

# The Effect of Fund Managers' Educational Background on Fund Performance and Money Flows

Anindya Sen<sup>1</sup>

[anindya.sen@otago.ac.nz](mailto:anindya.sen@otago.ac.nz)

Department of Accountancy and Finance  
The University of Otago

Kian M. Tan \*

[eric.tan@otago.ac.nz](mailto:eric.tan@otago.ac.nz)

Department of Accountancy and Finance  
The University of Otago

## Abstract

This paper examines the impact of quality and diversity of educational backgrounds of managers on the performance of team managed mutual funds using a large sample of U.S. mutual funds from 1994 to 2013. We find that the proportion of team members from top MBA programs and diversity of educational specialization (i.e. quantitative and finance) within the team have a significant positive effect on fund performance as measured by risk-adjusted returns and correlate with lower expense ratios. We also find evidence that diversity within the team is positively correlated with higher fund flows from investors. Our findings have implications for investors – namely that education quality and diversity of educational backgrounds of the fund manager team matters when it comes to selecting mutual funds.

Keywords: Fund Manager, Education, Diversity, Team-Managed, Performance, Money Flows

JEL Classifications: G23, G28

---

<sup>1</sup> Author names are in alphabetical order

\* Please address all correspondence to Eric Tan. We are responsible for any errors in this paper.

## I. Introduction

This paper examines the impact of quality and diversity of educational backgrounds of fund managers on the performance of team managed mutual funds. The impact of educational background of managers on the performance of individually managed funds (as opposed to team managed ones) was studied in a seminal paper by Chevalier and Ellison (1999). Using a sample of 492 managers of growth and income funds for the period 1988 – 1994 and controlling for a variety of factors (such as survivorship bias and manager age) Chevalier and Ellison showed that managers from undergraduate institutions with higher average student SAT scores obtain higher returns.

The growing prevalence of managers with post-graduate professional degrees, such as MBA's in the industry raises the closely related question of whether such degrees make any difference to performance. This question is addressed by Gottesman and Morey (2006) in the specific context of individual fund managers with MBA degrees. The authors specifically chose a period 2000 – 2003 when the market was not bullish – a point of contention about Chevalier and Ellison's work – and found evidence that managers from MBA programs with a higher average student GMAT score showed better performance. In addition, managers with MBA degrees from the top 30 ranked programs in *Business Week* rankings performed significantly better than those without MBA's or from lower ranked MBA programs.

Our contribution to the literature is motivated by the recent rise of team-managed funds in the U.S. mutual fund industry (see Massa, Reuter, and Zitzewitz, 2010). This is also supported by our data documenting the proportion of team-managed funds to increase from 37% in 1994 to 73% in 2013, representing an increase of 97% in the number of funds managed by group of managers. While there is still no general consensus on which form of fund management structure is associated with better fund performance – see for example, Prather and Middleton (2002), Bliss, Porter, and Schwarz (2008), Chen et al. (2004) or Bar, Kempf, and Ruenzi (2011) – recent findings by Patel and Sarkissian (2014) and Adams, Nishikawa, and Rao (2015) suggest that

team-managed funds are able to generate superior returns. An analysis of the various factors related to performance of team managed funds is an issue of importance worth analyzing.

More specifically, the issue of group related characteristics of fund members comes to the fore. For instance, would the presence of a large proportion of managers from top MBA programs improve the performance of the fund? While at first glance, the answer seems obviously affirmative, one may argue that graduates from top institutions could be more ambitious and/or egotistic. While such characteristics might be wholly beneficial in individually managed funds, they could potentially lead to infighting and clashes in team managed funds, resulting in compromised performance. In our work, we answer this question by finding evidence that in team managed funds, the proportion of managers with degrees from top MBA programs has a positive effect on fund performance. Our work thus extends Gottesman and Morey's result to the context of team managed funds and our evidence is consistent with their results.

Another naturally occurring question in the context of groups is, of course, the effect of diversity. The question of diversity can be examined across multiple dimensions – ethnic diversity, socio-economic diversity, cultural diversity and so on. A priori, it is difficult to predict the effect of diversity on work performance. For instance, one might argue that diversity within a group might lead to the formation of smaller cliques based on age, gender or race with minimal communication between cliques which could prove detrimental to team performance. Conversely, a diverse group might bring different viewpoints and areas of expertise to the workplace, leading to enhanced problem solving and improved performance.

Jehn, Northcraft and Neale (1999) frame the problem by examining diversity along the dimensions of *Informational Diversity* related to differences in expertise and perspectives of team members versus *Social Category Diversity* such as gender, age or ethnicity which may lead to the formation of cliques within the larger group. Based on their study, they find evidence for the positive effect of informational diversity on firm performance. However, their study was based

on a small sample of groups from a single company. Further research along these lines has provided support for their framework. Simons, Pelled and Smith (1999) studied of top management of 57 companies to find that informational diversity measures directly related to the job had the most significant positive impact on performance while social diversity measures were statistically insignificant. Kochan, Bezrukova et al. (2003) examined the effects of social diversity measures such as racial and gender diversity in the performance of four large Fortune 500 companies and found no significant effect. Dahlin, Weingart, and Hinds (2005) directly examine the issue of educational diversity on range and depth of information use in work teams and find a positive correlation. More recently, Cimerova, Dodd, and Frijns (2014) study a sample of large UK firms for the period 2002 – 2012 and find that cultural diversity in the firm's board of directors has a negative effect on firm performance as measured by Tobin's Q and Return on Assets.

The growing body of results presented above has led us to hypothesize that educational diversity in the team would have a positive effect of the performance of a mutual fund. A major advantage of looking at the mutual fund industry is that performance is easily quantifiable based on fund returns and the finance literature has developed a number of metrics to calibrate fund performance. In addition, all fund management teams perform the relatively homogenous task of providing high returns to investors and have access to the same pool of publicly available financial data. This fact largely ameliorates the difficulties associated with accurately calibrating the performance of teams – we do not have the issue of different teams working on very different tasks and performance can be measured to a common standard.

In addition, our data set comprises 3,288 equity funds and over 200,000 observations spanning the period 1994 – 2013. The comprehensive nature of the data set eliminates the potential biases inherent in considering teams within one, or a few, firms as in some of the studies mentioned above. Furthermore, the period considered for analysis spans a range of market conditions from bullish (1994 – 1998 and 2003 – 2007), a major recession (Great

Financial Crisis of 2008) and an intermediate period, thus reducing concerns about any performance bias due to underlying market conditions.

Our research is closest to Bar, Niessen, and Ruenzi (2007) who examine the question of work group diversity on performance in the context of the mutual fund industry. However, important differences in emphasis and analysis exist between our work and theirs. Bar, Niessen, and Ruenzi focus primarily on the question of informational versus social diversity measures on performance. They find that, as per their measures, informational diversity – measured by diversity of tenure in the industry and number of years of formal education - is positively correlated to performance while social diversity – based on gender and age – is negatively correlated.

Our work focuses more closely on educational background alone. We look at measures on both educational quality and educational diversity. As mentioned earlier, educational quality is measured by the proportion of managers with MBA's from top programs. In contrast to Bar, Niessen, and Ruenzi, we do not measure educational diversity in terms of length of formal education. Instead, we create a diversity measure based on the subject of specialization of managers in their undergraduate degree. In our analysis, educational diversity is measured according to two criteria - specialization in quantitative versus non-quantitative subjects and specialization in finance versus non-finance subjects. Further details of the exact construction of the measure are detailed in the Methods section.

