On the Team Approach to Mutual Fund Management: Observability, Incentives, and Performance

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Abstract

We identify a team approach in which the asset management company assembles a team for a fund from fund managers also managing other funds (i.e., every fund manager works "part-time" for the fund). We show that the previously-documented underperformance of team-managed funds concentrates on those using this team approach. A plausible reason for the underperformance of this team approach is that poor observability of individual fund manager's effort disincentives fund managers from acquiring information. We conclude that a team *per se* does not represent a poor incentive mechanism. The internal structure of a team is more relevant in providing incentives.

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I Introduction

As asset management companies, such as Fidelity and Vanguard, have been using the team approach to mutual fund management increasingly often, how the team management approach affects fund performance has become one of the focal points in the mutual fund research.[1] In an important article, Chen, Hong, Huang, and Kubik (henceforth CHHK, 2004) show that team-managed funds significantly underperform, relative to solo-managed funds. They interpret this as evidence that a team forms a hierarchy discouraging communication and acquisition of information (Stein, 2002). We take a deeper look into the composition of mutual fund management teams, and show that the underperformance of team-managed funds concentrates only on those with poor observability of individual fund manager's effort. Unlike CHHK (2004), we argue that a team *per se* does not represent a poor incentive mechanism. The internal structure of a team is more relevant in providing incentives.

Suppose that an asset management company needs to organize the management for one of its sponsored funds. It can use three approaches. First, it can use a solo manager to run the fund. Second, it can use a team of fund managers to run the fund, while in this team, at least one fund manager works "full-time" for this fund (i.e., she is not managing other fund at the same time). Third, it can use a team of fund managers to run the fund, but in this team, every fund manager works "part-time" for this fund (i.e., every fund manager is also managing other fund at the same time).

We are particularly interested in the third team approach. An obvious advantage of this team approach is that it is cost efficient because the asset management company can easily assemble a task force from existing fund managers. The other two approaches typically require new hire of a solo or "full-time" fund manager, which is relatively expensive and

[1] We review this literature in detail later in this section.

time consuming. The disadvantage of this team approach is that it can cause an incentive problem. Intuitively, it is hard to say that any fund manager cares about fund performance and works hard to enhance it. This poor observability of individual fund manager's effort prevents the asset management company from rewarding her properly. Knowing this, she has few incentives to work hard in the first place. In contrast, the other two approaches cause a lesser incentive problem. The asset management company can infer from fund performance whether the solo or "full-time" fund manager works hard,[2] and thereafter reward her properly. Knowing this, she has incentives to work hard in the first place. Throughout this article, we refer to this team approach simply as poorly-designed fund management, and the other two approaches as well-designed fund management.[3]

We develop three hypotheses based on the above analysis.

[H1] The team approach with poorly-designed fund management is cost efficient from the perspective of asset management companies.

[H2] The underperformance of team-managed funds concentrates on funds with poorly-designed fund management.

[H3] A plausible reason for the underperformance of funds with poorly-designed fund management is that poor observability of individual fund manager's effort disincentives fund managers from acquiring information.

Our findings are broadly consistent with these hypotheses.

[2]The "full-time" fund manager will work hard because this is her only chance to prove her investment ability.

[3]Our intuition here is based on Holmström (1979). He points out that in an economic organization, good (poor) observability of an agent's effort improves (deteriorates) the contract, which provides incentives, and thereafter increases (decreases) performance.

Grossman and Hart's (1986) and Hart and Moore's (1990) property rights theory on firm has a similar argument; that is, when an agent faces ambiguity about her share of output, she has few incentives to make firm-specific investment.

We start our empirical analysis by using a Morningstar database, which provides precise fund manager information, to identify well- and poorly-designed fund management for individual open-end U.S. domestic equity mutual funds for the period of 1998 to 2012.[4] Poorly-designed fund management has gained popularity. In January 1998, for instance, 139 (or 15%) of our sample equity funds had poorly-designed fund management; in December 2012, this number (percentage) had increased to 885 (44%).[5] Importantly, funds with poorly-designed fund management represent most of the increase in team-managed funds. If we exclude these funds, the number and percentage of the remaining team-managed funds, which have well-designed fund management, increase at the same speed as those of solo-managed funds do.

Regarding the hypothesis [H1], we find that funds with poor-designed fund management have a low expense ratio, relative to funds with well-designed fund management. Moreover, possibly due to this lower expense ratio (which however can hardly offset the underperformance of these funds, as we will show later), these funds are attractive to retirement savers. This finding is consistent with the notion that retirement savers are unlikely to be business savvy.[6]

Regarding the hypothesis [H2], we use both portfolio analysis and regression analysis to show that funds with poorly-designed fund management underperform, relative to both solo- and team-managed funds with well-designed fund management. This result is robust (i) after controlling for risk and style differences using various factor models, such as

[4]We focus on these funds because they have complete and reliable holdings information, which we need to study fund investment behavior shedding light on fund managers' incentives to acquire information.

[5]For the whole universe of U.S. mutual funds, 436 (or 19%) of mutual funds had poorly-designed fund management in January 1998; this number (percentage) had increased to 2,343 (43%) in December 2012.

[6]See, for example, Benartzi and Thaler (2001), Madrian and Shea (2001), Agnew, Balduzzi, and Sunden (2003), Duflo and Saez (2003), Huberman and Jiang (2006), and Carroll, Choi, Laibson, Madrian, and Metrick (2009). These studies find that retirement savers exhibit tendency to rebalance and trade infrequently and to follow default options. This inertia indicates that they are unlikely to be business savvy.

CAPM, the Fama-French (1993) three-factor model, the Carhart (1997) four-factor model, and the Pástor-Stambaugh (2003) five-factor model; and (ii) after controlling for other fund characteristics, including fund total net assets (TNA), age, expense and turnover ratios, flow, various fixed effects, etc. We further show that if we exclude funds with poorly-designed fund management, then the remaining team-managed funds, which have well-designed fund management, perform similarly as solo-managed funds.

