

Manager Cultural Diversity and Mutual Fund Performance

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Abstract

This paper examines the effect of culturally diverse management teams on mutual fund risk and return. Prior studies document that diverse teams bring information gains, but also communication costs. I find that cultural diversity, measured by the range or standard deviation of the individualism scores associated with managers' cultural origins, increases fund risk, but has no effects on fund return. Communication cost seems to dominate information gain brought by the cultural diversity. The positive effect of managerial cultural diversity on fund risk comes from increased exposure to the systematic risk, measured by benchmark beta and market beta. Sub-sample analysis indicates that cultural diversity increases fund risk only when the team has a low individualism score on average, or when the leader manager has a high individualism score. This is consistent with the closed style leadership in the groupthink theory. Finally, I use turnover in the fund management team as a shock to increase the managerial cultural diversity and find a positive treatment effect on fund risk.

Keywords: Cultural Diversity; Individualism; Communication Cost; Groupthink Theory; Mutual Fund Performance;

JEL Classification: Z1; G19; G40;

1. Introduction

In the past ten years, there has been an explosion of research on culture and its effects on corporate governance, mergers and acquisitions, capital markets, investor behaviors, and many other aspects of financial economy (Zingales, 2015). This new research reflects a broader social shift towards, among other things, increased diversity in the workplace. The cultural diversity of mutual fund managers, measured by the range of the individualism scores in the management team within a certain mutual fund-year (the maximum value minus the minimum value), or the standard deviation of the individualism scores, has been increasing rapidly since 1990. In this paper, I examine whether and how the cultural (individualism) diversity of mutual fund managers influences mutual fund risk and return.

Prior studies find evidence that diversity of other aspects of mutual fund managers, not cultural attributes, can affect fund performance. The Lazear (1999) model predicts that diverse fund management teams outperform homogenous teams if information gains outweigh communication costs, and vice versa. Bär, Niessen, and Ruenzi (2009) document that information gains dominate in tenure and education diverse teams, leading to higher fund performance; communication costs dominate in gender diverse teams, leading to lower fund performance. Other studies find that cultural diversity of board members affect firm performance. Frijns, Dodd, and Cimerova (2016) show that national cultural diversity in corporate boards negatively affects firm performance. The authors argue that the negative effect is mainly driven by the diversity in individualism and masculinity because these two dimensions affect group work quality and increase team frictions. Overall, existing studies explore the effect of non-cultural diversity on mutual fund managers and the effect of cultural diversity on corporate boards. In this paper, I examine

the effect of cultural diversity in the mutual fund management team on fund risk and return. To my knowledge, this is the first paper to look into this topic, which fills a gap in the literature.

In this paper, the main measurement for cultural diversity in mutual fund management team is “individualism”, one key cultural trait from Hofstede’s framework. I then examine whether and to what extent that diversity in individualism affects the risk and return of mutual funds. It has been documented in the literature that individualism is the most salient dimension of cultural heterogeneity in intragroup processes (eg., Gudykunst and Bond 1997; Kirkman et al. 2006; Lim et al. 2016). Individualism versus collectivism describes inter-individual differences that guide a person to differentiate his or her behavior from that of others (Hofstede, 1980, 2001).

Cultural diversity (measured by individualism diversity in this paper) in mutual fund management teams should have a large influence on fund risk and return. There has been a long debate in the literature about cultural diversity (Milliken and Martins 1996). Cultural diversity has both benefits and costs. On the positive side, cultural diversity brings in different opinions, information and perspectives, or even specific knowledge of certain countries (Nederveen Pieterse et al. 2013; Simons and Peterson 2000; Maznevski 1994). On the negative side, cultural diversity can cause additional frictions in communications, decrease intragroup trust and efficiency in coordination, which in turn affecting the quality of the final group decision (Anderson et al., 2011; Doney et al., 1998; Bjørnskov, 2008; De Wit et al., 2012; Jehn and Mannix 2001; Kirchmeyer and Cohen 1992). As a result, if the information gain dominates the communication cost caused by individualism diversity, mutual fund should have higher return relative to risk when the individualism diversity increases; if the communication cost dominates the information gain brought in by individualism diversity, mutual fund should have lower return relative to risk when the individualism diversity increases.

At the same time, individualism has been documented to affect momentum anomaly and affect decisions of many financial market players such as CEOs, investors, and venture capitalists since individualists behave very differently from collectivists. Individualists tend to collect or analyze information on their own and express opinions emphatically. They are also found to be over-confident, optimistic and aggressive in risk-taking, and stick to their own judgement and downweigh others' opinions. Collectivists tend to be less motivated to collect or process new information, be less motivated to speak out their own voice and conform to the group decision easily. However, collectivists bring in different social backgrounds and skill sets. I then ask a question: how would the behavior bias of the individualists and collectivists affect mutual fund team decisions and fund risk and return? According to the groupthink theory by Irving Janis, groupthink is a psychological phenomenon that occurs within a group of people in which the desire for harmony or conformity in the group results in an irrational or dysfunctional decision-making outcome. A typical structural fault that disrupts the communication is lack of impartial leadership. Closed style leadership is when leaders announce their opinions before the group discusses the issue together and this is found to be more biased in their judgments. Open style leadership is when leaders withhold their opinion until a later time in the discussion and this is best for leaders so that the group can discuss the issue without any pressures from the leader. Based on these theories, I also expect that different combination of individualism levels of the team members can affect the decisions of the mutual fund teams dynamically. Higher individualism diversity should lead to excessive risk-taking when a lead manager who is an individualist is working with a group of collectivists. Higher individualism diversity should not lead to excessive risk-taking when a lead manager who is a collectivist is working with a group of individualists.

I analyze a panel dataset of 5193 unique managers in 2125 U.S. mutual funds from 1990 to 2015. The number of managers in each fund-year ranges from 1 to 10. I first find an increasingly large dispersion in team cultural diversity across U.S. equity funds. Results show that younger and smaller funds and funds in large families are more likely to have a culturally diversified team. Interestingly, I also find a higher team diversity during the years when the U.S. president is a member of the democratic party. Next, when testing effects of cultural diversity, I find that diversity in mutual fund managers' individualism has positive effect on fund risk, but has negligible effects on fund return. In other words, an increase in diversity in individualism is associated with an increase in fund risk, without a compensating increase in expected return. This suggests that communication costs brought in by individualism diversity in mutual fund management team exceed the associated information gain.

I address three endogeneity concerns. First, a positive association between individualism diversity and mutual fund risk might be driven by some omitted variables. For example, mutual funds that fall into the same investment category may share similar risk and return attributes. To mitigate this concern, I include category fixed effects in my regressions. Second, to address the influence of macro-economic shocks and time series trends, I control for year fixed effects in my regressions. Third, to mitigate the concern of reverse causality, I use fund risk or return one period ahead of the cultural diversity measures in all my regressions.

I also conduct additional tests to search for possible channels through which the fund risk is affected by the increase of individualism diversity. The increase in fund risk that comes with the increase in managers' cultural diversity appears to be caused by the increased systematic risk. Teams with higher cultural diversity desire higher risk and higher return. Because most mutual funds face leverage constraints, teams with high cultural diversity tend to hold high beta stocks,

which are overpriced. However, fund risk increases as a result while return does not change. This is consistent with the betting-against-beta anomaly.

Moreover, I find that effects from cultural diversity are strong when the average individualism level of a management team is below the median, or when the lead manager with the longest tenure has an individualism score above the median. This indicates that cultural diversity increases fund risk most when the average managers has a low individualism level, or when one lead manager has a high individualism level, by causing more communication frictions. Individualist leader makes suboptimal decision to invest in inefficient high beta stocks to take higher risk and to expect higher return, while the other collectivist team members are not outspoken enough to adjust the team decision. This is consistent with closed style leadership in the groupthink theory by Irving Janis. In the opposite case, results also show that the individualism diversity does not increases fund risk when one lead manager has low individualism or when an average manager has high individualism. Collectivist leader listens to others' opinion before making decisions, leading to an optimal team decision incorporating everyone's information. This is consistent with open style leadership in the groupthink theory by Irving Janis.

Finally, I use turnover in the mutual fund management team as a shock to increase the managerial cultural diversity and find a positive treatment effect on fund risk. The change in fund risk is significantly larger for funds that experience increase in managers' individualism diversity due to manager turnovers, compared to a propensity-score-matched control group without manager turnover. One possible source of endogeneity is that there may be a slow-moving missing variable that affect both long-run diversity across firms and performance. However, since the potential omitted variable is slow-moving, we would not expect it to be strongly correlated with

manager turnover at a high frequency. Using manager turnover as a shock here can therefore rule out this potential endogeneity concern.

This study contributes to the literature in three major ways. First, my paper contributes to the literature on culture and finance by looking at the cultural attributes of mutual fund managers. To my knowledge, this is the first paper to examine the effect of individualism on mutual fund performance. Prior studies have only discussed national culture and how it affects groups' decision-making process in other settings. Some papers argue that cultural norms are as important as stated values in achieving success and that all individuals, especially elite group members who have decision-making powers, could be affected by their cultural characteristics when they process information and relate to other people (Graham et al., 2017; Schwartz, 2012; Maznevski, 1994; Schneider and De Meyer, 1991). Some other works examine the effect of individualism culture on investors, corporate managers, and venture capitalists, usually leading to more confidence and information analysis, less herding behavior, lower stock price co-movements, and higher investment success (Eun, Wang, and Xiao, 2015; Shu, Sulaeman, and Yeung, 2004; Brochet, Miller, and Naranjo, 2016; Beckmann, Menkhoff, and Suto, 2008; Keswani, Miguel, and Ramos, 2014; Gompers, Mukharlyamov, and Xuan, 2013). In this paper, I test the effect of individualism culture on mutual fund managers and how it affects mutual fund risk and return. This will add value to the literature on culture and individualism.

