Investment Styles, Fees, & Returns Among Individually Managed & Team Managed Mutual Funds

The Honors Program
Senior Capstone Project
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ABSTRACT

Identifying a successful mutual fund investment involves a crucial analysis of alternatives, all of which influence the true benefit of the investment. Major considerations must include performance, management and fees; which ultimately determine investment returns. Studies have shown that team managed mutual funds exhibit similar risk adjusted performance to individually managed mutual funds, however studies lack this comparison of performance based on fund fees and investment objective. This gap in research implies that there is an opportunity to examine how fund management, investment objective, and fund fees affect overall returns to the investor. Using the 2010 Center for Research in Security Prices (CRSP) database, this study provides an examination of team managed and individually managed mutual funds with given investment styles on the basis of fees and overall returns. This study finds empirical evidence that team management has a significant negative effect on equity objective mutual funds, while having a positive impact on Debt and Equity combination funds. In addition, our research concludes that team management has no significant effect on funds whose primary focus is debt. Across the majority of fund objectives, the added benefit of team management in the mutual fund industry continues to be outweighed by the increased cost of a team managed operating structure.

INTRODUCTION

The mutual fund industry has increasingly become an instrument for investors, both knowledgeable and new to the industry, to generate desired returns based on a given amount of risk. A large variety of mutual funds are offered, ones which cater to the diverse needs of the worlds investors. Mutual funds for higher risk, speculative strategies can be found, as well as funds which play very conservatively and look to achieve lower, more stable returns.

The United States is a major hub for mutual fund investment, and as can be seen in Figure 1 below, holds 48% of worldwide mutual fund assets. Within this slice of mutual fund assets totaling $11.1 trillion, 33% or $3.6 trillion is invested in domestic equity funds, and 11% or $1.2 trillion is invested international equity funds. Relating to other fund types investigated in this study, bond funds total 20% or $2.2 trillion while hybrid funds account for $666 billion. Thus, this study attempts to analyze fund types which comprise over 70% of mutual fund assets. With such a large amount of assets at work, and many investors relying and betting on the returns of these funds, it is important to understand if one type of fund may have an advantage over another.

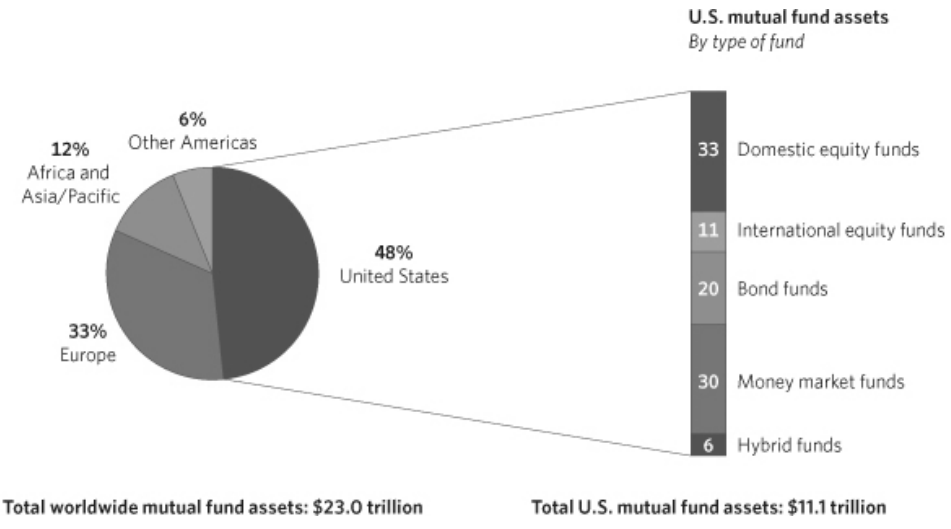

Figure 1: Worldwide Mutual Fund Market – Percentage of Total Net Assets 2009 (2010 Investment Company Fact Book)

Due to the recent economic turmoil, investors risk aversion has increased, meaning investors are now willing to take less risk in the mutual fund and equity markets than in previous decades.

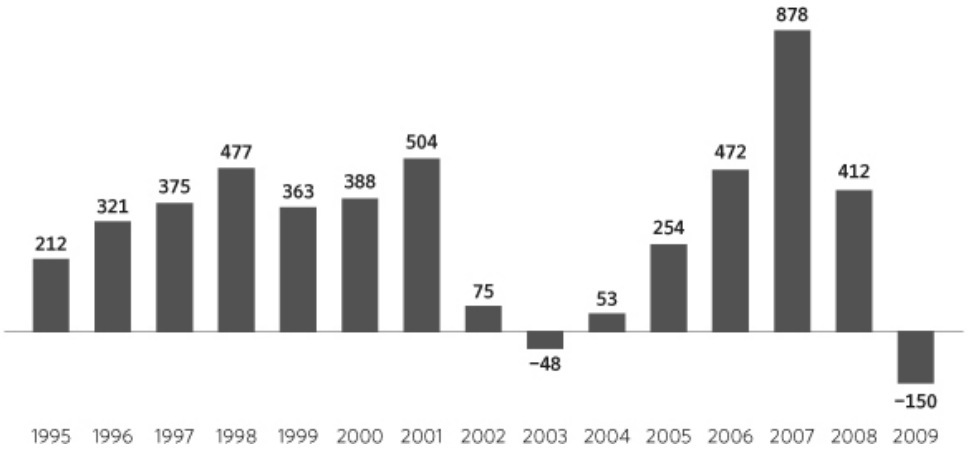

Figure 2: Net Flows to Mutual Funds 1995-2009 (Billions) (2010 Investment Company Fact Book)

This trend has caused net flows to mutual funds to decrease by $150B in 2009, as can be seen in Figure 2, signifying investor's uncertainty in the markets (2010 Investment Company Fact Book, 2010).

More specific to this study, which focuses on mutual fund objective type, investors have continued to withdraw cash from mutual funds. As seen in Figure 3 below, withdrawals totaled $9B in 2009 but were still much less than the $234B withdrawn due to the market turmoil of 2008. This is mainly due to the correlation between equity inflows and stock market performance (2010 Investment Company Fact Book, 2010).