Regarding the hypothesis [H3], we first design tests to rule out several alternative explanations for the underperformance of funds with poorly-designed management. (i) The "free-ride" explanation argues that managers of these funds free ride, so no one spends effort, leading to underperformance. (ii) The "busy manager" explanation argues that managers of these funds are too busy, leading to underperformance. (iii) The "poor-quality manager" explanation argues that managers of these funds simply have poor quality. (iv) The causality explanation argues that asset management companies deliberately choose the poorly-designed fund management structure for poor-performing funds.

We then examine the investment behavior of funds with poorly-designed fund management. These funds exhibit low levels of industry concentration (Kacperczyk, Sialm, and Zheng, 2005), local holdings (Coval and Moskowitz, 1999, 2001), and unsystematic risk, and invest inactively (i.e., most fund performance is explained by factor returns; Amihud and Goyenko, 2013), relative to funds with well-designed fund management. All these findings are consistent with the notion that poorly-designed fund management disincentivizes fund managers from acquiring private information on industry and on local companies.

Our study contributes to a fast growing literature on the organizational issues of mutual fund management, including Chen, Jiang, Hong, and Kubik (2012) on outsourcing fund management, Massa and Zhang (2012) on the internal hierarchical structure of fund management, Kuhnen (2009) on the business networks between fund managers and fund

directors, Massa, Reuter, and Zitzewitz (2010) on the marketing implications of disclosing versus hiding fund managers' names, Nohel, Wang, and Zheng (2010) on side-by-side management of mutual funds and hedge funds, etc.

In this literature, our study is closely related to CHHK (2004). They show that team-managed funds significantly underperform, relative to solo-managed funds, and interpret this as evidence that a team forms a hierarchy discouraging communication and acquisition of information (Stein, 2002). We take a deeper look into the composition of mutual fund management teams. We show that the not all team-managed funds underperform; only those with poor observability of individual fund manager's effort do. We emphasize the internal structure of a team in providing incentives.

Other related studies in this literature find weak or no evidence that team-managed funds underperform, relative to solo-managed funds. For example, Bär, Kempf, and Ruenzi (2005) find weak evidence of underperformance. Prather and Middleton (2002) and Bliss, Potter, and Schwarz (2008) find no evidence of underperformance. Dass, Nanda, and Wang (2013) study balanced funds. They show that team-managed balanced funds exhibit better security selection performance, but worse marketing timing performance than sole-managed balanced funds. The overall returns across the two management structures are similar. Patel and Sarkissian (2013) is an exception. They find that team-managed funds significantly outperform, relative to solo-managed funds.

We organize the rest of this article as follows. Section II describes the data. Section III presents our empirical analysis. Section IV concludes.

II The Data

We obtain mutual fund and fund manager data for the period of January 1998 to December 2012 from the Morningstar Direct database. This database includes all historical records of mutual funds and is free of surviviorship bias. It also provides precise fund manager information.[7] We infer from this information whether a fund is managed by a solo fund manager or a team of fund managers. To avoid possible reporting errors in the Morningstar database, we eliminate the observations in which a team has more than 10 members and in which a solo manager or a team manages more than 10 funds.

We identify the fund-month observations in which a team of fund managers manages the fund, while every member of the team also manages other fund at the same time. According to our earlier discussion, these observations have fund management with poor observability of individual fund manager's effort (i.e., poorly-designed fund management). Other fund-month observations, including solo-managed funds and team-managed funds for which at least one member of the team does not manage other fund at the same time, have fund management with good observability of individual fund manager's effort (i.e., well-designed fund management).[8]

We focus our empirical analysis on open-end U.S. domestic equity mutual funds.[9] The holdings information of these funds, which can be obtained from Thomson Reuters

[7]For example, it reports that the Vanguard Equity-Income fund was managed by George U. Sauter [2003-08-08 2005-09-23]; Joel M. Dickson [2003-08-08 2005-09-23]; James P. Stetler [2003-12-31 present]...

[8]Here we consider only the universe of mutual funds in the Morningstar database. We are not able to identify if a mutual fund manager also manages a hedge fund or holds a senior position in the asset management company. In this case, the fund manager will be classified as a "full-time" manager, and the mutual fund will be classified as having well-designed fund management. We consider this as a limitation of our study, although it is unlikely to change our results.

[9]We take into consideration other categories of mutual fund when identifying a sample equity fund's poorly- or well-designed fund management status. For example, suppose that a sample equity fund is managed by two fund managers. The first manager is also managing a balanced fund; the second manager is also managing a fixed income fund. Then, these two fund managers are classified as working "part-time" for this fund; this fund is classified as having poorly-designed fund management.

CDA/Spectrum database, is complete and reliable.[10] We need this information to study fund investment behavior. Morningstar categorizes the investment styles of these funds as large growth, large blend, large value, mid growth, mid blend, mid value, small growth, small blend, or small value. We exclude sector funds because these funds may invest in foreign countries. Some funds have multiple share classes. We aggregate the share classes to obtain fund-level information.

[Insert Figure 1 here.]

We end up with 2,245 distinct equity mutual funds and 269,284 fund-month observations. Figure 1 plots the numbers and percentages for funds with poorly- and well-designed fund management by month for the sample period of January 1998 to December 2012. In the case of funds with well-designed fund management, we report for solo-managed funds and team-managed funds separately.

A notable observation is that poorly-designed fund management has gained popularity. In January 1998, for instance, 139 (or 15%) of our sample funds had poorly-designed fund management; in December 2012, this number (percentage) had increased to 885 (44%). Importantly, the increasingly-often use of poorly-designed fund management accounts for most of increase in team-managed funds. If we exclude these funds, the number and percentage of the remaining team-managed funds, which have well-designed fund management, increase at the same speed as those of solo-managed funds do.

[Insert Table 1 here.]

Table 1 reports for each type of funds the summary statistics on fund TNA, fund age, expense and turnover ratios, flow, the number of fund managers, and monthly return

[10]The CDA/Spectrum database collects information on the stockholdings of mutual funds from their filings with the Security and Exchange Commission (SEC) and their voluntary reports. Most mutual funds disclosed their holdings quarterly, despite that they are only required to disclose their holdings semiannually.

before subtracting expenses. We compute the flow as the growth rate of TNA. We adjust for the appreciation of TNA and assume that the cash flows happens at the month end. The mean (median) number of fund managers may not be an integer because we report time-series average of cross-section mean (median).