Second, my study contributes to the broad literature on team and team diversity. Past work focused on the team diversity of corporate boards or analysts. This paper is the first to look into the cultural diversity of the mutual fund team managers. My mutual fund setting on team diversity provides clearer quantifiable performance and simpler comparable management goals. In order to estimate the influence of culture related behavior biases, it is arguably a better setup to

study cultural backgrounds of mutual fund managers comparing to study the cultural backgrounds of firm executives. This is because mutual fund performance can more directly reflect fund managers' own preferences. In the corporate finance literature, the effect of cultural diversity on board members is controversial. Researchers find that executives could be culturally biased and become less effective due to cultural diversity (Manzoni et al., 2010; Nederveen Pieterse et al., 2013). However, some other studies find that cultural diversity of board directors can increase firm performance and stock return (Delis et al., 2017; Giannetti and Zhao, 2015). Also, studies find evidence consistent with higher levels of cultural diversity improving the accuracy of analysts' consensus forecasts (Merkley, Michaely, and Pacelli, 2017). In this paper, I find cultural diversity of mutual fund managers turns out to increase fund risk.

Third, I contribute to the literature on the background of mutual fund managers. Existing literature studied other characteristics of mutual fund managers such as age or tenure, or whether the fund is managed by a team. Some studies examine the relation between mutual fund performance and managers' age, education, family backgrounds, or industry experiences (Chevalier and Ellison, 1999; Chuprinin and Sosyura, 2016; Gottesman and Morey, 2006; Kempf, Manconi and Spalt, 2017). Other studies show that mutual fund manager teams follow less extreme investment styles, their portfolios are less industry concentrated, and they are eventually less likely to achieve extreme performance outcomes (Bar, Kempf, and Ruenzi, 2011). My paper studies the cultural diversity of the fund managers.

Finally, my paper also contributes to the psychology literature on groupthink theory and on the effects of individualism. Ferris, Jayaraman and Sabherwal (2013), Ahern, Daminelli and Fracassi (2015), Chui, Titman, and Wei (2010), Shu, Sulaeman, and Yeung (2004), Beckmann, Menkhoff, and Suto (2008), Gompers, Mukharlyamov, and Xuan (2013) all have shown that in-

dividualism is paramount important in individual decision making and investment behaviors. It affects momentum anomaly, and affects decisions of many financial market players such as CEOs, investors, and venture capitalists. This paper shows that individualist behavior bias can affect risk taking decisions in mutual fund teams.

The remainder of this paper is organized as follows. Section 2 explains the data. Section 3 shows empirical testing results and conducts robustness checks. Section 4 concludes.

2. Data and Variables

2.1 Data

The primary data source I use in this paper is the survivorship-bias-free Morningstar Direct Mutual Fund (MDMF) database. This database covers U.S. open-end mutual funds and provides information about fund names, manager names, returns, fund size, family size, fund age, expense ratios, turnover ratios, team size, fund tickers, benchmark portfolios, portfolio manager names, fund family names, and other fund characteristics.

My sample covers all actively managed U.S. domestic equity funds that have more than 50% of their assets invested in common stocks. I exclude index funds, funds of funds, and funds whose managers are anonymous. Following Elton, Gruber, and Blake (2001), Chen et al. (2004), and Pástor, Stambaugh, and Taylor (2015), I exclude funds with less than \$15 million in total net assets (TNA) due to potential data/reporting/operational biases. To control for the incubation bias documented in Evans (2010), I remove the first 36 months of return data for each fund.

2.2 Variable construction

Fund risk: I use several proxies to measure the level of overall fund risk exposures. The first measure, *Total Risk*, is calculated as the standard deviation of the monthly returns in a year for each mutual fund. Next, I compute funds' exposure to the market factor, *Market Beta*, by using the Carhart (1997) four-factor model:

$$R_{i,t} - R_{f,t} = \alpha_{i,t} + \beta_{i,t}(R_{m,t} - R_{f,t}) + \beta_{i,s}SMB_t + \beta_{i,h}HML_t + \beta_{i,u}UMD_t + \varepsilon_{i,t} \quad (1)$$

Where $R_{i,t} - R_{f,t}$ is the monthly return of fund i in time t minus the risk-free rate; $R_{m,t} - R_{f,t}$ is the market factor (i.e., the excess return of the CRSP value-weighted market index over the risk-free rate); SMB is the return difference between small- and large-cap stocks; HML is the return difference between high and low book-to-market stocks, and UMD is the return difference between stocks with high and low past returns.¹ I calculate *unsystematic risk* as the idiosyncratic risk from the four-factor model. Finally, I use the loadings on the benchmark index in Morningstar Database, which is S&P 500 index, as *benchmark beta*.

Fund performance: To compute funds' risk-adjusted performance, I adjust funds' returns using the Carhart (1997) four-factor model. That is, using 24-month rolling windows, I estimate the following regression for each fund each month to control for the risk exposures to the four factors in Carhart (1997), i.e., market, size, book-to-market, and momentum:

$$R_{i,t}^g - R_{f,t} = \alpha_i + \sum_{k=1}^4 \beta_{i,k,t} f_{k,t} + \varepsilon_{i,t} \quad (2)$$

Where $f_{k,t}$ refer to the four Carhart (1997) factors, $R_{i,t}^g$ is the gross return of fund i in month t , and $R_{f,t}$ is the risk-free rate in month t . Equation (2) is actually a simplified version for equa-

¹ Data on the risk factors were obtained from the Ken French Data Library.

tion (1). I use the estimated beta for a given 24-month period ending in month $t - 1$ to calculate the alpha in month t . I then compute *4-Factor Alpha* as follows:

$$4 - Factor\ Alpha_t = R_{i,t}^g - R_{f,t} - \sum_{k=1}^4 \beta_{i,k,t-1} f_{k,t} \quad (3)$$

Manager characteristics: Based on the managers' last names from Morning star, culture origins of the managers and the corresponding individualism scores in the national culture theory developed by Geert Hofstede have been hand-matched. The individualism score can range from 0 to 100. The higher the score is, the higher tendency of individualism the person has. For example, if the manager comes from China, the score is as low as 20. If the manager comes from US, the score is as high as 91.

Then the mutual fund management teams' individualism diversity is calculated as the range of the individualism score within a certain mutual fund-year by using the maximum value minus the minimum value, or the standard deviation of individualism computed as the standard deviation of the individualism scores of all the managers in a fund-year. Standard deviation of tenure is also calculated as the standard deviation of the tenure length of all the managers in a fund-year.

Fund characteristics and other variables: I follow Agarwal, Ma and Mullally (2016) to use the following six key fund characteristics as control variables. *Fund Size* is log of (1 + assets under management of the fund); Assets under management (AUM) of the fund are the sum of assets under management across all share classes of the fund. *Family Size* is log of (1 + assets under management in the firm); Assets under management in the firm are the sum of assets under management across all share classes of the fund family, excluding the fund itself. *Fund Age* is the number of months since inception; *Expense Ratio* is determined by dividing a fund's annual operating expenses by the average dollar value of its monthly assets under management over the year; *Turnover Ratio* is defined as the minimum of sales or purchases divided by average of the

total monthly net assets of a fund during the year; *Team Size* is the number of managers in the fund between 1 and 10. A summary of definitions of variables used in this paper can be found in Appendix A.

I also set up another two variables for the specific research questions in this paper. *Team* is a dummy variable that equals one if a fund is managed by multiple managers and zero otherwise; *Democratic* is a year dummy which equals to one if the President of U.S. is democratic in that year otherwise 0.

2.3 Summary Statistics

My final sample consists of 2125 unique U.S. equity mutual fund management teams from 1990 to 2015. Figure 1 plots the trend line of individualism diversity measures over the whole sample from 1990 to 2015. Panel A displays the average level of the range of individualism of all mutual funds for each of the 16 years and the fitted regression line. Panel B uses the average level of the standard deviation of individualism instead. Panel C shows the average level of the range of individualism per manager across all funds for each year and the fitted regression line. I use the range of individualism for each fund-year to divide by number of managers in the fund-year to get the range of individualism per manager. Panel D shows the average level of the standard deviation of individualism per manager instead. I divide the standard deviation of individualism for each fund-year by number of managers in the fund-year to get the standard deviation of individualism per manager. All values are winsorized at 1% and 99%. In all graphs, we can see that the individualism diversity increases over the sample period as a general trend. The fitted trend lines in all four panels have a positive and statistically significant slope.

Table 1 shows the summary statistics for the variables used in the main regressions. The sample consists of 19326 fund-year pair in the main regression. The mean value of the range of the individualism level is 15.36 and the average level of the standard deviation of the individualism level is 8.39. The mean level of the standard deviation of managers' tenure is 1.66. The summary statistics of other fund characteristics are comparable to prior mutual fund studies. Since the values in the summary statistics table for fund size and family size are in log terms, and the assets under management should be \$359 million in an average fund and \$11 billion in an average firm. The average fund in our sample is about 185 months old and is team-managed by 2 or more people. The average expense ratio is 1.3% and the average turnover ratio is 77%.