We argue that educational diversity as per our measure provides a more accurate proxy for informational diversity than length of formal education – in the sense that diversity of educational backgrounds is more likely to lead to the different viewpoints and expertise necessary for enhanced problem solving in the workplace. We find that both our measures of educational diversity in the team have a statistically significant positive impact on mutual fund performance. Thus, our research is consistent with, and further extends the conclusions of both Gottesman and Morey (2006) and Bar, Niessen, Ruenzi (2007). Going further, we also find

evidence that fund flows from investors are positively correlated to educational diversity within the team.

In addition to the above, we find that the proportion of managers with MBA degrees from top programs is negatively correlated with the expense ratio. This result connects our work with earlier results by Carhart (1997) and Barber, Odean, and Zheng (2005) showing that high operating expenses are detrimental to fund performance. Our result suggests a possible factor linking higher educational quality and better fund performance – namely that a better educated managerial team might be optimizing operating expenses and thus contributing to enhanced performance.

The rest of this paper is organized as follows. Section II describes our data and key variables. Section III presents the methods and the empirical results are reported in section IV. In Section V we present our further tests and Section VI concludes.

## **II. Data Sources and Sample Construction**

### **A. Data**

The primary source of data for this paper comes from the Morningstar Direct Mutual Fund (MDMF) database which contains information on fund characteristics, fund's monthly returns, inception date, assets under management (AUM), investment objectives, fund fees, and turnover ratio. To facilitate comparison with the prior literature, this study focuses on actively managed U.S. domestic equity mutual funds. Following Chen et al. (2004), we exclude index, international, bond, and specialized sector funds from our sample.<sup>2</sup> With the exception of total net assets, this study aggregates all fund share classes characteristics at the fund portfolio level using asset-weighted averages. We then winsorize all of our variables at 1<sup>st</sup> and 99<sup>th</sup> percentile to remove the effect of outliers.

---

<sup>2</sup> We perform such filtering using the Morningstar category classifications from the following link: [http://corporate.morningstar.com/us/documents/MethodologyDocuments/MethodologyPapers/MorningstarCategory\\_Classifications.pdf](http://corporate.morningstar.com/us/documents/MethodologyDocuments/MethodologyPapers/MorningstarCategory_Classifications.pdf)

Next, we apply two criteria to eliminate two known potential biases associated with the mutual fund database. First, to address incubation bias, we exclude funds that existed prior to the reported fund starting date (Evans (2010)) and exclude observations whose fund names are missing from the Morningstar database. Second, we exclude funds with AUM of less than \$15 million, since only successful funds enter the database (Elton, Gruber, and Blake (2001)). Our study is not subject to survivorship bias as we include both surviving and non-surviving funds in our sample. Then we collect information on fund manager characteristics (such as tenure, experience, and education) which are sourced from Morningstar Direct database, U.S. Securities and Exchange Commission filings, mutual fund websites, and ZoomInfo.

To determine the ranking of MBA programs across universities in the United States, we relied on “MBA Business School Ranking” as provided by Bloomberg from 1994 to 2013.<sup>3</sup> And to categorize the education background into different disciplines, we relied on International Standard Classification of Education (ISCED) as a framework in our study.<sup>4</sup> Finally, we restrict our analysis to focus on team-managed funds in line with our interest to examine the effect of diversity in education on fund performance and money flows from 1994 to 2013. Our final sample consists of 3,288 equity mutual funds with 248,413 fund monthly observations.

## **B. Descriptive Statistics**

In Table 1, we provide a correlation matrix for all continuous control variables. The condition index of the matrix is 2.71, which is low enough to show that there is no potential issue surrounding multicollinearity.

*< Insert Table 1 here >*

We report the descriptive statistics of our U.S. mutual fund data in Table 2. In Panel A of Table 2, the average size of the equity funds in our sample is \$321 million and belongs to a

---

<sup>3</sup> See <http://www.bloomberg.com/bw/articles/2014-11-11/best-business-schools-2014-the-complete-rankings-table>.

<sup>4</sup> See <http://www.uis.unesco.org/Education/Documents/isced-fields-of-education-training-2013.pdf>.

family with total net assets under management of \$17,397 million. The expense ratio of 1.22% and turnover ratio of 82% are largely consistent with previous literature. In terms of the composition of fund managers, the equity funds in our sample are managed by three to four managers on average.

In Panel B of Table 2, we find fund managers in our sample to have tenure of around 4.5 years in a particular fund, asset management experience of 8.18 years, and with average age of 43 years old. Given available information on the educational background of fund managers, we find 54% of the fund managers in our sample to have MBA. And out of fund manager with MBA degree, we find 88% of them obtained MBA from top 30 education institutions in accordance to Bloomberg “MBA Business School Ranking”. We also further partition fund managers with quantitative and finance background. Fund managers with education background in accounting, finance, engineering, mathematics, physics, and statistics are classified under quantitative category while fund managers with background in finance, banking and insurance are classified under finance category. In Panel B of Table 2, we find 43% (31%) of fund managers in our sample have quantitative (finance) background. The issues surrounding whether having fund managers with quantitative and finance background help to explain better fund performance will be examined in greater details in next section.

< Insert Table 2 here >

As a preliminary analysis, we partition our education diversity measures (i.e. *Diversity Top MBA*, *Diversity Quant*, and *Diversity Finance*) into quintiles with Q1 represents the least diverse group and Q5 represents the most diverse group. In Panel A of Table 3, focusing on *Diversity Top MBA*, we find diverse group of fund managers with MBA from Top 30 Business School are associated with lower fund performance. In contrast, in Panel B and C of Table 3, we find group of fund managers with diverse educational background in quantitative and finance are associated with higher fund performance. We subject our preliminary findings to more rigorous empirical tests using regression models after controlling for fund and managers’ characteristics.



< Insert Table 3 here >

### III. Methods

#### A. Diversity Measure

Consistent with prior literature, we use Teachman (1980) entropy-based index to construct our diversity education variables.

$$Diversity\ Education = \frac{\sum_i -p_i \cdot \ln(p_i)}{-\ln(1/n)} \quad (1)$$

where  $i$  represents number of categories that a fund manager belongs to,  $p_i$  represents the proportion of fund managers that belong to category  $i$ , and  $n$  represents number of fund managers. We then standardize our diversity measure by dividing the maximum possible entropy based on number of fund managers so that our diversity measure range from 0 to 1 for ease of interpretation.

In this study, we create three types of education diversity based on fund managers' educational background. First, we construct education diversity based on the proportion of fund managers who obtained MBA from Top 30 MBA Business School (*Diversity Top MBA*) versus those that do not. Second, we construct education diversity based on the proportion of fund managers who had quantitative background versus those that do not (*Diversity Quant*). Finally, we construct education diversity based on the proportion of fund managers who had finance, banking, and insurance background (*Diversity Finance*) versus those that do not.

#### B. Performance Measures

We construct conditional fund alphas (Fund Alpha) using the Carhart's (1997) four factor models and predetermined instruments as proposed by Ferson and Schadt (1996) as the performance measure for this study.

$$r_{Fd} - R_f = \alpha + \beta_1(R_m - R_f) + \beta_2SMB + \beta_3HML + \beta_4UMD + \beta_5Instruments + \varepsilon_{Fd} \quad (2)$$

where  $r_{Fd}$  is a fund's monthly return,  $R_f$  is the risk-free return rate,  $R_m$  is the return of the S&P500 market,  $SMB$  is "Small Minus Big" which accounts for the spread in returns between small and large-sized funds based on total net assets under management,  $HML$  is "High Minus Low" which accounts for the spread in returns between value and growth funds, and  $UMD$  represents the momentum factor loadings. Instruments as proposed by Ferson and Schadt (1996) includes dividend yield of the CRSP index, a yield spread (long- minus short-term bonds), the yield on a short-term Treasury bill, a corporate bond yield spread (low- minus high-grade bonds), and a dummy variable for Januarys.

