, 2006, Staying the course: Performance persistence and the role of investment style consistency in professional asset management, Unpublished Working Paper, University of Texas- Austin.

Busse, Jeffrey, 2001, Another Look at Mutual Fund Tournaments, *Journal of financial and Quantitative Analysis* 36, 53-73.

Chevalier, J. and G. Ellison, 1997, Risk Taking by Mutual Funds as a Response to Incentives, *Journal of Political Economy*, 105: 1167-1200

Chevalier, J. and G. Ellison, 1999, Career Concerns of Mutual Fund Managers, *Quarterly Journal of Economics* 114, 389-432.
Chevalier, J. and G. Ellison, 1999, Are Some Mutual Fund Managers Better than Others? Cross-Sectional Patterns in Behavior and Performance, *Journal of Finance* 54, 875-900.
Chordia, T., 1996, The Strucuture of Mutual Fund Changes, Journal of Financial Economics, 41, 3-39.
Daniel, Kent, Mark Grinblatt, Sheridan Titman, and Russ Wermers, 1997, Measuring Mutual Fund Performance with Characteristic-Based Benchmarks, *Journal of Finance* 52, 1035-1058.
diBartolomeo, Dan, and Witkowski, Erik, 1997, "Mutual fund misclassification: evidence based on style analysis", Financial Analysts Journal, September/October, 32-43
Droms, W. G., and Walker, D.A., 1996, Mutual Fund investment performacen, Quarterly Review of Ecomincs and Finance, 36(3). 347-363.
Edelen, R. M., 1999, Investor flow and the Assessed performance of Open-end Mutual Funds, Journal of Financial Economics, 53, 439-466.
Elton, E.J., Gruber, M.J., Das, S., and Hlavka, M., 1993, Efficiency with costly information: A reinterpretation of evidence for managed portfolios, Review of Finance Studies, 6(1), 1-22.
Elton, Edwin J., Martin J. Gruber, and Jeffrey Busse,2004, Are Investors Rational? Choices among Index Funds, *Journal of Finance*, Vol. 59, No. 1,
Friend, L., Blume, M. and Crockett, J. ,1970, Mutual Fund and other institutional investors, New Yort: McGraw-Hill.
Goetzmann, W. N., and Ibbotson, R. G., 1994, Do winers repeat? Patterns in mutual fund performance, Journal of Portfolio Management, 20, 9-18.
Golec, J.h., 1996, The effects of mutual fund managers' characteristics on their portfolio performance, risk, and fees, Financial Services Review, 5(2), 133-148.
Grinblatt, Mark, and Sheridan Titman, 1989, Mutual Fund Performance: Analysis of Quarterly Portfolio Holdings, *Journal of Business* 62, 394-415.
Grinblatt, Mark, and Sheridan Titman, 1992, The Persistence of Mutual Fund Performance, *Journal of Finance* 47, 1977-1984.
Grinblatt, Mark, and Sheridan Titman, 1993, Performance Measurement without Benchmarks: An Examination of Mutual Fund Returns, *Journal of Business* 66, 47-68.
Grinblatt and Titman (2002, 2nd ed.; 1997, 1st ed.), Financial Markets & Corporate Strategy, Irwin/McGraw-Hill.
Grinblatt, Mark, Sheridan Titman, and Russ Wermers, 1995, Momentum Investment Strategies, Portfolio Performance, and Herding: A Study of Mutual Fund Behavior, *American Economic Review* 85, 1088-1105.
Gruber, Martin J., 1996, Another Puzzle: The Growth in Actively Managed Mutual Funds, *The Journal of Finance* 51, 783-810.
Ippolito, R., 1989, Efficiency with costly information: A study of mutual fund performance, 1965-84, Quarterly Journal of Economics, 104, 1-23
Ippolito, R., 1992, Consumer reaction to measures of poor quality: Evidence from the mutual fund industry. *Journal of Law and Economics* 35, 45-70.