III Empirical Analysis

A. Testing [H1]: Expenses and Clientile

A.1 Expenses

Table 1 shows that consistent with the hypothesis [H1], funds with poorly designed fund management has a relatively low expense ratio. Specifically, the mean expense ratio of these funds is 115 bps per annum, whereas the mean expense ratio of funds with well-designed fund management is 120.4 bps per annum (118.3 bps per annum for solo-managed funds, and 123.6 bps per annum for team-managed funds). We find that the difference, -5.3 bps per annum, is negative and significant at the 1% level.

However, the lower expenses of funds with poorly-designed fund management can hardly offset their underperformance. Specifically, Table 1 shows the mean return of these funds is 67.3 bps per month, whereas the mean returns of funds with well-designed fund management is 73 bps per month (for both solo-managed and team-managed funds). We find that the difference, -5.8 bps per month, is negative and significant at the 1% level.[11] The underperformance (5.8 bps per month) of these funds is more than 10 times of the lower expenses (5.3 bps per annum).

[11]We show in Section III.B. that this underperformance is robust after controlling for risk and style differences in fund performance, and other fund characteristics.

A.2 Clientile

Who invest in funds with poor-designed fund management? The Morningstar database provides snapshot information on whether a fund receives investment from retirement plans. We find that an unusually large proportion of funds with poorly-designed fund management are invested by retirement savers. For example, in 2012, 13% of our sample funds with poorly-designed fund management receive investment from retirement plans, whereas this percentage for funds with well-designed fund management is only 7%.

An important literature in economics and finance shows that retirement savers exhibit significant inertia, and are unlikely to be business savvy.[12] Our finding suggests that they are attracted by the lower expenses of funds with poorly-designed fund management, despite that the lower expenses of these funds can hardly offset their underperformance.

B. Testing [H2]: Fund Performance

In this section, we test the hypothesis [H2] by examining the performance of funds with poorly-designed fund management, relative to funds with well-designed fund management. We use both portfolio analysis and regression analysis

B.1 Portfolio Analysis

We construct two portfolios. One is a portfolio of funds with poorly-designed fund management. The other is a portfolio of funds with well-designed fund management. We compute the monthly return of each portfolio as the equally weighted average return of all funds in the portfolio. We use the returns before subtracting expenses. These returns describe fund managers' investment performance, which we are primarily interested in.

[12]See the citations in Footnote 6.

Table 2 reports for each portfolio five risk- and style-adjusted performance measures. The first performance measure is the excess return of the portfolio over the market portfolio. The next four measures are the abnormal returns of CAPM, the Fama-French (1993) three-factor model, the Carhart (1997) four-factor model, and the Pástor-Stambaugh (2003) five-factor model.[13]

[Insert Table 2 here.]

The portfolio of funds with poorly-designed fund management significantly underperforms, relative to the portfolio of funds with well-designed fund management. Specifically, Row 1 of Table 2 shows that the underperformance equals 5.8 bps per month (at the 1% significance level). Row 2 uses CAPM to control for market risk. The underperformance equals 6.3 bps per month (at the 1% significance level). Row 3 uses the Fama-French (1993) three-factor model to further control for size and value. The underperformance equals 5.3 bps per month (at the 1% significance level). Row 4 uses the Carhart (1997) four-factor model to further control for momentum. The underperformance equals 5.2 bps per month (at the 1% significance level). Row 5 uses the Pástor-Stambaugh (2003) five-factor model to further control for liquidity. There is little change in the magnitude and significance of the underperformance.

[13]The abnormal return is given by the intercept of the following time-series regression:

$$R_{pt} - R_{Ft} = \alpha_p + \beta_{p\mathrm{M}}(R_{Mt} - R_{Ft}) + \beta_{p\mathrm{SMB}}\mathrm{SMB}_t + \beta_{p\mathrm{HML}}\mathrm{HML}_t + \beta_{p\mathrm{MOM}}\mathrm{MOM}_t + \beta_{p\mathrm{LIQ}}\mathrm{LIQ}_t + \epsilon_{pt}.$$

The dependent variable is the portfolio return minus the risk-free rate. The explanatory variables are the returns of the five zero-investment factor portfolios. $R_{Mt} - R_{Ft}$ is the market portfolio return minus the risk-free rate, SMB_t is the average return of small-cap stocks minus the average return of large-cap stocks, HML_t is the average return of high book-to-market stocks minus the average return of low book-to-market stocks, MOM_t is the average return of high momentum stocks minus the average return of low momentum stocks, and LIQ_t is average return of low liquidity stocks minus the average return of high liquidity stocks. CAPM uses the first factor. Fama and French (1993) use the first three factors. Carhart (1997) uses the first four factors. Pástor and Stambaugh (2003) use all five factors.

We obtain the market, size, value, momentum, and liquidity factor returns through WRDS.

Subsample: Small-Cap Funds vs. Non-Small-Cap Funds

Table 3 reports the portfolio returns within subsamples of small-cap and non-small-cap funds. We define small-cap and non-small-cap funds according to Morningstar classification. Interestingly, the underperformance of funds with poorly-designed fund management, relative to funds with well-designed fund management, concentrates in small-cap funds. Specifically, in the subsample of small-cap funds, the underperformance in the Carhart abnormal return equals 10.1 bps per month (at the 1% significance level). In the subsample of non-small-cap funds, the underperformance in the Carhart abnormal return, 2.8 bps per month, is not significant.

[Insert Table 3 here.]

Intuitively, small-cap funds invest mainly in small-cap stocks, which are subject to severe information problems. Our finding indicates that poorly-designed fund management underperforms, especially when acquiring information is important. This suggests that this management structure disincentivizes fund managers from acquiring information. We will examine this implication further in Section III.C.2.

B.2 Regression Analysis

We continue our analysis using multivariate regressions. The previous portfolio analysis indicates that the Carhart (1997) four-factor model controls for risk and style differences properly, so we use the Carhart abnormal return as our only performance measure here.

The regression analysis has two main differences from the portfolio analysis. First, it can simultaneously control for other fund variables that may affect fund performance. Second, it takes into consideration the possibility that the factor loadings of individual

funds may very over time because the Carhart (1997) four-factor model is estimated based on the recent data.[14]

[Insert Table 4 here.]

