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Abstract

The literature has conflicting reports regarding the impact of group decision making on performance. We first observe that in mutual fund studies this results from large discrepancies in reported managerial structures between CRSP and Morningstar databases reaching on average 20% per year. Then we show that with more superior Morningstar data team-managed funds exhibit higher risk-adjusted returns than single-managed funds. The performance spread is present across all fund categories, except aggressive funds, and is robust to the inclusion of fund- and manager-level controls. Across various managerial structures, the largest team-induced gains are reached among funds managed by three individuals. Furthermore, teams significantly improve fund performance when funds are located in financial centers, reflecting larger networking potential and/or better skills of people who reside in larger cities. This improvement is achieved in teams more homogeneous in age and education. In spite of higher returns however, team-managed funds are not riskier than single-managed funds in terms of market exposure or idiosyncratic volatility. Finally, team-managed funds trade less aggressively and are able to generate extra inflows for their funds. Thus, collective decision making is beneficial, but its scale depends on team size and diversity as well as its geographic location.

JEL classifications: G23; J24

Keywords: Knowledge spillover, Management structure, Performance evaluation, Team diversity

1. Introduction

There is a large body of theoretical and empirical studies across a variety of disciplines that examines the benefits of group versus individual decision making. The idea that a "group mind" is distinctly different from a single one was first put forward by the social psychologist Le Bon (1896). From its inception, the concept of a "crowd" has generally been associated with negative outcomes, in that people, who are loosely linked to each other but act collectively, are believed to pose risks to the established laws and regulations. There is experimental evidence that groups may indeed act more aggressively and undertake riskier decisions than the average choices of individuals in a group – phenomena known as "risky shifts" (see Wallach and Kogan, 1965; Stoner, 1968) and "group polarization" (see Moscovici and Zavalloni, 1969; Kerr, 1992; Sunstein, 2002).[1] In addition, Janis (1982) developed the concept of a "groupthink" where people in smaller groups accept decisions they may not fully agree on just to avoid conflicts with their colleagues. All these studies imply inferior choices made within groups than among individuals resulting from extreme decisions by a dominant player in a team or a reduction in critical thinking for the sake of unanimity with other group members.[2]

There is an alternative economics and finance literature that highlights the benefits of decision making process within groups.[3] Sah and Stiglitz (1986, 1991) point out that, while individual group members have different opinions, the aggregate "group opinion" is the average opinion of all group members. Sharpe (1981) shows that teams in the portfolio management industry are able to achieve diversification of style and judgment. Barry and Starks (1984) provide a theoretical setting suggesting that teams in investment funds may reduce portfolio risk. Very few empirical studies provide support to the opinion and risk diversification theories of

[1] Ambrus, Greiner, and Pathak (2009) cast doubts on "group shifts" findings using the standard practice of comparing the means of group and individual decisions.

[2] In economics, the negative effect of group decision making is often linked to possible productivity losses resulting from free-riding by some members of the teams of firm workers and the ways to reduce this problem (e.g., see Alchian and Demsetz, 1972; Holmstrom, 1982; Rasmusen, 1987; Nalbantian and Schotter, 1997).

[3] There is also some support for the "wisdom of a crowd" phenomenon as opposed to not only individual, but also even small group decision making advocated by Surowiecki (2005).

groups.[4] Hamilton, Nickerson, and Owan (2003), using data from the garment industry, find that teams increase productivity, and that this increase is more apparent among earliest team members, high-ability workers, and heterogeneous teams. Adams and Ferreira (2010) analyze individual and group bettors in iceberg break-up betting and find that teams arrive to less extreme decisions than individuals.

The goal of this paper is to analyze the effect of teams on fund performance, their risk-taking behavior and other fund characteristics using a large U.S. equity mutual fund database. There are two distinguishing feature of our analysis. First, we focus not only on the examination of the individual/team split for fund performance but also on the understanding of the value of an extra group member for the benefits of team management. The intuition here is that any group work always leads to a tradeoff between a larger intrinsic knowledge base of the group versus a difficulty in arriving at optimal decisions, especially under time constraints, which are present in many job occupancies, including the mutual fund industry. Second, we differentiate the team impact on fund performance across geographic locations, more specifically, between financial centers and other cities. The intuition here is that the value of adding a new member to a team must to be higher in large cities where each individual is more likely to bring to the group his/her unique knowledge, skills, and networking ability.

Our data comes from Morningstar and covers the period between January 1992 and December 2010. Some studies provide evidence of better and more precise coverage of mutual funds by Morningstar than CRSP (e.g., see Elton, Gruber, and Blake, 2001; Massa, Reuter, and Zitzewitz, 2010; Karagiannidis, 2010). However, these papers do not systematize the disparity in fund management structure reporting. Therefore, as a first step, we highlight the discrepancies between CRSP and Morningstar data on managerial structure of funds. We show that very often

[4] Prior evidence in favor of team decision making is based only on studies on signaling games experiments, such as Bornstein and Yaniv (1998), Cooper and Kagel (2004), and others. Experimental studies often lead to contradictory results. For instance, Bone, Hey, and Suckling, (1999) find no support for the superiority of group decision making. Barber, Heath, and Odean (2003) find that groups are more likely to purchase stocks than individuals for "good reasons" even though these reasons do not improve performance. In contrast, Blinder and Morgan (2005), based on experiments simulating monetary policy decisions by central banks, show that groups achieve better outcomes than individuals.

CRSP reports single-managed funds while these funds are team-managed in Morningstar, and vice versa. The existence of these differences, which in some years in excess of 20% of the overall sample of named equity mutual funds, cast serious doubts on the results of many recent studies that use fund manager-specific information using CRSP data.[5] Indeed, the impact of a team on fund performance using an exactly matched sample between CRSP and Morningstar is very different for the two datasets. With CRSP data teams have no or negative contribution to risk-adjusted returns computed based on unconditional and conditional versions of Carhart (1997) model, while with Morningstar data teams show not only positive but also often significant addition to fund performance.

Next, we examine the difference between team and single-managed funds across various aspects of fund performance. We observe that on average funds which are team-managed have higher risk adjusted returns than their single-managed counterparts. This result holds steadily after accounting for a range of fund and manager characteristics and is present across various fund investment objectives except those in aggressive growth category. We then examine the relation between the size of a fund management team and fund returns. We observe that this relation is non-linear. In particular, we find that three-person teams are the largest contributors to fund performance relative to single-managed funds. This result corroborates well with the notion of increasing problems of free-riding and decreasing cooperation effectiveness in larger groups (e.g., Alchian and Demsetz, 1972; Holmstrom, 1982; Mueller, 2012). We also investigate the benefits of group decision making across various locations. We split the sample into funds whose advisors are located in six financial centers as defined in Christoffersen and Sarkissian (2009) and those located in smaller cities and repeat our tests. We show that only funds located in financial centers gain from team management, interpreting this result as highlighting the importance of learning and information spillover effects in larger cities (e.g., see Jacobs 1969;

[5] The non-inclusive list of recent studies that use CRSP data on fund management structure include Agarwal and Ma (2011), Bar, Kempf, and Ruenzi (2010), Chen, Hong, Huang, and Kubik (2004), Cici, (2011), Dass, Nanda, and Wang (2011), Deuskar, Pollet, Wang, and Zheng (2011), Han, Noe, and Rebello (2008), Kempf and Ruenzi (2007), and Nohel, Wang, and Zheng (2010).

Glaeser, 1999). Locating in financial centers helps individual members to bring more heterogeneous knowledge and skills to their teams and is consistent with diversification benefits arising from team work argued by Sharpe (1981). In addition, we find among funds in financial centers that those with more diverse team members in terms of age and undergraduate institution underperform those with more homogeneous managers. These results are consistent with potentially larger frictions and conflicts of interests associated with heterogeneous groups, as emphasized in Jehn, Northcraft, and Neale (1999), and career concerns issues in the mutual fund industry raised in Chevalier and Ellison (1999b).

Finally, we analyze whether team-managed funds exhibit different risk-taking behavior than single-managed ones and what fund characteristics are associated with team management. We find little evidence that team-managed and single-managed funds differ statistically in their exposure to total risk, market risk, and idiosyncratic risk. However, the volatility of team-managed funds is larger in economic terms than their single-managed counterparts. Subsequently, we observe that a substantial part of this excess volatility among funds with multiple managers comes from their statistically larger loadings on small and value stocks. We further show that team-managed funds lead to substantially lower turnover, more than 12% annually with a full set of fund and manager characteristic controls. This result implies less aggressive trading within groups of portfolio managers and, therefore, provides additional support that teams lead to less extreme behavior. Finally, teams help funds bring more money: we find positive and significant link between team management and net fund flows reflecting a recent trend in mutual fund industry to rely more on team-managed funds.

The list of empirical finance studies that deal with group and individual decision making is not very long. For example, Prather and Middleton (2002) find no evidence of differences in fund performance between group and individual decision making, but they deal with data sample with large survivorship bias. Chen, Hong, Huang, and Kubik, (2004) find underperformance among team-managed funds, while Bar, Kempf, and Ruenzi (2010) find that teams have lower risk-adjusted returns and smaller portfolio risk than individual managers. However, both these

studies use CRSP data and do not account for manager characteristics. Massa, Reuter, and Zitzewitz (2010) compare single, named, and anonymous team management practices. Kostovetsky and Warner (2011) study manager turnover differences in equity mutual funds while controlling for manager team size, but they do not examine fund performance issues related to fund management structure.

The rest of the article is organized as follows. Section 2 presents the motivation for our analysis and hypotheses development. Section 3 describes the fund- and manager-level data. In section 4, we compare managerial structures reported in CRSP and Morningstar databases and then conduct preliminary tests on the importance of team management for fund performance using the two data sources. Section 5 presents the main empirical findings of our paper. Section 6 examines the differences between team-managed and single-managed funds in terms of various measures of fund risk and several fund characteristics. Section 7 concludes.

2. Motivation and Hypotheses Development

There is widespread evidence nowadays from the industry that mutual funds prefer moving towards team management. For example, below is an excerpt from the December 2, 2011 Reuters report:

> Mutual fund star managers have gone the way of the vinyl record: They're cool to have, expensive to get, and sometimes, not the best quality. In their place, fund companies like Federated Investors, Eaton Vance and Invesco are moving in favor of a team-oriented approach. Even Fidelity Investments, home of one of the first star managers, Peter Lynch, has switched some funds to a team-managed approach. The move helps fund companies defend against poaching, protect their funds' returns, and shield themselves from the level of outflows seen at competing firms after their high-profile stars have flamed out.[6]

[6] "Funds move away from star managers, favor teams," by Jessica Toonkel, December 2, 2011, Thomson Reuters.

Recent academic sources also document the same trend (e.g., Massa, Reuter, and Zitzewitz, 2010). This evidence however stands in stark contrast with the results of numerous experimental and empirical academic studies that have tried, but with little success, to identify benefits of group work in various fields of social science, including finance and economics. For instance, papers such as Chen, Hong, Huang, and Kubik, (2004), Massa, Reuter, and Zitzewitz (2010), Bar, Kempf, and Ruenzi (2010) among others find that team management in mutual funds provides no gains over single-managed funds and even often leads to inferior performance. Some literature from economics that finds beneficial impact of teams on productivity and more balanced decision making, such as Hamilton, Nickerson, and Owan (2003) and Adams and Ferreira (2009), are based on extremely limited data. Therefore, our main hypothesis, similar to most of the aforementioned studies, states the rationale for the existence and the spread of teamwork in fund management, namely:

H1. Fund performance is higher among team-managed funds.

Note that the value of group decision making may greatly depend on internal and external factors. First, there are many studies that examine team performance as a function of team size. For instance, research shows that larger teams may often perform worse than small ones (e.g., see Thompson, 2003; Mueller, 2012). While the earlier literature has no clear answer on the optimal number of people in a group (on average, varies between five and ten), it is obvious that the ideal team size should depend on the tasks performed by individuals within a group. It appears that the more diluted the tasks are, the smaller should be the optimal group size. In this respect, Mueller (2012) argues that if companies deal with various coordination and motivational issues, then any group composed of five or more individuals will already see significant increases in coordination costs within the group and diminishing motivation across members of the group. Hence, we can state our first prediction as follows:

P1. Fund performance is non-linear in the number of team members.

Second, the value of an additional team member must be greater under those conditions when each individual has a higher potential to enhance the overall knowledge and resource base of the group. In the fund management industry in particular, skills, knowledge as well as networking ability of each team member can be of great importance to fund performance. Numerous studies have shown that those conditions are more readily available in larger cities (e.g., see Jacobs 1969; Glaeser, 1999; Christoffersen and Sarkissian, 2009). Indeed, larger cities, especially financial centers, can provide positive externalities to portfolio managers including, but not limited to, easier knowledge transfer, faster and more diverse business connections, and potential access to private information. Therefore, we can now formulate our second prediction:

P2. Fund performance is higher among team-managed funds located in larger cities.

Finally, numerous studies compare individual and group decision making to the level of risk. We follow the arguments in Sah and Stiglitz (1986, 1991), Sharpe (1981), and Barry and Starks (1984) and assume that working in teams does not induce extreme risk taking behavior among portfolio managers. Thus, our second hypothesis can be stated as follows:

H2. Team-managed funds do not take excessive risk.

Note that given the inconclusiveness of previous studies on the impact of group decision making on fund performance, it is imperative to deal with precise fund managerial structure data. We specifically address this issue in the next section.

3. Data

3.1. Main Data Source

Our primary data source is Morningstar Direct (MS, henceforth), a relatively new survivorship-bias free institutional research product offered by Morningstar, Inc. This database provides one of the most comprehensive and in-depth coverage of open-ended mutual funds across the globe, including the United States. Our sample covers actively managed U.S. diversified domestic equity funds with the following investment objectives: Aggressive Growth (includes Small Company), Growth, Growth & Income, and Equity Income from 1992 to 2010. We exclude all sector funds from our analysis because their portfolios are constrained to follow a particular industry and hence are not diversified. We also exclude index funds because majority of these funds are not actively managed. MS reports all data at the fund share class level, including the names of the fund managers. However, different share classes of the same fund might have identical underlying portfolio with the same fund manager(s). This might lead us to multiple counting of fund management information and bias our analysis. To avoid such biases, we aggregate mutual fund share class level observations to one fund level observation using a unique fund identifier in MS.