Ippolito, R., 1993, On the studies of mutual fund performance, 1962-1991, Financial Analysze Journal, 49, 42-50.
Jain, P.K., and Kim, J.C., 2006, "Investor Recognition, Liquidity, and Exchange Listings in the Reformed Markets", Financial Management, 35, 21-42
Jensen, M.C. (1968), The performance of mutual funds in the period of 1945-1964, Journal of Finance, 23, 16-26.
Khorana, A., (1996): Top management turnover: An empirical investigation of mutual fund managers. *Journal of Financial Economics*, vol. 40, 403-427
Khorana, A., 2001, Performance changes following top management turnover: Evidence from open-end mutual funds, *Journal of Financial and Quantitative Analysis* 36, 371-393.
Kim, Moon, Shukla, Ravi, and Tomas Michael, 2000, "Mutual fund objective misclassification", Journal of Economics and Business, 52, 309-323
Nanda, V., Narayanan, M. P., Warther, V. A., 2000. Liquidity, investment ability, and mutual fund structure. *Journal of Financial Economics* 57, 417-43.
Mahoney, P.G.,2004, Manager-Investor Conflicts in Mutual Funds, Journal of Economic Perspectives, 18, No. 2, 161-182.
Nada, V., Narayanan, M.P., and V.A. Warther, 2006, Liquidity, Investment Ability, and Mutual Fund Structure, Journal of Financial Economics, 57, 417-443.
Nanda, V., Wang, Z. J., Zheng, L. 2004. Family values and the star phenomenon. *Review of Financial Studies* 17, 667-698.
Sharpe, W.F., 1966, Mutual Fund performance, Journal of Business, 39, 119-138.
Sirri, E.R. and Tufano, P., 1998, Costly search and mutual fund flows, Journal of Finance, 53, 1589-1622.
Wermers, Russ, 2000, Mutual Fund Performance: An Empirical Decomposition into Stock Picking Talent, Style, Transactions Costs, and Expenses, *Journal of Finance* 55, 1655-1695.
Zhao X., 2004, Why are some mutual funds closed to new investment? Journal of Bank Finance; 28(8): 1867-87.

Appendix A1. ICDI's Fund Objective Code

Code	Description
AG	Aggressive growth
BL	Balanced
BQ	High quality bonds
BY	High yield bonds
GB	Global bonds
GE	Global equity
GI	Growth and income
GM	Ginnie Mae funds
GS	Government securities
IE	International equities
IN	Income
LG	Long-term growth
MF	Tax-free money market fund
MG	Government securities money market fund
MQ	High quality municipal bond fund
MS	Single-state municipal bond fund
MT	Taxable money market fund
MY	High-yield market fund
QI	Option income (write covered options)
PM	Precious metals
SF	Sector funds
SP	Special funds (unclassified)
TR	Total return
UT	Utility funds

Appendix A.2 – Descriptions of variables

(1) Style Deviation: An intentional or unintentional departure from the stated mutual fund objective state in the prospectus. Style deviation utilizes one of the deviation measures including the Fama/ French Style-drift, Russell Style-drift, 12 month tracking-error and 24 month tracking-error.
(2) Prev. 1yr Return: Previous one year fund return is calculated as the change in the mutual funds net asset value over the previous twelve month period per shareholder.
(3) Turnover: Turnover ratio is the percentage of a mutual fund' holdings that are sold every year.
(4) NAV: Net assets value (in million) is the value of an mutual fund's shares calculated by subtracting any liabilities from the market value of the firm's assets and dividing the difference by the number of share outstanding.
(5) Manager Tenure: The number of years since the manager managing the fund.
(6) Fund Age: The number of years since inception
(7) Expense Ratio: Expense ratio represents the recurring management fees that a fund company charges its shareholders each year, expressed in terms of a percentage of the fund's assets.
(8) High-Low: A categorical variable which takes the value of 1 if the fund is managed by a multi-risk manager and the manager manages both high- and low-growth (risk) funds in the given year, and 0 otherwise.
(9) Multi: A categorical variable which takes the value of 1 if a manager is a multi-risk manager and 0 otherwise.
(10) Year1999 and Year2000: Year binary variable that account for the 1999 and 200 calendar year.