Table 4 reports the regression results. We use the panel regression approach, and run the regression at a monthly frequency. The dependent variable, the Carhart abnormal return, is the difference between a fund-month's realized return and expected return from the Carhart (1997) four-factor model estimated based on 24 months of lagged data. The "poorly-designed" dummy equals 1 (0) for a fund-month with poorly-designed fund management. Other explanatory variables include TNA, fund age, expense and turnover ratios, and flow. All these variables are lagged by one month, except for turnover ratio, which is contemporary.[15] TNA and fund age are skewed to the right, so we take the natural logarithms. We include style and time fixed effects. Standard errors are clustered at the fund level.

Consistent with our previous portfolio analysis, funds with poorly-designed fund management still underperform, relative to funds with well-designed fund management. Specifically, Column 1 (2) of Table 4 shows that before (after) we control for other fund characteristics, the coefficient on the "poorly-designed" dummy, -0.038 (-0.028), is negative and significant at the 1% level.

Relation to CHHK (2004): Team- vs. Solo-Managed Funds

CHHK (2004) find that team-managed funds underperform, relative to solo-managed funds. We show in Columns 3 to 4 in Table 4 that this is due to the underperformance

[14]Ferson and Schadt (1996) point out that risk levels and risk premia may move together, which causes factor loadings of funds in an unconditional factor model to vary over time.

[15]Morningstar assigns the same level of turnover ratio to a fund for a whole calendar year. We also tried to lag turnover ratio by one year (not reported to save space). The results are the same.

of funds with poorly-designed fund management, which constitute a significant part of team-managed funds.

Specifically, Column 3 replicates CHHK's (2004) test using our fund sample. The team dummy equals 1 (0) for a team- (solo-)managed fund-month. The coefficient on the team dummy, -0.02, is negative and significant at the 10% level, which is consistent with CHHK (2004). Column 4 excludes the fund-months with poorly-designed fund management and runs the same test again. The coefficient on the team dummy, -0.005, is no longer significant. This indicates that among funds with well-designed fund management, team-managed funds perform similarly to solo-managed funds.

C. Testing [H3]: The Causes of Fund Performance

In this section, we test the hypothesis [H3] by examining the causes of the underperformance of funds with poorly-designed fund management. We first rule out some alternative explanations using the matching fund approach and a dynamic analysis. We then check the investment behavior of these funds, shedding light on the impact of this management structure on fund managers' incentives.

C.1 Ruling Out Several Alternative Explanations

Ruling Out the "Free-Ride" Explanation

The "free-ride" explanation argues that managers of a fund with poorly-designed fund management tend to free ride other members of the team, so no one spends effort, which leads to underperformance.[16]

[16]Stein (2002) suggests another way the team management structure could affect fund managers' incentives and performance. Specifically, a team forms a hierarchy, which prevents communication of "soft" information and disincentivizes fund managers from acquiring this information, which in turn leads to underperformance. Here we don't distinguish between this mechanism and the "free-ride" explanation

We test this explanation by comparing the performance of a fund with poorly-designed fund management and the performance of a matching fund with well-designed fund management. We require that the treatment fund and the matching fund have the same team size, the same investment style, and the closest TNA. Since these two funds have the same team size, they are subject to the same scale of the free-ride problem and should perform similarly according to the "free-ride" explanation.

We conduct the comparison using the portfolio approach. Specifically, we construct two portfolios. One is a portfolio of treatment funds with poorly-designed fund management. The other is a portfolio of matching funds. We compute the monthly return of each portfolio as the equally weighted average return of all funds in the portfolio.

[Insert Table 5 here.]

Table 5 reports the results. Contrary to the "free-ride" explanation, the portfolio of treatment funds with poorly-designed fund management still underforms the portfolio of matching funds. For example, Row 4 shows that the underperformance in the Carhart abnormal return equals 10.1 bps per month (at the 1% significance level). This rules out the "free-ride" explanation.

Ruling Out the "Busy Manager" Explanation

The "busy manager" explanation argues that managers of a fund with poorly-designed fund management are too busy, as they all are managing other funds at the same time.

We test this explanation by comparing the performance of a fund with poorly-designed fund management and the performance of a matching solo-managed fund. We require that the treatment fund and the matching solo-managed fund have the same fund manager, the

because they give similar predictions for the effects of team structure on incentives and performance.

same investment style, and the closest TNA. Since these two funds have the same busy manager, they should perform similarly according to the "busy manager" explanation.

We conduct the comparison using the portfolio approach. Specifically, we construct two portfolios. One is a portfolio of treatment funds with poorly-designed fund management. The other is a portfolio of matching solo-managed funds. We compute the monthly return of each portfolio as the equally weighted average return of all funds in the portfolio.

[Insert Table 6 here.]

Table 6 reports the results. Contrary to the "busy manager" explanation, the portfolio of treatment funds with poorly-designed fund management still underperforms, relative to the portfolio of matching solo-managed funds. For example, Row 4 shows that the underperformance in the Carhart abnormal return equals 9.2 bps per month (at the 5% significance level). This rules out the "busy manager" explanation.

Ruling out the "Poor-Quality Manager" Explanation

The "poor-quality manager" explanation argues that managers of funds with poorly-designed fund management simply have poor quality.

In our test in Table 6, the treatment fund with poorly-designed fund management and the matching solo-managed fund have the same fund manager. This forms a good control for fund manager quality. However, the treatment fund still underperforms, relative to the matching solo-managed fund. This rules out the "poor-quality manager" explanation.

Ruling Out the Causality Problem: A Dynamic Analysis

One may argue that asset management companies use poorly-designed fund management deliberately for poor-performing funds. These funds had poor performance even before this management structure was adopted. This may cause a causality problem in our analysis

of fund management and fund performance.

We test this causality problem using a dynamic analysis. In Panel A of Figure 2, we identify 1,279 funds switching from well- to poorly-designed fund management. We plot the equally weighted average of their cumulative objective-adjust return (or simply OAR; which equals the fund return minus the value-weighted average return of a portfolio comprising all other funds with the same investment objective) in the 36 months around the switch.[17] In the 18 months before the switch, the cumulative OAR increases, indicating a fairly good performance. In the 18 months after the switch, the cumulative OAR decreases, indicating a performance deterioration.