To determine whether a fund is sole-managed or team-managed at the end of a calendar year, we use the detailed fund manager data which includes fund manager names, the exact date a fund manager joins and leaves a particular fund. We classify a fund as sole- or team-managed based on the number of fund managers with the fund at the end of calendar year. When only one fund manager is named at the end of calendar year, we classify that fund as sole-managed for that year. Similarly, when two or more fund managers are named with the fund, we classify the fund as team-managed. We remove all fund-years which have missing fund manager names or tenure dates from our sample. Our final sample covers 3,935 unique funds with 35,440 manager-fund-year observations.

3.2. Fund Characteristics

For each fund we obtain information on total net assets under management, expense ratios, turnover ratios, fund inception date, and fund family name from MS. This information helps us control for fund characteristics that are well known in the literature to affect individual fund performance. These characteristics typically include fund size, measured by the total net assets under management of the fund at the end of calendar year; fund age, defined as the difference between the fund's inception year and the current year; expenses, measured by the annual net expense ratio of the fund; turnover, measured by the turnover ratio of the fund; fund family size, measured by the total net assets under management of the fund complex to which the fund belongs at the end of calendar year; fund return volatility, measured by standard deviation of raw net returns of funds over the past year. We also include net fund flows, defined as the net growth in the total net assets of funds, as a percentage of their total net assets, adjusted for prior year returns. To minimize the effect of outliers on our analysis, we winsorize expense ratios, turnover and annual fund flow variables at 1% and 99% levels.

Christoffersen and Sarkissian (2009) show that fund managers located in financial centers earn higher returns than their peers located in smaller towns. To control this location effect, we obtain the location information of fund advisors from MS. Following Christoffersen and Sarkissian (2009), we define the following six cities to be financial centers: Boston, Chicago, Los Angeles, New York, Philadelphia, and San Francisco. If the fund advisor company is headquartered within a 50-mile radius of any of these six cities, we classify the fund as located in the financial center.

It is important to point that our location variable differs from the previous studies. Instead of using the headquarter location of the fund company or fund sponsor (e.g., Christoffersen and Sarkissian, 2009), we use the headquarter location of the fund advisor company. For majority of funds, the fund advisor and the fund sponsor (the company that offers the mutual fund to public) might be the same company (Chen, Hong, and Kubik, 2011). But for few funds they might be different because these funds choose to outsource their portfolio management to third-party fund

advisor companies. By choosing the fund advisor location, we make analysis immune to the possibility of any bias due to third-party fund management outsourcing.

3.3. Fund Manager Characteristics

In any study that examines potential impact of group decision making on fund performance, it is important to control for the influence of manager's demographic characteristics.[7] The demographic information available to us includes the name(s) of fund manager(s), the name(s) of all funds they currently manage and have managed in the past, their start and end dates with those funds, all undergraduate and graduate degrees received, the year in which the degrees were granted, and the name of degree-granting institution. In addition, we also have a detailed biographical sketch for all fund managers from MS. This sketch is provided to MS by the fund managers themselves which includes their personal and past work experience details. Following Chevalier and Ellison (1999a), we use these data to create four manager characteristics variables: Manager Tenure, MBA dummy, Average SAT, and Manager Age.

Specifically, we define the manager tenure as the difference between the year when a fund manager started as a portfolio manager for a given fund and the current year. To create the MBA dummy variable, we use the graduate degree details of each fund manager in our sample. We define the MBA dummy variable as one if the fund manager received an MBA degree and zero otherwise. To construct the average SAT, we closely follow the methodology of Chevalier and Ellison (1999a). First, we obtain the name of the undergraduate institution for each fund manager. Then, we look for that institution's SAT score in the 23-rd edition of Lovejoy's College Guide (see Straughn and Straughn, 1995). Most schools report the upper and lower of median verbal and math scores for incoming student in that year. To calculate the composite SAT score for a given school, we simply add the average of the upper and lower bounds of the verbal score to the average of the upper and lower bounds of the math score. In few cases,

[7] Unfortunately, this has not been the case in many papers which attempt to determine the impact of team management of fund performance (e.g., Bar, Kempf, and Ruenzi, 2011; Massa, Reuter, and Zitzewitz, 2010).

schools choose to report ACT scores instead of SAT. In those cases, we convert the ACT to an equivalent SAT using SAT-ACT concordance tables provided by the College Board.[8]

The construction of fund manager age variable is not straightforward because very few fund managers in our sample disclose their date of birth in their biographical sketch. To overcome this problem, we again follow the methodology proposed by Chevalier and Ellison (1999a). For managers who report their date of birth, we simply take the difference between the year of their birth and the current year. For managers who do not report their date of birth, we construct an approximate manager age variable by assuming that each manager was 21 year old upon receiving their undergraduate degree. The limited coverage of undergraduate degree year information does reduce our sample size, but does not affect our analysis.

An important difference between Chevalier and Ellison (1999a) and our study is that they focus only on single manager funds, while our study focuses on both single- and team-managed funds. It is relatively straightforward to create manager characteristics for single-managed funds. But it is somewhat problematic to create manager characteristics for teams of fund managers. Ideally, one might be able to create team characteristics based on detailed understanding of the contribution of each team member. Unfortunately, we do not have any these data. To overcome this problem, we simply assume equal contribution of each team member. Hence, manager characteristics for a team, such as manager tenure, age and SAT scores will simply be the equally-weighted average of manager tenure, age and SAT scores of each fund manager in the team, respectively. For the MBA dummy variable in case of teams, we define it to be one if any one of the team members has a MBA degree and zero otherwise.

3.4. Fund Performance Measures

For computing fund performance measures we use each fund's monthly net fund returns from MS. We use three different performance metrics: objective-adjusted returns, OAR,

[8] For more a detailed description of the construction of average SAT score, please refer to Chevalier and Ellison (1999a).

unconditional four-factor alpha, α(4U), using Carhart (1997) model, and conditional four-factor alpha, α(4C), following the application of Ferson and Schadt (1996) framework to Carhart (1997) model. We define OAR as the difference between the average monthly return (net-of-fees) of a fund in the year minus the mean fund returns across all funds for a given fund investment objective and year. We estimate each fund's unconditional and conditional risk-adjusted alphas using the following two equations:

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + s_i SMB_t + h_i HML_t + m_i UMD_t + e_{i,t}, \quad (1)$$

and

$$r_{i,t} = \alpha_i + \beta_i r_{m,t} + s_i SMB_t + h_i HML_t + m_i UMD_t + b_i^{Tbill}\left(r_{m,t} \times Z_{t-1}^{Tbill}\right) + b_i^{Term}\left(r_{m,t} \times Z_{t-1}^{Term}\right) + e_{i,t}, \quad (2)$$

respectively, where $r_{i,t}$ is the monthly net fund return less the risk-free rate (proxied by the one-month U.S. T-bill rate), $r_{m,t}$ is the monthly U.S. excess market return (i.e., the return on the CRSP Value-weighted NYSE/AMEX/Nasdaq composite index less the one-month U.S. T-bill rate), while α_i is the risk-adjusted return, unconditional in Eq. (1), α(4U), and conditional in Eq. (2), α(4C). SMB, HML, and UMD are returns on the size, book-to-market, and momentum portfolios, respectively.[9] In equation (2), Z_{t-1}^{Tbill} and Z_{t-1}^{Term} are the two lagged (demeaned) public information variables: the one-month U.S. Treasury bill rate (T-bill) and the term-structure spread (Term), defined as the difference in yields on the 10-year U.S. government bond and three-month U.S. T-bill.

Funds change the number of fund managers from year to year. Therefore, we remove all fund-years that have less than 12 monthly fund return observations and estimate the fund alphas using their prior twelve monthly returns. Although the 12-month horizon gives us fewer data points for the estimation than we may want, we believe that given the high frequency of fund

[9] These data are from Ken French's site, http://mba.tuck.dartmouth.edu/pages/faculty/ ken.french/data_library.html.

manager turnover, the longer (greater than one year) estimation horizons will introduce bias in our analysis by incorrectly attributing fund performance to a certain type management structure.

3.5. Summary Statistics

First, in Figure 1, we show the evolution of mutual fund management structure from 1992 to 2010. It depicts the percentage of single-managed and team-managed funds along with the total number of funds in each year of our sample. The total number of funds increased from around 750 in the beginning of the sample period to more than 2,000 by 2010, peaking in 2007 with close to 2,500 funds. Consistent with reports in other studies (e.g., Massa, Reuter, and Zitzewitz, 2010), we can see that the proportion of single-managed funds has dropped significantly in the last two decades from almost 70% in 1992 to around 30% in 2010.

Table 1 shows the summary statistics of mutual funds by the fund management structure, where the data on team-managed funds is divided into funds with two managers, three managers, four managers, and five managers or more. Panel A reports the distribution (number and proportion in percent) of single- and team-managed funds for each year in our sample. While all team-managed funds have increased their presence in the industry, multiple-manager funds (five and more) have experienced the largest relative and absolute gains in representation, four-fold from 4% in 1992 to 16% in 2010. However, the largest proportion of team-managed funds has been directed by two managers throughout our sample period.

Panel B of Table 1 reports three measures of performance, OAR, α(4U), and α(4C), for single and team-managed funds. It also contains information about the difference test in mean performance measures between each group of team-managed funds and single-managed funds. We can see that team-managed funds show better objective- and especially risk-adjusted performance. For example, the difference in OAR between two-manager and single-manager funds is 0.014 per month or about 17bp per year, while that between four-manager and single-manager funds is almost 56bp per year, although this result is statistically insignificant. However, both fund alphas show that three-manager funds, and, to some extent, funds managed

by five or more people gain the most relative to funds managed by a single person. For three-manager funds, the differences in α(4U) and α(4C) are 43bp and 47bp per year, respectively, and these results are significant at the 5% level. For five-plus-manager funds, the positive and significant difference is observed only with respect to the unconditional alpha measure. Other team sizes are not associated with significant outperformance relative to single-managed funds.

Panel C of Table 1 reports mutual fund characteristics other than performance measures. These include fund volatility, total net assets (Find Size), fund age (Fund Age), turnover, and expenses. Among other fund characteristics, the notable differences across managerial structures include turnover and expenses. Both these measures decrease with an increase in the number of fund managers (and expenses decrease monotonically). In addition, fund size tends to increase with team size. There are no obvious differences however in fund volatility and age.

Finally, Panel D of Table 1 reports fund manager characteristics for our five managerial structure groups. We notice that the average tenure with the same fund is the highest among single-managed funds and so are the average SAT scores. Not surprisingly, funds with larger teams are more likely to have at least one manager with an MBA degree. The average age of managers appears relatively stable across both single-managed and team-managed funds.

4. Management Structure: CRSP versus Morningstar

4.1. Fund Management Structure Differences

First of all, we determine the accuracy of funds' management structure information by comparing our MS sample to the widely used CRSP Survivorship Bias Free Mutual Fund Database (CRSP, henceforth). Like MS, the unit of observation in CRSP is the fund share class and the fund tickers are uniquely assigned to share classes. To avoid double counting of fund's management structure, we aggregate the share class-level information to fund level for each fund. We match each fund in our MS sample to CRSP using individual fund tickers and date of

inception. In cases where the fund ticker information is missing, we use fund names along with their date of inception for matching purposes. We carefully do this matching by hand because there are differences in fund naming conventions in both MS and CRSP. MS only reports the most recent name adopted by the fund whereas CRSP reports different names adopted by the fund over its active life. To ensure the accuracy of our matching strategy, we double check each matched fund by hand. At the end, we are able to match 92.78% of our MS sample funds to CRSP (3,651 out of 3,935 funds) sample between 1992 and 2010.

We also classify CRSP sample into single- or team-managed funds. For each fund in a given calendar year CRSP reports the name of the fund manager(s) under "Portfolio Manager Name" (also known as "mgr_name") variable. We classify a fund as sole-managed when only one manager name is listed and classify as team-managed when two or more managers (or phrases such as "Team Managed" and "Investment Committee") are listed. We remove funds from our sample that report the name of the fund company or their advisor(s) under the manager name variable. In addition, we also remove fund-year observations for which the manager name is not available. We end up with 29,918 manager-fund-year observations in CRSP that represents an 84.42% match with our main MS sample.

The table below provides an example of mismatch between the two data sources. This example includes AARP Growth and Income Fund (CRSP Fund No: 53; MS Fundid: FSUSA004ZG).

			# Fund Managers		
Fund Name (MS)	Fund Name (CRSP)	Year	MS	CRSP	SEC
AARP Growth & Income	AARP Growth & Income Fund	1992	3	3	-
AARP Growth & Income	AARP Growth Tr: Growth and Income Fund	1993	3	1	-
AARP Growth & Income	AARP Growth Tr: Growth and Income Fund	1994	3	1	-
AARP Growth & Income	AARP Growth Tr: Growth and Income Fund	1995	3	1	3
AARP Growth & Income	AARP Growth Tr: Growth and Income Fund	1996	4	3	4
AARP Growth & Income	AARP Growth Tr: Growth and Income Fund	1997	5	1	5
AARP Growth & Income	AARP Growth Tr: Growth and Income Fund	1998	4	1	4
AARP Growth & Income	AARP Growth Tr: AARP Growth and Income Fund	1999	2	2	2

The table compares the fund name as well as the number of fund managers that manage the fund at the end of the each calendar year for both CRSP and MS. To test the accuracy of fund manager information in both databases, we compare this information to the one provided by the fund to the financial regulator, the Securities and Exchange Commission (SEC), each year. We hand collect the fund manager information from the fund's Prospectuses and other filings available on SEC's EDGAR database each year. To determine the number of fund managers in the SEC database, we count the names of fund managers listed in the SEC filings at the end of the calendar year.[10] The first and second columns report the name of the fund given in MS and CRSP, respectively. Columns 4-6 show the number of fund managers reported in MS, CRSP, and SEC databases in a given year, respectively. The first three rows in the last column have missing values because we were unable to find corresponding year's SEC filings on EDGAR's website. This table shows the managerial structure reported by Morningstar is consistent with SEC, but we cannot the say the same thing about CRSP data.