Table 2 reports the correlation of the variables of the main regressions. The correlation between total risk and range of individualism is negative but not significant (-0.013). I find the same result for the correlation between total risk and standard deviation of individualism (-0.011). This is univariate test result that does not control for other relevant variables. Therefore, I base conclusions on multivariate tests in the next section. The correlation between total risk and each of the six fund characteristics shows great significance, indicating the importance of controlling for the fund characteristics. I conduct multivariate tests in Section 3.

3. Empirical Results

3.1 Determinants of Cultural Diversity

Table 3 reports the regression results of the determinants of cultural diversity. I use the following model to examine the effect of the potential factors on cultural diversity measures:

$$\begin{aligned} \text{Individualism Diversity}_{i,t+1} = & \alpha + \beta_1 \times \text{Democratic}_t + \beta_2 \times \text{Manager Characteristics}_{i,t} + \\ & \beta_3 \times \text{Fund Characteristics}_{i,t} + \gamma_i + \delta_t + \varepsilon_{i,t} \end{aligned} \quad (5)$$

Where *Individualism Diversity* $_{i,t+1}$ stands for *Range of Individualism* or *Std. dev. of Individualism* for fund i in year $t+1$; *Democratic* $_t$ is a year dummy which equals to one if the president of U.S. is democratic in year i otherwise 0; *Manager Characteristics* is *Std. dev. of Tenure*. I use *Fund Characteristics* as control variables. *Fund Characteristics* includes *Fund Size*, *Family Size*, *Fund Age*, *Expense*, *Turnover*, and *Team Size*. I also include year fixed effects (δ_t) and category fixed effects (γ_{ij}) in the specification. The year fixed effects account for the effect of market-wide national shocks and other time-varying factors that can affect both manager characteristics and individualism diversity at the same time. The category fixed effects control for time-invariant factors that are common to the funds in a same category. I use nine investment categories: large blend, large growth, large value, mid-cap blend, mid-cap growth, mid-cap value, small blend, small growth, and small value. To control for potential serial correlations in the panel data, standard errors are clustered at the fund level to allow for arbitrary heteroscedasticity and autocorrelation for each fund.

Democrats have a long history of defending civil rights for all groups of Americans and promote one of their core principles – diversity. I expect that when the President of U.S. is democratic in a certain year, there is a national mood to promote diversity that affects both elections and selection of fund managers. Or, after the election, the President sets the national mood, and this affects selection of fund teams and the cultural diversity of the mutual fund management teams would be higher. Consistent with my expectation, I find higher team diversity during the years that the U.S. president belongs to the Democratic Party. The coefficient of democratic dummy turns out to be positive and significant in the regression results of the determinants of

cultural diversity (5.425, t=5.94 for range; 3.492, t=0.579 for standard deviation). In the democratic year, average cultural diversity in the mutual fund management team is increased by a score of 5.245 (t=5.94) for the range of individualism and 3.492 (t=6.03) for the standard deviation. This shows that the promotion of diversity by a democratic president is positively correlated with either of the individualism diversity measures.

I also find a positive and significant effect of the standard deviation of tenure on the range (0.471, t=4.06) or the standard deviation (0.453, t=6.38) of individualism. It demonstrates that when managers in a fund-year are more diverse in tenure, there is a higher chance that the managers are also more diverse in individualism as well.

Finally, I find younger and smaller funds, and also funds in large families are more likely to have a culturally diversified team.

3.2 Does Diversity Affect Performance? Baseline Test

Table 4 reports baseline results that study effects of cultural diversity on fund performance (risk and return). The baseline regression is specified as follows:

$$Fund\ Performance_{i,t+1} = \alpha + \beta_1 \times Individualism\ Diversity_t + \beta_2 \times Manager\ Characteristics_{i,t} + \beta_3 \times Fund\ Characteristics_{i,t} + \gamma_i + \delta_t + \varepsilon_{i,t} \quad (6)$$

Where $Fund\ Performance_{i,t+1}$ represents *total risk* or *alpha* for fund i in year $t+1$. $Individualism\ Diversity_t$ stands for *Range of Individualism* or *Std. dev. of Individualism* for fund i in year t . I control for both *Manager Characteristics* and *Fund Characteristics*. *Std. dev. of Tenure* is used as *Manager Characteristics*. *Fund Characteristics* includes *Fund Size*, *Family Size*, *Fund Age*, *Expense*, *Turnover*, and *Team Size*, all of which may influence fund risk and return based

on the prior literature. For instance, since Kempf and Ruenzi (2008) find that risk changes are more pronounced among managers of funds with high expense ratios, managed by a single manager, and belong to large families, I control for expense ratio, team size and family size. I also control for fund age, fund size and turnover because Kempf, Ruenzi and Thiele (2009) suggest that younger, larger funds with higher turnover ratio might have greater risk-taking incentives. I also include year fixed effects (δ_i) and category fixed effects (γ_{ij}) in the specification. The year fixed effects account for the effect of market-wide national shocks and other time-varying factors that can affect both fund risk or return and individualism diversity at the same time. The category fixed effects control for time-invariant factors that are common to the funds in a same category. To control for potential serial correlations in the panel data, standard errors are clustered at the fund level to allow for arbitrary heteroskedasticity and autocorrelation for each fund.

In Panel A, I use range of individualism as the main variable of interest to measure cultural diversity. The dependent variable is total risk in Columns 1 and 2 and alpha in Columns 3 and 4. I do not control for standard deviation of tenure in Columns 1 and 3, and I add it back in Columns 2 and 4. As reported in the table, I find range of individualism in the fund management team increases mutual fund total risk. The effect is positive and significant for both regressions with and without controlling for the standard deviation of tenure (0.135, $t=2.05$ and 0.128, $t=1.94$ respectively). This effect is economically significant. For one standard deviation increase in the range of individualism, fund total risk is increased by 1.42% of its standard deviation. Columns 3 and 4 show that effect of cultural diversity is negligible on fund alpha. Coefficients are both economically and statistically insignificant (-0.017, $t=0.71$ in Column 3; -0.019, $t=0.79$ in Column 4). These findings indicate that while the cultural diversity in the mutual fund management team (represented by range of individualism score) increases, fund total risk increases without any ad-

ditional return compensation. There is no extra return for the extra risk taken. This provides evidence that is consistent with the hypothesis that additional communication costs brought in by individualism diversity exceed the associated benefit from potential information gain.

With respect to the controls, I find their coefficient results in the base regression for total risk consistent with the prior literature. For example, I find the coefficients for expense ratio are positive and significant, indicating that higher expense ratio causes additional risk-taking behavior. The coefficients for team size are negative and significant, demonstrating that a larger team size reduces the risk taking of the team. The coefficients of family size turn out to be positive but not significant, showing a bigger family size leads to more risk-taking decisions. The coefficients of fund age are negative and significant, implying that older funds have less risk-taking incentives. The coefficients of fund size and turnover are both positive and significant, showing that larger funds or funds with better turnover have more risk-taking activities.

In Panel B, I use standard deviation of individualism as the measurement for cultural diversity. Results qualitatively remain the same. The effect of cultural diversity on fund total risk is positive and significant, both statistically and economically (0.214, $t=1.89$ and 0.190, $t=1.70$ for regressions with and without control for tenure standard deviation, respectively). One standard deviation increase in standard deviation of individualism increases total risk by 1.2% of its standard deviation. The effect of individualism standard deviation on fund alpha is statistically and economically insignificant. All these show that my baseline results are robust to this alternative measurement of cultural diversity of fund managers.

3.3 Channel Regression Results

In this sub-section, I conduct additional tests to identify possible channels through which fund risk is affected by the change in cultural diversity.

Table 5 shows the results of the first series of channel regressions. Panel A shows the relation between range of individualism and possible channels: benchmark beta, market beta, and unsystematic risk. Panel B shows the relation between standard deviation of individualism and the same possible channels as in Panel A. The regression model is specified as follows:

$$\begin{aligned} \text{Potential Channels}_{i,t+1} = & \alpha + \beta_1 \times \text{Individualism Diversity}_t + \beta_2 \times \text{Manager Characteristics}_{i,t} \\ & + \beta_3 \times \text{Fund Characteristics}_{i,t} + \gamma_i + \delta_t + \varepsilon_{i,t} \end{aligned} \quad (6)$$

Where *Potential Channels*_{*i, t+1*} represents *benchmark beta, market beta, unsystematic risk* for fund *i* in year *t+1*. *Individualism Diversity*_{*t*} stands for *Range of Individualism* or *Std. dev. of Individualism* for fund *i* in year *t*. *Manager Characteristics* is *Std. dev. of Tenure*. *Fund Characteristics* include *Fund Size, Family Size, Fund Age, Expense, Turnover, and Team Size*. I also include year fixed effects (δ_t) and category fixed effects (γ_{ij}) in the specification and standard errors are clustered at the fund level to allow for arbitrary heteroskedasticity and autocorrelation for each fund. Similar to baseline regressions, I remove the manager characteristics control, standard deviation of tenure, in columns 1, 3 and 5, and I add that back in columns 2, 4 and 6. Columns 1 and 2 report effects of cultural diversity on benchmark beta; Columns 3 and 4 report effects on market beta; Columns 5 and 6 report effects on unsystematic risk. As reported in the table, I find the effects of individualism range on benchmark beta and market beta are positive and significant, both statistically and economically (0.033, $t=2.54$ for benchmark beta; 0.037, $t=3.70$ for market beta). For one standard deviation increase in the range of individualism, benchmark beta is increased by 3.8% of its standard deviation, and market beta is increased by 5.1% of its standard deviation. I also find unsystematic risk is unaffected by individualism diver-

sity. Results qualitatively remain the same when I use standard deviation of individualism to measure cultural diversity (0.059, $t=2.68$ for benchmark beta; 0.067, $t=3.78$ for market beta). One standard deviation increase in the standard deviation of individualism increases benchmark beta by 4.36% of its standard deviation, and increases market beta by 4.11% of its standard deviation. Overall, these results indicate that cultural diversity increases total risk through systematic risk, not idiosyncratic risk. Individualism diversified mutual fund management teams tend to hold over-priced high beta stocks.