The evidence suggests that inconsistent with the above argument, there is a significant structural change in fund performance after the switch from well- to poor-designed fund management. The poor fund performance exhibits only after the switch. This rules out the possible causality problem.

[Insert Figure 2 here.]

We find consistent evidence in Panel B of Figure 2. Here we identify 1,491 funds switching from poorly- to well-designed fund management. In the 18 months before the switch, the cumulative OAR decreases sharply, indicating a poor performance. In the 18 months after the switch, the cumulative OAR stabilizes, indicating a performance improvement.

C.2 Investment Behavior

In what follows, we examine the investment behavior of funds with poorly-designed fund management. We continue to use the matching fund approach because it effectively con-

[17] We don't use abnormal returns of factor models here because it is not clear which data should be used to estimate the factor models during a structural change.

trols for team size and manager quality.

[Insert Table 7 here.]

Industry Concentration

We follow Kacperczyk, Sialm, and Zheng (2005) to compute a fund-month's industry concentration index (ICI) as the sum of the squared deviations of the value weights for each of ten industries held by the mutual fund from the industry weights of the market portfolio. We compute portfolio weights using the latest holdings information obtained from the Thomson Reuters CDA/Spectrum database.

Row 1 of Table 7 shows that funds with poorly-designed fund management have a relatively low level of industry concentration. Specifically, the ICI of these funds is lower than that of the matching funds based on team size, investment style, and TNA, or the matching solo-managed funds based on fund manager, investment style, and TNA by 0.007 (at the 1% significance level).

Local Holdings

We follow CHHK (2004) to compute a fund-month's local holdings. We divide the stock-holdings of the fund-month into local stocks and non-local stocks. A stock is considered a local stock if the company's headquarters and the fund's headquarters are located in the same census region.[18] We compute the local holdings as the total value weight of local stocks held by the fund, adjusted by deducting the total value weight of all stocks in the census region in the market portfolio.

[18]There are nine census regions in the U.S., including New England, Middle Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific.

Row 2 of Table 7 suggests that funds with poorly-designed fund management have a relatively low level of local holdings. Specifically, the local holdings of these funds are lower than those of the matching funds based on team size, investment style, and TNA by 0.6% (at the 1% significance level). The local holdings of these funds are higher than those of the matching solo-managed funds based on fund manager, investment style, and TNA by 0.8%, but this result is only marginally significant.

Risk-Taking

For a fund-month, we estimate the Carhart (1997) four-factor model using daily returns. We compute the unsystematic risk as the standard deviation of the residuals.

Row 3 of Table 7 shows that funds with poorly-designed fund management have a relatively low level of unsystematic risk-taking. Specifically, the unsystematic risk of these funds is lower than that of the matching funds based on team size, investment style, and TNA by 1.2 bps per day (at the 1% significance level), and is lower than that of the matching solo-managed funds based on fund manager, investment style, and TNA by 2.7 bps per day (at the 1% significance level).

Active Investing

We follow Amihud and Goyenko (2013) to measure active investing for a fund-month using $1-R^2$ of the Carhart (1997) four-factor model estimated from daily returns (i.e., the extent to which the fund performance is explained by factor returns).

Row 4 of Table 7 shows that funds with poorly-designed fund management invest relatively inactively. Specifically, the active investing measure of these funds is lower than that of the matching funds based on team size, investment style, and TNA by 0.9% (at the 1% significance level), and is lower than that of the matching solo-managed funds based on fund manager, investment style, and TNA by 0.8% (at the 1% significance level).

Discussions

To summarize, funds with poorly-designed fund management exhibit relatively low levels of industry concentration (Kacperczyk, Sialm, and Zheng, 2005), local holdings (Coval and Moskowitz, 1999, 2001), and unsystematic risk, and invest inactively (Amihud and Goyenko, 2013).

All these findings are consistent with the notion that poorly-designed fund management disincentivizes fund managers from acquiring private information on industry and on local companies. Specifically, fund managers tend to concentrate their portfolios in industries (Kacperczyk, Sialm, and Zheng, 2005) and local companies (Coval and Moskowitz, 1999, 2001), about which they have information advantage. Low levels of industry concentration and local holdings indicate that they have few incentives to acquire private information. As they rely mostly on public information to invest, it is not surprising that they take a low level of unsystematic risk, and invest inactively.

IV Conclusions

In this article, we take a deeper look into the composition of mutual fund management teams. We identify a team approach in which the asset management company assembles a team for a fund from fund managers also managing other funds (in other words, every fund manager works "part-time" for the fund), and show that the underperformance of team-managed funds concentrates only on those using this team approach. We further show that a plausible reason for the underperformance of this team approach is that poor observability of individual fund manager's effort disincentives fund managers from acquiring information. Unlike previous studies on the team management approach (e.g., CHHK, 2004), we conclude that a team *per se* does not represent a poor incentive mechanism.

The internal structure of a team is more relevant in providing incentives.

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Figure 1: The Number and Percentage of Funds with Poorly- and Well-Designed Fund Management by Month

We plot the numbers (Panel A) and percentages (Panel B) for open-end U.S. domestic equity mutual funds with poorly- and well-designed fund management by month for the period of January 1998 (month 1) to December 2012 (month 168). In the case of funds with well-designed management, we plot for solo-managed funds and team-managed funds separately.