To examine whether fund managers' education background matter for fund performance, we run the regression model as presented in equation (3) below.

$$\begin{aligned}
\text{Fund Alpha}_{i,t:t+k} &= \alpha_{i,t} + \beta_1 \text{Education}_{i,t} + \beta_2 \text{Log(Fund Size)}_{i,t} + \beta_3 \text{Log(Fund Age)}_{i,t} \\
&+ \beta_4 \text{Log(Family Size)}_{i,t} + \beta_5 \text{Expense Ratio}_{i,t} + \beta_6 \text{Turnover Ratio}_{i,t} \\
&+ \beta_7 \text{Volatility}_{i,t} + \beta_8 \text{Fund Flow}_{i,t} + \beta_9 \text{Fund Return}_{i,t} + \beta_{10} \text{Team Size}_{i,t} \\
&+ \beta_{11} \text{Log(Manager Age)}_{i,t} + \beta_{12} \text{Log(Manager Tenure)}_{i,t} \\
&+ \beta_{13} \text{Log(Manager Experience)}_{i,t} + \varepsilon_{i,t}
\end{aligned} \tag{3}$$

where *Fund Alpha* is the compounded monthly fund's alpha calculated based on Carhart's four-factor model and conditional on instruments as proposed by Ferson and Schadt (1996).  $\text{Log(Fund Size)}$  is the natural logarithm of the fund's total net assets in millions of dollars.  $\text{Log(Age)}$  is the natural logarithm of the fund's age in years, where age is calculated as the difference between the data date and the date that the fund first appeared in the CRSP mutual fund database.  $\text{Log(Family Size)}$  is the natural logarithm of the combined total net assets of all funds managed by a fund family in millions of dollars. *Expense Ratio* is the percentage of fund assets charged by the fund on an annual basis to compensate for operating costs, and includes the management fee and 12b-1 fees. *Turnover Ratio* measures the percentage of fund assets that are renewed, and is calculated

as the minimum of sales and purchases divided by the average yearly fund size. *Volatility* is measured by the standard deviation of a fund's net returns over the past twelve months. *Fund Flow* is the measure of inflow and outflow of assets. *Team Size* is the number of managers managing the funds.  $\text{Log}(\text{Manager Age})$  is the natural logarithm of average fund managers' age in a fund.  $\text{Log}(\text{Manager Tenure})$  is the natural logarithm of average fund managers' tenure in a fund.  $\text{Log}(\text{Manager Experience})$  is the natural logarithm of average fund managers' experience in the asset management industry.

### C. Fund Fees Measure

Are fund managers with better education quality and greater diversity in educational background being associated with lower or higher fund fees? To address this issue, we utilize an OLS regression model to examine the relation between our education variables and the level of fund fees, as presented in equation (4) below.

$$\begin{aligned}
 \text{Expense Ratio}_{i,t+12} &= \alpha_{i,t} + \beta_1 \text{Education}_{i,t} + \beta_2 \text{Log}(\text{Fund Size})_{i,t} + \beta_3 \text{Log}(\text{Fund Age})_{i,t} \\
 &+ \beta_4 \text{Log}(\text{Family Size})_{i,t} + \beta_5 \text{Turnover Ratio}_{i,t} + \beta_6 \text{Volatility}_{i,t} \\
 &+ \beta_7 \text{Fund Flow}_{i,t} + \beta_8 \text{Fund Alpha}_{i,t} + \beta_9 \text{Team Size}_{i,t} \\
 &+ \beta_{10} \text{Log}(\text{Manager Age})_{i,t} + \beta_{11} \text{Log}(\text{Manager Tenure})_{i,t} \\
 &+ \beta_{12} \text{Log}(\text{Manager Experience})_{i,t} + \varepsilon_{i,t}, \tag{4}
 \end{aligned}$$

where  $\text{Expense Ratio}_{i,t}$  is the percentage of fund assets charged by the fund on an annual basis to compensate for operating costs, and includes the management fee and 12b-1 fee. Since expense ratio is revised either semi-annually or annually, we use expense ratio in the subsequent 12 months as our dependent variable. All other explanatory variables are as explained above.

### D. Fund Flow Measures

We follow Sirri and Tufano (1998) in calculating mutual fund flows as the percentage net growth in fund assets beyond reinvested dividends. We assume that all distributions made to investors are subsequently reinvested with the fund. This measure of fund flows represents the net demand for a mutual fund, where a positive flow indicates that on average investors are entering the fund, while a negative flow indicates that investors are withdrawing funds.

$$Fund\ Flow_{i,t:t+k} = \frac{TNA_{i,t:t+k} - TNA_{i,t}(1+R_{i,t:t+k})}{TNA_{i,t}} \quad (5)$$

To examine the effect of education diversity on money flows, we estimate the following regression model as presented in equation (6) below.

$$\begin{aligned} Fund\ Flow_{i,t:t+k} &= \alpha_{i,t} + \beta_1 Education_{i,t} + \beta_2 \log(Fund\ Size)_{i,t} + \beta_3 \log(Fund\ Age)_{i,t} \\ &+ \beta_4 \log(Family\ Size)_{i,t} + \beta_5 Expense\ Ratio_{i,t} + \beta_6 Distribution\ Fee_{i,t} \\ &+ \beta_7 Turnover\ Ratio_{i,t} + \beta_8 Volatility_{i,t} + \beta_9 Category\ Flow_{i,t} \\ &+ \beta_{10} Low_{i,t} + \beta_{11} Medium_{i,t} + \beta_{12} High_{i,t} + \beta_{13} Team\ Size_{i,t} \\ &+ \beta_{14} \log(Manager\ Age)_{i,t} + \beta_{15} \log(Manager\ Tenure)_{i,t} \\ &+ \beta_{16} \log(Manager\ Experience)_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (6)$$

where  $Fund\ Flow_{i,t:t+k}$  represents the percentage flow of money entering or exiting fund  $i$  over three-, six-, nine-, and twelve-month future horizons. Category Flow is the aggregate flow into each fund category at time  $t$ . Since the flow-performance relationship is non-linear for mutual funds, we follow Sirri and Tufano (1998) by introducing fractional performance ranks based on fund alpha.  $Low_{i,t}$  is defined as  $\min(Rank_t, 0.2)$ ,  $Mid_{i,t}$  is defined as  $\min(Rank_t - Low, 0.6)$ , and  $High_{i,t}$  is defined as  $\min(Rank_t - Low - Mid, 0.2)$ . All other explanatory variables are as explained above.

## IV. Empirical Results

### A. Performance Analysis

In this section, we consider the effect of education diversity on future fund performance. In Panel A of Table 4, we find the proportion of fund managers with MBA from Top 30 Business School to be associated with superior performance. In particular, funds with higher proportion of managers with *Top MBA* are associated with 1.03% higher risk-adjusted return in comparison with other funds with findings being statistically significant at 5% level. Using *Diversity Top MBA* measure, in model (5) to (8), we find that funds with more diversity in fund managers having Top MBA versus non-Top MBA are associated with lower fund performance which is consistent with our earlier findings. Overall, the findings suggest that the education quality of fund managers matter for fund performance.