Table 2 reports the full extent of a misspecification in management structure between CRSP and MS datasets for each year in our sample. Column 2 reports the number of matched funds. We see that the overlap in funds between the two databases is large in every year of our sample and it roughly follows the same trend as the overall number of funds in our sample reported in Table 2. Column 3 and 4 as well as 5 and 6 report the percent of single-managed and

[10] Creating the number of fund manager variable based on SEC filings is somewhat involved. We start by hand-collecting the fund's Prospectus (Form N-1A), Annual Report (Form N-30D), and Post-Effective Amendments (Forms POS AM, 497, 485APOS and 485BPOS) available on SEC's EDGAR database each year. Funds are legally required to include the full name, title, length of service, and business experiences of the individuals, including each member of portfolio management team who are primarily responsible for the day-to-day management of the fund in these filings. In cases where funds employ large portfolio teams, SEC requires the fund to provide information on at least five members who share the most significant responsibility for the day-to-day management of the fund's portfolio, for example, the managers with the largest percentages of assets under management. Funds are also required to disclose any change in fund manager(s) and provide information about the new manager(s) under the Securities Act through these filings. Each of these filings contains a filing date, which refers to the date the information was made public, and an effectiveness date, which refers to the date the information took effect. We then sort these filings based on their effectiveness date for each calendar year. Lastly, to determine the number of fund manager(s) in the fund, we simply count the name(s) of the fund manager(s) listed in the last SEC filing at the end of the calendar year. Because of the difficulty of doing this exercise over our entire sample of fund-year observations, we only checked several randomly chosen funds on the consistency of their Morningstar managerial data with SEC filings.

team-managed funds in CRSP and MS databases, respectively. We can observe that for the whole of 1990s, especially in the beginning of the sample period, CRSP reports much more single-managed funds than MS. Towards the 2000s, the overall proportion of single- and team-managed funds becomes similar between the two databases. Columns 7 to 12 report misspecification statistics. Columns 7 and 8 show the number of funds and their proportion that is identified as single-managed funds in CRSP but are team-managed in MS. Columns 9 and 10 show the opposite problem, that is, the number of funds and their proportion that is identified as team-managed funds in CRSP but are single-managed in MS. Finally, column 11 gives the total number of misspecified funds, while the last column indicates the percent of misspecification in the overall matched sample.

Columns 7-12 of Table 2 easily show that the largest misspecification in managerial structure reporting between the two databases occurs in the early part of the sample. The total misspecification is higher than 20% of the matched sample for most of the 1990s. However, even in the 2000s, when both CRSP and MS report about the same proportion of single- and team-managed funds (see columns 4 and 6), there is still a significant misreporting in fund management structure that never goes below 10% of the sample. Note that the average management structure misspecification over the whole sample period is almost 19%. Taking into account the fact that we were not able to match about 16% of MS sample with CRSP database, the actual misspecification in the reports on the number of managers between the two databases is in excess of 20% during the last two decades. The range of misspecification in CRSP is 17% to 29% for single-managed funds and 6% to 23% for team-managed funds. Thus, Table 2 illustrates that the extent of differences in management structure reporting between CRSP and MS databases is very large and is likely to have a direct impact on studies using CRSP data in analyzing the impact of teams in mutual funds returns.

4.2. Fund Performance Differences

Now we proceed to comparing the effect of team management on mutual fund performance using CRSP and MS data. The regression model that we deal with has the following general form:

$$Perf_{i,t} = c_o + c_1 Team_{i,t} + \delta_1 Fund\_Controls_{i,t-1} + \delta_2 Mgr\_Controls_{i,t} + \delta_3 FE_{i,t} + e_{i,t}, \quad (3)$$

where $Perf_{i,t}$ is one of our performance measures, Team is the dummy for multiple-manager funds, $Fund\_Controls_{i,t-1}$ and $Mgr\_Controls_{i,t}$ are the sets of fund- and manager-specific characteristics, while $FE_{i,t}$ includes the year and fund investment objective fixed effects. Our fund-level controls are lagged by one period to exclude the contemporaneous effect that they may have on fund performance.

Table 3 reports the results of panel regression tests of our two risk-adjusted returns, $\alpha(4U)$ and $\alpha(4C)$, computed in a similar way from CRSP and MS databases on a large set of fund and manager characteristics. In this table we again use our matched sample between the two databases. The independent variable of interest is Team, defined as a dummy variable which equals one if the fund has two (or more) fund managers and zero if it has only one fund manager at the end of calendar year. Most of other independent variables are defined in Table 1. To reduce the influence of outliers, we take the natural logs of fund size, fund age, and manager age. Variable Flows is the net growth in total net assets under management of the fund over the past year. SAT score is divided by 100. All fund-level controls are lagged by one period except fund age. All regression specifications include time and investment objective fixed effects (FE), and the standard errors are clustered by fund. Each regression model also reports the number of observations and the adjusted R^2.

Panel A of Table 3 shows full sample estimations. There are 18,437 fund-year observations with fund controls alone, but this number drops to 10,982 after the inclusion of manager characteristics. Columns 1-4 report the estimation output using CRSP data. Columns 1 and 2 show the estimates for $\alpha(4U)$, without and with fund manager controls, respectively, while

columns 3 and 4 show the corresponding estimates for α(4C). We can see that in all these regressions, the coefficient estimate on Team is negative but statistically insignificant. This result could explain conclusions in many papers that use CRSP data that team management does not add any positive value for fund performance (e.g., see Chen, Hong, Huang, and Kubik, 2004; Bar, Kempf, and Ruenzi, 2011). Columns 5-8 of report the estimation output using MS data. Again columns 1 and 2 show the estimates for α(4U), while columns 3 and 4 for α(4C), again without and with fund manager controls, respectively. Now, we see that the results are drastically different. The coefficient on Team is consistently positive across all estimations and, even though is not always significant, is also economically sizable at least after accounting for both fund and manager characteristics. Moreover, at the bottom of the panel we also report the test results of the hypothesis that slope coefficients on Team in the corresponding MS and CRSP estimations are the same, Team (MS-CRSP) = 0. As one can see, the difference is positive and statistically highly significant across all four regression specifications. In economic terms, this difference is 43-48bp per year, depending on the type of alpha, for the tests that are based on estimates from regression models with a full set of control variables.

It is worthwhile to mention the estimation results related to our control variables. In particular, note that the coefficient estimates and their statistical significance are very consistent across both CRSP and MS, unlike the results on the Team dummy, and are in line with results in previous studies. Among fund-level characteristics, we observe that fund size and expenses have large detrimental effect on performance. These results are similar to findings in many other papers.[11] However, funds benefit when they are part of a larger family, again consistent with earlier studies (Chen, Hong, Huang and Kubik, 2004; Pollet and Wilson, 2008). We also document persistency in our two risk-adjusted performance measures. Finally, there is also some evidence (for α(4U)) that higher turnover reduces subsequent returns. As for the manager characteristics, consistent with Chevalier and Ellison (1999a) we find a positive and highly

[11] For the relation between firm size and performance see Chen, Hong, Huang, and Kubik (2004); for the relation between firm expenses and performance see Jensen (1968), Elton, Gruber, Das, and Hlavka (1993), Carhart (1997) and others.

significant relation between fund performance metrics and managers' SAT scores and no relation to MBA degree. In addition, our results confirm that fund returns are higher for more experienced managers with longer tenures at their respective funds (e.g., see Christoffersen and Sarkissian, 2009). Note finally that even though the inclusion of manager characteristics drastically reduces the total number of fund-year observations, the adjusted R^2 indicate that they provide incremental explanatory power for fund returns and therefore are important for proper decoupling of the team management effect from manager-specific variables.

Panel B of Table 3 shows sub-sample estimations over two non-equal periods, 1992-1999 and 2000-2010. This non-equal time period split is motivated by some of the well-known earlier results on the importance of teams for mutual fund returns, such as Chen, Hong, Huang, and Kubik (2004), who use CRSP data over the 1992-1999 period and do not find any benefits for team management. Each specification controls for fund and manager characteristics but, for the sake of convenience, we report only the coefficient on Team dummy alongside with its respective p-values. The evidence in Panel A that using MS data leads to significantly more positive impact of team management on fund performance is present also in sub-sample estimations. The test that slopes on Team for the respective MS and CRSP regressions are the same, that is, Team (MS-CRSP) = 0, is rejected for all specifications.

Thus, Table 3 shows that large discrepancies in management structure records between CRSP and MS databases can translate to significant differences in team management impact on fund performance. *Ceteris paribus*, MS data is able to provide much more support for the benefits of group decision making in the mutual fund industry.

4.3. Additional Misspecification Issues in Management Structure

There are two additional implications of the misspecification in management structure data in CRSP which are important. First, one can no longer rely on the start dates of fund manager(s) provided in this database, particularly in cases where more than one fund manager names are listed. The start date (also variable known as "mgr_dt") in CRSP corresponds to a

unique fund manager entry and specifies the date the current manager(s) took control and assumed responsibility of the fund. For entries that list one fund manager these dates might be less problematic, but for entries that list two or more fund managers these dates might lead to serious errors. By giving one start date for funds with two or more fund managers, CRSP leads researchers to assume that these managers joined the fund on the same date which might not be true in all cases. And this is exactly what we find in MS data, where in almost all team-managed funds, different fund managers join the fund on different dates. Second, because CRSP provides incomplete information on the number of fund managers (as shown previously), one also cannot rely on the name of fund manager(s) provided in this dataset. Particularly, studies on manager turnover which use fund manager names from CRSP might be affected from this misspecification.

5. Team Management and Fund Performance: Empirical Tests

Having established that a researcher, using MS data, is more likely to find evidence of positive contribution of team work in fund management industry, we now directly examine the extent of its impact by using our full MS sample. Note that the sample that we use for the reminder of the paper is larger than the one used in the CRSP-MS matching tests in Table 3. Our goal is to analyze the potential benefits of team management for various fund and/or manager characteristics.

5.1. The Average Effect of Team Management

Table 4 reports the results of the tests on the impact on team management on our three measures of fund performance, OAR, α(4U) and α(4C). We report test results with net (expense-adjusted) returns in Panel A and gross (expense-unadjusted) returns in Panel B. As in Table 3, all regression specifications include time and investment objective fixed effects, and the standard

errors are clustered by fund. We also indicate the number of observations and the adjusted R^2. Again, the variable of interest is the Team dummy. Most of our controls are also similar to those in Table 3 with two exceptions. First, given some controversy regarding the inclusion of lagged dependent variable in panel tests, we no longer consider lagged performance measures as additional independent variables.[12] Second, given the evidence of funds returns may be different across geographic locations (e.g., Coval and Moskowitz, 2001; Christoffersen and Sarkissian, 2009), now include a dummy variable for financial centers (FC) which equals one if the fund is in a financial center and zero otherwise.

In columns 1-3 of Table 4, the dependent variable is the objective-adjusted returns. We report the results without and with fund-level and manager-level controls. In Panel A, the Team dummy comes up positive in all three regressions and is significant at the 10% level in the most comprehensive specification that controls for both fund and manager characteristics. In this latter regression, the economic impact of team management on objective-adjusted fund returns is close to 40bp per year. In columns 4-6, the dependent variable is the four-factor alpha. In this case, in Panel A even without controls, the impact of team management is positive and significant at the 5% level. After adding fund-level variables, its significance drops slightly to 10%, but with the inclusion of manager characteristics, the coefficient on Team becomes significant at the 5% level, and its economic magnitude increases by about 50% relative to that in column 4. In columns 7-9, the dependent variable is conditional alpha. In Panel A, the coefficient on Team again is positive in all three specifications, and while it is a bit less significant in the first two regressions relative to the corresponding output in columns 4 and 5, it is again significant at the 5% level for the most comprehensive last regression specification. In fact, the economic impact of team management on conditional alpha after accounting for all fund and manager characteristics is 46bp per year. The slopes on most of the control variables in line with those

[12] See Maddala and Rao (1973) and Grubb and Symons (1987) among others.

reported in Table 3.[13] In Panel B of Table 4, we generally see the same pattern as in Panel A. There is only a small reduction in economic and statistical significance of the coefficient on Team dummy for each estimation vis-à-vis the corresponding test in Panel A. As before, the impact of team management on fund performance is the largest after controlling for both fund-level and manager characteristics.

We have observed that on average funds with team management practices appear to do better than single-managed funds. The next natural inquiry is to determine whether teams benefit all type of funds, irrespective of their investment objective. If team-induced performance gains are concentrated in a specific fund category, then the most likely explanation for previous findings will be not so much related to the benefits that teams brings to fund operations but rather to the characteristics of that single fund category. Table 5 reports the results of our tests on the impact on team management separately for each of the four fund investment objectives. We show the outcome of tests for two risk-adjusted measures of fund performance, $\alpha(4U)$ and $\alpha(4C)$, and report the same set of estimates as in Table 4. The characteristics of regression models are also the same as before but they always include both fund- and manager-level controls.

Columns 1 and 2 of Table 5 show that team management virtually has no impact on aggressive growth funds returns. This could be due to the fact that aggressive growth funds are believed to be benefitting the most among other fund types from higher turnover rates; therefore, coordinating frequent trading decisions among multiple team members may become impeding for fund performance. Note also that aggressive growth funds deal with more "soft," not easily available information about stocks and, as Stein (2002) argued, in these cases, single-manager structures may be preferable. This is not however the case for other objective categories. As shown in columns 3-8, managerial teams have economically and statistically significant, at least at 10% level, relation to risk-adjusted returns in all six estimations but one, for $\alpha(4U)$ of growth

[13] Note that the primary difference in the statistical significance of Team dummy between Table 4 and Table 3 comes from the increased sample size (e.g., more than 6% in tests with all control variables) rather than small changes in the set of control variables.

funds.[14] Even in this case, the economic impact of team management is 37bp per year, while that for growth & income and equity income funds approaches a whapping 1.00% per year. Therefore, Table 5 illustrates that having funds managed by teams of managers benefits most of fund categories.

5.2. The Effect of an Additional Team Member

Our previous analysis shows that on average team-managed funds perform better than single-managed funds, and this result holds across most of fund investment objectives. Clearly, another relevant question is whether the positive relation between team management and fund returns is linear in team size. Prior research is very scarce on this issue. The only convincing evidence of non-linear benefits of team size is present in Hamilton, Nickerson, and Owan (2003) who find largest increases in productivity of garment industry workers when they join the teams at the early stages of team formation.