Table 6 reports subsample analysis while I divide the sample based on individualism level of managers. Based on the groupthink theory, leadership style is an important factor that affects the final group decision. It is therefore necessary to analyze the effect of individualism diversification based on different leadership styles. I classify my sample by whether the average individualism level of a manager team is above or below the median, and also based on whether the individualism score of the leader manager who has the longest tenure in the team is above or below the median. I then rerun my baseline regressions in these subsamples and report results in Panels A and B, respectively.

As shown in Panel A, the effects of cultural diversification concentrate in fund teams with an average individualism score below the median. I find both range (0.242, $t=3.025$) and standard deviation (0.359, $t=2.70$) of fund individualism score positively contribute to the total risk of mutual fund. The effects become insignificant when I look at the subsample of fund teams with an average individualism score above the median. This might be due to higher level of individualism diversity causing more severe communication costs when most managers in the fund are of low individualism. People of collectivist cultures are less likely to accept different opinions, thus leading to more communication frictions. Also, they are less motivated to collect or process new

information, or speak out their own voice, causing a less optimal decision making. This leads to inferior decision making and risk divarication, consistent with the groupthink theory by Irving Janis.

Similarly, Panel B reports relationships between fund total risk and individualism diversity measures for funds with lead manager's individualism score level below and above median individualism level across all funds. I find my baseline results remain only in subsample of funds with lead managers' individualism score above the median. When one lead manager is of high individualism level, this person may stick to his own judgement and ignore others' opinions, failing to control the risk-taking behavior to certain scope. As a result, the final group decision can be inefficient and the fund will invest in overpriced high beta stocks. These findings are also consistent with the findings in Panel A.

Overall, when most managers in the team are of low individualism level, or the leader manager is of high individualism level, cultural diversity will brings in higher communication cost than potential information gain. Group decisions are less efficient here. This is consistent with groupthink theory.

3.4 Manager Turnover Test and Robustness Checks

In this subsection, I conduct robustness tests by using fund manager turnovers as shocks to mutual funds' individualism diversity levels. The univariate test results for manager turnover samples are reported in Table 7.

While fund manager changes, cultural diversity level in the management team also changes. I first identify fund-year observations that have positive cultural diversity change due to shocks of manager turnover to be my treated sample. I then one-to-one propensity-score-match these

treated funds to a control group that has no manager change by using six fund characteristics (fund size, family size, fund age, expense, turnover ratio, and also team size). A detailed comparison between my treated sample and control sample is reported in Panel A of Table 7. The p-values of the differences are above 0.1 across all six fund characteristics, indicating treated firms are comparable to matched firms.

Panels B of Table 7 shows the paired difference of change in total risk of treated funds with positive changes in range of individualism caused by manager turnover compared to matched funds without manager turnover. The paired difference is computed as the change in total risk for treatment group with positive change in cultural diversity due to the manager turnover minus the change in total risk for control group without any cultural diversity change or manager turnover.

I compute the median and mean of the paired difference of the change in total risk one, or two, or three years before and after the manager turnover between the treatment and control group. The change in total risk is calculated as the average total risk one, or two, or three years after the manager turnover minus the average total risk one, or two, or three years before the manager turnover. I also run Wilcoxon signed rank tests for the median of the paired difference and t-tests for the mean of the paired difference. As reported, the paired differences (treated - control) of changes in total risk one year before to one year after the manager turnover event is significantly positive (mean=14.869, p-value=0.066; median=19.085, p-value=0.086). Similarly, I find the paired differences to be significant positive for the period of two years before to two years after (mean=18.854, p-value=0.052; median=21.168, p-value=0.070), and also for the period of three years before to three years after (mean=23.965, p-value=0.031; median=24.28, p-value=0.036). All these results show that increases in cultural diversity increases fund risk. The change in fund risk is significantly larger for funds with an increase in the managers' individual-

ism diversity due to manager turnover compared to the propensity-score-matched control group without manager turnover. Interestingly, I find the paired difference of change in fund risk increases over time for both mean and median, in terms of both magnitude and significance. This indicates that effects from cultural diversity can be slow-moving and increase over time.

In Panel C, I report the paired difference of change in total risk of treated funds with positive changes in standard deviation of individualism caused by manager turnover compared to matched funds without manager turnover. Results qualitatively remain the same as what are reported in Panel B. The mean and median of paired differences for changes in total risk one year before to one year after (mean=14.659, p-value=0.012; median=25.334, p-value=0.011), two year before and two year after (mean=27.33, p-value=0.01; mean=25.742, p-value=0.013), and three year before to three year after (32.094, p-value=0.002; median=30.213, p-value=0.003) the manager turnover are all positive and significant. Similarly, I also find an increasing trend of the treatment effect over time here.

Figure 2 shows the change in total risk before and after manager turnovers. It shows that the total risk of the turnover sample significantly increases after the manager turnover and is much higher compared to the propensity-score-matched control sample without any manager change while there is no such trend before the manager turnover. Overall, these results are consistent with my baseline findings.

Finally, as an alternative robustness check, I run the base regressions and the first series of the channel regressions again for mutual funds with team managers only and exclude the one-manager funds. The range and the standard deviation of individualism for the one-manager funds are set to be zero when I include them in my baseline settings. Table 8 reports these ro-

bustness test results. The coefficients for range of individualism and standard deviation of individualism remain positive and significant for total risk, benchmark beta, and market beta. The results for the team only group are the same as the full sample analysis. My results are robust after excluding one-manager funds.

4. Conclusion

In this paper, I study how mutual fund managers' cultural diversity affects fund risk and return. According to the Lazear (1999) model, diversity in manager cultural individualism can bring information gains, but also communication costs at the same time. I find that diversity in individualism is associated with an increase in fund risk, especially systematic risk, without a compensating increase in expected return. My findings support my hypothesis that the communication costs brought by individualism diversity exceed the information gain due to the diversity.

I also conduct additional channel regressions and subsample analysis to further explore the mechanism behind the relation between diversity and risk. Empirical results suggest that it is the systematic risk that increases when the cultural diversity of the management team increases. This finding indicates that diversified management teams fail to make efficient group decisions and invest in over-priced high beta stocks. This provides evidence for the betting against beta anomaly. The positive relationship between fund risk and individualism diversity is also stronger when the average individualism level of the manager team is below the median, or when the lead manager with the longest tenure has an individualism score above the median. When most managers are of low individualism level, or when one single lead manager is of high individualism level, it might make the communication harder within the group. This is consistent with the closed style leadership in the groupthink theory.

To verify that these effects are actually driven by cultural diversity, I also perform tests based on the shifts in diversity that occur after manager turnover. By conducting subsample analysis of the fund-year observations experiencing manager turnovers, I verify that increases in cultural diversity result in increases in fund risk. The change in fund risk before and after the manager turnover is significantly larger for funds with an increase in the managers' individualism diversity caused by manager change compared to a propensity-score-matched control group without manager turnover.

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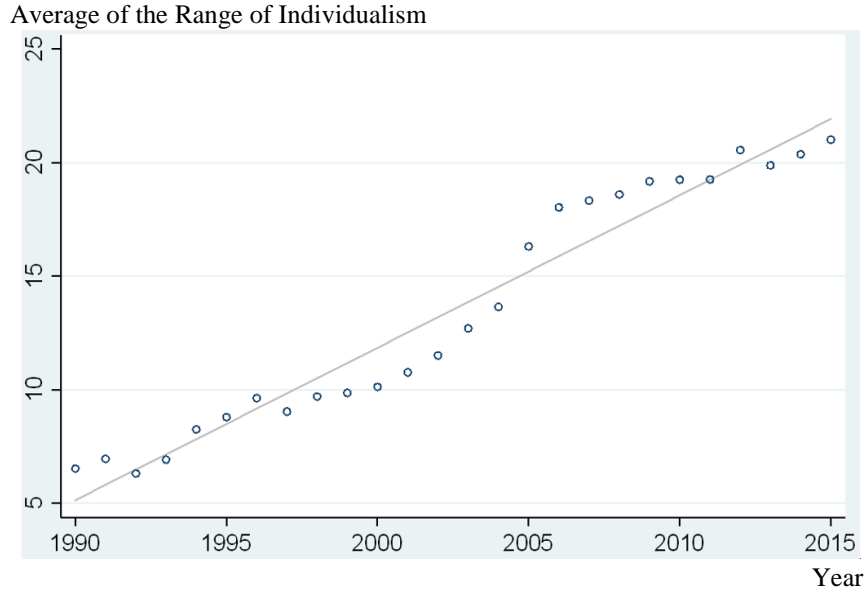
Appendix A: Definition of Variables