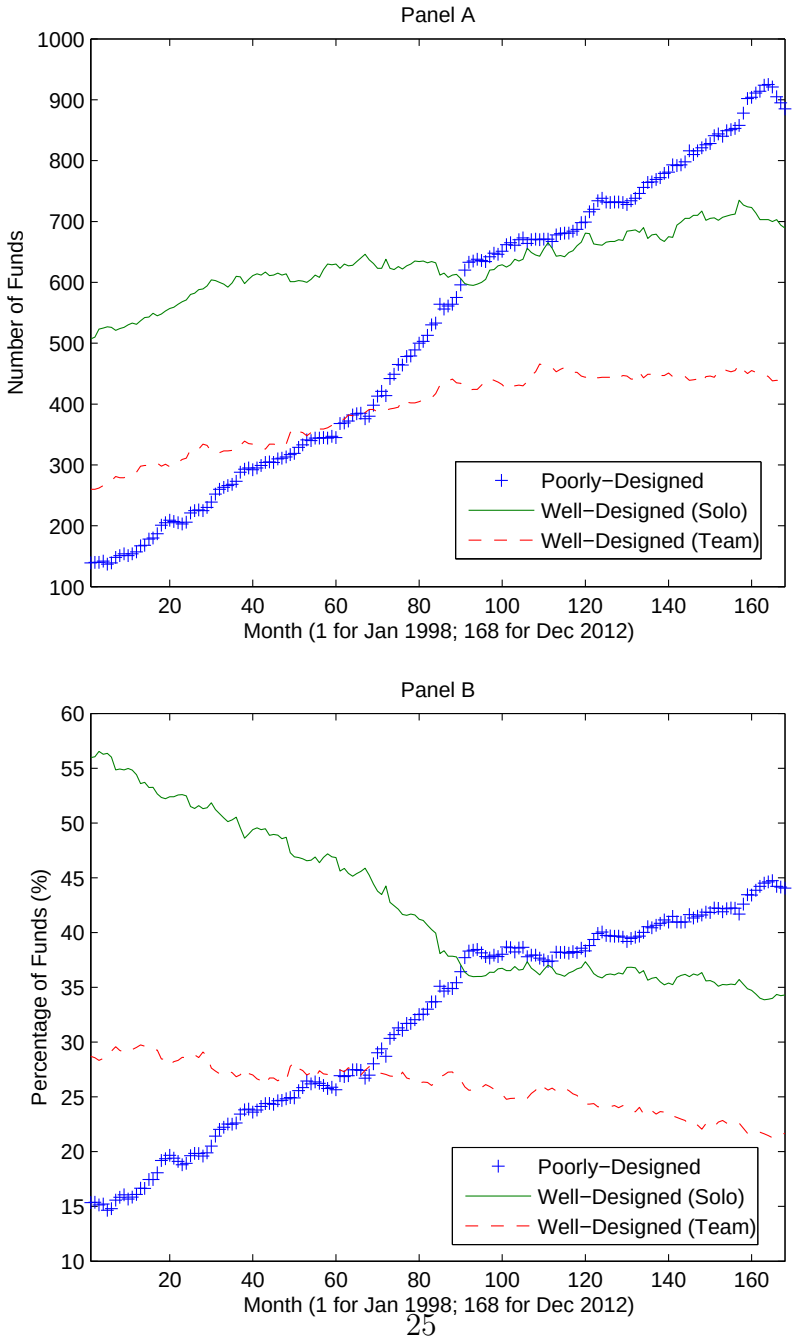

Figure 2: The Cumulative OAR around the Switch between Well- to Poorly-Designed Fund Management

We plot the equally weighted cumulative objective-adjusted return (OAR) in the 36 months around the switch for the 1,279 funds switching from well- to poorly-designed fund management (Panel A), and 1,491 funds switching from poorly- to well-designed fund management (Panel B) during the period of January 1998 to December 2012.

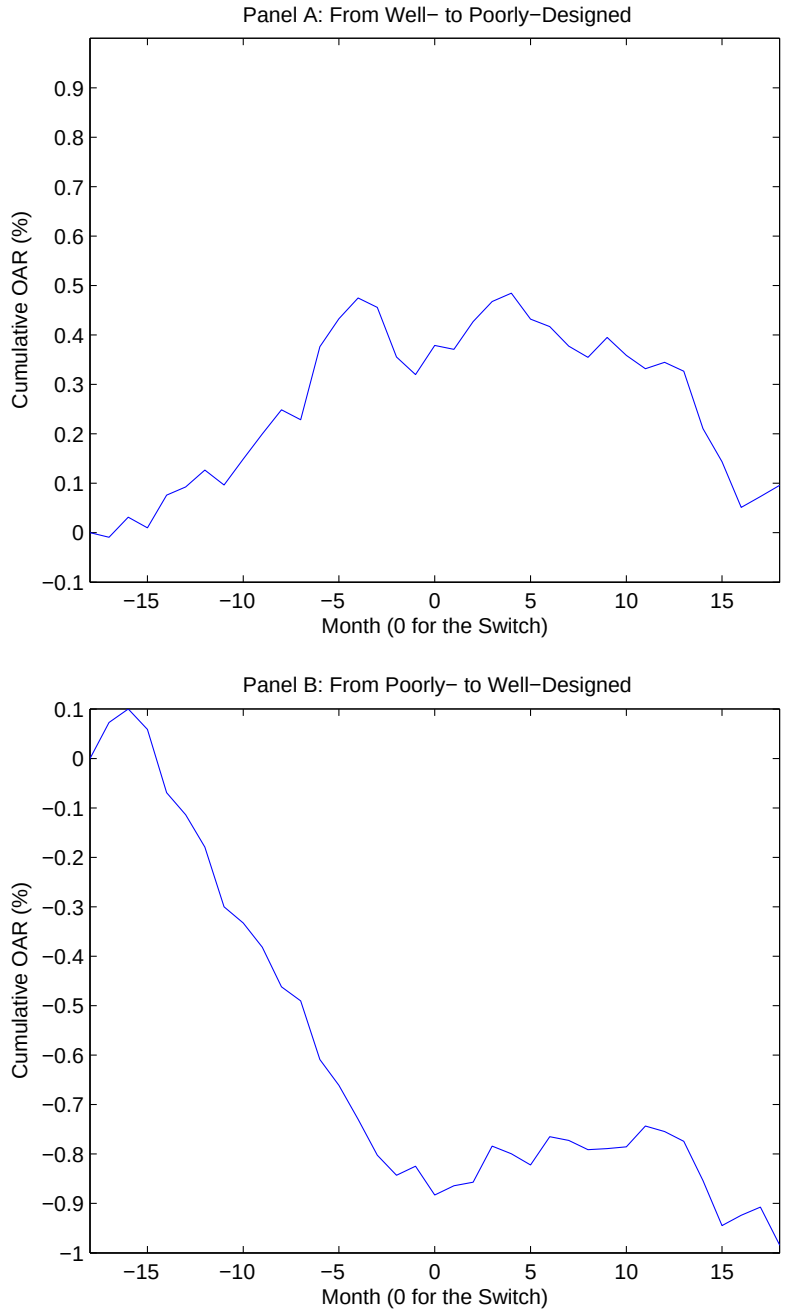

Table 1: Summary Statistics

This table reports the time-series average of cross-sectional summary statistics for open-end U.S. domestic equity mutual funds with poorly- and well-designed fund management for the sample period of January 1998 to December 2012. The sample includes 2,245 distinct funds and 269,284 fund-month observations. In the case of funds with well-designed fund management, we report for solo-managed funds and team-managed funds separately. All continuous variables are winsorized at the 1% and 99% levels.