Recall from our Table 1 (Panel B) that team size indeed appears to be important to fund returns, and that the largest gains in risk-adjusted performance are observed among funds administered by three managers. What is necessary to do now is to examine if this pattern persists or changes after controlling for our usual sets of fund and manager characteristics. Therefore, we run the following regression model:

$$\begin{aligned} Perf_{i,t} &= c_0 + c_1 2FM_{i,t} + c_2 3FM_{i,t} + c_3 4FM_{i,t} + c_4 5FM_{i,t} + \\ &+ \delta_1 Fund\_Controls_{i,t-1} + \delta_2 Mgr\_Controls_{i,t} + \delta_3 FE_{i,t} + e_{i,t}, \end{aligned} \quad (4)$$

where $2FM_{i,t}$, is a dummy which equals one if the fund has two fund managers at the end of calendar year and zero otherwise; $3FM_{i,t}$, is a dummy which equals one if the fund has three fund managers at the end of calendar year and zero otherwise; $4FM_{i,t}$ is a dummy which equals one if the fund has four fund managers at the end of calendar year and zero otherwise; and $5FM_{i,t}$ is a

[14] Note that some drop in the statistical significance of Team dummy for growth and equity income funds simply occurs because of the reduction in sample size rather than from the decrease in the magnitude of coefficients from the full-sample estimation in Table 4.

dummy which equals one if the fund has five (or more) fund managers at the end of calendar year and zero otherwise. The other variables are defined as before.

Table 6 shows the estimation results of fund management team size on the two measures of risk-adjusted fund performance, $\alpha(4U)$, and $\alpha(4C)$. Consistent with results of simple difference tests in Panel B of Table 1, the three-manager funds add the most of performance gains vis-à-vis single-managed funds in terms of both unconditional and conditional alphas. The economic value of a three-person team management on fund performance ranges between 50bp and 60bp per year for the specification that includes all control characteristics (0.04 and 0.05 percent per month, respectively). Teams with two managers as well as larger teams (four and five or more managers) add less performance gains relative to single-managed funds. These extra benefits are not always statistically significant even at the 10% level which is achieved only among funds with five or more managers. However, note that not only statistical significance of funds managed by five people but also their economic impact decreases with the inclusion of control variables, especially after accounting for average manager characteristics. Having said that, the economic value of team management for funds that are managed by two, four, or five or more managers can still remain sizable, although always less than that for funds managed by three people in each respective tests specification. For instance, for funds with five or more managers the annual impact of team management on their conditional alpha is 43bp, as reported in column 6 (it is 60bp for three-manager funds).

Thus, Table 6 confirms our prediction P1 and shows that team size is non-linearly related to fund performance. Intuitively, the number of team members determines the tradeoff associated with larger knowledge base that more people bring to the team versus coordination costs among multiple individuals, as indicated by Mueller (2012) and others. This result is also consistent with Hamilton, Nickerson, and Owan (2003). Each group member brings his/her specific skills and talents, but large cohorts of people with various views on the subject matter may reduce productivity due to higher difficulty of arriving to unanimous conclusions.

5.3. Team Management and Geographic Location

If teams in the financial industry are able to achieve diversification of style and judgment, as argued by Sharpe (1981), then the value of having a team must be more profound under those conditions when there are more objective reasons for people in groups to have "uncorrelated" to each other views. This can occur more easily in larger cities than in smaller communities. Indeed, group members in larger cities may have more independent sources of information and more diverse networking potential than residents of small towns. Therefore, we test this idea by examining now the team impact on fund performance in financial centers versus smaller towns. The regression model is as follows,

$$\begin{aligned} Perf_{i,t} &= c_0 + c_1 Team_{i,t} + c_2 Team_{i,t} \times FC_i + c_3 FC_i + \\ &+ \delta_1 Fund\_Controls_{i,t-1} + \delta_2 Mgr\_Controls_{i,t} + \delta_3 FE_{i,t} + e_{i,t} \end{aligned}, \quad (5)$$

where $Team_{i,t} \times FC_i$ is the interaction term between the dummies on team management and financial center dummies.

Table 7 reports the estimation results of fund management team size on our two risk-adjusted measures of fund performance, $\alpha(4U)$, and $\alpha(4C)$. Besides reporting the usual outcome of estimations, for each regression it also shows the results of the F-test of the hypothesis that the performance of team-managed and single-managed funds is the same. These tests are conducted separately across funds whose advisors are located in six financial centers and those outside that set of cities. Columns 1, 2, and 3 of the table show the estimation results for the unconditional alpha without controls, with fund controls only, and with full set of control variables, respectively. We can see that in all three specifications, the coefficient on Team is statistically zero (sometimes positive, sometimes negative), implying that teams add no gains to performance for funds not located in financial centers. The F-test at the bottom of the table restates these results. However, the value of a team is diametrically opposite in financial centers. First, the coefficient on the interaction term is consistently positive and economically significant, indicating extra benefits of team management in financial centers versus other places. Second

and more importantly, the F-test shows that in financial centers team-managed funds always significantly (at the 5% level) outperform single managed funds.[15]

Our estimations with conditional alpha in columns 4-6 of Table 7 lead to the same findings. Again, we observe no gains to managing funds in teams if the locations of funds advisors are outside financial centers. When funds are in financial centers, the evidence of benefits of group-decision making is even higher than before. Both economic and statistical results are stronger than in the case of unconditional alpha. For instance, for the regression specification with the full set of control variables (column 6), the marginal value of multiple-manager funds versus single-managed ones is almost 70bp per year, and this difference is statistically significant at the 1% level. All these findings confirm our prediction P2.

The results in Table 7 support Sharpe (1981) arguments and provide novel evidence that group decision making is more beneficial in such environments where group members are more likely to acquire knowledge and skills and establish business connections. Clearly, at least in the finance industry in general and mutual fund industry in particular, this becomes more achievable in financial centers than in smaller cities. Our evidence also highlights a new example of superior learning and/or knowledge spillover effects in larger cities as argued by Jacobs (1969), Glaeser (1999) and others.

5.4. The Role of Team Diversity

Besides the tradeoff between group and individual decision making and the determination of the optimal size of a team, the other important question is the potential effect of group diversity on performance. The literature on diversity in teams has led to inconclusive results regarding the impact of group composition on their performance (see Williams and O'Reilly, 1998; Jehn, Northcraft, and Neale, 1999; Hamilton, Nickerson, and Owan, 2003; Van Knippenberg and Schippers, 2007). On the positive side, larger diversity in team members may

[15] In these tests, we test whether the combined coefficient of the team impact on fund performance, c_1+c_2, is positive and statistically significant since both Team and FC are dummies and here take the value of unity.

enhance information processing skills of the group as a whole; on the negative side – significant differences among team members may cause frictions, conflicts of interests, and within-group biases. Most of the aforementioned studies deal with limited experimental and empirical data.

Our rich mutual fund dataset with various characteristics of fund managers provides an ideal testing ground for the examination of the effect of group diversity on fund performance. In particular, we can create diversity proxies across three dimensions of fund manager characteristics: tenure with the fund, SAT score, and age. As a diversity measure we use the coefficient of variation. It is the ratio of the standard deviation of a variable over its mean, and it is a useful statistic for data which can only take non-negative values (e.g., see Allison, 1978). Thus, our diversity proxies are:

$$Tenure\ \ Diversity_{i,t} = \sigma(Tenure_{i,t}) / \mu(Tenure_{i,t}), \tag{6}$$

$$SAT\ \ Diversity_{i,t} = \sigma(SAT_{i,t}) / \mu(SAT_{i,t}), \tag{7}$$

$$MAge\ \ Diversity_{i,t} = \sigma(MAge_{i,t}) / \mu(MAge_{i,t}), \tag{8}$$

where σ and μ are the standard deviation and mean of the corresponding manager characteristic, respectively. The table below reports the summary statistics of these diversity measures.

	Mean	S.D.	Min	Max	Median
Tenure Diversity	0.6313	0.3468	0.0338	2.0718	0.6082
SAT Diversity	0.0990	0.0574	0.0022	0.3735	0.0945
MAge Diversity	0.1834	0.1110	0.0111	0.6985	0.1746

All average and median diversity measures are within 0-1 range. The largest spread in these measures is observed for the fund tenure diversity, the smallest for SAT score diversity.

Table 8 shows the impact of team diversity on fund performance for funds located in financial centers and other places. We immediately focus on geographic breakup of our sample

since we already determined a primary impact of team management on funds located in larger cities. The table reports the estimates from panel regressions of unconditional and conditional fund alphas on three team diversity measures defined by Eqs. (6-8), the number of observations, and the adjusted R-squares.[16] Columns 1 to 4 show the results for funds in financial centers, while columns 5 to 8 – in other locations. In columns 1 and 3 financial center fund alphas are regressed only on the three manager diversity measures with no any controls. We observe significant economic and statistical impact of diversity in SAT scores and manager age on fund performance, and this relation is negative. This implies that homogeneous teams in financial centers outperform heterogeneous ones. The diversity in manager tenure does not appear to play an important role for fund returns. After controlling for the full set of fund and manager characteristics, including the team size in columns (2) and (4), our earlier conclusions only strengthen. Now, the values and statistical significance of coefficients on manager diversity measures based on SAT scores and age increase, while retaining the negative sign. A one standard deviation (0.06) increase in the SAT score diversity increases unconditional and conditional alphas by about 50bp and 70bp per year, respectively, while one standard deviation (0.1) increase in manager age diversity leads up to 60bp annual performance boost based on conditional alpha. We do not find any consistent evidence for the importance of diversity in team members among funds located outside financial centers, illustrating again the irrelevance of team management for fund performance for these types of funds. The only significant outcome occurs with manager tenure diversity which results in a positive slope when the dependent variable is conditional alpha after controlling for fund and other manager characteristics.

Thus, our findings support other papers on team diversity that highlight more problems than benefits associated with grouping people with different characteristics into the same teams (e.g., Jehn, Northcraft, and Neale, 1999). The results are also consistent with career concerns

[16] Note that our sample size now is much lower than in the earlier tests. This drop occurs for the following two reasons. First, in the current tests we use only team-managed funds. Second, when only one manager in a team has identifiable characteristic, it is impossible to compute the diversity measure based on this characteristic. However, these observations still contribute to the sample that contains average manager characteristics.

issues in mutual funds (e.g., see Chevalier and Ellison, 1999b). Managers with large differences in incentives and career options, stemming from differences in their educational background and age, are unlikely to collaborate well on such vaguely defined issues as fund portfolio composition and trading activity.

6. Team Management, Risk Taking, and Fund Characteristics

After analyzing various aspects of performance differences between team-managed and single-managed funds in the earlier part of the paper, in this section, we examine whether there exist systematic differences in risk taking and other fund characteristics that can be distinctly attributed to group decision making in mutual fund industry. First, recall that the existing literature is unclear on the impact of team on risk taking. Some studies, such as Wallach and Kogan (1965), Stoner (1968), Sunstein (2002), and others find that groups could act more aggressively and undertake more risk. Other studies, however, such as Barry and Starks (1984) and Adams and Ferreira (2009), provide theoretical and some empirical evidence that groups, may in fact, reduce risk. To address these issues within our framework, we use the following model:

$$Risk_{i,t} = d_0 + d_1 Team_{i,t} + \delta_1 Fund\_Controls_{i,t-1} + \delta_2 Mgr\_Controls_{i,t} + \delta_3 FE_{i,t} + e_{i,t}, \quad (7)$$

where $Risk_{i,t}$ is one of fund's i risk measures at time t. We consider several risk measures. The first is the total volatility of the fund. The second is market risk and the idiosyncratic residual volatility coming from the standard CAPM. The final set comes from the Carhart (1997) model (see Eq. (1)) and includes market beta, the loadings on size, book-to-market and momentum portfolios, as well as the idiosyncratic residual volatility from this model.

Table 8 reports the results of the estimation of the impact of team management on various risk measures. In this table, the market and residual risk from the CAPM are denoted by Mrk1

and IdVol1, respectively, while these risks from the Carhart (1997) model as Mrk4 and IdVol4, respectively. Each regression specification includes a full set of fund and manager controls as in previous tests with the exception of two fund-level variables, namely, fund family size and net flows. There are no a priori expectations about the impact of those two variables have on risk characteristics of funds. We can see that team management has no statistically significant impact on funds' total risk, market risk, or idiosyncratic risk, irrespective whether the latter two measures are estimated based on the CAPM or Carhart (1997) model. One could still argue that the total risk of team managed funds, even though being insignificant statistically, is large in economic sense, reaching almost 1% per year (0.0797*12). However, the two metrics of the idiosyncratic risk, IdVol1 and IdVol4, that have different signs as well as economically similar yet small exposures to the market portfolio, Mrk1 and Mrk4 imply at best potential exposure to non-conventional risk measures. Indeed, we observe that team-managed funds load more on small firms and high book-to-market firms: the coefficients on SMB and HML are both positive and significant. Among control variables, the most consistent results for market risk are that we find that it increases for large funds and funds with higher turnover rates. Also, we note that fund age has negative and almost everywhere statistically significant impact on risk across most of its measures except momentum.

In sum, Table 8 illustrates that the impact of group-decision making on fund risk taking behavior is not very straightforward. Team-managed funds do not seem to take more market risk, and their volatility, both total and risk-adjusted, is also non-excessive, but they may expose themselves more to other possible measures of risk than single-managed funds.

Next, we look if team management is associated with specific fund characteristics using the regression setting below:

$$FundChar_{i,t} = d_0 + d_1 Team_{i,t} + \delta_1 Fund\_Controls_{i,t-1} + \delta_2 Mgr\_Controls_{i,t} + \delta_3 FE_{i,t} + e_{i,t}, \qquad (8)$$

where $FundChar_{i,t}$ is one of fund's i characteristics at time t. Four fund characteristics are relevant for our analysis: Expenses, turnover, fund size and net flows. Clearly, in these regression models, our set of fund-level control variables must depend on the fund characteristic in question.