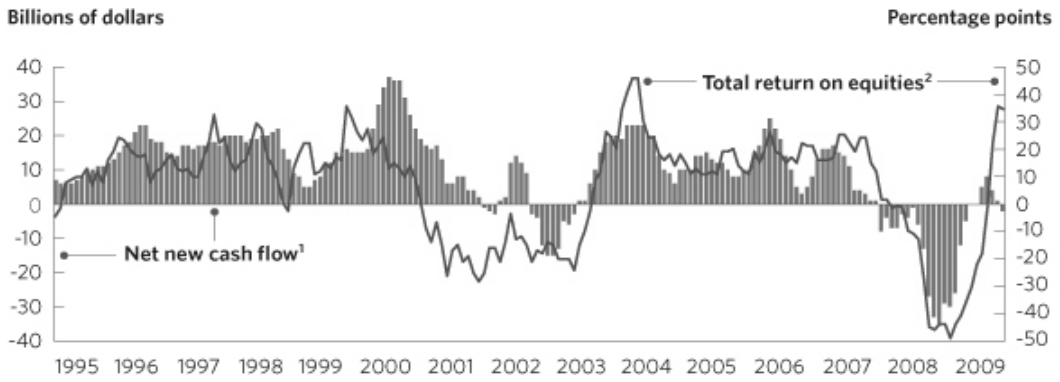

Figure 3: Net Flows to Equity Funds Related to Global Stock Price Performance 1995-2009 (2010 Investment Company Fact Book)

Age is another key factor in gauging the risk tolerance of investors. The United States is home to an aging population, and as they get older, they are willing to take on less risk. Typically in one's life cycle, a younger investor will take on more risk due to expected revenue from work over the rest of their life. An older investor, perhaps nearing retirement, will look for fixed income opportunities with little risk to ensure they are able to maintain their standard of living. Figure 4 below depicts the changes in willingness to take substantial investment risk over time by percentage of households. Shown below, individuals ages 50 and older are willing to take significantly less risk in their investments than the younger generations. For example, in 2009 only 8% of households 65 or older were willing to take on above average investment risk, while 26% of households 35 to 49 were willing to take on excess risk. Thus the aging of the population may play an important fact in the demand for certain types of mutual funds in the future. This fact has important implications to this study, as team managed funds may offer the potential for less risk to the investor.

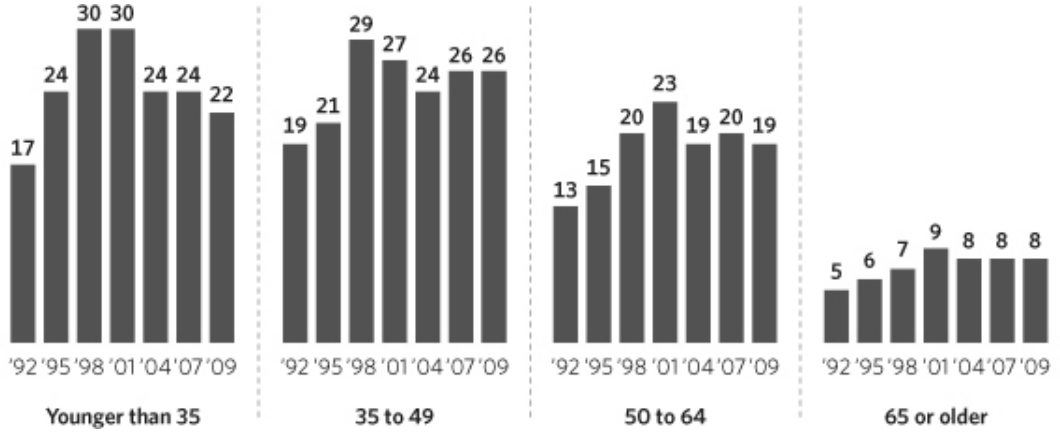

Figure 4: Willingness to Take above Average Risk or Substantial Investment Risk by Age (Percentage of Households) (2010 Investment Company Fact Book)

These trends of increasing investor risk aversion lead the question of what type of fund best serves investors given today's market characteristics. A given investor looks to maximize return for a given amount of risk, and as this study will examine, may be able to obtain greater return from funds whose decisions are made by a team of managers, rather than a single person. These funds that are team managed also tend to exhibit lower risk structures, offering stronger decisions to the investor for less risk. This argument will be discussed further later in the study, and was made prevalent by Blinder and Morgan (2005). In addition, fund fees have become a crucial selling point for mutual funds, and must be taken into account when calculating and analyzing investor returns.

A more recent trend in academia has been the analysis of many different characteristics that may be used to predict or affect fund performance. Examples include fund size, manager attributes, and price history of the fund. Chevalier & Ellison (1999) examine such details as the fund manager's age, tenure, required SAT scores of their undergraduate institution, and their MBA status to predict fund performance. Chevalier & Ellison (1999) believe strong management characteristics lead to strong investment performance, but suggest an untapped area of study based on management team size.

Middleton & Prather (2002) argue that team size, and in essence decision making, are based on two main theories. The first theory is called classical utility theory, and the second is called behavioral decision making theory. In classical utility theory, Arrow (1987) would argue that differing alternative approaches to the same problem should lead to the same maximizing choice and optimal outcome. He argues that this is the case whether the decision is made by an individual, group, or organization. Thus, Arrow (1987) argues individual and group decision makers should not vary in their performance.

On the other hand, the behavioral decision making theory as argued by Vollrath et al. (1989) asserts that when a given task is complex and completed under above average levels of uncertainty, group members pool their resources. Group members tend to integrate their knowledge and correct errors, thus producing superior performance and decision making compared to individuals. One aspect of research this study lacks however is the effect of team management on costs. It may be true that teams make superior decisions, however it is necessary to examine if those decisions lead to returns which outweigh the increased costs of team management. The rationale behind these studies and theories is clear; it is very important to understand the relationship between a manager's decisions and investment performance, as investor's risk and return are based on their decisions.

This study attempts to quantify the effects of management structure on fund returns, and identify on a risk adjusted basis where an investor is better off putting their money. As previously mentioned, investors risk profiles, willingness to invest, and overall feelings towards the markets are constantly changing. If there is an opportunity for an investor to have more certainty on a given investment decision, cash flows will flock there. This study aims to expand upon recent research, specifically Bliss et al. (2008) and Droms (2006) which still leave the management team size/structure question unexplained. According to Droms (2006) 54 million U.S. homes own mutual funds, of which 71% seek and rely on professional investment advice. This means that the majority of households investing in mutual funds are quite uninformed investors. In addition, for the majority of mutual funds, alpha is not statistically different from zero, meaning investors will benefit by either reducing costs or

obtaining more pre-investment information. If an investor can successfully learn new information or seek out lower cost funds they may be able to generate higher returns. By examining the hypothesis that team managed mutual funds do in fact provide higher risk adjusted returns than individually managed mutual funds, this study attempts to provide further evidence for how investors can make an informed investment decision.