		Poorly-Designed			Well-Designed (Solo)			Well-Designed (Team)		
		Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
(1)	TNA ($million)	1062.948	256.470	2377.335	1407.310	234.732	3375.343	1115.961	193.509	2936.356
(2)	Fund Age	11.995	9.069	11.067	13.241	10.075	12.161	13.291	9.764	12.928
(3)	Expense Ratio (%)	1.150	1.128	0.425	1.183	1.187	0.480	1.236	1.208	0.385
(4)	Turnover Ratio	0.795	0.623	0.669	0.798	0.557	0.757	0.779	0.615	0.654
(5)	Flow (%)	1.056	0.015	5.609	0.870	-0.013	5.298	0.980	-0.003	5.504
(6)	No. of Managers	2.965	2.447	1.321	1.000	1.000	0.000	3.005	2.439	1.441
(7)	Monthly Return (Before Expenses; %)	0.673	0.641	2.112	0.730	0.699	2.235	0.730	0.701	2.201

Table 2: Fund Performance: Before-Expense Portfolio Returns

This table reports the five risk- and style-adjusted returns for the portfolios of funds with poorly- and well-designed fund management for the period of January 1998 to December 2012. The equally weighted portfolio returns (before expenses) are expressed at a monthly frequency. We use the excess return over the market portfolio and the abnormal returns of CAPM, the Fama-French (1993) three-factor model, the Carhart (1997) four-factor model, and the Pástor-Stambaugh (2003) five-factor model. The *t*-statistics are given in parentheses. The differences in these returns, along with their *t*-statistics, between the portfolios of funds with poorly- and well-designed fund management are also reported. *, **, and *** indicate the significance levels of 10%, 5%, and 1%.

Before-Expense Monthly Portfolio Return (%)

		Poorly-Designed	Well-Designed	Difference
		(1)	(2)	(3)=(1)-(2)
(1)	Excess Return	0.160**	0.219***	-0.058***
		(2.39)	(3.15)	(-3.09)
(2)	CAPM	0.156**	0.219***	-0.063***
		(2.33)	(3.14)	(-3.41)
(3)	Fama-French	0.084	0.137***	-0.053***
		(1.65)	(2.76)	(-2.99)
(4)	Carhart	0.084	0.136***	-0.052***
		(1.64)	(2.73)	(-2.91)
(5)	Pástor-Stambaugh	0.050	0.102**	-0.052***
		(0.99)	(2.07)	(-2.81)

Table 3: Fund Performance: Before-Expense Portfolio Returns within Subsamples

This table reports the five risk- and style-adjusted returns for the portfolios of funds with poorly- and well-designed fund management within subsamples of small-cap and non-small-cap funds for the period of January 1998 to December 2012. The equally weighted portfolio returns (before expenses) are expressed at a monthly frequency. We use the excess return over the market portfolio and the abnormal returns of CAPM, the Fama-French (1993) three-factor model, the Carhart (1997) four-factor model, and the Pástor-Stambaugh (2003) five-factor model. The t-statistics are given in parentheses. The differences in these returns, along with their t-statistics, between the portfolios of funds with poorly- and well-designed fund management are also reported. *, **, and *** indicate the significance levels of 10%, 5%, and 1%.

Before-Expense Monthly Portfolio Return (%)

		Small-Cap Funds			Non-Small-Cap Funds		
		Poorly-Designed	Well-Designed	Difference	Poorly-Designed	Well-Designed	Difference
		(1)	(2)	(3)=(1)-(2)	(4)	(5)	(6)=(4)-(5)
(1)	Excess Return	0.299*	0.400**	-0.102***	0.126***	0.160***	-0.034*
		(1.72)	(2.33)	(-3.72)	(2.66)	(3.17)	(-1.65)
(2)	CAPM	0.274	0.373**	-0.099***	0.129***	0.169***	-0.041**
		(1.59)	(2.20)	(-3.63)	(2.70)	(3.40)	(-2.11)
(3)	Fama-French	0.048	0.150**	-0.102***	0.101**	0.130***	-0.029
		(0.61)	(2.06)	(-3.71)	(2.21)	(2.88)	(-1.58)
(4)	Carhart	0.043	0.144*	-0.101***	0.103**	0.131***	-0.028
		(0.55)	(1.97)	(-3.66)	(2.23)	(2.87)	(-1.54)
(5)	Pástor-Stambaugh	0.006	0.105	-0.099***	0.070	0.097**	-0.028
		(0.08)	(1.44)	(-3.50)	(1.54)	(2.19)	(-1.47)

Table 4: Fund Performance: Panel Regression Evidence

This table reports the panel regression results for the period of January 1998 to December 2012. We run the regression at a monthly frequency. The dependent variable, the Carhart abnormal return, is the difference between a fund-month's realized return and expected return from the four-factor model of Carhart (1997) estimated based on 24 months of lagged data. The "poorly-designed" dummy equals 1 (0) for a fund-month with poorly- (well-)designed fund management. The team dummy equals 1 (0) for a team- (solo-)managed fund-month. All other explanatory variables are lagged by one month, except for turnover ratio, which is contemporary. We include style and time fixed effects. Standard errors are clustered at the fund level. The t-statistics are given in parentheses. *, **, and *** indicate the significance levels of 10%, 5%, and 1%.