Table 9 reports the results of tests based on Eq. (8). The table has 12 columns, three regression specifications per each fund characteristic. Columns 1-3 show the results for fund expenses. Consistent with Table 1 data, we find that team-managed funds are generally cheaper for investors. This result is significant with fund-level controls but, with the sample reduction after the addition of manager-level controls, drops to insignificance. Columns 4-6 show the results for fund turnover. We observe that team management drastically reduces the trading frequency of funds and this drop is statistically significant. For instance, in economic terms, an average team-managed fund reduces annual turnover by 12.4% relative to a single-managed fund with similar fund and manager characteristics. Columns 7-9 show the results for fund size. *A priori*, one can think that larger funds are more likely to have teams of portfolio managers. However, just like Table 1 provides no clear signs that multiple-manager funds are usually larger, the estimation results in the current table that account for control variables also give no convincing support for any relation between team management and fund size.[17] Finally, in columns 10-12, we show the impact of teams on generating fund flows. In these tests, we follow Sirri and Tufano (1998) and, besides controlling for the standard set of fund characteristics, also the lagged unconditional alpha, $\alpha(4U)_{i,t-1}$, and the lagged flows to funds with the same investment objective, $Obj\ Flows_{i,t-1}$. We find that team-managed funds are able to generate significantly higher net flows to their respective funds. This statistically significant result becomes even stronger after the incorporation of managerial controls in the last column of the table. Our finding that team-managed funds increase fund flows is also consistent with recent trend of the increase of proportion of multiple-manager funds.

[17] Our set of fund-level control variables also include lagged fund size as in Chevalier and Ellison (1999a).

7. Conclusions

In this paper, we revisit the question on the benefits of collective versus individual decision making. Few studies exist in economics literature that estimate the impact of a team on worker productivity and risk taking in rather indirect ways basing their findings on relatively limited data. Using detailed managerial-level data from mutual funds allows one to directly observe any differences in various aspects of performance and risk preferences between single-managed and team-managed funds. However, prior research in this area has been largely relying on CRSP dataset and the prevailing conclusion has been multiple-manager funds perform no better if not worse than solo-manager ones.

We use mutual fund data from Morningstar and first meticulously show that there exist large discrepancies in managerial structure reporting between this database and CRSP. This misspecification averages about 20% per year over our sample period of 1992-2010. More importantly, using more reliable Morningstar data we provide compelling evidence that team management has on average a positive impact on fund risk-adjusted returns across all fund investment objectives except aggressive growth. In these tests, we are able to control for a range of fund-level and manager-specific characteristics.

We further show that the influence of a group decision making on fund performance is non-linear in team size and is not uniform across all geographic locations. Funds benefit the most from a team work of three portfolio managers. This may indicate the potential trade-off between the benefits of collective wisdom and increasing coordination and/or free-rider issues that become more problematic in larger groups. Also, the benefits of team management are strongly present among funds in financial centers but not outside those locations. This outcome is consistent with the idea that larger cities provide wider opportunities for learning and knowledge spillovers, so the potential contribution of each manager to fund activities in larger cities is higher than in smaller towns. We observe that team management practice in financial centers is

effective among funds with more homogeneous managers along education and age dimensions, possibly reflecting the benefits of more alignment in career concerns. Finally, we show that among other benefits of team-managed funds are substantially lower turnover and ability to attract new money flows into their funds.

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Table 1
Summary statistics of mutual funds management structure

Panel A: Distribution of single and team-managed funds

	1 Manager		2 Managers		3 Managers		4 Managers		5+ Managers	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
1992	519	67	145	19	70	9	17	2	29	4
1993	584	63	202	22	78	8	20	2	39	4
1994	672	64	243	23	85	8	23	2	35	3
1995	729	61	273	23	115	10	30	3	45	4
1996	767	57	350	26	121	9	57	4	46	4
1997	859	56	399	26	161	11	63	4	48	3
1998	921	53	449	26	210	12	67	4	84	5
1999	961	51	494	26	258	14	81	5	99	6
2000	987	49	587	29	253	12	90	5	116	6
2001	1004	47	602	28	272	13	115	6	134	7
2002	1000	46	647	30	283	13	120	6	137	7
2003	971	44	662	30	287	13	145	7	161	8
2004	876	39	659	30	320	14	174	9	196	10
2005	832	35	698	29	335	14	226	11	300	14
2006	802	33	731	30	352	14	222	11	346	16
2007	776	31	748	30	363	15	247	12	333	16
2008	776	32	732	30	356	15	243	12	327	16
2009	719	31	691	30	392	17	189	9	315	16
2010	622	29	666	31	398	19	164	9	293	16
Total	15377	43	9978	28	4709	13	2293	7	3083	10

Table 1 (continued)

Panel B: Fund performance of single and team-managed funds

	1 Manager		2 Managers		3 Managers		4 Managers		5+ Managers	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
OAR	0.001	1.347	0.015	1.283	0.018	1.157	0.048	1.480	0.037	0.975
Diff			0.014		0.017		0.047		0.036	
p-value			(0.447)		(0.470)		(0.147)		(0.176)	
α(4U)	-0.042	0.796	-0.031	0.765	-0.006	0.738	-0.029	0.788	-0.005	0.603
Diff			0.011		0.036**		0.013		0.037**	
p-value			(0.342)		(0.017)		(0.528)		(0.031)	
α(4C)	-0.006	0.857	-0.003	0.822	0.033	0.793	0.009	0.866	0.018	0.659
Diff			0.003		0.039**		0.015		0.024	
p-value			(0.806)		(0.016)		(0.498)		(0.188)	

Panel C: Fund characteristics of single and team-managed funds

	1 Manager		2 Managers		3 Managers		4 Managers		5+ Managers	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Volatility	4.728	2.567	4.820	2.647	4.981	2.638	4.756	2.701	4.715	2.262
TNA	914	3,800	667	2,030	864	2,690	941	3,450	2,310	10,300
Fund Age	10.240	12.569	10.208	12.185	10.201	12.209	9.193	10.514	10.615	11.446
Turnover	0.913	0.843	0.856	0.698	0.906	0.745	0.828	0.630	0.807	0.627
Expenses	1.316	0.475	1.292	0.437	1.270	0.424	1.244	0.410	1.178	0.407

Panel D: Fund manager characteristics of single and team-managed funds

	1 Manager		2 Managers		3 Managers		4 Managers		5+ Managers	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Tenure	4.42	4.80	3.83	3.60	3.67	3.20	3.52	3.2	3.61	2.9
SAT	1157.44	139.12	1146.17	116.13	1143.16	99.95	1139.86	93.01	1145.23	79.91
MBA	0.53	0.50	0.70	0.46	0.80	0.40	0.87	0.34	0.95	0.23
Mage	45.90	9.56	44.99	8.83	44.34	8.53	44.32	8.53	44.48	7.09

Table 1 (continued)

This table gives the summary statistics of domestic equity mutual funds in the United States from 1992 to 2010. Panel A reports the number (and percentage) of funds managed by one, two, three, four, and five (or more) fund managers each year. Panel B report the mean and standard deviation of three fund performance measures. OAR (%, per month) is investment objective adjusted fund return, which is the difference between the average monthly net fund return for fund i in year t and the average monthly fund return of all funds in the matched investment objective in year t. α(4U) and α(4C) are the monthly risk-adjusted net fund returns using unconditional and conditional versions of Carhart (1997) four-factor model, respectively. The panel also shows the difference in performance test results between each group of team-managed funds and single-managed funds. Panel C reports the mean and standard deviation of different fund characteristics over the entire sample period. Volatility (%) is the standard deviation of monthly fund returns over the past 12 months for fund i in year t. TNA ($, millions) is the total net asset under management of fund i in year t. Fund Age (years) is the difference between fund i's inception year and the current year t. Turnover is the minimum of aggregated sales or aggregated purchases of securities of the year divided by the average 12-month total net assets of the fund. Expenses (%) is the annual total expense ratio of the fund i in year t. Panel D reports fund manager characteristics following Chevalier and Ellison (1999). Tenure (years) is the number of years the fund manager remains with the fund i at time t. SAT is the SAT score of matriculates of the fund manager's undergraduate institution. MBA is defined as a dummy variable which equals one when a fund manager (or at least one of the team members) has MBA degree and zero otherwise. MAge (years) is the fund manager's age at current year t. Important note: In case of teams, we simply take the average for each of these characteristics: Tenure, SAT and MAge.

Table 2
Misspecification in management structure: CRSP versus Morningstar

Year	Matched # Funds	CRSP		Morningstar		Misspecification					
						Single(CRSP) - Team(MS)		Team(CRSP) - Single(MS)		# Misspecified Funds	% Matched Sample
		% Single	% Team	% Single	% Team	# Funds	% Single(CRSP)	# Funds	% Team(CRSP)		
1992	582	80.76	19.24	67.87	32.13	89	18.94	14	12.50	103	17.70
1993	720	81.94	18.06	64.58	35.42	147	24.92	22	16.92	169	23.47
1994	835	79.64	20.36	63.35	36.65	176	26.47	40	23.53	216	25.87
1995	946	78.22	21.78	61.42	38.58	196	26.49	37	17.96	233	24.63
1996	1040	69.04	30.96	58.17	41.83	173	24.09	60	18.63	233	22.40
1997	1238	63.25	36.75	56.54	43.46	166	21.20	83	18.24	249	20.11
1998	1560	60.90	39.10	54.17	45.83	222	23.37	117	19.18	339	21.73
1999	1668	54.02	45.98	50.84	49.16	177	19.64	124	16.17	301	18.05
2000	1678	52.26	47.74	48.63	51.37	197	22.46	136	16.98	333	19.85
2001	1798	50.17	49.83	47.94	52.06	183	20.29	143	15.96	326	18.13
2002	1864	47.64	52.36	46.51	53.49	190	21.40	169	17.32	359	19.26
2003	1933	42.42	57.58	44.28	55.72	145	17.68	181	16.26	326	16.86
2004	1940	33.04	66.96	40.21	59.79	116	18.10	255	19.63	371	19.12
2005	2015	33.20	66.80	35.33	64.67	184	27.50	227	16.86	411	20.40
2006	2068	33.70	66.30	33.46	66.54	203	29.12	198	14.44	401	19.39
2007	2129	31.38	68.62	31.75	68.25	122	18.26	130	8.90	252	11.84
2008	2110	30.19	69.81	32.65	67.35	122	19.15	174	11.81	296	14.03
2009	1928	30.39	69.61	31.64	68.36	116	19.80	140	10.43	256	13.28
2010	1866	30.98	69.02	29.80	70.20	105	18.17	83	6.44	188	10.08

This table describes the nature and extent of misspecification in the management structure of the U.S. domestic equity mutual funds from 1992 to 2010. Using a matched sample of mutual funds in the CRSP and Morningstar (MS) mutual fund database, the first columns in the table report the percentage of mutual funds classified as reporting one manager name (Single-managed), reporting two or more manager names (Team-managed) in both databases by year. In both cases the unit of observation is the mutual fund, not the fund share class. Columns seven to twelve report the extent of management structure misspecification in the matched sample by year. Column seven reports the number of funds that are classified as single-managed in CRSP but are team-managed in MS in the same calendar year. Column eight reports these misspecified funds as a percentage of all funds classified as single-managed in CRSP. Similarly, column nine reports the number of funds that are identified as team-managed in CRSP but are single-managed in MS. Column ten reports these misspecified funds as a percentage of all funds classified as team-managed in CRSP. Columns eleven and twelve report the total number of misspecified funds and express it as a percentage of total matched sample each year.

Table 3
Effect on team management on fund performance: CRSP versus Morningstar

Panel A: Full matched sample analysis

	CRSP				Morningstar			
	α(4U)	α(4U)	α(4C)	α(4C)	α(4U)	α(4U)	α(4C)	α(4C)
Team	-0.0012	-0.0108	-0.0033	-0.0058	0.0134	0.0247	0.0127	0.0340**
	(0.912)	(0.475)	(0.777)	(0.728)	(0.204)	(0.106)	(0.266)	(0.039)
Fund $Size_{i,t-1}$	-0.0270***	-0.0316***	-0.0260***	-0.0243***	-0.0272***	-0.0321***	-0.0262***	-0.0248***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fund $Age_{i,t}$	-0.0035	-0.0166*	-0.0092	-0.0304***	-0.0031	-0.0175*	-0.0087	-0.0316***
	(0.629)	(0.076)	(0.244)	(0.003)	(0.672)	(0.061)	(0.269)	(0.002)
Family $Size_{i,t-1}$	0.0122***	0.0128***	0.0125***	0.0085**	0.0123***	0.0134***	0.0126***	0.0092**
	(0.000)	(0.001)	(0.000)	(0.049)	(0.000)	(0.001)	(0.000)	(0.032)
$Expenses_{i,t-1}$	-0.0573***	-0.0585***	-0.0457***	-0.0472**	-0.0568***	-0.0571***	-0.0451***	-0.0455**
	(0.000)	(0.002)	(0.005)	(0.022)	(0.000)	(0.003)	(0.006)	(0.027)
$Turnover_{i,t-1}$	-0.0271***	-0.0224*	-0.0050	0.0137	-0.0268***	-0.0212*	-0.0047	0.0153
	(0.003)	(0.078)	(0.622)	(0.334)	(0.003)	(0.097)	(0.644)	(0.280)
$Flows_{i,t-1}$	-0.0043	-0.0026	-0.0057*	-0.0057	-0.0043	-0.0026	-0.0057*	-0.0057
	(0.150)	(0.468)	(0.075)	(0.126)	(0.153)	(0.464)	(0.077)	(0.123)
$Performance_{i,t-1}$	0.0948***	0.1027***	0.0782***	0.0809***	0.0948***	0.1025***	0.0782***	0.0805***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Tenure_{i,t}$		0.0038**		0.0044**		0.0045***		0.0052***
		(0.022)		(0.013)		(0.007)		(0.003)
$SAT_{i,t}$		0.0220***		0.0196***		0.0230***		0.0208***
		(0.000)		(0.002)		(0.000)		(0.001)
$MBA_{i,t}$		0.0093		-0.0021		0.0015		-0.0112
		(0.587)		(0.917)		(0.928)		(0.571)
$MAge_{i,t}$		-0.0838**		-0.1010**		-0.0789*		-0.0952**
		(0.038)		(0.017)		(0.051)		(0.025)
Constant	0.1668**	0.3841**	0.1248	0.4854**	0.1611**	0.3366*	0.1189	0.4286**
	(0.025)	(0.033)	(0.132)	(0.014)	(0.032)	(0.065)	(0.153)	(0.031)
Time & Obj. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (Fund)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	12.65	13.33	12.76	13.31	12.66	13.35	12.76	13.34
Obs.	18,437	10,982	18,437	10,982	18,437	10,982	18,437	10,982
Team (MS-CRSP) = 0					0.0146***	0.0355***	0.0160***	0.0398***
p-value					(0.000)	(0.000)	(0.000)	(0.000)