Variable Name	Definition
Panel A: Fund Risk and Fund Performance	
Total Risk	Standard deviation of the monthly returns in a year for each mutual fund
Alpha	Alpha from the four-factor model
Benchmark Beta	Loadings on benchmark index, which is S&P 500 (Standard & Poor's 500 Index)
Market Beta	Loadings on market factor
Unsystematic Risk	Idiosyncratic risk from four-factor model
Panel B: Manager Characteristics	
Range of Individualism	The range of the individualism score within a certain mutual fund by using the maximum value minus the minimum value
Std. dev. of Individualism	Standard deviation of the individualism score in a fund
Std. dev. of Tenure	Standard deviation of the tenure length of all the managers in a fund-year
Panel C: Fund Characteristics	
Fund Size	Log of (1 + Assets under management of the fund); Assets under management of the fund are Sum of assets under management across all share classes of the fund
Family Size	Log of (1 + Assets under management in the firm); Assets under management in the firm are Sum of assets under management across all share classes of the fund family, excluding the fund itself
Fund Age	Number of months since inception; Age of the oldest share class in the fund
Expense	Fund expense ratio; Ratio of the fund's annual operating expenses by the average dollar value of its assets under management
Turnover	Fund turnover ratio; The lesser of purchases or sells, divided by average Total Net Assets
Team Size	Number of managers in the fund between 1 and 10
Panel D: Others	
Team	A dummy variable that equals one if a fund is managed by multiple managers and zero otherwise
Democratic	A year dummy which equals to one if the President of U.S. is democratic in that year otherwise 0
Manager Turnover	When there is any manager change from one fund-year to the next year in the same fund, including manager addition, deletion or changed to another person

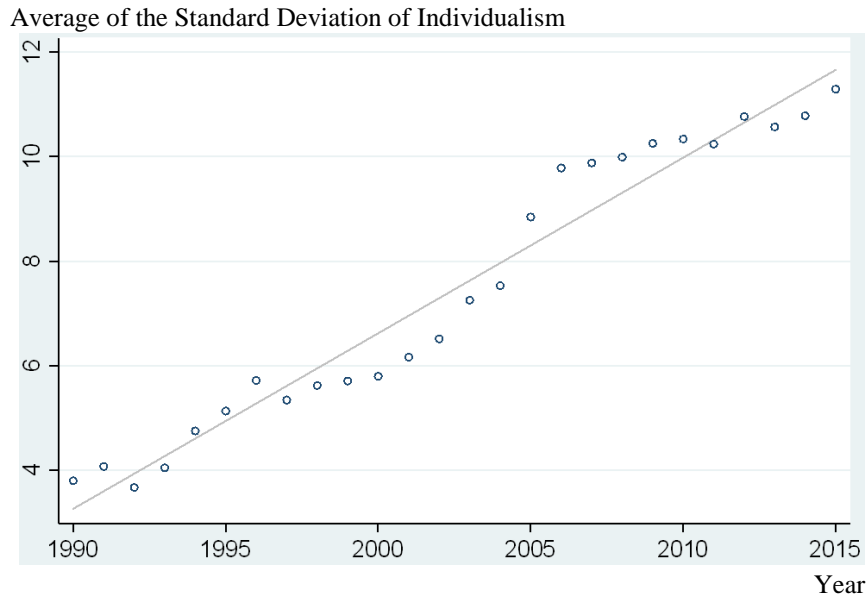
Figure 1: Trend lines of Cultural Diversity

Figure 1 plots the trend line of individualism diversity measures over the whole sample from 1990 to 2015. The first graph pictures the average level of the range of individualism of all mutual funds for the each of the 16 years and the fitted regression line. The second graph uses average level of the standard deviation of individualism instead. The third graph shows average level of the range of individualism per manager across all funds for each year and the fitted regression line. The fourth graph shows the average level of the standard deviation of individualism per manager instead. All values are winsorized.

Panel A



Panel B



Panel C

Average of Range of Individualism per Manager



Panel D

Average of Standard Deviation of Individualism per Manager



Figure 2: Change in Total Risk before and after Manager Turnover

Figure 2 shows that the Change in Total Risk before and after Manager Turnover. It shows that the total risk of the turnover sample significantly increased after the manager turnover compared to the propensity-score-matched control sample without any manager change while there is no such trend before the manager turnover. The propensity score matching details are shown in Table 7.

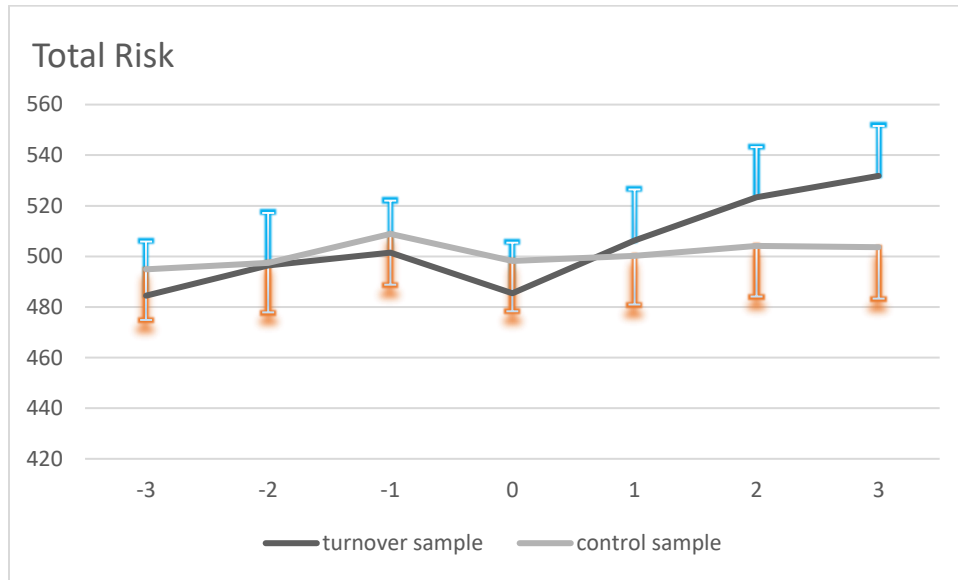


Table 1: Summary Statistics

Table 1 shows the Summary Statistics of the Variables of the Base Regressions. The sample period is from 1990 to 2015. *Total Risk* is the standard deviation of the monthly returns in a year for each mutual fund in the sample. *Range of Individualism* is the range of the individualism score within a certain mutual fund. *Std. dev. of Individualism* is the standard deviation of the individualism score in a fund. *Std. dev. of Tenure* is the standard deviation of the tenure of the managers for a fund. Tenure is defined as the (average) number of years that a manager(s) has been at the helm of a fund. *Percentage of Female* is the percentage of female managers in a mutual fund. *Fund Size* is log of (1+assets under management of the fund); Assets under management (AUM) of the fund are the sum of assets under management across all share classes of the fund. *Family Size* is log of (1+assets under management in the firm); Assets under management in the firm are the sum of assets under management across all share classes of the fund family, excluding the fund itself. *Fund Age* is the number of months since inception. *Expense* is the fund expense ratio, determined by dividing the fund's annual operating expenses by the average dollar value of its assets under management. *Turnover* is the fund turnover ratio, defined as the minimum of sales or purchases divided by the average total monthly net assets of a fund during a year. *Team Size* is the number of managers in the fund between 1 and 10. *Benchmark Beta* is the loadings on benchmark index. *Market Beta* is the loadings on market factor. *Unsystematic Risk* is the idiosyncratic risk from four-factor model. *Total Risk*, *benchmark Beta*, *Market Beta* and *Unsystematic Risk* here have been multiplied by 100 to increase the coefficient magnitude.

Variable	Obs	Mean	Std. dev.	Min	25%	Median	75%	Max
Total Risk	19326	456.85	193.45	154.76	307.18	410.65	587.53	1,075.98
Range of Individualism	19326	15.36	20.29	0.00	0.00	3.00	22.00	78.00
Std. dev. of Individualism	19326	8.39	10.84	0.00	0.00	2.12	13.44	48.79
Std. dev. of Tenure	19326	1.66	2.83	0.00	0.00	0.00	2.31	16.26
Fund Size	19326	19.70	1.61	16.64	18.48	19.64	20.81	23.76
Family Size	19326	23.18	2.46	17.07	21.53	23.65	24.97	27.94
Fund Age (in months)	19326	184.73	155.67	36.00	84.00	138.00	224.00	840.00
Expense (%)	19326	1.26	0.37	0.24	1.01	1.26	1.50	2.25
Turnover (%)	19326	76.97	64.16	2.00	31.00	60.00	103.00	336.00
Team Size	19326	2.33	1.61	1.00	1.00	2.00	3.00	8.00
Benchmark Beta	17862	95.71	17.65	42.52	86.18	96.51	105.68	147.95
Market Beta	19307	99.80	14.66	59.05	91.65	99.86	107.61	147.02
Unsystematic Risk	19307	120.53	63.29	33.41	76.82	106.07	145.98	366.95

Table 2: Correlation Table

This table reports the Correlation of the Variables of the Main Regressions. The sample period is from 1990 to 2015. *Total Risk* is the standard deviation of the monthly returns in a year for each mutual fund in the sample. *Range of Individualism* is the range of the individualism score within a certain mutual fund. *Std. dev. of Individualism* is the standard deviation of the individualism score in a fund. *Std. dev. of Tenure* is the standard deviation of the tenure of the managers for a fund. *Fund Size* is log of (1+assets under management of the fund); Assets under management (AUM) of the fund are the sum of assets under management across all share classes of the fund. *Family Size* is log of (1+assets under management in the firm); Assets under management in the firm are the sum of assets under management across all share classes of the fund family, excluding the fund itself. *Fund Age* is the number of months since inception. *Expense* is the fund expense ratio. *Turnover* is the fund turnover ratio. *Team Size* is the number of managers in the fund between 1 and 10. *, **, and *** indicate significance at the 10%, 5%, and 1% level, respectively.