Next, we examine whether the education discipline of fund managers matter for fund performance. In our study, we focus on two specific forms of education disciplines. First, *Quant* is defined as proportion of fund managers with educational background in accounting, finance, engineering, mathematics, physics, and statistics. Second, *Finance* is defined as proportion of fund managers with educational background in finance, banking and insurance. In Panel B and C of Table 4, we find both *Quant* and *Finance* to be associated with negative fund performance of 0.13% in 6-months and 0.20% in 9-months respectively. Our findings are supported by our education diversity measures. In particular, *Diversity Quant* (*Diversity Finance*) is associated with, on average, 0.80% (0.72%) higher risk-adjusted return in 12-months horizon. These findings suggest that the diversity in education disciplines of fund managers also matter for fund performance.

The findings on our control variables are reported as follow. First, we find fund size to be negative and statistically significant at 1%. This is consistent with Chen et al. (2004) who argue that the performance of funds suffers as fund size increases (i.e. diseconomies of scale). Second, consistent with Chevalier and Ellison (1999), we find turnover ratio to be significant and positively related to fund performance. Third, we find volatility of fund returns and fund flow to be negatively related to fund performance.

< Insert Table 4 here >

## B. Channel of Mutual Fund Outperformance

In this section, we seek to explore further the positive association between the education quality and diversity of educational background of fund managers with mutual fund performance. One plausible channel is that team-managed funds with higher proportion of managers with MBA from top programs have tendency to charge lower fund fees which in turn leads to positive fund performance.

In model (1) of Table 5, we find the proportion of fund managers with MBA from Top 30 Business School to be associated with lower future expense ratio with findings being statistically significant at 1% level. We find consistent findings using *Diversity Top MBA* measure in model (2). That is, funds with less diversity in fund managers having Top MBA versus non-Top MBA are associated with lower future expense ratio. The findings suggest that fund managers with better education quality are able to generate positive risk-adjusted returns for their investors through their ability to lower fund fees. In model (3) and (5) of Table 5, we find weak evidence that the proportion of fund managers with quantitative and finance backgrounds are associated with higher future expense ratio. Such findings support our earlier results in Table 4 whereby we report the negative association between mutual fund performance and the proportion of fund managers having quantitative and finance backgrounds. This suggests that high fund fees are detrimental to fund performance as documented by Carhart (1997) and Barber, Odean, and Zheng (2005).

The findings on our control variables are reported as follow. First, we find fund age and family size are negatively related to expense ratio. This is consistent with our expectations that older funds have more operational knowledge to achieve efficiency, while fund belonging to larger fund family complexes are able to gain economies of scale. Second, we find funds with larger number of fund managers are associated with lower expense ratio. Such findings are in-

line with the findings of Patel and Sarkissian (2014) and Adams, Nishikawa, and Rao (2015) who document that team-managed funds are able to generate superior returns.

< Insert Table 5 here >

### C. Money Flows Analysis

If the educational background of fund managers is associated with superior performance, do investors react to the changes in the composition of fund managers with different background? Or in other words, do investors value the diversity in educational backgrounds of fund managers in the forms of money inflows? To answer such research question, we examine the effect of education diversity on future fund flows using OLS regression model as specified in equation (5) above.

In Panel A of Table 6, we find the proportion of fund managers with MBA from Top 30 Business School is associated with future money inflows up to 12 months period. We also find similar findings when we use *Diversity Top MBA* measure albeit being low in its statistical significance up to 6-months period. In Panel B and C of Table 6, we however do not find any statistical findings using *Diversity Quant* and *Diversity Finance* as our education measures to explain future money flows.

The findings on our control variables are reported as follow. First, consistent with prior literature, we find evidence of an asymmetric flow-performance relationship, as shown by a positive coefficient on High performance rank variable (Ippolito 1992, Gruber 1996, Chevalier and Ellison 1997, Sirri and Tufano 1998, and others). Second, consistent with Barber, Odean, and Zheng (2005), we find investors stay away from funds with high expense ratio but are responsive to funds with high marketing fees. Third, we find investors to channel more flows to team-managed funds and value fund managers' experience in asset management industry.

< Insert Table 6 here >

## **V. Further Tests**

### **A. Short versus Long-Term Performance**

Does education diversity in a team managed funds matter for long-term performance? In this section, we re-run our empirical analysis in Table 3 and 4 using focusing on long-term performance measures as our dependent variables across 24-, 36-, 48-, and 60-months horizon. Consistent with our main results, we find that *Diversity Top MBA* is associated with lower long-term performance while *Diversity Quant* and *Diversity Finance* are associated with higher long-term performance up to 60 months horizons. The overall results are not reported for the sake of brevity but are available upon requests.

### **B. Non-Crisis and Crisis Period**

One may argue that our results can be potentially driven by the underperformance of mutual funds during the 2007-2008 financial crises. To alleviate such concern, we partition our sample into non-crisis versus crisis period. We define crisis period as observations that fall in year 2007 and 2008 and classified the remaining observations as non-crisis period. We observe two key observations. First, our main results on the effect of education diversity on fund performance and money flows hold for non-crisis subsample. Second, when we re-run our empirical analysis of Table 4 and 5 on crisis subsample, we find *Diversity Finance* to be positively related to future fund performance while *Diversity Quant* and *Diversity Finance* to be positively related to future fund flows. These findings suggest that diversity in education disciplines matter for fund performance and attract investors' flow of funds particularly during financial crisis period.

## **VI. Conclusion**

Our paper investigates the effect of educational quality and diversity on the performance of team managed funds. Using a large sample of 3,288 funds over a fifteen year period from



1994 to 2013, we find that both educational quality and diversity in terms of educational specialization have a positive effect on fund performance as measured by risk-adjusted returns with findings being statistically significant at the 5% level. Our results control for a large number of firm and manager-specific control factors including fund size, turnover ratio, manager age and experience. Our data also spans a considerable time period encompassing a wide range of market conditions and are stable over time.

Our results are consistent with earlier findings in the literature linking education quality and fund performance – extending them from the domain of individually managed to team-managed funds. Our findings also add to the growing body of literature showing a significant positive correlation between informational diversity of teams and performance and we believe our measure of educational diversity is an accurate proxy for the intuitive notion of informational diversity.

Going further, we begin some investigations into the issue of investment flows. Our investigations suggest that diversity in management teams also attract higher amounts of funding from investors and this finding is robust to market conditions. We believe that further investigation of this question would be a promising direction for future research.

Another set of topics for further investigation would include identifying and elucidating the detailed mechanisms linking higher educational quality of the managerial team and improved fund performance. For instance, in this paper, we find that having a higher proportion of managers with MBA degrees from top programs is correlated with lower operating expenses. It is possible that higher educational quality of the managers might be connected to more efficient operation of the fund and hence, lower operating expenses, which contributes to better performance. It is also worth investigating the correlation between educational quality of management teams and investment strategy characteristics such as riskiness of investments, investment horizons and so on.