Table 3 (continued)

Panel B: Sub-period analysis

	CRSP				Morningstar			
	1992-1999		2000-2010		1992-1999		2000-2010	
	α(4U)	α(4C)	α(4U)	α(4C)	α(4U)	α(4C)	α(4U)	α(4C)
Team	-0.0020	0.0213	0.0015	-0.0165	0.0215	0.0520*	0.0122	0.0153
	(0.941)	(0.515)	(0.892)	(0.314)	(0.400)	(0.086)	(0.298)	(0.402)
Fund Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Mgr. Controls	No	Yes	No	Yes	No	Yes	No	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time & Obj. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (Fund)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	5.42	5.66	15.13	16.37	5.43	5.74	15.14	16.37
Obs.	3,626	2,618	14,811	8,364	3,626	2,618	14,811	8,364
Team (MS-CRSP) = 0					0.0235***	0.0307***	0.0107***	0.0319***
p-value					(0.000)	(0.000)	(0.000)	(0.000)

This table compares the effect of management structure on fund performance across CRSP and Morningstar databases using a panel regression approach on matched sample from 1992 to 2010. Panel A reports regression estimates of the matched funds across full sample period using both databases, while Panel B reports regression estimates of the matched funds across two sub-periods. The dependent variable includes two performance measures, α(4U) and α(4C), which are the monthly risk-adjusted net fund returns using unconditional and conditional versions of Carhart (1997) four-factor model, respectively. The independent variable of interest is Team, defined as a dummy variable which equals one if the fund has two (or more) fund managers and zero if it has only one fund manager at the end of calendar year. Other independent variables include various fund and manager characteristics as controls. Fund Size is the log of total net assets under management of the fund. Fund Age is the log of the difference between the fund's inception year and the current year. Family Size is the log of total net asset under management of the fund's family. Expenses is the annual total expense ratio of the fund. Turnover is the minimum of aggregated sales or aggregated purchases of securities of the year divided by the average 12-month total net assets of the fund. Flows is the net growth in total net assets under management of the fund over the past year. Performance is the corresponding lagged fund performance measure, α(4U) or α(4C). Tenure is the number of years the fund manager remains with the fund. SAT is the SAT score (divided by 100) of matriculates of the fund manager's undergraduate institution. MBA is defined as a dummy variable which equals one when a fund manager (or at least one of the team members) has MBA degree and zero otherwise. Manager Age is the log of fund manager's age in current year. All regression specifications include time and investment objective fixed effects (FE), and the standard errors are clustered by fund. Each regression model also reports the p-values of coefficients, the number of observations and the adjusted R^2. Team (MS-CRSP) is the hypothesis that slope coefficients on Team in the corresponding Morningstar and CRSP estimations are the same and p-value is the p-value of this test. ***, ** and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 4
Effect of team management of fund performance

Panel A: Tests with net (expense-adjusted) returns

	OAR			α(4U)			α(4C)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Team_{i,t}$	0.0237	0.0128	0.0308*	0.0216**	0.0181*	0.0320**	0.0189*	0.0184	0.0381**
	(0.154)	(0.332)	(0.094)	(0.031)	(0.100)	(0.043)	(0.081)	(0.118)	(0.025)
$Fund\ Size_{i,t-1}$		-0.0384***	-0.0555***		-0.0211***	-0.0253***		-0.0225***	-0.0211***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
$Fund\ Age_{i,t}$		0.0048	-0.0048		-0.0138*	-0.0284***		-0.0142*	-0.0382***
		(0.631)	(0.696)		(0.080)	(0.004)		(0.093)	(0.000)
$Family\ Size_{i,t-1}$		0.0126***	0.0208***		0.0104***	0.0110***		0.0106***	0.0080*
		(0.000)	(0.000)		(0.000)	(0.005)		(0.001)	(0.060)
$Expenses_{i,t-1}$		-0.0214	-0.0462*		-0.0414**	-0.0532***		-0.0369**	-0.0472**
		(0.311)	(0.056)		(0.011)	(0.007)		(0.041)	(0.028)
$Turnover_{i,t-1}$		0.0377***	0.0372**		-0.0279***	-0.0241*		-0.0196*	-0.0046
		(0.005)	(0.031)		(0.004)	(0.072)		(0.069)	(0.746)
$Volatility_{i,t-1}$		-0.0307**	-0.0063		-0.0112**	-0.0068		0.0235***	0.0261***
		(0.017)	(0.786)		(0.033)	(0.339)		(0.000)	(0.000)
$Flows_{i,t-1}$		-0.0025	-0.0057		-0.0001	0.0008		-0.0027	-0.0033
		(0.411)	(0.169)		(0.974)	(0.818)		(0.346)	(0.356)
FC_i		0.0110	-0.0007		-0.0047	-0.0079		-0.0051	0.0104
		(0.378)	(0.965)		(0.663)	(0.571)		(0.663)	(0.491)
$Tenure_{i,t}$			0.0078***			0.0060***			0.0071***
			(0.001)			(0.001)			(0.000)
$SAT_{i,t}$			0.0321***			0.0212***			0.0188***
			(0.000)			(0.001)			(0.005)
$MBA_{i,t}$			0.0293			0.0005			-0.0091
			(0.174)			(0.979)			(0.645)
$MAge_{i,t}$			-0.0017			-0.1032**			-0.1310***
			(0.971)			(0.012)			(0.002)
Constant	0.0098	0.5517***	0.2223	-0.0556**	0.1569**	0.4361**	-0.0996***	0.0213	0.4687**
	(0.751)	(0.000)	(0.296)	(0.049)	(0.044)	(0.019)	(0.001)	(0.801)	(0.019)
Time & Obj. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (Fund)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	-0.04	1.93	2.99	11.02	11.90	12.77	11.09	12.31	13.25
Obs.	31,440	20,565	12,135	26,703	19,781	11,646	26,703	19,781	11,646

Table 4 (continued)

Panel B: Tests with gross (expense-unadjusted) returns

	OAR			α(4U)			α(4C)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Team_{i,t}$	0.0179	0.0091	0.0288	0.0172*	0.0159	0.0302*	0.0145	0.0163	0.0362**
	(0.273)	(0.482)	(0.112)	(0.082)	(0.142)	(0.056)	(0.177)	(0.161)	(0.032)
Fund Controls	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Mgr. Controls	No	No	Yes	No	No	Yes	No	No	Yes
Constant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time & Obj. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (Fund)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	-0.05	2.16	3.22	10.86	11.91	12.82	10.97	12.54	13.49
Obs.	31,440	20,565	12,135	26,703	19,781	11,646	26,703	19,781	11,646

This table shows the effect of management structure on fund performance using the Morningstar U.S. domestic equity mutual fund sample from 1992 to 2010. It reports the estimates from panel regressions of fund performance on management structure (team versus single) and other controls. Panel A shows test results with net (expense-adjusted) returns; Panel B – with gross (expense-unadjusted) returns. The dependent variable includes three performance measures: OAR, α(4U), and α(4C). OAR is the difference between the average monthly net fund return for the fund in year t and the average monthly net fund returns of all funds in the matched investment objective in year t. α(4U) and α(4C) are the monthly risk-adjusted net fund returns using unconditional and conditional versions of Carhart (1997) four-factor model, respectively. The independent variable of interest is Team, defined as a dummy variable which equals one if the fund has two (or more) fund managers and zero if the fund has only one fund manager at the end of calendar year. Other independent variables include various fund and manager characteristics as controls. Fund Size is the log of total net assets under management of the fund. Fund Age is the log of the difference between the fund's inception year and the current year. Family Size is the log of total net asset under management of the fund's family. Expenses is the annual total expense ratio of the fund. Turnover is the minimum of aggregated sales or aggregated purchases of securities of the year divided by the average 12-month total net assets of the fund. Flows is the net growth in total net assets under management of the fund over the past year. Volatility (%) is the standard deviation of monthly net fund returns over the past 12 months for the fund. FC is the dummy variable which equals one if the fund is in a financial center and zero otherwise. Financial center funds have headquarters located within 50 miles of Boston, Chicago, Los Angeles, New York, Philadelphia, or San Francisco. Tenure is the number of years the fund manager remains with the fund. SAT is the SAT score (divided by 100) of matriculates of the fund manager's undergraduate institution. MBA is defined as a dummy variable which equals one when a fund manager (or at least one of the team members) has MBA degree and zero otherwise. MAge is the log of fund manager's age in current year. All regression specifications include time and investment objective fixed effects and the standard errors are clustered by fund. Each regression model also reports the p-values of coefficients, the number of observations and the adjusted R^2. ***, ** and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 5
Effect of team management of fund performance by investment objective

	Aggressive Growth		Growth		Growth & Income		Equity Income	
	α(4U)	α(4C)	α(4U)	α(4C)	α(4U)	α(4C)	α(4U)	α(4C)
$Team_{i,t}$	-0.0010	-0.0179	0.0305	0.0388*	0.0736***	0.0833***	0.0765*	0.0804*
	(0.981)	(0.696)	(0.151)	(0.082)	(0.005)	(0.003)	(0.050)	(0.051)
$Fund\ Size_{i,t-1}$	-0.0286*	-0.0297*	-0.0264***	-0.0202***	-0.0250***	-0.0200*	-0.0078	-0.0063
	(0.092)	(0.076)	(0.000)	(0.002)	(0.008)	(0.065)	(0.622)	(0.725)
$Fund\ Age_{i,t}$	-0.0194	-0.0144	-0.0267**	-0.0374***	-0.0298*	-0.0343**	-0.0545	-0.0835**
	(0.535)	(0.662)	(0.039)	(0.007)	(0.054)	(0.046)	(0.137)	(0.025)
$Family\ Size_{i,t-1}$	0.0112	0.0137	0.0085*	0.0039	0.0213***	0.0200**	-0.0018	-0.0064
	(0.304)	(0.220)	(0.092)	(0.478)	(0.005)	(0.015)	(0.892)	(0.673)
$Expenses_{i,t-1}$	-0.0601	-0.0589	-0.0448*	-0.0330	-0.1044***	-0.1071***	0.1230	0.0714
	(0.211)	(0.270)	(0.087)	(0.232)	(0.001)	(0.003)	(0.124)	(0.462)
$Turnover_{i,t-1}$	-0.0256	-0.0037	-0.0334**	-0.0106	0.0296	0.0326	0.0517	0.0451
	(0.559)	(0.931)	(0.025)	(0.521)	(0.142)	(0.192)	(0.461)	(0.573)
$Volatility_{i,t-1}$	-0.0247**	0.0062	-0.0016	0.0273***	0.0026	0.0495**	-0.0067	0.0100
	(0.016)	(0.567)	(0.871)	(0.003)	(0.885)	(0.040)	(0.835)	(0.786)
$Flows_{i,t-1}$	0.0111	0.0043	-0.0022	-0.0060	0.0035	0.0076	-0.0057	-0.0051
	(0.216)	(0.631)	(0.604)	(0.177)	(0.590)	(0.368)	(0.528)	(0.581)
FC_i	-0.0304	-0.0116	-0.0149	0.0024	0.0221	0.0270	-0.0059	-0.0044
	(0.350)	(0.756)	(0.423)	(0.902)	(0.393)	(0.352)	(0.903)	(0.931)
$Tenure_{i,t}$	0.0101*	0.0121**	0.0052**	0.0050**	0.0070**	0.0110**	0.0030	0.0127**
	(0.074)	(0.036)	(0.010)	(0.021)	(0.030)	(0.024)	(0.614)	(0.019)
$SAT_{i,t}$	0.0273*	0.0166	0.0260***	0.0259***	0.0067	0.0046	-0.0416*	-0.0412
	(0.064)	(0.291)	(0.001)	(0.002)	(0.521)	(0.715)	(0.085)	(0.118)
$MBA_{i,t}$	-0.0319	-0.0553	-0.0004	-0.0030	-0.0334	-0.0667*	0.0854	0.1554***
	(0.514)	(0.281)	(0.987)	(0.909)	(0.260)	(0.057)	(0.127)	(0.003)
$MAge_{i,t}$	0.0068	-0.0753	-0.1463***	-0.1800***	-0.0810	-0.0514	-0.0404	-0.0581
	(0.950)	(0.499)	(0.005)	(0.001)	(0.342)	(0.561)	(0.767)	(0.679)
Constant	-0.1863	0.0375	0.6879***	0.5771**	0.1575	-0.3166	0.4302	0.5282
	(0.696)	(0.939)	(0.006)	(0.039)	(0.696)	(0.471)	(0.528)	(0.462)
Time & Obj. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (Fund)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	15.23	15.06	13.84	13.42	15.66	18.00	16.04	18.42
Obs.	2,402	2,402	6,908	6,908	1,761	1,761	575	575

Table 5 (continued)

This table shows the effect of management structure on fund performance using the Morningstar U.S. domestic equity mutual fund sample from 1992 to 2010. It reports the estimates from panel regressions of fund performance on management structure (team versus single) and other controls and other controls across four different MS investment objective categories: Aggressive Growth, Growth, Growth & Income, and Equity Income. The dependent variable includes two performance measures, α(4U) and α(4C), which are the monthly risk-adjusted net fund returns using unconditional and conditional versions of Carhart (1997) four-factor model, respectively. The independent variable of interest is Team, defined as a dummy variable which equals one if the fund has two (or more) fund managers and zero if the fund has only one fund manager at the end of calendar year. Other independent variables include various fund and manager characteristics as controls. Fund Size is the log of total net assets under management of the fund. Fund Age is the log of the difference between the fund's inception year and the current year. Family Size is the log of total net asset under management of the fund's family. Expenses is the annual total expense ratio of the fund. Turnover is the minimum of aggregated sales or aggregated purchases of securities of the year divided by the average 12-month total net assets of the fund. Flows is the net growth in total net assets under management of the fund over the past year. Volatility (%) is the standard deviation of monthly net fund returns over the past 12 months for the fund. FC is the dummy variable which equals one if the fund is in a financial center and zero otherwise. Financial center funds have headquarters located within 50 miles of Boston, Chicago, Los Angeles, New York, Philadelphia, or San Francisco. Tenure is the number of years the fund manager remains with the fund. SAT is the SAT score of matriculates of the fund manager's undergraduate institution. MBA is defined as a dummy variable which equals one when a fund manager (or at least one of the team members) has MBA degree and zero otherwise. MAge is the log of fund manager's age in current year. All regression specifications include time and investment objective fixed effects and the standard errors are clustered by fund. Each regression model also reports the p-values of coefficients, the number of observations and the adjusted R^2. ***, ** and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 6
Effect of team size on fund performance