Panel A	Total Risk	Range of Individualism	Std. dev. of Individualism	Std. dev. of Tenure
Total Risk	1			
Range of Individualism	-0.013	1		
Std. dev. of Individualism	-0.011	0.958***	1	
Std. dev. of Tenure	-0.037***	0.285***	0.285***	1
Fund Size	-0.053***	0.007	-0.003	0.152***
Family Size	-0.015*	0.052***	0.037***	-0.004
Fund Age	-0.075***	-0.029***	-0.025***	0.246***
Expense	0.094***	-0.045***	-0.039***	-0.065***
Turnover	0.206***	-0.009	-0.003	-0.109***
Team Size	-0.017**	0.647***	0.496***	0.345***

Panel B	Fund Size	Family Size	Fund Age	Expense	Turnover	Team Size
Fund Size	1					
Family Size	0.572***	1				
Fund Age	0.339***	0.126***	1			
Expense	-0.281***	-0.201***	-0.130***	1		
Turnover	-0.138***	0.036***	-0.098***	0.195***	1	
Team Size	0.036***	0.044***	-0.017*	-0.038***	-0.040***	1

Table 3 Determinants of Cultural Diversity

This table reports the Determinants of Cultural Diversity. The sample period is from 1990 to 2015. *Democratic* is a year dummy which equals to one if the President of U.S. is democratic in that year otherwise 0. *Range of Individualism* is the range of the individualism score within a certain mutual fund. *Std. dev. of Individualism* is the standard deviation of the individualism score in a fund. *Std. dev. of Tenure* is the standard deviation of the tenure of the managers for a fund. *Fund Size* is log of (1+assets under management of the fund); Assets under management (AUM) of the fund are the sum of assets under management across all share classes of the fund. *Family Size* is log of (1+assets under management in the firm); Assets under management in the firm are the sum of assets under management across all share classes of the fund family, excluding the fund itself. *Expense* is the fund expense ratio. *Turnover* is the fund turnover ratio. *Team Size* is the number of managers in the fund between 1 and 10. All dependent variables are measure in year t+1. Year fixed effects and category fixed effects are included in all regressions. Standard errors in parentheses are clustered at the fund level. *, **, and *** indicates significance at the 10%, 5%, and 1% level, respectively.

	(1) Range of Individualism	(2) Std. dev. of Individualism
Democratic	5.425*** (0.913)	3.492*** (0.579)
Std. dev. of Tenure	0.471*** (0.116)	0.453*** (0.071)
Fund Size	-0.388* (0.231)	-0.246* (0.143)
Family Size	0.292** (0.141)	0.128 (0.086)
Fund Age	-0.006*** (0.002)	-0.004*** (0.001)
Expense	-1.580** (0.767)	-0.900* (0.463)
Turnover	0.003 (0.004)	0.003 (0.002)
Team Size	6.745*** (0.228)	2.559*** (0.111)
Constant	0.025 (4.066)	3.446 (2.497)
Year FE	Yes	Yes
Category FE	Yes	Yes
Observations	19,326	19,326
R-squared	0.355	0.234

Table 4: Results of Base Regressions

This table shows the results of the base regression. The sample period is from 1990 to 2015. Panel A shows the correlation between *Total Risk* or *Alpha* and *Range of Individualism*. Panel B shows the correlation between *Total Risk* or *Alpha* and *Standard Deviation of Individualism*. *Total Risk* is the standard deviation of the monthly returns in a year for each mutual fund in the sample. *Alpha* is the alpha from the four-factor model. *Range of Individualism* is the range of the individualism score within a certain mutual fund. *Std. dev. of Individualism* is the standard deviation of the individualism score in a fund. *Std. dev. of Tenure* is the standard deviation of the tenure of the managers for a fund. *Fund Size* is log of (1+assets under management of the fund); Assets under management (AUM) of the fund are the sum of assets under management across all share classes of the fund. *Family Size* is log of (1+assets under management in the firm); Assets under management in the firm are the sum of assets under management across all share classes of the fund family, excluding the fund itself. *Fund Age* is the number of months since inception. *Expense* is the fund expense ratio. *Turnover* is the fund turnover ratio. *Team Size* is the number of managers in the fund between 1 and 10. All dependent variables are measure in year t+1 to alleviate reverse causality concerns. Year fixed effects and category fixed effects are included in all regressions. Standard errors in parentheses are clustered at the fund level. *, **, and *** indicates significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
Panel A	Total Risk	Total Risk	Alpha	Alpha
Range of Individualism	0.128* (0.066)	0.135** (0.066)	-0.017 (0.024)	-0.019 (0.024)
Std. dev. of Tenure		-0.445 (0.436)		0.082 (0.144)
Fund Size	4.576*** (1.092)	4.592*** (1.089)	-1.899*** (0.312)	-1.982*** (0.312)
Family Size	0.116 (0.711)	-0.021 (0.723)	0.860*** (0.200)	0.845*** (0.203)
Fund Age	-0.025** (0.010)	-0.022** (0.010)	0.002 (0.002)	0.002 (0.002)
Expense	7.985** (3.623)	8.460** (3.597)	-7.323*** (1.132)	-7.167*** (1.133)
Turnover	0.192*** (0.026)	0.190*** (0.025)	-0.031*** (0.007)	-0.031*** (0.008)
Team Size	-1.388* (0.790)	-1.033 (0.790)	-0.290 (0.271)	-0.270 (0.270)
Constant	333.465*** (20.753)	334.079*** (20.621)	68.718*** (6.508)	69.561*** (6.495)
Year FE	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes
Observations	19,326	19,326	19,307	19,307
R-squared	0.746	0.746	0.205	0.206

Table 4 continued.

Panel B	(1)	(2)	(3)	(4)
	Total Risk	Total Risk	Alpha	Alpha
Std. dev. of Individualism	0.190*	0.214*	-0.039	-0.041
	(0.112)	(0.113)	(0.040)	(0.040)
Std. dev. of Tenure		-0.483		0.094
		(0.438)		(0.145)
Fund Size	4.561***	4.588***	-1.900***	-1.984***
	(1.092)	(1.089)	(0.312)	(0.312)
Family Size	0.133	-0.010	0.858***	0.844***
	(0.711)	(0.723)	(0.200)	(0.203)
Fund Age	-0.025**	-0.022**	0.002	0.002
	(0.010)	(0.010)	(0.002)	(0.002)
Expense	7.966**	8.453**	-7.330***	-7.175***
	(3.627)	(3.601)	(1.132)	(1.133)
Turnover	0.192***	0.190***	-0.030***	-0.031***
	(0.026)	(0.025)	(0.008)	(0.008)
Team Size	-0.987	-0.627	-0.305	-0.294
	(0.694)	(0.699)	(0.237)	(0.238)
Constant	332.897***	333.365***	68.835***	69.702***
	(20.777)	(20.641)	(6.512)	(6.499)
Year FE	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes
Observations	19,326	19,326	19,307	19,307
R-squared	0.746	0.746	0.205	0.206

Table 5: Results of Channel Regressions

This table reports the Channel Regression Results. The sample period is from 1990 to 2015. In Panel A, it shows the correlation between *range of individualism* and possible channels: *benchmark beta*, *market beta* and *unsystematic risk*. Panel B shows the correlation between *Standard Deviation of Individualism* and the same possible channels. *Range of Individualism* is the range of the individualism score within a certain mutual fund. *Std. dev. of Individualism* is the standard deviation of the individualism score in a fund. *Benchmark Beta* is the loadings on benchmark index. *Market Beta* is the loadings on market factor. *Unsystematic Risk* is the idiosyncratic risk from four-factor model. *Std. dev. of Tenure* is the standard deviation of the tenure of the managers for a fund. *Fund Size* is log of (1+assets under management of the fund); Assets under management (AUM) of the fund are the sum of assets under management across all share classes of the fund. *Family Size* is log of (1+assets under management in the firm); Assets under management in the firm are the sum of assets under management across all share classes of the fund family, excluding the fund itself. *Fund Age* is the number of months since inception. *Expense* is the fund expense ratio. *Turnover* is the fund turnover ratio. *Team Size* is the number of managers in the fund between 1 and 10. All dependent variables are measure in year t+1. Year fixed effects and category fixed effects are included in all regressions. Standard errors in parentheses are clustered at the fund level. *, **, and *** indicates significance at the 10%, 5%, and 1% level, respectively.