## References

- Adams, J.C., Nishikawa, T., and Rao, R.P., 2015. Mutual fund performance, management teams, and boards. *Working Paper*, University of Colorado Denver.
- Barber, B. M., Odean, T., and Zheng, L., 2005. Out of sight, out of mind: The effects of expenses on mutual fund flows. *Journal of Business* 78, 2095-2120.
- Bar, M., Kempf, A., and Ruenzi, S., 2011. Is a team different from the sum of its part? Evidence from mutual fund managers. *Review of Finance* 15, 359-396.
- Bar, M., Niessen, A., and Ruenzi, S., 2007. The impact of work group diversity on performance: Large sample evidence from the mutual fund industry.  
SSRN Papers: <http://dx.doi.org/10.2139/ssrn.1017803>
- Bliss, R.T., Potter, M.E., and Schwarz, C., 2008. Performance characteristics of individually-managed versus team-managed mutual funds. *Journal of Portfolio Management* 34, 110-119.
- Carhart, M. M., 1997. On persistence in mutual fund performance. *Journal of Finance* 52, 57-82.
- Chevalier, J.A, Ellison, G., 1997. Risk-taking by mutual funds as a response to incentives. *Journal of Political Economy* 105, 1167-1200.
- Chevalier, J. A., Ellison, G., 1999. Are some mutual fund managers better than others? Cross-sectional patterns in behavior and performance. *Journal of Finance* 54, 875-899.
- Chen, J., Hong, H., Huang, M., Kubik, J.D., 2004. Does fund size erode mutual fund performance? The role of liquidity and organization. *American Economic Review* 94, 1276-1302.
- Cimerova, H., Dodd, O., and Frijns, B. 2014. The impact of cultural diversity in corporate boards on firm performance.  
<http://www.nzfc.ac.nz/archives/2015/papers/programme/132.pdf>
- Dahlin, K.B., Weingart, L.R., and Hinds, P.J. 2005. Team diversity and information use. *Academy of Management Journal* 48, 1107-1123.

- Elton, E.J., Gruber, M.J., Blake, C.R., 2001. A first look at the accuracy of the CRSP mutual fund database and a comparison of the CRSP and Morningstar mutual fund databases. *Journal of Finance* 56, 2415-2430.
- Evans, R.B., 2010. Mutual fund incubation. *Journal of Finance* 65, 1581-1611.
- Ferson, W.E., Schadt, R.W., 1996. Measuring fund strategy and performance in changing economic conditions. *Journal of Finance* 51, 425-461.
- Gottesman, A. A., and Morey, M.R., 2006. "Manager education and mutual fund performance." *Journal of Empirical Finance* 13, 145-182.
- Gruber, M.J., 1996. Another puzzle: The growth in actively managed mutual funds. *Journal of Finance* 51, 783-810.
- Ippolito, R.A., 1992. Consumer reaction to measures of poor quality: Evidence from the mutual fund industry. *Journal of Law and Economics* 35, 45-70.
- Jehn, K.A., Northcraft, G.B., and Neale M.A., 1999. Why differences make a difference: A field study of diversity, conflict and performance in workgroups. *Administrative Science Quarterly* 44, 741-763.
- Kochan, T., Bezrukova, K., et al. 2003. The effects of diversity on business performance: report of the diversity research network. *Human Resource Management* 42, 3-21.
- Massa, M., Reuter, J., Zitzewitz, E., 2010. When should firms share credit with employees? Evidence from anonymously managed mutual funds. *Journal of Financial Economics* 95, 400-424.
- Patel, S., and Sarkissian, S., 2014. To group or not to group? Evidence from CRSP, Morningstar Principia, and Morningstar Direct mutual fund databases. *Working Paper*, University of Western Ontario.
- Prather, L.J., and Middleton, K.L., 2002. Are N+1 heads better than one? The case of mutual fund managers. *Journal of Economic Behavior and Organization* 47, 103-120.

- Simons, T., Pelled, L.H., and Smith, K.A., 1999. Making use of difference: Diversity, debate and decision comprehensiveness in top management teams. *Academy of Management Journal*, 42, 662-673.
- Sirri, E.R., Tufano, P., 1998. Costly search and mutual fund flows. *Journal of Finance* 53, 1589-622.
- Teachman, J. D., 1980. Analysis of population diversity. *Sociological Methods and Research* 8, 341-362.

**Table 1: Correlation Matrix**

This table provides the correlation matrix of the independent variables used in this study.  $\text{Log}(\text{Fund Size})$  is the natural logarithm of the fund's total net assets in millions of dollars.  $\text{Log}(\text{Fund Age})$  is the natural logarithm of the fund's age in years.  $\text{Log}(\text{Family Size})$  is the natural logarithm of the combined total net assets of all funds managed by a fund family in millions of dollars.  $\text{Expense Ratio}$  is the percentage of fund assets charged by the fund on an annual basis to compensate for operating costs, and includes the management fee and 12b-1 fees.  $\text{Turnover Ratio}$  measures the number of times that fund assets are renewed, and is calculated as the minimum of sales and purchases divided by the average yearly fund size.  $\text{Volatility}$  is measured by the standard deviation of a fund's net returns over the past twelve months.  $\text{Fund Flow}$  is the measure of inflow and outflow of assets following Sirri and Tufano (1998).  $\text{Fund Alpha}$  is the monthly fund returns adjusted using Carhart's (1997) four-factor model and predetermined instruments as proposed by Ferson and Schadt (1996).  $\text{Team Size}$  is number of managers running the fund.  $\text{Log}(\text{Manager Age})$  is the natural logarithm of the average fund managers' age in a fund.  $\text{Log}(\text{Manager Tenure})$  is the natural logarithm of the number of years the managers has been at the helm of the fund.  $\text{Log}(\text{Manager Experience})$  is the natural logarithm of the number of years the managers have been working in asset management industry.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
(1) Log(Fund Size)	1.000														
(2) Log(Fund Age)	0.307	1.000													
(3) Log(Family Size)	0.450	0.110	1.000												
(4) Expense Ratio	-0.062	-0.063	-0.093	1.000											
(5) Turnover Ratio	-0.093	-0.107	0.021	0.196	1.000										
(6) Volatility	-0.007	0.013	0.017	0.078	0.143	1.000									
(7) Fund Flow	0.024	-0.130	0.006	-0.011	0.041	-0.009	1.000								
(8) Fund Alpha	-0.012	0.013	0.000	0.002	0.012	0.001	-0.007	1.000							
(9) Team Size	0.017	0.003	0.049	-0.087	0.000	-0.014	0.034	0.001	1.000						
(10) Log(Manager Age)	0.008	0.102	-0.082	-0.057	-0.139	-0.005	-0.030	-0.003	0.023	1.000					
(11) Log(Manager Tenure)	0.145	0.561	-0.079	-0.072	-0.190	0.039	-0.116	-0.003	-0.025	0.269	1.000				
(12) Log(Manager Experience)	0.116	0.330	0.076	-0.066	-0.144	0.039	-0.057	0.000	0.084	0.406	0.552	1.000			
(13) Diversity Top MBA	0.010	-0.007	0.052	0.026	0.015	-0.008	-0.008	-0.004	0.075	0.010	-0.006	0.048	1.000		
(14) Diversity Quant	0.025	0.008	-0.044	-0.031	-0.058	-0.011	0.004	0.006	0.037	-0.009	-0.006	-0.024	-0.008	1.000	
(15) Diversity Finance	0.016	0.002	-0.028	0.027	-0.041	-0.014	0.005	0.005	0.145	-0.033	0.000	0.002	0.008	0.569	1.000