LITERATURE REVIEW

Mutual fund management and performance has become a hot topic in recent research, as more and more individuals wonder where their money will be best invested. In the case of a typical investor, the most profitable destination for their funds will be dependent upon the style of fund they invest in, the manager's capabilities and decision making, his or her education level, the fees charged by the fund, some luck, and finally the amount of available investment information. Recent research has focused on many of these characteristics separately, attempting to quantify the effect each has on fund returns. Even more recently, studies such as Bliss et al (2008) have attempted to combine many of these effects in order to analyze the combined impact of such factors. This study looks to combine these factors in order to examine a new scenario, connecting fund fees, fund style, and fund performance in relation to individual and team management. The results of this study will attempt to demonstrate where an investor will be better off investing their money in regards to management structure and fees. It is first necessary, however, to understand the accumulation of studies leading to this point.

According to Sharpe (1991) two main assumptions can be made about mutual funds. The first is that before costs, the return on the average actively managed dollar will equal the return on the average passively managed dollar. Second, after costs, the return on the average actively managed dollar will be less than the return on the average passively managed dollar. Sharpe (1991) is arguing in this study that actively managed mutual funds do not benefit the investor, on average. He recommends a practice that is used prominently in the industry today, the process of benchmarking a defined, specific index in order to measure investment success.

One effect that this study fails to quantify is if a different type of management structure in actively managed funds will reduce this negative impact of costs and increase returns.

When comparing mutual fund management and performance, the question of predictability and sustained performance comes into play. Pozen (2002) defines mutual fund persistence as the idea that funds which have performed well continue to perform well. In addition, funds that do not perform well continue to underperform, regardless of manager change. To re-enforce this, Grinblatt (1993) studied mutual fund performance to find that over a given period, a fund that performed well in the first half of the period continued to perform well in the second half. On the other hand, funds that struggled and lagged in the first period tended to continue this effort in the second period. Although there are clearly exceptions in the mutual fund industry, Grinblatt's (1993) study does show there is a notion of predictability for mutual fund returns. Pozen (2002) also reflects that many times investors will hold onto poor performing funds due to cognitive dissonance, meaning investors keep revising their expectations to hope the fund will rebound. In addition, he mentions that over-performing funds do not charge higher fees than others, and thus cash flows run to these funds, which help create future positive performance.

Managers play a key role in the performance of the funds they oversee. After all, they are human, and thus are subject to varying emotions, irrational decision making, and different levels of risk tolerance. There are however characteristics of managers which help impact returns in a positive way. If an investor is able to predict or identify these characteristics in a fund manager, he or she may be able to increase their probability of abnormal returns. According to Golec (1996) investors can expect stronger risk-adjusted performance from a manager who is younger (less than 46yrs.) and has an MBA with long tenure at his/her fund (greater than 7 years). In this study, Golec (1996) also finds that well diversified low fee funds to perform better, perhaps supporting a more passive management style. In regards to returns, Golec (1996) argues that large management fees do not imply poorer performance; rather they often imply superior management skill and better returns. Very often as managers improve their track record and become more well-known and talented, they call for a larger

management fee or will leave the fund. He also mentions that controlling for fund type is very important in this type of study, citing its significant effect on the endogenous variables used. Areas for future study and extensions may include the combination effect of multiple managers in a single fund, as well as complementary characteristics they may bring to the table.

In a related study conducted three years later in 1999, Chevalier and Ellison (1999) investigate the relationship between fund performance, the manager's age, average SAT score, and MBA status. This study finds that those who have attended schools that require higher average SAT scores have higher risk-adjusted returns. This makes logical sense as a manager who is typically more intelligent will perform better, even if sometimes it is due to higher risk exposure. What this means is that some managers may in fact have superior raw talent than others, and can better predict and time the markets than their fellow portfolio managers. Again however, Chavalier and Ellison (1999) neglect to analyze the increased costs of such managers and subsequent fee adjusted returns. Chevalier and Ellison (1999) also reinforce the Golec (1996) study by finding that managers with MBA's outperform those without by 63 basis points per year. Moving further in this analysis, they discover that this difference is entirely due to MBA managers having more systematic risk. This may be a combination of more confidence in gray-area investment decisions as well as a better understanding of the business cycle.

Fund style is an additional method for determining the investment prospects of a given mutual fund. Specific fund styles may prove better able to cope with macroeconomic shifts, or benefit from changes in consumer attitudes, while others may suffer or lag. Goetzmann (1996) examines equity funds ranging from aggressive growth to income funds. Traditionally, funds typically fall under many pre-determined umbrellas for style such as "small-cap" or "growth." However, Goetzmann (1996) finds that many active funds have moved to much different styles, reflecting the influence of their managers rather than typical fund objectives. These funds fall into many new categories such as "trend-chasers" and "glamour managers." This point re-enforces the ideals that in the end, all managers are

human, and subject sometimes to questionable or irrational decision making. For all mutual funds, the investment policy statement outlines the funds objectives, however over time, as Goetzmann (1996) indicates, managers may move away from this. Such drives of managers to grow their fund and prestige to new heights may put investors at risk. Perhaps however, funds that stray towards new categories and lose focus could be curbed through team management, with more people monitoring fund focus and positioning.

Daniel et al. (1997) contends that investors who focus on more mature, established large funds will see a more reasonable fee structure, due to economies of scale for expenses, management fees, and trading costs. By doing so Daniel et al. (1997) argues the fund will be able to maintain a stable beta, keep return variance low, and ensure its survival. Based on their research, Daniel et al (1997) concluded that the amount by which the average mutual fund beats a mechanical strategy is under 100 basis points. This tends to be approximately the management fee. Based on this information, the best funds are those that have managers who change their investment style over time based on new market conditions and trends. If this zero-sum relationship between the fund's alpha and management fees exists, managers must attempt to do one of two things. The first option would be to lower fees, which is unlikely. The second is to increase returns, and based on the increased potential of group decision making, and two heads being superior to one, this is highly plausible. However, on the other side of the coin one must consider the potential for performance erosion due to added expenses and "decision making overhead" from a team of portfolio managers.

Moving towards a focus on the differentiation between an individually managed mutual fund and a team managed fund, Prather and Middleton (2000) examine managerial structure of mutual funds based on two main contrasting theories for decision making:

1. Classical Utility Theory – Differing alternatives to the same problem should lead to the same maximizing choice and optimal performance outcome, whether the decision is made by an individual, group, or organization. This theory implies that individual and group decision makers would not vary in their performance outcomes.
2. Behavioral Decision Making Theory – When a given task is complex and completed under high levels of uncertainty, group members tend to pool and

> integrate their resources. This leads to the correction of each other's errors, while producing superior performance compared to that of an individual.