Panel A	(1) Benchmark Beta	(2) Benchmark Beta	(3) Market Beta	(4) Market Beta	(5) Unsystemat- ic Risk	(6) Unsystemat- ic Risk
Range of Individualism	0.030** (0.013)	0.033*** (0.013)	0.035*** (0.010)	0.037*** (0.010)	-0.047 (0.036)	-0.052 (0.036)
Std. dev. of Tenure		-0.186** (0.088)		-0.238*** (0.077)		0.671*** (0.233)
Fund Size	0.152 (0.220)	0.176 (0.216)	0.095 (0.169)	0.150 (0.166)	1.805*** (0.690)	1.426** (0.677)
Family Size	0.564*** (0.147)	0.541*** (0.150)	0.551*** (0.114)	0.512*** (0.115)	-3.407*** (0.427)	-3.304*** (0.428)
Fund Age	-0.005** (0.002)	-0.004* (0.002)	-0.001 (0.002)	-0.000 (0.002)	-0.009 (0.006)	-0.011* (0.006)
Expense	1.147 (0.762)	1.281* (0.764)	0.256 (0.557)	0.351 (0.554)	14.373*** (2.121)	14.911*** (2.081)
Turnover	0.028*** (0.005)	0.028*** (0.005)	0.034*** (0.004)	0.033*** (0.004)	0.132*** (0.016)	0.132*** (0.015)
Team Size	-0.056 (0.170)	0.060 (0.171)	-0.073 (0.130)	0.072 (0.132)	-1.683*** (0.462)	-1.878*** (0.462)
Constant	78.983** * (4.343)	78.674*** (4.332)	75.077*** (3.160)	74.565*** (3.134)	106.781*** (11.526)	109.943*** (11.436)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,862	17,862	19,307	19,307	19,307	19,307
R-squared	0.142	0.144	0.169	0.173	0.526	0.530

Table 5 continued.

Panel B	(1) Benchmark Beta	(2) Benchmark Beta	(3) Market Beta	(4) Market Beta	(5) Unsystematic Risk	(6) Unsystematic Risk
Std. dev. of Individualism	0.050** (0.022)	0.059*** (0.022)	0.059*** (0.018)	0.067*** (0.018)	-0.110* (0.061)	-0.126** (0.062)
Std. dev. of Tenure		-0.198** (0.089)		-0.253*** (0.078)		0.709*** (0.235)
Fund Size	0.150 (0.220)	0.176 (0.216)	0.093 (0.169)	0.151 (0.166)	1.803*** (0.690)	1.415** (0.676)
Family Size	0.568*** (0.147)	0.543*** (0.150)	0.555*** (0.114)	0.514*** (0.114)	-3.411*** (0.427)	-3.304*** (0.428)
Fund Age	-0.005** (0.002)	-0.004* (0.002)	-0.001 (0.002)	-0.000 (0.002)	-0.009 (0.006)	-0.011* (0.006)
Expense	1.144 (0.762)	1.282* (0.764)	0.257 (0.557)	0.356 (0.553)	14.349*** (2.121)	14.877*** (2.081)
Turnover	0.028*** (0.005)	0.028*** (0.005)	0.034*** (0.004)	0.033*** (0.004)	0.132*** (0.016)	0.133*** (0.015)
Team Size	0.024 (0.149)	0.144 (0.151)	0.013 (0.113)	0.158 (0.117)	-1.704*** (0.419)	-1.912*** (0.422)
Constant	78.827*** (4.349)	78.470*** (4.337)	74.901*** (3.163)	74.340*** (3.135)	107.116*** (11.521)	110.382*** (11.427)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,862	17,862	19,307	19,307	19,307	19,307
R-squared	0.142	0.144	0.169	0.173	0.526	0.531

Table 6: Results of Additional Channel Regressions

Panel A reports the correlation between *total risk* and diversity measures of individualism for funds with an average individualism level below and above the median. Panel B reports the correlation between *total risk* and diversity measures of individualism for funds with lead manager's individualism level below and above the median. The sample period is from 1990 to 2015. *Range of Individualism* is the range of the individualism score within a certain mutual fund. *Std. dev. of Individualism* is the standard deviation of the individualism score in a fund. *Std. dev. of Tenure* is the standard deviation of the tenure of the managers for a fund. *Fund Size* is log of (1+assets under management of the fund); Assets under management (AUM) of the fund are the sum of assets under management across all share classes of the fund. *Family Size* is log of (1+assets under management in the firm); Assets under management in the firm are the sum of assets under management across all share classes of the fund family, excluding the fund itself. *Fund Age* is the number of months since inception. *Expense* is the fund expense ratio. *Turnover* is the fund turnover ratio. *Team Size* is the number of managers in the fund between 1 and 10. All dependent variables are measure in year t+1. Year fixed effects and category fixed effects are included in all regressions. Standard errors in parentheses are clustered at the fund level. *, **, and *** indicates significance at the 10%, 5%, and 1% level, respectively.

For funds with average individualism below the median				
Panel A	(1)	(2)	(3)	(4)
	Total Risk	Total Risk	Total Risk	Total Risk
Range of Individualism	0.229*** (0.080)	0.242*** (0.080)		
Std. dev. of Individualism			0.322** (0.133)	0.359*** (0.133)
Std. dev. of Tenure		-1.232** (0.599)		-1.298** (0.601)
Fund Size	4.371*** (1.397)	4.721*** (1.389)	4.333*** (1.397)	4.703*** (1.389)
Family Size	0.067 (0.994)	-0.196 (1.011)	0.085 (0.997)	-0.188 (1.012)
Fund Age	-0.021* (0.011)	-0.018* (0.011)	-0.022** (0.011)	-0.018 (0.011)
Expense	4.651 (4.645)	5.343 (4.644)	4.500 (4.653)	5.240 (4.652)
Turnover	0.205*** (0.035)	0.200*** (0.034)	0.205*** (0.035)	0.200*** (0.034)
Team Size	-3.050*** (0.985)	-2.524** (1.005)	-2.007** (0.836)	-1.464* (0.860)
Constant	332.274*** (28.918)	329.808*** (29.023)	331.490*** (28.998)	328.759*** (29.098)
Year FE	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes
Observations	9590	9590	9590	9590
R-squared	0.758	0.758	0.758	0.758

For funds with average individualism above the median

	(1)	(2)	(3)	(4)
Panel A	Total Risk	Total Risk	Total Risk	Total Risk
Range of Individualism	-0.245 (0.179)	-0.216 (0.178)		
Std. dev. of Individualism			-0.394 (0.273)	-0.363 (0.275)
Std. dev. of Tenure		0.270 (0.600)		0.303 (0.604)
Fund Size	4.865*** (1.551)	4.633*** (1.562)	4.859*** (1.551)	4.618*** (1.562)
Family Size	0.229 (0.947)	0.298 (0.964)	0.222 (0.947)	0.298 (0.964)
Fund Age	-0.026* (0.014)	-0.024* (0.014)	-0.026* (0.014)	-0.024* (0.014)
Expense	12.467** (5.224)	13.431*** (5.207)	12.449** (5.225)	13.427** (5.208)
Turnover	0.181*** (0.036)	0.182*** (0.035)	0.181*** (0.036)	0.183*** (0.035)
Team Size	1.640 (1.225)	1.770 (1.222)	1.298 (1.085)	1.483 (1.089)
Constant	327.997*** (27.718)	327.946*** (27.450)	328.850*** (27.790)	328.765*** (27.506)
Year FE	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes
Observations	9736	9736	9736	9736
R-squared	0.737	0.738	0.737	0.738

For funds with lead manager's individualism below the median

	(1)	(2)	(3)	(4)
Panel B	Total Risk	Total Risk	Total Risk	Total Risk
Range of Individualism	-0.054 (0.129)	0.007 (0.131)		
Std. dev. of Individualism			-0.116 (0.200)	0.018 (0.202)
Std. dev. of Tenure		-1.925*** (0.708)		-1.934*** (0.714)
Fund Size	3.085 (2.005)	3.600* (1.993)	3.081 (2.004)	3.603* (1.992)
Family Size	-0.068 (1.342)	-0.556 (1.375)	-0.074 (1.344)	-0.556 (1.374)
Fund Age	-0.021 (0.014)	-0.017 (0.014)	-0.021 (0.014)	-0.017 (0.014)
Expense	3.165 (7.024)	3.442 (6.963)	3.162 (7.025)	3.445 (6.965)
Turnover	0.238*** (0.048)	0.230*** (0.047)	0.239*** (0.048)	0.230*** (0.047)
Team Size	-0.287 (1.669)	1.101 (1.758)	-0.303 (1.457)	1.101 (1.559)
Constant	357.145*** (39.373)	357.055*** (39.356)	357.465*** (39.422)	357.002*** (39.394)
Year FE	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes
Observations	6026	6026	6026	6026
R-squared	0.729	0.730	0.729	0.730

For funds with lead manager's individualism above the median

Panel B	(1)	(2)	(3)	(4)
	Total Risk	Total Risk	Total Risk	Total Risk
Range of Individualism	0.387*** (0.149)	0.458*** (0.154)		
Std. dev. of Individualism			0.589** (0.230)	0.706*** (0.237)
Std. dev. of Tenure		0.327 (0.848)		0.143 (0.851)
Fund Size	7.341*** (2.046)	7.059*** (2.049)	7.269*** (2.046)	6.998*** (2.049)
Family Size	-0.507 (1.329)	-0.300 (1.341)	-0.459 (1.331)	-0.264 (1.342)
Fund Age	-0.041** (0.016)	-0.040** (0.017)	-0.042** (0.016)	-0.040** (0.017)
Expense	15.779** (6.825)	17.260** (6.717)	15.594** (6.838)	17.100** (6.725)
Turnover	0.221*** (0.048)	0.223*** (0.048)	0.222*** (0.048)	0.224*** (0.048)
Team Size	-1.738 (2.338)	-1.950 (2.441)	-0.688 (2.047)	-0.511 (2.159)
Constant	288.462*** (38.074)	288.292*** (37.312)	287.786*** (38.058)	287.185*** (37.315)
Year FE	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes
Observations	5734	5734	5734	5734
R-squared	0.731	0.732	0.731	0.732

Table 7: Univariate Test Results for Manager Turnover Subsample

Table 7 reports the Univariate Test Results for Manager Turnover Subsample. In Panel A, it shows the results of the propensity score matching for the manager turnover subsample and the matched sample without manager change. In Panel B, it shows the paired difference of change in *total risk* of funds with positive changes in *range of individualism* caused by manager turnover compared to matched funds without manager turnover. In Panel C, it shows the paired difference of change in *total risk* of funds with positive changes in *std. dev. of individualism* caused by manager turnover compared to matched funds without manager turnover. *The change in total risk* is calculated by using the difference of the average value of *total risk* one, two or three years before and after the manager turnover. *The paired difference* is computed as the change in total risk for treatment group with the manager turnover minus the change in total risk for control group without any manager turnover. I run the Wilcoxon signed rank test for the median of the paired difference and t-test for the mean of the paired difference.