	α(4U)			α(4C)		
	(1)	(2)	(3)	(4)	(5)	(6)
2 Managers	0.0121	0.0124	0.0307*	0.0058	0.0073	0.0304
	(0.317)	(0.336)	(0.091)	(0.653)	(0.600)	(0.119)
3 Managers	0.0359**	0.0320**	0.0405*	0.0384**	0.0388**	0.0499**
	(0.015)	(0.045)	(0.065)	(0.016)	(0.021)	(0.032)
4 Managers	0.0155	-0.0068	0.0154	0.0230	0.0052	0.0392
	(0.516)	(0.737)	(0.526)	(0.373)	(0.802)	(0.126)
5+ Managers	0.0305**	0.0328*	0.0291	0.0236	0.0307*	0.0361
	(0.043)	(0.050)	(0.184)	(0.151)	(0.093)	(0.123)
$\text{Fund Size}_{i,t-1}$		-0.0216***	-0.0249***		-0.0232***	-0.0209***
		(0.000)	(0.000)		(0.000)	(0.000)
$\text{Fund Age}_{i,t}$		-0.0140*	-0.0288***		-0.0140	-0.0386***
		(0.079)	(0.003)		(0.101)	(0.000)
$\text{Family Size}_{i,t-1}$		0.0103***	0.0108***		0.0106***	0.0078*
		(0.001)	(0.006)		(0.001)	(0.068)
$\text{Expenses}_{i,t-1}$		-0.0421**	-0.0523***		-0.0373**	-0.0465**
		(0.011)	(0.009)		(0.040)	(0.031)
$\text{Turnover}_{i,t-1}$		-0.0003***	-0.0002*		-0.0002*	-0.0000
		(0.006)	(0.082)		(0.071)	(0.774)
$\text{Volatility}_{i,t-1}$		-0.0112**	-0.0071		0.0236***	0.0257***
		(0.033)	(0.325)		(0.000)	(0.000)
$\text{Flows}_{i,t-1}$		-0.0004	0.0003		-0.0030	-0.0038
		(0.879)	(0.924)		(0.304)	(0.282)
FC_i		-0.0050	-0.0081		-0.0051	0.0107
		(0.651)	(0.565)		(0.665)	(0.484)
$\text{Tenure}_{i,t}$			0.0057***			0.0069***
			(0.001)			(0.000)
$SAT_{i,t}$			0.0201***			0.0177***
			(0.002)			(0.008)
$MBA_{i,t}$			0.0028			-0.0099
			(0.879)			(0.627)
$MAge_{i,t}$			-0.1054**			-0.1314***
			(0.012)			(0.002)
Constant	-0.0772***	0.2731***	0.4536**	-0.0292	0.2131***	0.4870**
	(0.0002)	(0.0001)	(0.015)	(0.192)	(0.006)	(0.016)
Time & Obj. FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (Fund)	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	11.13	11.96	12.83	11.20	12.39	13.28
Obs.	25,908	19,555	11,534	25,908	19,555	11,534

Table 6 (continued)

This table shows the effect of team size on fund performance using the Morningstar U.S. domestic equity mutual fund sample from 1992 to 2010. It reports the estimates from panel regressions of fund performance on team size and other controls. The dependent variable includes two risk-adjusted performance measures, α(4U) and α(4C). α(4U) and α(4C) are the monthly risk-adjusted net fund returns using unconditional and conditional versions of Carhart (1997) four-factor model, respectively. 2 Managers is a dummy variable which equals one if the fund has two fund managers at the end of calendar year and zero otherwise; 3 Managers is a dummy variable which equals one if the fund has three fund managers at the end of calendar year and zero otherwise; 4 Managers is a dummy variable which equals one if the fund has four fund managers at the end of calendar year and zero otherwise; 5+ Managers is a dummy variable which equals one if the fund has five (or more) fund managers at the end of calendar year and zero otherwise. Other independent variables include various fund and manager characteristics as controls. Fund Size is the log of total net assets under management of the fund. Fund Age is the log of the difference between the fund's inception year and the current year. Family Size is the log of total net asset under management of the fund's family. Expenses is the annual total expense ratio of the fund. Turnover is the minimum of aggregated sales or aggregated purchases of securities of the year divided by the average 12-month total net assets of the fund. Flows is the net growth in total net assets under management of the fund over the past year. Volatility (%) is the standard deviation of monthly net fund returns over the past 12 months for the fund. FC is the dummy variable which equals one if the fund is in a financial center and zero otherwise. Financial center funds have their advisors located within 50 miles of Boston, Chicago, Los Angeles, New York, Philadelphia, or San Francisco. Tenure is the number of years the fund manager remains with the fund. SAT is the SAT score (divided by 100) of matriculates of the fund manager's undergraduate institution. MBA is defined as a dummy variable which equals one when a fund manager (or at least one of the team members) has MBA degree and zero otherwise. MAge is the log of fund manager's age in current year. All regression specifications include time and investment objective fixed effects and the standard errors are clustered by fund. Each regression model also reports the p-values of coefficients, the number of observations and the adjusted R^2. ***, ** and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 7
Interaction of team and location on fund performance

	α(4U)			α(4C)		
	(1)	(2)	(3)	(4)	(5)	(6)
$Team_{i,t}$	0.0095	-0.0052	0.0144	-0.0089	-0.0152	0.0092
	(0.572)	(0.774)	(0.551)	(0.612)	(0.417)	(0.725)
$Team_{i,t} \times FC_i$	0.0222	0.0400*	0.0290	0.0469**	0.0578**	0.0475
	(0.286)	(0.076)	(0.326)	(0.033)	(0.016)	(0.138)
FC_i	-0.0124	-0.0290	-0.0278	-0.0267	-0.0401**	-0.0223
	(0.459)	(0.127)	(0.284)	(0.129)	(0.046)	(0.431)
$Fund\ Size_{i,t-1}$		-0.0212***	-0.0253***		-0.0226***	-0.0210***
		(0.000)	(0.000)		(0.000)	(0.001)
$Fund\ Age_{i,t}$		-0.0135*	-0.0280***		-0.0137	-0.0376***
		(0.088)	(0.004)		(0.105)	(0.000)
$Family\ Size_{i,t-1}$		0.0106***	0.0111***		0.0108***	0.0082*
		(0.000)	(0.005)		(0.000)	(0.054)
$Expenses_{i,t-1}$		-0.0414**	-0.0535***		-0.0368**	-0.0477**
		(0.0114)	(0.0071)		(0.041)	(0.026)
$Turnover_{i,t-1}$		-0.0271***	-0.0238*		-0.0186*	-0.0039
		(0.005)	(0.0763)		(0.084)	(0.780)
$Volatility_{i,t-1}$		-0.0112**	-0.0069		0.0235***	0.0260***
		(0.033)	(0.3373)		(0.000)	(0.000)
$Flows_{i,t-1}$		-0.0000	0.0009		-0.0026	-0.0032
		(0.996)	(0.805)		(0.365)	(0.371)
$Tenure_{i,t}$			0.0059***			0.0070***
			(0.001)			(0.000)
$SAT_{i,t}$			0.0211***			0.0186***
			(0.001)			(0.005)
$MBA_{i,t}$			0.0017			-0.0072
			(0.926)			(0.717)
$MAge_{i,t}$			-0.1033**			-0.1311***
			(0.012)			(0.002)
Constant	0.0911***	0.1689**	0.4460**	0.1028***	0.0387	0.4849**
	(0.005)	(0.031)	(0.016)	(0.003)	(0.648)	(0.016)
Time & Obj. FE	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (Fund)	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	11.29	11.91	12.77	11.33	12.34	13.26
Obs.	24,714	19,781	11,646	24,714	19,781	11,646
F-test: FC (Team - Single)	0.0317**	0.0348**	0.0434**	0.0380***	0.0426***	0.0567***
p-value	(0.013)	(0.011)	(0.026)	(0.007)	(0.004)	(0.007)
F-test: NFC (Team - Single)	0.0095	-0.0052	0.0144	-0.0089	-0.0152	0.0092
p-value	(0.572)	(0.774)	(0.551)	(0.612)	(0.417)	(0.725)

Table 7 (continued)

This table shows the impact of management structure and fund location interaction has on fund performance using the Morningstar U.S. domestic equity mutual fund sample from 1992 to 2010. It reports the estimates from panel regressions of fund performance on Team and Financial Center location and other controls. Panel A reports the regression results using the entire sample, while Panel B reports the results across four different investment categories of Aggressive Growth, Growth, Growth & Income, and Equity Income. The dependent variable includes two performance measures, α(4U) and α(4C), which are the monthly risk-adjusted net fund returns using unconditional and conditional versions of Carhart (1997) four-factor model, respectively. Independent variables of interest are Team×FC, Team, and FC, where Team is defined as a dummy variable which equals one if the fund has two (or more) fund managers and zero otherwise, while FC is a dummy variable which equals one if the fund is located in a financial center and zero otherwise. Financial center funds have their advisors located within 50 miles of Boston, Chicago, Los Angeles, New York, Philadelphia, or San Francisco. Other independent variables are defined as in Tables 3-6. All regression specifications include time and investment objective fixed effects and the standard errors are clustered by fund. Each regression model also reports the p-values of coefficients, the number of observations and the adjusted R^2. ***, ** and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 8
Effect of team diversity on fund performance across geographic locations

	Financial Centers				Non-Financial Centers			
	α(4U)		α(4C)		α(4U)		α(4C)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tenure Diversity$_{i,t}$	-0.0290	0.0093	-0.0657	-0.0229	0.0351	0.0772	0.0805	0.1225**
	(0.515)	(0.838)	(0.167)	(0.643)	(0.499)	(0.166)	(0.155)	(0.049)
SAT Diversity$_{i,t}$	-0.6243**	-0.6434**	-0.8084***	-1.0662***	0.0325	0.0066	-0.0126	-0.0395
	(0.032)	(0.019)	(0.007)	(0.000)	(0.938)	(0.988)	(0.977)	(0.933)
MAge Diversity$_{i,t}$	-0.4225**	-0.3695**	-0.5429***	-0.4976***	0.2100	0.2642	0.1042	0.1605
	(0.027)	(0.047)	(0.002)	(0.003)	(0.202)	(0.110)	(0.552)	(0.353)
Team Size$_{i,t}$		0.0047		0.0193		-0.0488**		-0.0235
		(0.815)		(0.377)		(0.037)		(0.357)
Fund Size$_{i,t-1}$		-0.0227**		-0.0161		-0.0208*		-0.0250*
		(0.029)		(0.180)		(0.097)		(0.064)
Fund Age$_{i,t}$		-0.0196		-0.0198		-0.1047***		-0.0937***
		(0.375)		(0.398)		(0.001)		(0.005)
Family Size$_{i,t-1}$		0.0117		-0.0003		0.0161		0.0173
		(0.259)		(0.976)		(0.179)		(0.178)
Expenses$_{i,t-1}$		-0.1558***		-0.1473***		-0.0318		-0.0299
		(0.000)		(0.000)		(0.541)		(0.607)
Turnover$_{i,t-1}$		-0.0004		-0.0002		-0.0004		-0.0003
		(0.178)		(0.447)		(0.290)		(0.464)
Volatility$_{i,t-1}$		-0.0159		0.0317**		-0.0097		0.0304*
		(0.252)		(0.013)		(0.565)		(0.055)
Flows$_{i,t-1}$		0.0061		0.0075		0.0065		0.0081
		(0.657)		(0.575)		(0.454)		(0.417)
Tenure$_{i,t}$		0.0019		-0.0173		0.0681***		0.0562**
		(0.909)		(0.352)		(0.003)		(0.021)
SAT$_{i,t}$		0.0111**		0.0158***		0.0174***		0.0175***
		(0.018)		(0.001)		(0.003)		(0.004)
MBA$_{i,t}$		0.0449		0.0688		0.0112		-0.0365
		(0.458)		(0.349)		(0.881)		(0.642)
MAge$_{i,t}$		-0.4275***		-0.4131***		-0.2509**		-0.2450**
		(0.000)		(0.000)		(0.030)		(0.035)
Constant	0.2798***	1.7039***	0.3243***	1.7141***	-0.0387	0.1286	-0.0714	-0.0957
	(0.007)	(0.003)	(0.003)	(0.003)	(0.740)	(0.805)	(0.564)	(0.859)
Time & Obj. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (Fund)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	15.14%	16.59%	17.40%	18.35%	13.18%	15.79%	15.39%	17.83%
Obs.	1,924	1,667	1,924	1,667	1,350	1,214	1,350	1,214

Table 8 (continued)

This table shows the impact of team diversity on fund performance across fund locations using the Morningstar U.S. domestic equity mutual fund sample from 1992 to 2010. It reports the estimates from panel regressions of fund performance on three team diversity measures across funds located in financial centers and other places. The dependent variable includes two performance measures, α(4U) and α(4C), which are the monthly risk-adjusted net fund returns using unconditional and conditional versions of Carhart (1997) four-factor model, respectively. Independent variables of interest are Tenure Diversity, measured by the coefficient of variation of all managers' tenure with the fund in a team; SAT Diversity, measured by the coefficient of variation of all managers' SAT scores within a team; and Manager Age (MAge) Diversity, measured by coefficient of variation of all fund managers' age (in years) within a team. Team Size equals the number of fund managers within a team in a given year. For teams with four or more managers the Team Size equals four. Other independent variables are defined as in Tables 3-6. Financial center funds have their advisors located within 50 miles of Boston, Chicago, Los Angeles, New York, Philadelphia, or San Francisco. All regression specifications include time and investment objective fixed effects and the standard errors are clustered by fund. Each regression model also reports the p-values of coefficients, the number of observations and the adjusted R^2. ***, ** and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 9
Effect of team management on risk-taking behavior