Prather and Middleton (2000) maintain that there is no significant difference between the outcomes of team-managed and individually managed mutual funds. They do not doubt that teams make superior decisions, however believe these decisions require higher costs, which limit performance. This question of higher costs to limit performance will be quantified in this study. In addition, Prather et al. (2004) considers a 25 variable model to analyze the effect of fund factors on fund performance and agree that management structure does not have a major effect on fund performance. In addition, he provides that the more focused the portfolio manager (i.e. not involved in multiple funds), the more successful the fund will be. In this study, Prather et al. (2004) finds that management variables are not related to excess returns; rather most excess performance is determined based on the objective of the specific fund. There has been consistent debate over such topics in academic literature, as years of research have not yet found a consistent answer.

Karceski (2002) contends that portfolio manager's actions in bull and bear markets may influence the cash flows into and out of mutual funds. During bull markets, some managers will tilt their holdings towards high-beta stocks, thus offering more upside potential. This action will provide the fund with the greatest benefit should the market continue to rise. Because of this strong performance if there is in fact a bull market, investors risk aversion will fall as they commit more and more money to mutual funds, creating a retail client effect. In a bear market managers may be more inclined to focus their funds on safer, low beta stocks with high dividend payments, thus increasing the confidence that low risk returns will be created. During these times, cash flows to funds will slow down or even be negative, as investors seek preservation of their capital. Typically Karceski (2002) mentions the average mutual fund has a market beta of 1.05.

One final note crucial to the mutual fund industry, and studies about it, is the presence of survivorship bias in research. Because of its implications for skewing results, it is important to explicitly monitor in this study. Carhart et al. (2002) examines mutual fund survivorship,

concluding that the average bias for samples longer than 15 years is over 1%. In addition, they find that fund performance does tend to be truly consistent, and is unrelated to fund size and turnover. This study addresses the issue of survivorship by including both live and dead funds over the specified time period, thus not limiting results to only those funds which are still alive today. In order to address this, this study focused only on funds in recent years from 1995-2010.

The analysis of returns of mutual funds and how they may be affected by management style and strategy is a question at the forefront of mutual fund analysis. Lynch and Musto (2003) argue that funds only change strategy after poor performance, which is a logical explanation. They continue to assert that this means that funds with strategy changes will have dollar flow and performance that are less sensitive to past performance. The idea here is that funds that perform well will tend to ride it out and not change, and thus their performance can be better predicted. Those funds that hire new personnel and implement new techniques will be much more difficult to predict. These results are also consistent with the study of Chevalier and Ellison (1999), which maintains poor performer's that change managers suffer less cash outflow than those that keep the same manager.

Another factor taken into account in this study is fund size. Chen et al. (2004) focuses on diversified U.S. equity mutual funds. They conclude that fund size does in fact erode performance, both before and after fees and expenses. In addition, Chen et al. (2004) finds that the effect of fund size on returns is most pronounced for funds that invest heavily in small cap stocks, which suggests liquidity is an important reason that fund size erodes performance. When managing a growing portfolio of funds, it will reach a point where a single manager can no longer be fully capable of managing such an excess of funds, and it thus may run less efficiently.

Blinder and Morgan (2005) begin looking into the performance and decision making speed of funds managed by teams versus those managed by individuals. Based on their study, they contend that groups are not slower than individuals in decision making. They also find that group decisions, are on average better than individual decisions, whether made in unanimity

or majority rule. Blinder and Morgan (2005) would argue that because of this superior decision making by groups with no additional information, more heads are better than one, and recommend the use of committees for important decisions. The Blinder and Morgan (2005) findings have direct implications for this study, as they establish that teams on average make better decisions than individuals. In an industry such as mutual funds, where success and survival is based largely on manager decisions, this becomes crucial. The next question which this study attempts to analyze is how these decisions are reflected in higher costs, and how they will affect the investor's final returns.

Performance manipulation is also a very important mutual fund tactic which an informed investor must be cautious of when making an investment. It is possible, as Welch et al. (2007) shows for mutual fund managers to implement tactics and make trades in an effort to boost certain performance metrics and statistics. For example, a rebalancing strategy can yield a market beating Jensen's alpha 86% of the time, even when transaction costs are unrealistically high! By understanding that managers may be able to actively make adjustments to favorably affect their funds statistics, investors must be very informed of the mutual funds strategy compared to other funds of the same type.

Bliss et al. (2008) examines the comparison between individually managed and team managed mutual funds on the basis of risk. In this study, they find that team managed mutual funds have significantly lower risk than individually managed mutual funds, attributable to better team decision making. Contrary to common belief, Bliss et al (2008) concludes that team managed funds actually have lower expenses and loads than those of individually managed funds. These fees can be lower by up to fifty basis points per year. This may also be attributable to the sharing of costs and expenses between a family of funds, which may often be team managed. The Bliss (2008) study, like this study, controls for size, turnover, expenses and team management, yet implies that further research may be necessary regarding the specific team decision making process. In addition, future research may benefit from excluding family funds (where team management expenses can be shared) and examining the effect of team management on these independent funds. If family funds where expenses are

low are excluded, it may be that team managed funds actually provides expenses greater than the benefits they create, causing returns to suffer. Our study attempts to expand the Bliss et al. (2008) analysis, applying these metrics to analyze overall fund returns both before and after accounting for fees.

Continuing on the important topic of risk, Massa and Patgiri (2009) observe the relationship of incentives to mutual fund performance, and how these affect risk taken. This study finds that high-incentive managerial contracts induce managers to take more risk and reduce the funds probability of survival. In return for this, surviving funds with high incentives do typically deliver persistent higher risk adjusted returns. On average, the top 20% of high-incentive funds outperform the bottom 20% by 2.70% per year. Massa and Patgiri (2009) find that an increase of 1% in incentives typically leads to a nearly 1% increase in the annual volatility of monthly fund returns. In terms of survival of a fund, a 1% increase in incentives leads to a reduction in survival probability of 2%.

Thus based on the previous research done in this specific area, and this study's attempt to expand upon gaps identified in this research, we expect that team managed mutual funds provide a greater risk adjusted return than individually managed mutual funds of the same objective type. In addition, we expect the benefit of team management to be most profound for actively managed equity mutual funds. When examining debt funds, we expect team management to have an insignificant if not negative impact on fund returns, as team management in this objective type is not as prevalent in the industry. Using these hypotheses, this study provides an empirical study relating a comparison in performance of team and individually managed mutual funds based on fund size, turnover, expenses and other explanatory variables.