**Table 2: Descriptive Statistics**

This table provides descriptive statistics of equity mutual funds in our sample. Panel A reports fund characteristics of equity mutual funds, while Panel B reports manager and education characteristics used in our study. *Fund Size* is the total net assets of the fund in millions of dollars. *Fund Age* is the age of the fund in years calculated as the difference between a particular date and the date that the fund first appeared in the Morningstar Direct database. *Family Size* is the combined total net assets of all funds within a particular mutual fund family in millions of dollars. *Expense Ratio* is the percentage of fund assets charged by the fund on an annual basis to compensate for operating costs, and includes the management fee and 12b-1 fees. *Marketing Fee* is the cost paid by the fund for marketing and distribution, and is presented as a percentage of fund assets. *Turnover Ratio* measures the percentage of fund assets that are renewed, and is calculated as the minimum of sales and purchases divided by the average yearly fund size. *Volatility* is measured by the standard deviation of a fund's net returns over the past twelve months. *Fund Flow* is the measure of inflow and outflow of assets following Sirri and Tufano (1998). *Objective Fund Flow* is fund's flow in excess of mean flow of all funds in similar investment objectives. *Fund Return* is fund's monthly return net of operating expenses. *Objective Adjusted Return* is fund's return in excess of mean return of all funds in similar investment objectives. *Fund Alpha* is the monthly fund returns adjusted using Carhart's (1997) four-factor model and predetermined instruments as proposed by Ferson and Schadt (1996). *Team Size* is number of managers running the fund. *Manager Age* is average fund managers' age in a fund. *Manager Tenure* is the number of years the managers has been at the helm of the fund. *Manager Experience* is the number of years the managers have been working in asset management industry. *Bachelor/Master/MBA/PhD* is the proportion of fund managers holding BA, MA, MBA, and PhD as their highest qualification. *Top MBA* is the proportion of fund managers with MBA from top 30 MBA Business School. *Quant* and *Finance* are proportion of fund managers with quantitative and finance background based on ISCED framework. Diversity measures are as described in text.

Variable	Mean	Std Dev	Min	Max
<b>Panel A: Fund Characteristics</b>				
Fund Size (\$mil)	321.409	371.907	15.000	1,735.661
Fund Age (years)	10.547	8.518	0.000	85.750
Family Size (\$mil)	17,397.400	20,319.060	15.003	108,749.100
Expense Ratio (%)	1.223	0.419	0.050	2.662
Marketing Fee (%)	0.255	0.245	0.000	0.968
Turnover Ratio (%)	82.046	71.594	1.000	564.000
Volatility	4.448	1.906	0.000	18.220
Fund Flow	2.546	16.156	-42.398	111.681
Objective Adjusted Flow	0.680	16.032	-58.520	119.369
Fund Return	0.755	4.893	-13.590	12.177
Objective Adjusted Return	0.002	1.633	-18.512	16.307
Fund Alpha	-0.046	2.826	-15.245	14.161
Team Size	3.352	2.111	2.000	14.000
<b>Panel B: Manager and Education Characteristics</b>				
Manager Age	43.390	8.092	11.917	91.917
Manager Tenure	4.533	3.706	0.000	44.333
Manager Experience	8.184	4.660	0.000	44.333
Bachelor	0.756	0.254	0.111	1.000
Masters	0.382	0.204	0.034	1.000
MBA	0.536	0.253	0.043	1.000
PhD	0.364	0.260	0.024	1.000
Top MBA	0.878	0.218	0.167	1.000
Quant	0.434	0.472	0.000	1.000
Finance	0.308	0.427	0.000	1.000
Diversity Top MBA	0.088	0.217	0.000	1.000
Diversity Quant	0.096	0.236	0.000	1.000
Diversity Finance	0.148	0.290	0.000	1.000

**Table 3: Summary Statistics Based on Education Diversity**

This table provides the summary statistics of fund performance and fund flow measures based on our education diversity measures. We partition Diversity Top MBA, Diversity Quant, and Diversity Finance into quintiles with Q1 (Q5) represents the least (most) diverse education category. We perform a difference in means test between Q1 and Q5 group and report the corresponding t-statistics and the significance of its p-value.

Panel A: Diversity Top MBA								
<u>Variables</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q5</u>	<u>Diff (Q5 - Q1)</u>	<u>TTEST</u>	<u>Sig</u>
Fund Return	0.782	0.733	0.670	0.886	0.717	-0.065	0.745	
Objective Adjusted Return	0.009	0.003	-0.012	-0.003	-0.037	-0.045	1.492	
Fund Alpha	-0.041	-0.038	-0.079	-0.068	-0.096	-0.055	1.065	
Fund Flow	2.730	3.497	2.571	1.900	1.535	-1.195	4.062	***
Objective Adjusted Flow	0.751	1.856	0.859	0.045	-0.376	-1.127	3.862	***
Panel B: Diversity Quant								
<u>Variables</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q5</u>	<u>Diff (Q5 - Q1)</u>	<u>TTEST</u>	<u>Sig</u>
Fund Return	0.745	0.854	0.436	0.811	0.919	0.174	-2.444	**
Objective Adjusted Return	0.000	0.036	-0.070	-0.024	0.023	0.023	-0.934	
Fund Alpha	-0.065	0.043	-0.048	-0.066	-0.010	0.055	-1.306	
Fund Flow	2.755	3.570	3.139	2.477	2.682	-0.072	0.303	
Objective Adjusted Flow	0.786	1.894	1.173	0.299	0.541	-0.245	1.030	
Panel C: Diversity Finance								
<u>Variables</u>	<u>Q1</u>	<u>Q2</u>	<u>Q3</u>	<u>Q4</u>	<u>Q5</u>	<u>Diff (Q5 - Q1)</u>	<u>TTEST</u>	<u>Sig</u>
Fund Return	0.745	0.822	0.652	0.735	0.774	0.029	-0.521	
Objective Adjusted Return	-0.001	0.022	0.007	0.004	-0.037	-0.036	1.821	*
Fund Alpha	-0.067	0.032	-0.013	-0.089	-0.020	0.046	-1.379	
Fund Flow	2.703	3.401	3.629	3.497	2.236	-0.467	2.517	**
Objective Adjusted Flow	0.728	1.735	1.828	1.378	0.102	-0.626	3.398	***