Dependent Variable: Before-Expense Monthly Carhart Abnormal Return (%), Jan 1998-Dec 2012

	(1)	(2)	(3)	(4) [Poorly-Designed Fund -Months Excluded]
"Poorly-Designed" Dummy	-0.038***	-0.028***		
	(-3.82)	(-2.75)		
Team Dummy			-0.020*	-0.005
			(-1.79)	(-0.35)
ln(TNA)		-0.032***	-0.033***	-0.032***
		(-8.87)	(-8.93)	(-6.67)
ln(Fund Age)		-0.002	-0.001	-0.017
		(-0.27)	(-0.16)	(-1.54)
Expense Ratio		-0.346	-0.220	-1.346
		(-0.27)	(-0.17)	(-0.83)
Turnover Ratio		-0.020**	-0.020**	0.006
		(-2.05)	(-2.07)	(0.51)
Flow		0.000	0.000	0.000
		(0.17)	(0.17)	(0.15)
Style Fixed Effects	YES	YES	YES	YES
Time Fixed Effects	YES	YES	YES	YES
Cluster SE	YES	YES	YES	YES
No. of Fund-Month Obs	244,913	231,416	231,416	153,760

Table 5: Fund Performance: Before-Expense Portfolio Returns; Matching by Team Size, Style, and TNA

This table reports the five risk- and style-adjusted returns for the portfolios of treatment funds with poorly-designed fund management and matching funds with well-designed fund management for the period of January 1998 to December 2012. A treatment fund and its matching fund have the same team size, the same investment style, and the closest TNA. The equally weighted portfolio returns (before expenses) are expressed at a monthly frequency. We use the excess return over the market and the abnormal returns of CAPM, the Fama-French (1993) three-factor model, the Carhart (1997) four-factor model, and the Pástor-Stambaugh (2003) five-factor model. The t-statistics are given in parentheses. The differences in these returns, along with their t-statistics, between the portfolios of treatment funds and matching funds are also reported. *, **, and *** indicate the significance levels of 10%, 5%, and 1%.

Before-Expense Monthly Portfolio Return (%);
Matching by Team Size, Style, and TNA

		Poorly-Designed (1)	Well-Designed (2)	Difference (3)=(1)-(2)
(1)	Excess Return	0.299*	0.400**	-0.102***
		(1.72)	(2.33)	(-3.72)
(2)	CAPM	0.274	0.373**	-0.099***
		(1.59)	(2.20)	(-3.63)
(3)	Fama-French	0.048	0.150**	-0.102***
		(0.61)	(2.06)	(-3.71)
(4)	Carhart	0.043	0.144*	-0.101***
		(0.55)	(1.97)	(-3.66)
(5)	Pástor-Stambaugh	0.006	0.105	-0.099***
		(0.08)	(1.44)	(-3.50)

Table 6: Fund Performance: Before-Expense Portfolio Returns; Matching by Fund Manager, Style, and TNA

This table reports the five risk- and style-adjusted returns for the portfolios of treatment funds with poorly-designed fund management and matching solo-managed funds for the period of January 1998 to December 2012. A treatment fund and its matching solo-managed fund have the same fund manager, the same investment style, and the closest TNA. The equally weighted portfolio returns (before expenses) are expressed at a monthly frequency. We use the excess return over the market and the abnormal returns of CAPM, the Fama-French (1993) three-factor model, the Carhart (1997) four-factor model, and the Pástor-Stambaugh (2003) five-factor model. The t-statistics are given in parentheses. The differences in these returns, along with their t-statistics, between the portfolios of treatment funds and matching funds are also reported. *, **, and *** indicate the significance levels of 10%, 5%, and 1%.

Before-Expense Monthly Portfolio Return (%);
Matching by Fund Manager, Style, and TNA

		Poorly-Designed (1)	Solo-Managed (2)	Difference (3)=(1)-(2)
(1)	Excess Return	-0.014	0.127**	-0.141***
		(-0.22)	(2.07)	(-2.95)
(2)	CAPM	-0.020	0.119*	-0.140***
		(-0.31)	(1.96)	(-2.90)
(3)	Fama-French	-0.042	0.076	-0.118**
		(-0.62)	(1.35)	(-2.51)
(4)	Carhart	-0.015	0.077	-0.092**
		(-0.24)	(1.35)	(-2.13)
(5)	Pástor-Stambaugh	-0.045	0.062	-0.108**
		(-0.70)	(1.08)	(-2.48)

Table 7: Investment Behavior

This table reports the mean levels of industry concentration index (ICI), local holdings, unsystematic risk-taking, and active investing for treatment funds with poorly-designed fund management, matching funds with well-designed fund management, and matching solo-managed funds for the period of January 1998 to December 2012. A treatment fund and its matching fund with well-designed fund management have the same team size, the same investment style, and the closest TNA. A treatment fund and its matching solo-managed fund have the same fund manager, the same investment style, and the closest TNA. For a fund-month, ICI is computed following Kacperczyk, Sialm, and Zheng (2005) as the sum of the squared deviations of the value weights for each of ten industries held by the mutual fund from the industry weights of the market portfolio. We follow CHHK (2004) to define a stock as a local stock if the company's headquarters and the fund's headquarters are located in the same census region. Local holdings is computed as the total value weight of local stocks held by the fund, adjusted by deducting the total value weight of all stocks in the census region in the market portfolio. We estimate the Carhart (1997) four-factor model using daily returns. The unsystematic risk is computed as the standard deviation of the residuals. Active investing is computed following Amihud and Goyenko (2013) as the $1 - R^2$. The differences in these levels, along with their t-statistics, between treatment funds and matching funds are also reported. *, **, and *** indicate the significance levels of 10%, 5%, and 1%.

		Matching by Team Size, Style, and TNA			Matching by Fund Manager, Style, and TNA		
		Poorly-Designed	Well-Designed	Difference	Poorly-Designed	Solo-Managed	Difference
		(1)	(2)	(3)=(1)-(2)	(4)	(5)	(6)=(4)-(5)
(1)	ICI	0.055	0.062	-0.007***	0.047	0.053	-0.007***
				(-11.10)			(-8.27)
(2)	Local Holdings	-0.004	0.003	-0.006***	-0.010	-0.017	0.008*
				(-5.74)			(1.83)
(3)	Unsystematic Risk (% per day)	0.280	0.292	-0.012***	0.232	0.259	-0.027***
				(-12.17)			(-7.95)
(4)	Active Investing	0.064	0.073	-0.009***	0.049	0.057	-0.008***
				(-19.67)			(-7.91)