DATA & EMPIRICAL METHODOLOGY

The source of the equity mutual fund data used in this study, including performance information as well as fund characteristics (such as fees, management structure, and first offer dates) were obtained from the Center for Research in Security Prices (CRSP) database from

1995-2010. The CRSP database provides quarterly updates of managers, turnover, and expense ratios, as well as other data categories. Within this time period, this study considers 14,334 unique mutual funds based on the following restrictions. The study's sample includes both live and dead funds with total net asset values greater than twenty million dollars. In addition, this study focuses on the distinguishing identifier classifying each fund as individually managed or team managed. This information was also obtained using the CRSP database. For use in this study, monthly returns from the CRSP database were compounded to quarterly figures to ensure the observations matched. For the sake of having the most unbiased sample, this study applies standard regressions across multiple fund types, including general domestic equity, municipal bond funds, commodity funds, etc. In addition, our sample ranges from 1995 – 2010. This starting date for our data sample reflects our desire for consistency, as the reporting processes for CRSP data switched at the end of 1994 from Wiesenberger objectives to Lipper Classifications. By including both currently live fund observations as well as those funds which are currently dead but were at one point active this study eliminates survivorship bias.

Computation of Returns

Based on the documentation for the Center for Research in Securities Prices, returns for each mutual fund are reported on a monthly basis. In order to ensure that all the variables used in this study were on an apples-to-apples basis, these returns had to be changed to quarterly. This adjustment was done by compounding the returns of the three months which corresponded with a given quarter. For example, the observation returns for January, February, and March were compounded to yield the quarter 1 return.

Data Organization

Based on this study's restrictions and boundaries, it became necessary to ensure all data observations could be identified uniquely, and all information merged correctly to be on a quarterly basis. In order to do this, this study applies a series of filters to the CRSP data to place the data into quarterly buckets. Specifically, data for fees and/or fund style are placed into a quarterly bucket (1, 2, 3, and 4) and assigned a number to identify them with that

quarter and year. By doing this, our study allows us to account for the fact that fund fees, styles, or other characteristics may change over the lifetime of the fund.

Once the data set was compiled, it became necessary to organize the large number of mutual fund observations based on their fund objective, thus allowing us to see the impact of management structure across multiple fund types. In order to do this, mutual funds were assigned to one of seven objective buckets based on their Lipper Objective and Classification Codes as provided in the CRSP database. The buckets reflect the following objectives:

1. Domestic Equity – Mutual funds whose main focus is investment in 100% equities of companies within the United States.
2. Non-Domestic Equity – Mutual funds whose main focus is investments in 100% equities of companies outside of the United States.
3. Debt/Equity Combined Funds – Mutual funds whose portfolio mix consists of a combination of both equities and debt securities.
4. Government Debt – Mutual funds who invest solely in U.S. government and U.S. government agency securities.
5. Corporate Debt – Mutual funds whose main investment focus is in debt securities issued by corporations.
6. Municipal Debt – Mutual funds whose primary investment focus is that of debt securities issued by a city, other local governments or their agencies.
7. Materials & Commodities – Mutual funds which invest in securities relating to materials and commodities, such as Gold.

Mutual fund performance is primarily affected by factors such as size, turnover, fees, and yield; however this study attempts to identify the impact of these characteristics on team managed versus individually managed mutual funds. In addition, this study attempts to quantify the impact of fees on overall fund returns for multiple fund objectives. The results of this study were calculated using a regression analysis based on data in the CRSP database. The regression equation examines how fund returns (dependent variable) are affected by the fund being individually managed or team managed (indicator variable) as well as by other control variables (independent variables). Such other control variables include characteristics such as fee structure, turnover, yield, total net assets, etc. Following common practice when conducting mutual fund return studies, the three factors of the Fama-French model are also

included in the regression and are explained in detail below. The general regression equation is represented by Eq. 1

Eq. 1: Regression Model

$$FUNDRET - RISKFREE = \beta 0 + \beta 1MGMTTYPE + \beta 2TOTALFEES + \beta 3TURNOVER + \beta 4LOGTNALATEST + \beta 5SMB + \beta 6HML + \beta 7MRP + \beta 8YIELD + \varepsilon$$

Definition of Variables:

Dependent Variable:

1. Fund Returns-Risk Free Rate: Represents the quarterly compounded return for each fund as listed in the CRSP database on a percentage basis above that of the risk free rate.

Independent Variables:

2. Management Type: Indicates whether each fund is managed by a single portfolio manager, or a team of portfolio managers. This variable is crucial as previous research has found mixed results on the effects of team decision making and ultimately overall fund fees and returns. By accounting for this variable, this study adds an additional dimension to research previously done.
3. Total Fees: Represents the Total Fee Cost of a given mutual fund. This is a cumulative variable combining 12b1 fees (annual marketing and distribution fees), management fees (charge for active management), and the expense ratio for each mutual fund. In past studies, fee structure has been a major area of focus. This study allows this analysis to be expanded, by relating fee structure with management type.
4. Turnover: Represents the Turnover Ratio for each given mutual fund. This metric is calculated by dividing the aggregate sales or purchases of securities by the average 12-month total net assets of the fund. This ratio is expressed as a percentage of the fund. Turnover ratio is a very important metric to observe and compare with fees and returns as it may be indicative of the type of manager running the fund.
5. LOG Total Net Assets: The log of Total Net Assets of each fund is used in this study not only as a filter for funds over $20MM, but also to examine the relationship between fund size, performance, and fee structure. A total net assets variable or other similar size metric is common in research of this type, as fund size has repeatedly been an area of discussion in finance literature.
6. SMB: Small-Minus-Big is one of the three factors put forth in the Fama-French three factor model. This variable represents the spread in returns between small and large sized firms based on their market capitalization. This variable attempts to account for the difference in performance between large and small companies.

7. HML: High-Minus-Low is the second of the three factors expressed in the widely accepted Fama-French model. This variable represents the spread in returns between value and growth stocks. This metric is also known as the value premium assesses the outperformance of stocks with value characteristics over those with growth characteristics.
8. Rm-Rf: Market Risk Premium is the third factor included in the Fama-French model. This factor is a measure of the price of market risk, the return beyond that of the risk free rate which investors require in order to bear market risk with their investments.
9. Yield: Yield represents the ratio of income distributions to net asset value at the end of a given period. The Yield variable measures a manager's propensity to select high-dividend stocks. Because management fees are paid as a percentage of fund assets, the more the fund pays out the smaller its asset base and management fees. Managers may choose stocks that disburse large dividends as part of a value investment style, or to attract specific investors.