**Table 4: Effect of Education Quality/Diversity on Fund Performance**

This table reports the estimated coefficients from the OLS regression to examine the effect of education on fund performance. The dependent variable is the compounded monthly *Fund Alpha* from t+k1 to t+k2 horizon. Independent variables include: *Top MBA* is the proportion of fund managers with MBA from Top 30 MBA Business School in year t. *Diversity Top MBA* is the education diversity measure based on Top MBA. *Log(Fund Size)* is the natural logarithm of the fund's total net assets in millions of dollars. *Log(Fund Age)* is the natural logarithm of the fund's age in years. *Log(Family Size)* is the natural logarithm of the combined total net assets of all funds managed by a fund family in millions of dollars. *Expense Ratio* is the percentage of fund assets charged by the fund on an annual basis to compensate for operating costs, and includes the management fee and 12b-1 fees. *Turnover Ratio* measures the number of times that fund assets are renewed, and is calculated as the minimum of sales and purchases divided by the average yearly fund size. *Volatility* is measured by the standard deviation of a fund's net returns over the past twelve months. *Fund Flow* is the measure of inflow and outflow of assets following Sirri and Tufano (1998). *Team Size* is number of managers running the fund. *Log(Manager Age)* is the natural logarithm of the average fund managers' age in a fund. *Log(Manager Tenure)* is the natural logarithm of the number of years the managers has been at the helm of the fund. *Log(Manager Experience)* is the natural logarithm of the number of years the managers have been working in asset management industry. Time fixed effects are included in each regression and standard errors are clustered at fund level and reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Top MBA	Dependent Variable: Fund Alpha (t+k1:t+k2)							
	3 months	6 months	9 months	12 months	3 months	6 months	9 months	12 months
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Top MBA	0.259**	0.459**	0.715**	1.025**				
	(0.118)	(0.228)	(0.334)	(0.437)				
Diversity Top MBA					-0.202**	-0.367**	-0.561**	-0.805**
					(0.093)	(0.175)	(0.256)	(0.334)
Log(Fund Size)	-0.133***	-0.253***	-0.342***	-0.383***	-0.136***	-0.242***	-0.313***	-0.351***
	(0.026)	(0.048)	(0.067)	(0.086)	(0.022)	(0.040)	(0.057)	(0.073)
Log(Fund Age)	0.226***	0.404***	0.562***	0.697***	0.263***	0.465***	0.649***	0.804***
	(0.052)	(0.096)	(0.135)	(0.165)	(0.043)	(0.078)	(0.108)	(0.133)
Log(Family Size)	0.015	0.036	0.046	0.044	0.033**	0.068**	0.088**	0.100*
	(0.018)	(0.035)	(0.050)	(0.065)	(0.015)	(0.028)	(0.041)	(0.053)
Expense Ratio	-0.008	-0.005	-0.009	-0.043	-0.030	-0.024	-0.007	-0.009
	(0.076)	(0.146)	(0.211)	(0.271)	(0.066)	(0.126)	(0.183)	(0.236)
Turnover Ratio	0.226***	0.481***	0.719***	0.938***	0.165***	0.352***	0.542***	0.728***
	(0.064)	(0.119)	(0.169)	(0.215)	(0.046)	(0.083)	(0.117)	(0.147)
Volatility	-0.062**	-0.082	-0.171**	-0.279***	-0.069***	-0.098**	-0.184***	-0.296***
	(0.028)	(0.053)	(0.072)	(0.089)	(0.024)	(0.045)	(0.059)	(0.073)
Fund Flow	-0.371***	-0.585***	-0.868***	-1.238***	-0.533***	-0.880***	-1.243***	-1.664***



	(0.131)	(0.193)	(0.246)	(0.281)	(0.112)	(0.169)	(0.216)	(0.249)
Fund Alpha	-0.027	0.011	0.048	0.114***	-0.030**	0.007	0.041*	0.095***
	(0.017)	(0.024)	(0.030)	(0.033)	(0.014)	(0.020)	(0.025)	(0.028)
Team Size	0.004	0.008	0.010	0.011	0.006	0.013	0.019	0.023
	(0.005)	(0.010)	(0.014)	(0.018)	(0.005)	(0.009)	(0.014)	(0.018)
Log(Manager Age)	-0.080	-0.287	-0.562	-0.800	-0.146	-0.352	-0.580	-0.752
	(0.191)	(0.370)	(0.535)	(0.694)	(0.160)	(0.310)	(0.448)	(0.581)
Log(Manager Tenure)	-0.074	-0.138	-0.184	-0.217	-0.069*	-0.127*	-0.172*	-0.207
	(0.048)	(0.089)	(0.126)	(0.160)	(0.039)	(0.072)	(0.102)	(0.131)
Log(Manager Experience)	-0.008	0.065	0.072	0.098	-0.010	0.019	-0.021	-0.058
	(0.080)	(0.144)	(0.197)	(0.245)	(0.063)	(0.115)	(0.160)	(0.200)
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	70,550	68,693	66,750	64,702	101,562	98,925	96,141	93,278
Adjusted R2	0.019	0.035	0.054	0.071	0.020	0.034	0.051	0.069

**Table 4: Continued**

<u>Panel B: Quant</u>		<u>Dependent Variable: Fund Alpha (t+k1:t+k2)</u>							
Variables	<u>3 months</u>	<u>6 months</u>	<u>9 months</u>	<u>12 months</u>	<u>3 months</u>	<u>6 months</u>	<u>9 months</u>	<u>12 months</u>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Quant	-0.072*	-0.130*	-0.153	-0.147					
	(0.038)	(0.072)	(0.103)	(0.134)					
Diversity Quant					0.243**	0.432*	0.650*	0.798*	
					(0.117)	(0.227)	(0.332)	(0.429)	
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Observations	170,362	165,816	160,997	155,989	110,256	107,559	104,710	101,733	
Adjusted R2	0.018	0.032	0.048	0.063	0.020	0.033	0.049	0.065	

  

<u>Panel C: Finance</u>		<u>Dependent Variable: Fund Alpha (t+k1:t+k2)</u>							
Variables	<u>3 months</u>	<u>6 months</u>	<u>9 months</u>	<u>12 months</u>	<u>3 months</u>	<u>6 months</u>	<u>9 months</u>	<u>12 months</u>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Finance	-0.079**	-0.150**	-0.196*	-0.223					
	(0.039)	(0.075)	(0.108)	(0.140)					
Diversity Finance					0.121	0.256	0.513**	0.722**	
					(0.085)	(0.166)	(0.240)	(0.306)	
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Observations	170,362	165,816	160,997	155,989	110,256	107,559	104,710	101,733	
Adjusted R2	0.018	0.032	0.048	0.063	0.020	0.033	0.049	0.065	

**Table 5: Effect of Education Quality/Diversity on Fund Fees**

This table reports the estimated coefficients from the OLS regression to examine the effect of education on fund fees. The dependent variable is *Expense Ratio* which is the percentage of fund assets charged by the fund on an annual basis to compensate for operating costs, and includes management fee and 12b-1 fees. Independent variables include: *Top MBA* is the proportion of fund managers with MBA from Top 30 MBA Business School in year t. *Diversity Top MBA* is the education diversity measure based on Top MBA. *Log(Fund Size)* is the natural logarithm of the fund's total net assets in millions of dollars. *Log(Fund Age)* is the natural logarithm of the fund's age in years. *Log(Family Size)* is the natural logarithm of the combined total net assets of all funds managed by a fund family in millions of dollars. *Expense Ratio* is the percentage of fund assets charged by the fund on an annual basis to compensate for operating costs, and includes the management fee and 12b-1 fees. *Turnover Ratio* measures the number of times that fund assets are renewed, and is calculated as the minimum of sales and purchases divided by the average yearly fund size. *Volatility* is measured by the standard deviation of a fund's net returns over the past twelve months. *Fund Flow* is the measure of inflow and outflow of assets following Sirri and Tufano (1998). *Team Size* is number of managers running the fund. *Log(Manager Age)* is the natural logarithm of the average fund managers' age in a fund. *Log(Manager Tenure)* is the natural logarithm of the number of years the managers has been at the helm of the fund. *Log(Manager Experience)* is the natural logarithm of the number of years the managers have been working in asset management industry. Time fixed effects are included in each regression and standard errors are clustered at fund level and reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

Variables	Dependent Variable: Expense Ratio (Post-12 months)					
	(1)	(2)	(3)	(4)	(5)	(6)
Top MBA	-0.184*** (0.052)					
Diversity Top MBA		0.128*** (0.040)				
Quant			0.027* (0.016)			
Diversity Quant				-0.011 (0.035)		
Finance					0.032* (0.017)	
Diversity Finance						0.061** (0.026)
Log(Fund Size)	0.030*** (0.011)	0.026*** (0.009)	0.020*** (0.007)	0.019** (0.008)	0.020*** (0.007)	0.018** (0.008)
Log(Fund Age)	-0.013 (0.016)	-0.015 (0.013)	-0.007 (0.010)	-0.016 (0.013)	-0.008 (0.010)	-0.017 (0.013)
Log(Family Size)	-0.023**	-0.019***	-0.017***	-0.013**	-0.017***	-0.013**