		CAPM		Unconditional Carhart Model				
	Total Risk	Mrk1	IdoVol1	Mrk4	SMB	HML	MOM	IdVol4
$Team_{i,t}$	0.0797	0.0102	0.0569	0.0096	0.0267*	0.0301**	-0.0030	-0.0061
	(0.180)	(0.385)	(0.137)	(0.216)	(0.056)	(0.044)	(0.699)	(0.787)
$Fund\ Size_{i,t-1}$	0.0490***	0.0144***	-0.0146	0.0087***	-0.0037	-0.0064	0.0008	-0.0200***
	(0.002)	(0.000)	(0.201)	(0.000)	(0.296)	(0.124)	(0.735)	(0.005)
$Fund\ Age_{i,t}$	-0.1058***	-0.0128*	-0.0901***	-0.0026	-0.0252***	-0.0226***	0.0103**	-0.0428***
	(0.002)	(0.062)	(0.000)	(0.580)	(0.001)	(0.007)	(0.027)	(0.001)
$Expenses_{i,t-1}$	0.3180***	0.0509***	0.3614***	0.0042	0.1106***	-0.0330*	-0.0010	0.2253***
	(0.000)	(0.000)	(0.000)	(0.637)	(0.000)	(0.071)	(0.919)	(0.000)
$Turnover_{i,t-1}$	0.3300***	0.0806***	0.2109***	0.0330***	0.0798***	-0.0888***	0.0668***	0.1001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$FC_{i,}$	0.0013	0.0105	-0.0292	0.0080	0.0059	-0.0066	0.0029	-0.0299
	(0.980)	(0.338)	(0.422)	(0.267)	(0.666)	(0.662)	(0.707)	(0.163)
$SAT_{i,t}$	-0.0159	-0.0011	-0.0355**	0.0018	-0.0049	0.0066	-0.0049	-0.0146
	(0.478)	(0.817)	(0.023)	(0.558)	(0.389)	(0.322)	(0.108)	(0.132)
$Tenure_{i,t}$	0.0032	-0.0014	0.0225***	-0.0027***	0.0064***	0.0039**	-0.0015	0.0144***
	(0.608)	(0.297)	(0.000)	(0.003)	(0.000)	(0.022)	(0.109)	(0.000)
$MBA_{i,t}$	-0.1129	-0.0194	-0.0977**	-0.0003	-0.0171	0.0110	0.0143	-0.0859***
	(0.140)	(0.187)	(0.046)	(0.973)	(0.283)	(0.525)	(0.122)	(0.004)
$MAge_{i,t}$	-0.1954	-0.0528*	-0.0724	-0.0213	-0.0680**	0.0705*	-0.0279	-0.0142
	(0.175)	(0.075)	(0.448)	(0.276)	(0.044)	(0.065)	(0.159)	(0.801)
Constant	3.4496***	1.1181***	2.7306***	0.7849***	0.8407***	-0.2474	0.2991***	1.4975***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.151)	(0.001)	(0.000)
Time & Obj. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (Fund)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	58.00	18.56	45.46	6.90	31.71	12.12	10.03	33.15
Obs.	12,891	12,286	12,286	12,286	12,286	12,286	12,286	12,286

Table 9 (continued)

This table shows the effect of management structure on risk-taking behavior of mutual funds using the Morningstar (MS) U.S. domestic equity mutual fund sample from 1992 to 2010. The table reports the estimates from panel regressions of fund risk-taking on Team and other controls. The dependent variable includes different measures of risks. Total Risk is defined as the standard deviation of monthly net fund returns over the past twelve months. Mrk1 is the market risk defined as the coefficient of the market portfolio based on the CAPM performance evaluation model. IdVol1 is the standard deviation of the fund's residual return from the CAPM model. Mrk4, SMB, HML, and UMD are coefficients of market, size, book-to-market, and momentum portfolios based on the Carhart (1997) four-factor performance evaluation model. IdVol4 is the standard deviation of the fund's residual return from the Carhart (1997) model. The independent variable of interest is Team, defined as a dummy variable which equals one if the fund has two (or more) fund managers and zero if the fund has only one fund manager at the end of calendar year. Other independent variables include various fund and manager characteristics as controls. Fund Size is the log of total net assets under management of the fund. Fund Age is the log of the difference between the fund's inception year and the current year. Family Size is the log of total net asset under management of the fund's family. Expenses is the annual total expense ratio of the fund. Turnover is the minimum of aggregated sales or aggregated purchases of securities of the year divided by the average 12-month total net assets of the fund. FC is the dummy variable which equals one if the fund is in a financial center and zero otherwise. Financial center funds have headquarters located within 50 miles of Boston, Chicago, Los Angeles, New York, Philadelphia, or San Francisco. Tenure is the number of years the fund manager remains with the fund. SAT is the SAT score (divided by 100) of matriculates of the fund manager's undergraduate institution. MBA is defined as a dummy variable which equals one when a fund manager (or at least one of the team members) has MBA degree and zero otherwise. MAge is the log of fund manager's age in current year. All regression specifications include time and investment objective fixed effects and the standard errors are clustered by fund. Each regression model also reports the p-values of coefficients, the number of observations and the adjusted R^2. ***, ** and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 10
Effect of team management on fund characteristics

	Expenses			Turnover			Fund Size			Flows		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
$Team_{i,t}$	-0.0415***	-0.0252**	-0.0198	-0.0578***	-0.0551**	-0.1243***	0.1446**	0.0071	0.0216*	0.0391	0.0449**	0.0757**
	(0.002)	(0.043)	(0.273)	(0.004)	(0.012)	(0.000)	(0.028)	(0.410)	(0.081)	(0.184)	(0.043)	(0.020)
$Fund\ Size_{i,t-1}$		-0.0474***	-0.0527***		-5.7641***	-5.0287***		0.9300***	0.9313***		-0.2245***	-0.2210***
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)
$Fund\ Age_{i,t}$		0.0064	-0.0117		-1.4391	1.7573		-0.0341***	-0.0456***		-0.0733***	-0.0993***
		(0.544)	(0.397)		(0.350)	(0.310)		(0.000)	(0.000)		(0.000)	(0.000)
$Family\ Size_{i,t-1}$		-0.0245***	-0.0134***		3.6593***	1.7497**		0.0305***	0.0294***		0.0922***	0.0843***
		(0.000)	(0.007)		(0.000)	(0.021)		(0.000)	(0.000)		(0.000)	(0.000)
$Turnover_{i,t-1}$		0.0004***	0.0003**					-0.0167**	-0.0046		-0.0139	0.0109
		(0.000)	(0.013)					(0.012)	(0.572)		(0.417)	(0.656)
$Volatility_{i,t-1}$		0.0244***	0.0231***		6.3197***	6.5111***		-0.0130***	-0.0156***		-0.0055	0.0007
		(0.000)	(0.000)		(0.000)	(0.000)		(0.000)	(0.000)		(0.493)	(0.936)
$Flows_{i,t-1}$		-0.0049***	-0.0052***		-0.0378	0.1958		0.0367***	0.0413***			
		(0.001)	(0.010)		(0.885)	(0.557)		(0.000)	(0.000)			
FC_i		0.0154	0.0060		12.2349***	12.8597***		-0.0118	-0.0047		-0.0142	-0.0028
		(0.320)	(0.753)		(0.000)	(0.000)		(0.194)	(0.685)		(0.547)	(0.923)
$Expenses_{i,t-1}$					13.8426***	10.5228***		-0.0543***	-0.0601***		-0.1940***	-0.1882***
					(0.000)	(0.001)		(0.000)	(0.000)		(0.000)	(0.000)
$\alpha(4U)_{i,t-1}$											0.1982***	0.2158***
											(0.000)	(0.000)
$Obj.\ Flow_{i,t-1}$											0.1732**	0.1598
											(0.024)	(0.118)

Table 10 (continued)

$SAT_{i,t}$			0.0032			-1.8259			0.0196***			0.0416***
			(0.152)			(0.150)			(0.000)			(0.003)
$Tenure_{i,t}$			-0.0001			-2.6835***			0.0066***			0.0111***
			(0.163)			(0.000)			(0.000)			(0.001)
$MBA_{i,t}$			0.0095			4.7310			0.0042			0.0012
			(0.623)			(0.145)			(0.758)			(0.970)
$MAge_{i,t}$			0.0527			-29.9353***			-0.0100			-0.0502
			(0.230)			(0.000)			(0.744)			(0.567)
Constant	1.4001***	2.5953***	2.4249***	88.4358***	72.3038***	240.336***	18.2010***	1.2948***	0.7318***	0.4833***	2.7956***	2.5307***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Time & Obj. FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster (Fund)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R^2 (%)	4.10	17.96	16.57	2.91	9.38	13.57	1.35	93.18	92.96	0.64	9.59	9.87
Obs.	30,058	22,407	13,279	30,632	20,854	12,312	34,042	20,566	12,136	28,444	20,565	12,135

This table shows the effect of management structure on different fund characteristics of U.S. domestic equity mutual funds from 1992 to 2010. The table reports panel regressions estimates of different fund characteristics on Team and other controls. The dependent variable includes: Expenses, defined as the annual total expense ratio of the fund; Turnover, defined as the minimum of aggregated sales or aggregated purchases of securities of the year divided by the average 12-month total net assets of the fund; Fund Size, defined as the log of total net assets under management of the fund; and Flows, defined as the net growth in total net assets under management of the fund over the past year. The independent variable of interest is Team, defined as a dummy variable which equals one if the fund has two (or more) fund managers and zero if the fund has only one fund manager at the end of calendar year. Other independent variables include various fund and manager characteristics as controls. Fund Age is the log of the difference between the fund's inception year and the current year. α(4U) is the monthly risk-adjusted net fund return using Carhart (1997) four-factor model. Family Size is the log of total net asset under management of the fund's family. Volatility (%) is the standard deviation of monthly net fund returns over the past 12 months for the fund. FC is the dummy variable which equals one if the fund is a financial center fund and zero otherwise. Financial center funds have headquarters located within 50 miles of Boston, Chicago, Los Angeles, New York, Philadelphia, or San Francisco. Tenure is the number of years the fund manager remains with the fund. SAT is the SAT score of matriculates of the fund manager's undergraduate institution. MBA is defined as a dummy variable which equals one when a fund manager (or at least one of the team members) has MBA degree and zero otherwise. MAge is the log of fund manager's age in current year. All regression specifications include time and investment objective fixed effects and the standard errors are clustered by fund. Each regression model also reports the p-values of coefficients, the number of observations and the adjusted R^2. ***, ** and * indicate significance at the 1%, 5%, and 10% levels, respectively.

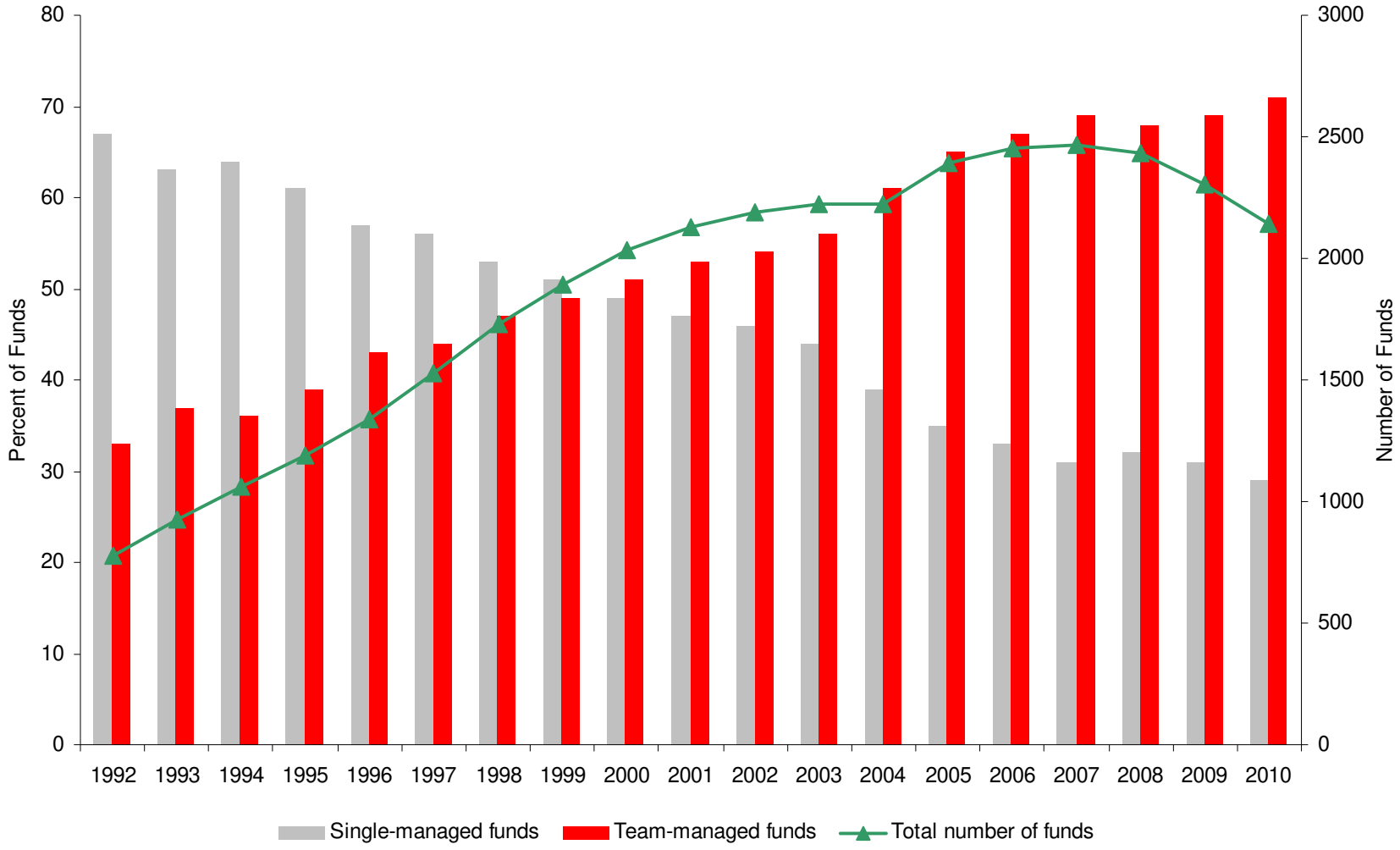

Figure 1. Evolution of mutual fund management structure from 1992 to 2010.
This figure shows the percentage of single-managed and team-managed funds along with the total number of funds in our sample for 1992 to 2010. The left-hand side vertical axis represents the percentage of single- and team-managed funds out of the total funds in our sample each year. The right-hand side vertical axis represents the total of funds in our sample each year. The horizontal axis represents each year included in our sample.