Table 1 below depicts these independent variables in chart form for quick reference. For summary statistics for all variables across all fund objective types, please see Table A2 in appendix A.

Table 1: Variable Descriptions

Independent Variables	**Description**
Management Type	Dummy variable indicating individually or team managed
Total Fees	Total fee cost of a given mutual fund
Turnover	Percentage of mutual fund holdings replaced in a given year
Total Net Assets	Total net asset value of the mutual fund, reported in millions
SMB (Small Minus Big)	Spread in returns between small and large sized firms
HML (High Minus Low)	Spread in returns between value and growth stocks
Rm-Rf (Risk Premium)	Market risk premium
Yield	Ratio of income distributions and Net Asset Value

EMPIRICAL RESULTS

The results of this study's regression analysis are depicted in table form and can be seen in Table A3 which can be found in Appendix A. Table A3 provides descriptive statistics for the seven objective categories of mutual funds examined in this study through regression analysis. As previously stated, mutual fund observations are separated into seven bucket categories reflecting fund type. For each of these regressions, a large portion of return behavior was

captured by the three factor Fama-French model variables SMB, HML, and Rm-Rf (Market Risk Premium). Previous research has proven these three variables to be crucial metrics in calculating returns.

Our regression model for Domestic Equity funds, as shown in Table A3 in Appendix A, yields an R^2 value of .8099, indicating that the independent variables do a strong job of explaining fund returns. Domestic Equity funds focus on investments in equities located within the borders of the United States. One would expect a larger tendency towards team management in such funds as they are more likely to be actively managed on a daily basis. With the various numbers of equities and exchanges constantly trading each day, one would expect a team to better manage such a fund. In this regression the dummy variable reflecting individual or team management was significant at the 5% level, yielding a coefficient of -0.00156. Although this impact may be economically minimal, it does yield important implications that team management may provide added returns, however these returns are overshadowed by increased management fees. In addition, if this team management coefficient is annualized, a more significant effect on returns is realized. Although team management may lead to better decisions, these decisions may be overshadowed by the increased time and expense. Turnover and Total Net Assets also were significant at the 5% level for Domestic Equity funds, each of which had positive coefficients of 0.00061 and 0.00052 respectively. These results signify that a fund with higher turnover, typically being actively managed, will produce higher returns for investors. In addition, these findings indicate that fund size also has a positive impact on returns of Domestic Equity funds, although small. These results correspond with previous research findings, following the theory that costs become more spread out across larger funds. Yield was also significant statistically and had a large impact on fund returns, with a coefficient of -0.10180. This impact may be so strong because so many U.S. investors are interested in funds which invest in stocks with high dividend yields. These stocks however tend to not experience the most appreciation in value, and investors must pay taxes on dividends. The tax implications of such a type of fund may contribute to the negative effect yield has on overall returns.

When examining Non-Domestic Equity Funds, those which focus on equity securities of companies located outside of the United States, our regression model yields an R^2 of .7076. The management of Non-Domestic funds requires executives to be increasingly aware of world events at all times of the day, and can prove to be extremely rewarding yet equally risky. Such funds lend themselves to a team management structure, allowing multiple individuals to work as a cohesive unit to follow current events and indicators around the world in order to ultimately make informed investment decisions. What we find however, is that this team management continues to have an adverse impact on fund returns. Significant at the 5% level, the Team Management dummy variable yielded a coefficient of -0.00565. Once again, as found with Domestic Equity funds, the economic impact is minimal but negative. This brings forth the trend that the value added from a team management structure may not be enough to counteract increased time and costs of running the fund in such a manner. An interesting result in the Non-Domestic equity regression is the impact of Total Fees on fund returns. Total Fees had a positive coefficient of 0.00260, meaning that funds in this category which charge higher fees tend to have higher returns. These higher fees may be reflective of superior management as well as active management. If a fund manager is able to move funds efficiently across markets and make active trades, higher expenses may in fact prove to be a benefit to investors. This finding is consistent with past studies such as Prather and Middleton (2002) that also imply high fund fees may sometimes imply above average management.

We next looked to observe Debt and Equity Combinations funds. Such funds combine debt securities and equity securities in order to find the ample diversified portfolio mix across asset classes. Management of this fund structure would also lend itself to team management, as certain members of the team would ideally be specialists in certain areas. For instance, a cohesive team which works well together would have members who are aware of their teammate's strengths and weaknesses. In this case, some members would ideally specialize in short term debt investments, while others in growth equity opportunities. The combined results would preferably be a higher alpha value. Our analysis of these debt/equity combined funds yielded an R^2 value of .6614. Once again, the most notable explanatory variables were

the Market Risk Premium, HML, and SMB indicators, all of which were significant at the 5% level. When examining the Team Management output, our results once again depicted a positive impact on fund returns. Yielding a coefficient of 0.00161, the Team Management variable indicates that for Debt and Equity combination funds, team management may actually prove beneficial to the investor. This may be due to the complexities of managing a fund across multiple asset classes. Another interesting finding is that for debt and equity combinations funds, it appears that fund size actually does erode fund performance. Our research shows that the larger the total net asset base for these types of funds, the more returns are adversely affected. The Total Net Assets variable yields a coefficient of -0.00008, which may be because these funds can become so large that they become hard to manage. As the fund grows larger it ultimately grows in complexity, which can lead to inefficiencies and ultimately hurt returns. These conclusions are consistent with the findings regarding fund size and erosion of returns as reported by Chen et al. (2004).

The next three fund types are reflective of mutual funds which solely focus on certain types of debt, specifically Government Debt, Corporate Debt, and Municipal debt. As mentioned earlier, Government Debt funds are those which invest only in U.S. government and U.S. government agency securities. Corporate Debt funds are those which invest in the debt securities issued by corporations, and Municipal Debt funds focus on debt securities issued by cities, local agencies, and other local governments. These are the types of funds which investors flock to who are looking for safe, constant returns. As opposed to an objective equity fund, such as aggressive growth which seeks a large amount of capital gains, these funds provide liquidity and peace of mind for investors seeking constant returns and capital preservation. For these three fund types, team management was not expected, as the "active" element of managing such funds is quite different from that of an equity fund. The management of these types of funds correlates best with a single fund manager and our findings support this. For Government Debt funds, the Team Management variable resulted in a coefficient of -0.00066, while Corporate Debt funds and Municipal Debt funds provided coefficients of -0.00223 and -0.00098 respectively. Each of these results corresponded with

our initial expectations, that in specialized debt funds team management does not provide any added value in terms of returns to the typical investor.