Panel A: Propensity Score Matching Results					
Matching Characteristics	Treated Mean	Control Mean	%bias	t	p> t
Fund Size	20.074	20.1	-1.7	-0.66	0.512
Family Size	23.762	23.852	-4	-1.61	0.108
Fund Age	215.04	216.99	-1.2	-0.46	0.643
Expense	1.2683	1.2702	-0.5	-0.19	0.846
Turnover	87.168	89.319	-3.4	-1.2	0.231
Team Size	2.9805	2.9322	3	0.99	0.323

Panel B: Change in Total Risk when Range of Individualism increases		
Change in Total Risk one year before and after the manager turnover		Change in Range of Individualism > 0
Paired Difference (treated-control)	Median	14.869*
		0.066
	Mean	19.085*
		0.086
	Obs	939
Change in Total Risk two years before and after the manager turnover		Change in Range of Individualism > 0
Paired Difference (treated-control)	Median	18.854*
		0.052
	Mean	21.168*
		0.070
	Obs	939
Change in Total Risk three year before and after the manager turnover		Change in Range of Individualism > 0
Paired Difference (treated-control)	Median	23.965**
		0.031
	Mean	24.28**
		0.036
	Obs	939

Panel C: Change in Total Risk when Std. dev. of Individualism increases		
Change in Total Risk one year before and after the manager turnover		Change in Std. dev. of Individualism > 0
Paired Difference (treated - control)	Median	14.659**
		0.012
	Mean	25.334**
		0.011
	Obs	1,258
Change in Total Risk two years before and after the manager turnover		Change in Std. dev. of Individualism > 0
Paired Difference (treated-control)	Median	27.33**
		0.010
	Mean	25.742**
		0.013
	Obs	1,258
Change in Total Risk three years before and after the manager turnover		Change in Std. dev. of Individualism > 0
Paired Difference (treated-control)	Median	32.094***
		0.002
	Mean	30.213***
		0.003
	Obs	1,258

Table 8: Robustness Check – Team of Managers Only

Table 8 shows the robustness check results for only mutual funds with teams of managers. The sample period is from 1990 to 2015. Funds with one single manager are excluded. Panel A shows the correlation between *range of individualism* and the fund performance measures. Panel B shows the correlation between *standard deviation of individualism* and the fund performance measures. All dependent variables are measure in year t+1. Year fixed effects and category fixed effects are included in all regressions. Standard errors in parentheses are clustered at the fund level. *, **, and *** indicates significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel A	Total Risk	Total Risk	Benchmark Beta	Benchmark Beta	Market Beta	Market Beta
Range of Individualism	0.157** (0.071)	0.150** (0.070)	0.034** (0.013)	0.033** (0.013)	0.040*** (0.011)	0.036*** (0.011)
Std. dev. of Tenure		-0.577 (0.484)		-0.242** (0.099)		-0.258*** (0.084)
Fund Size	4.469*** (1.202)	4.694*** (1.203)	0.218 (0.259)	0.301 (0.258)	0.135 (0.204)	0.247 (0.201)
Family Size	-0.151 (0.793)	-0.326 (0.814)	0.467*** (0.166)	0.413** (0.168)	0.464*** (0.135)	0.398*** (0.133)
Fund Age	-0.026** (0.012)	-0.022* (0.012)	-0.006*** (0.002)	-0.004* (0.002)	-0.003 (0.002)	-0.001 (0.002)
Expense	10.873*** (3.994)	11.306*** (3.978)	1.586* (0.817)	1.739** (0.811)	0.716 (0.622)	0.841 (0.624)
Turnover	0.141*** (0.029)	0.137*** (0.028)	0.029*** (0.006)	0.028*** (0.006)	0.036*** (0.005)	0.034*** (0.005)
Team Size	-1.070 (0.797)	-0.942 (0.801)	-0.056 (0.171)	-0.003 (0.170)	-0.034 (0.132)	0.015 (0.134)
Constant	343.635*** (21.954)	343.380*** (21.797)	77.803*** (4.731)	77.570*** (4.685)	76.642*** (3.690)	76.262*** (3.618)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11,194	11,194	10,422	10,422	11,189	11,189
R-squared	0.778	0.778	0.136	0.142	0.172	0.177

Table 8 continued.

Panel A	(7) Unsystematic Risk	(8) Unsystematic Risk	(9) Alpha	(10) Alpha
Range of Individualism	-0.025 (0.040)	-0.014 (0.039)	-0.009 (0.025)	-0.005 (0.025)
Std. dev. of Tenure		0.797*** (0.263)		0.171 (0.160)
Fund Size	1.159 (0.709)	0.777 (0.695)	-1.906*** (0.405)	-2.024*** (0.406)
Family Size	-3.052*** (0.447)	-2.915*** (0.442)	0.728*** (0.257)	0.707*** (0.258)
Fund Age	-0.005 (0.007)	-0.012 (0.007)	0.006** (0.003)	0.005 (0.003)
Expense	13.690*** (2.434)	13.517*** (2.416)	-8.335*** (1.405)	-8.637*** (1.401)
Turnover	0.063*** (0.016)	0.066*** (0.016)	-0.026*** (0.010)	-0.025*** (0.010)
Team Size	-1.181** (0.463)	-1.282*** (0.462)	-0.040 (0.285)	-0.039 (0.283)
Constant	119.289*** (12.722)	121.372*** (12.729)	71.787*** (9.163)	72.998*** (9.126)
Year FE	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes
Observations	11,189	11,189	11,189	11,189
R-squared	0.539	0.543	0.207	0.208

Table 8 continued.

	(1)	(2)	(3)	(4)	(5)	(6)
Panel B	Total Risk	Total Risk	Benchmark Beta	Benchmark Beta	Market Beta	Market Beta
Std. dev. of Individualism	0.257** (0.128)	0.245* (0.127)	0.059** (0.025)	0.057** (0.024)	0.075*** (0.020)	0.068*** (0.020)
Std. dev. of Tenure		-0.579 (0.483)		-0.243** (0.099)		-0.259*** (0.084)
Fund Size	4.432*** (1.201)	4.659*** (1.202)	0.210 (0.259)	0.294 (0.258)	0.127 (0.204)	0.240 (0.201)
Family Size	-0.119 (0.793)	-0.298 (0.814)	0.474*** (0.166)	0.420** (0.168)	0.471*** (0.135)	0.404*** (0.133)
Fund Age	-0.026** (0.012)	-0.022* (0.012)	-0.006*** (0.002)	-0.004* (0.002)	-0.003 (0.002)	-0.001 (0.002)
Expense	10.906*** (3.999)	11.335*** (3.983)	1.599* (0.817)	1.752** (0.811)	0.745 (0.621)	0.866 (0.623)
Turnover	0.141*** (0.029)	0.137*** (0.028)	0.029*** (0.006)	0.028*** (0.006)	0.036*** (0.005)	0.034*** (0.005)
Team Size	-0.478 (0.723)	-0.377 (0.733)	0.070 (0.154)	0.117 (0.155)	0.109 (0.118)	0.144 (0.121)
Constant	342.040*** (22.006)	341.873*** (21.858)	77.411*** (4.749)	77.191*** (4.702)	76.130*** (3.698)	75.802*** (3.627)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	11194	11194	10422	10422	11189	11189
R-squared	0.778	0.778	0.136	0.142	0.172	0.177

Table 8 continued.

	(7)	(8)	(9)	(10)
Panel B	Unsystematic Risk	Unsystematic Risk	Alpha	Alpha
Std. dev. of Individualism	-0.063 (0.072)	-0.043 (0.071)	-0.018 (0.046)	-0.011 (0.045)
Std. dev. of Tenure		0.797*** (0.263)		0.172 (0.160)
Fund Size	1.161 (0.709)	0.779 (0.696)	-1.904*** (0.405)	-2.023*** (0.406)
Family Size	-3.053*** (0.447)	-2.915*** (0.442)	0.727*** (0.257)	0.706*** (0.258)
Fund Age	-0.005 (0.007)	-0.012 (0.007)	0.006** (0.003)	0.005 (0.003)
Expense	13.633*** (2.435)	13.473*** (2.418)	-8.347*** (1.404)	-8.642*** (1.401)
Turnover	0.063*** (0.016)	0.066*** (0.016)	-0.026*** (0.010)	-0.025*** (0.010)
Team Size	-1.252*** (0.440)	-1.318*** (0.442)	-0.069 (0.263)	-0.058 (0.262)
Constant	119.805*** (12.719)	121.732*** (12.722)	71.923*** (9.177)	73.074*** (9.139)
Year FE	Yes	Yes	Yes	Yes
Category FE	Yes	Yes	Yes	Yes
Observations	11189	11189	11189	11189
R-squared	0.539	0.543	0.207	0.208