Lastly we analyzed Material & Commodity funds in order to gauge the effect of team management on a unique asset class that is hotly debated in current news. The regression run on these types of funds resulted in an R^2 of .447, indicating that the independent variables did a strong job of explaining the variation in returns. We found again for Material & Commodity funds that team management has a harmful effect on the mutual fund returns, as the coefficient value was -0.03642. This highly significant value may attest to the volatility and difficulty of timing commodities prices, whereas a buy and hold strategy may be more lucrative. Some interesting results however surfaced regarding the Total Fees variable. Significant at the 5% level, the Total Fees variable displayed a coefficient of 0.05552, indicating that for Material and Commodity funds, higher returns may be partially expected from those funds with higher fees. These fees may be reflective of both superior and intelligent active management. The magnitude of this impact of fees on returns is very large, and proves to be a significant finding.

It is important however, in any study, to account for any bias or uncertainty in the data and regressions used to form a conclusion. A fundamental tool to begin such an analysis involves examining the correlations between variables used in the regressions. If correlations exist which are too high, specifically above the threshold of .7 in this study, it may indicate that the information present in one variable is being covered by another already in the model. When examining the correlation coefficients of the regression models, we found only one area for concern. In each of the seven regressions the correlation between MGMTFEE and TOTALFEES was measured as above .9. The implication of these results is that the impact of fees is being reflected in both variables, even though both are separate and non-inclusive. Looking forward, it may be plausible to further separate these fee variables and examine the new regression results.

CONCLUSION

Over the past two decades, the growth in team-managed mutual funds has far outpaced the growth of individually managed mutual funds. This is due to the increasing belief in the effectiveness of team decision making; specifically the idea that diverse teams produce better results with lower risk than an individual. In addition, the idea of economization of management expenses across fund families has also induced many mutual funds to implement the team management structure. By sharing expenses across a larger number of funds, funds can potentially attract investors to a team managed fund without eroding performance. In terms of investments and fund management, many believe that a team can better analyze risks, comprehend multiple perspectives, and blend strategy to make a safe and effective decision. However, when looking at the history of top funds and fund managers, they are nearly always individuals. Managers like Peter Lynch and John Neff have become almost superhuman icons in the investment world, and prove that certain people can beat the markets. This study finds that although teams may be able to comprehend multiple complex perspectives and strategies as well as large amounts of information, the added value they provide measured by returns does not outweigh the increased cost of team management for most funds. For specific fund types which lend themselves to team management, such as Domestic Equity and Non-Domestic Equity funds, where vast amounts of information and strategies need to be implemented, our empirical evidence shows teams add more expense than value to investor returns. For Debt and Equity combination funds however, we do find that team management may have a small, yet significant impact on fund returns post-expenses. This is likely due to the high complexity of such funds, where it proves to be beneficial to have both a debt and equity specialist manager. In addition, this study finds that higher fund fees should not necessarily deter investors from choosing a given fund, as we find that higher fee structures in many instances are correlated with higher returns for the investor. Avenues for future study include further examining the fee relationship between funds that are independent and those that are part of fund families. The relationship between whether or not a fund is a member of a family and the funds expenses may lead to more specific indications of the success or failure of team management.

APPENDIX A

Table A1: Detailed Variable Descriptions

The following table provides a more detailed description of the independent variables used in this study.

Indep. Var.	**Description**
Management Type	Dummy variable indicating individually or team managed fund
Total Fees	Total fee cost of a given mutual fund (Inclusive of expense ratio and 12b1)
Turnover	Percentage of mutual fund holdings that have been replaced in a given year
Total Net Assets	Total net asset value of the mutual fund, reported in millions
Small Minus Big	Spread in returns between small and large sized firms, based on market capitalization
High Minus Low	Spread in returns between value and growth stocks, also known as the value premium
Risk Premium	Market risk factor: Return over the risk free rate investors require to bear market risk
Yield	Ratio of income distributions and Net Asset Value at the end of a given period

Table A2: Summary Statistics by Fund Type

The following table depicts summary statistics for each separate regression run in this study. Standard statistical measures run across the top row, while the first column offers identification for each variable. To read this table, simply look up the Asset Class/Fund Type in Column 1, and examine the associated statistics with each variable.

Independent Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Domestic Equity					
Returns (Dependent)	90892	0.0153	0.1058	-0.6245	1.2635
Management Type		0.3851	0.4866	0.0000	1.0000
Total Fees		0.6091	0.9240	-117.4069	4.0568
Turnover		0.8701	1.2475	0.0000	85.2800
Log(Total Net Assets)		4.7952	1.2945	2.9957	10.7619
Yield		0.0025	0.0079	0.0000	0.5739
Non-Domestic Equity					
Returns (Dependent)	23585	0.0242	0.1153	-0.7061	0.9536
Management Type		0.4529	0.4978	0.0000	1.0000
Total Fees		0.6938	0.7075	-59.3419	3.7799
Turnover		0.8711	1.2987	0.0000	27.9600
Log(Total Net Assets)		5.0380	1.4451	2.9957	10.8870
Yield		0.0052	0.0137	0.0000	0.7561
Debt/Equity					
Returns (Dependent)	16972	0.0114	0.0647	-0.2895	0.2576
Management Type		0.6182	0.4858	0.0000	1.0000
Total Fees		0.3231	0.8731	-99.7349	2.6915
Turnover		0.8238	1.5693	0.0000	44.2400
Log(Total Net Assets)		4.7108	1.2442	2.9957	10.2102
Yield		0.0104	0.0248	0.0000	1.1008

Table A2: Summary Statistics Continued

Government Debt	**Obs.**	**Mean**	**Std. Dev.**	**Min.**	**Max.**
Returns (Dependent)	5529	0.0123	0.0286	-0.2190	0.4851
Management Type		0.1662	0.3723	0.0000	1.0000
Total Fees		0.3811	0.2777	-3.9155	1.2623
Turnover		2.2751	4.2813	0.0100	54.2400
Log(Total Net Assets)		4.7950	1.2999	2.9957	9.9261
Yield		0.0165	0.0155	0.0000	0.1179
Corporate Debt					
Returns (Dependent)	11055	0.0150	0.0352	-0.2922	0.4973
Management Type		0.3832	0.4862	0.0000	1.0000
Total Fees		0.4045	0.5015	-27.0670	1.5470
Turnover		2.1798	2.3382	0.0000	32.6400
Log(Total Net Assets)		4.8174	1.3603	2.9957	10.2562
Yield		0.0207	0.0182	0.0000	0.1700
Municipal Debt					
Returns (Dependent)	5704	0.0090	0.0336	-0.3155	0.2123
Management Type		0.1598	0.3664	0.0000	1.0000
Total Fees		0.4019	0.4095	-20.3490	0.9028
Turnover		0.4607	0.5044	0.0000	8.1500
Log(Total Net Assets)		4.7656	1.2757	2.9957	10.0158
Yield		0.0170	0.0143	0.0000	0.0759
Materials & Commodities					
Returns (Dependent)	916	0.0417	0.1497	-0.5400	0.5328
Management Type		0.0766	0.2661	0.0000	1.0000
Total Fees		0.7217	0.3395	-2.2215	1.7523
Turnover		1.2028	2.0169	0.0000	13.0000
Log(Total Net Assets)		4.8687	1.3642	2.9957	9.7161
Yield		0.0066	0.0157	0.0001	0.1060

Table A3: Regression Results

The following table depicts regression results for each of the seven regressions run in this study. To interpret this table, identify the Asset Class/Fund Type you would like to study across the top row of the table. Then analyze the associated values with the independent variables and statistics in Column 1.

Independent Variables	Domestic EQ	Non-Domestic EQ	Debt/Equity	Gov. Debt	Corp. Debt	Muni. Debt	Mat./Commod.
Intercept	-0.00180**	0.00745	0.00260	0.00585	0.00931	0.00718	0.03011
Management Type	-0.00156**	-0.00565**	0.00161*	-0.00066	-0.00095	0.00098	-0.03642*
Total Fees	-0.00028	0.00260**	-0.00016	-0.00182	0.00088	0.00054	0.01449
Turnover	0.00061**	-0.00038	-0.00043	0.00013	-0.00002	0.00168	-0.00437
Log(Total Net Assets)	0.00052**	0.00028	-0.00008	0.00098**	0.00062**	-0.00009	-0.00151
SMB (Small Minus Big)	0.12857**	-0.03821**	-0.09880**	-0.06234**	-0.08035**	-0.04666**	0.18399
HML (High Minus Low)	-0.05749**	-0.05884**	0.04112**	0.01942**	0.09257**	0.06978**	-0.53372**
Rm-Rf (Risk Premium)	0.99663**	1.05877**	0.54471**	-0.05597**	0.10225**	0.07153**	1.06833**
Yield	-0.10180**	-0.05485	-0.05033**	-0.10156**	-0.14663**	-0.28922**	-0.69333**
R-Square	0.80990	0.70760	0.66140	0.06290	0.13450	0.09500	0.44700
Number of Obs.	111401	25555	19139	6425	13791	6703	927

*Note: **(*) Denotes Significance at the 5 (10) percent level using a two-tailed test*

REFERENCES

2010 Investment Company Fact Book. (2010). Retrieved October 3, 2010, from Investment Company Institute: http://www.icifactbook.org/fb_ch2.html#us

Arrow, K. J. (1987). Rationality of Self and Others in an Economic System. *Hogarth and Reder* , 201-215.

Blinder, A. S., & Morgan, J. (2005). Are Two Heads Better Than One? Monetary Policy By Committee . *Journal of Money, Credit, and Banking*

Bliss, R. T., Potter, M. E., & Schwarz, C. (2008). Performance Characteristics of Individually-Managed versus Team-Managed Mutual Funds. *The Journal of Portfolio Management* .

Brown, S. J., & Goetzmann, W. N. (1997). Mutual Fund Styles. *Journal of Financial Economics* , 373-399.

Browne, S. (2000). Risk-Constrained Dynamic Active Portfolio Management. *Management Science* , 1188-1199.

Carhart, M. M., Carpenter, J. N., Lynch, A. W., & Musto, D. K. (2002). Mutual Fund Survivorship. *The Review of Financial Studies* , 1439-1463.

Chen, J., Hong, H., Huang, M., & Kubik, J. D. (2004). Does Fund Size Erode Mutual Fund Performance? The Role of Liquidity and Organization. *The American Economic Review* , 1276-1302.

Chevalier, J., & Ellison, G. (1999). Are Some Mutual Fund Managers Better Than Others? Cross-Sectional Patterns in Behavior and Performance. *The Journal of Finance* .

Daniel, K., Grinblatt, M., Titman, S., & Wermers, R. (1997). Measuring Mutual Fund Performance With Characteristic-Based Benchmarks. *The Journal of Finance* , 1035-1058.

Droms, W. G. (2006). Hot Hands, Cold Hands: Does Past Performance Predict Future Returns. *Journal of Financial Planning* .

Golec, J. H. (1996). The Effects of Mutual Fund Mangers' Characteristics on Their Portfolio Performance, Risk and Fees. *Financial Services Review* .

Grinblatt, M., & Titman, S. (1993). Performance Measurement without Benchmarks: An Examination of Mutual Fund Returns. *The Journal of Business* , 47-68.

Ingersoll, J., Spiegal, M., Goetzmann, W., & Welch, I. (2007). Portfolio Performance Manipulation and Manipulation-Proof Performance Measures. *The Review of Financial Studies* .

Karceski, J. (2002). Returns-Chasing Behavior, Mutual Funds, and Beta's Death. *The Journal of Financial and Quantitative Analysis* , 559-594.

Kothari, S., & Warner, J. B. (2001). Evaluating Mutual Fund Performance. *The Journal of Finance* , 1985-2010.

Lynch, A. W., & Musto, D. K. (2003). How Investors Interpret Past Fund Returns. *The Journal of Finance* , 2033-2058.

Massa, M., & Patgiri, R. (2009). Incentrives and Mutual Fund Performance: Higher Performance or Just Higher Risk Taking? *The Review of Financial Studies* .

Perold, A. F. (1984). Large-Scale Portfolio Optimization. *Management Science* , 1143-1160.

Prather, L. J., & Middleton, K. L. (2002). Are N+1 Heads Better Than One? The Case of Mutual Fund Managers. *Journal of Economic Behavior and Organization* , 103-120.

Prather, L., Bertin, W. J., & Henker, T. (2004). Mutual Fund Characteristics, Managerial Attributes, and Fund Performance. *Review of Financial Economics* , 305-326.

Sharpe, W. F. (1991). The Arithmatic of Active Management. *Financial Analysts Journal* .

Vollrath, D., Sheppard, B., Hinsz, V., & Davis, J. (1989). Memory Performance by Decision Making Groups. *Organizational Behavior and Human Decision Processes* , 289-300.