	(0.009)	(0.007)	(0.005)	(0.006)	(0.005)	(0.006)
Turnover Ratio	0.076***	0.075***	0.083***	0.087***	0.084***	0.088***
	(0.021)	(0.015)	(0.011)	(0.013)	(0.011)	(0.013)
Volatility	0.021***	0.021***	0.025***	0.028***	0.025***	0.027***
	(0.008)	(0.006)	(0.005)	(0.006)	(0.005)	(0.006)
Fund Flow	-0.060***	-0.051***	-0.044***	-0.040***	-0.044***	-0.040***
	(0.014)	(0.012)	(0.009)	(0.011)	(0.009)	(0.011)
Fund Alpha	-0.016	-0.021	-0.000	-0.031	0.000	-0.035
	(0.057)	(0.048)	(0.035)	(0.044)	(0.035)	(0.044)
Team Size	-0.012***	-0.011***	-0.010***	-0.009***	-0.010***	-0.010***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Log(Manager Age)	0.020	-0.035	-0.034	-0.056	-0.031	-0.051
	(0.094)	(0.072)	(0.051)	(0.070)	(0.052)	(0.070)
Log(Manager Tenure)	-0.009	-0.018	-0.016*	-0.010	-0.016*	-0.009
	(0.016)	(0.013)	(0.009)	(0.012)	(0.009)	(0.012)
Log(Manager Experience)	-0.005	0.003	0.007	0.030	0.007	0.029
	(0.023)	(0.019)	(0.014)	(0.018)	(0.014)	(0.018)
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	62,847	90,505	150,856	98,742	150,856	98,742
Adjusted R2	0.094	0.090	0.084	0.084	0.084	0.086

**Table 6: Effect of Education Quality/Diversity on Money Flows**

This table reports the estimated coefficients from the OLS regression to examine the effect of education on money flows. The dependent variable is *Fund Flow* which measures the percentage growth of a fund that is due to new investments over t+k1 to t+k2 horizon. Independent variables include: *Top MBA* is the proportion of fund managers with MBA from Top 30 MBA Business School in year t. *Diversity Top MBA* is the education diversity measure based on Top MBA. *Log(Fund Size)* is the natural logarithm of the fund's total net assets in millions of dollars. *Log(Fund Age)* is the natural logarithm of the fund's age in years. *Log(Family Size)* is the natural logarithm of the combined total net assets of all funds managed by a fund family in millions of dollars. *Expense Ratio* is the percentage of fund assets charged by the fund on an annual basis to compensate for operating costs, and includes the management fee and 12b-1 fees. *Marketing Fee* is the cost paid by the fund for marketing and distribution, and is presented as a percentage of fund assets. *Turnover Ratio* measures the number of times that fund assets are renewed, and is calculated as the minimum of sales and purchases divided by the average yearly fund size. *Volatility* is measured by the standard deviation of a fund's net returns over the past twelve months. *Fund Flow* is the measure of inflow and outflow of assets following Sirri and Tufano (1998). *Category Flow* is the aggregate flow into each fund category at time t. *Low<sub>i,t-1</sub>* represents the performance rank in the lowest quintile and is measured as  $\min(Rank_t, 0.2)$ , *Mid<sub>i,t-1</sub>* represents the performance rank in quintiles 2–4 and is measured as  $\min(Rank_t - Low, 0.6)$ , and *High<sub>i,t-1</sub>* represents the performance rank in the highest quintile and is measured as  $\min(Rank_t - Low - Mid, 0.2)$ . *Team Size* is number of managers running the fund. *Log(Manager Age)* is the natural logarithm of the average fund managers' age in a fund. *Log(Manager Tenure)* is the natural logarithm of the number of years the managers has been at the helm of the fund. *Log(Manager Experience)* is the natural logarithm of the number of years the managers have been working in asset management industry. Time fixed effects are included in each regression and standard errors are clustered at fund level and reported in parentheses. \*, \*\* and \*\*\* indicate significance at the 10%, 5%, and 1% levels, respectively.

Variables	Dependent Variable: Fund Flow (t+k1:t+k2)							
	3 months (1)	6 months (2)	9 months (3)	12 months (4)	3 months (5)	6 months (6)	9 months (7)	12 months (8)
Top MBA	0.036*** (0.012)	0.070*** (0.023)	0.104*** (0.034)	0.140*** (0.045)				
Diversity MBA					-0.017* (0.009)	-0.030* (0.018)	-0.042 (0.027)	-0.054 (0.035)
Log(Fund Size)	-0.010*** (0.003)	-0.019*** (0.005)	-0.029*** (0.007)	-0.038*** (0.010)	-0.011*** (0.002)	-0.021*** (0.004)	-0.032*** (0.006)	-0.043*** (0.008)
Log(Fund Age)	-0.025*** (0.004)	-0.042*** (0.007)	-0.054*** (0.011)	-0.061*** (0.014)	-0.027*** (0.003)	-0.047*** (0.006)	-0.061*** (0.009)	-0.071*** (0.011)
Log(Family Size)	0.003 (0.002)	0.007** (0.003)	0.012** (0.005)	0.016** (0.007)	0.004*** (0.001)	0.008*** (0.003)	0.013*** (0.004)	0.018*** (0.006)
Expense Ratio	-0.032*** (0.010)	-0.058*** (0.019)	-0.080*** (0.028)	-0.099*** (0.038)	-0.033*** (0.008)	-0.063*** (0.015)	-0.094*** (0.023)	-0.123*** (0.030)
Marketing Fee	0.039** (0.017)	0.057* (0.032)	0.061 (0.046)	0.056 (0.060)	0.050*** (0.013)	0.085*** (0.025)	0.116*** (0.036)	0.138*** (0.047)
Turnover Ratio	0.008	0.016	0.025	0.034	0.022***	0.036***	0.045***	0.053***

	(0.005)	(0.011)	(0.016)	(0.021)	(0.007)	(0.012)	(0.016)	(0.020)
Volatility	-0.204	-0.452	-0.630	-0.533	-0.167	-0.343	-0.383	-0.125
	(0.210)	(0.402)	(0.590)	(0.765)	(0.172)	(0.327)	(0.478)	(0.621)
Category Flow	2.515**	4.090*	3.683	3.902	2.630**	4.437**	4.625*	6.157*
	(1.263)	(2.235)	(3.158)	(4.052)	(1.031)	(1.850)	(2.629)	(3.418)
Low	-0.046	-0.059	-0.038	-0.018	-0.037	-0.052	-0.034	-0.030
	(0.037)	(0.061)	(0.084)	(0.105)	(0.030)	(0.049)	(0.069)	(0.086)
Medium	-0.004	-0.010	-0.009	-0.011	-0.004	-0.004	-0.011	-0.006
	(0.008)	(0.012)	(0.015)	(0.018)	(0.006)	(0.009)	(0.012)	(0.014)
High	0.036	0.114*	0.184**	0.179*	0.064**	0.152***	0.250***	0.252***
	(0.036)	(0.061)	(0.083)	(0.103)	(0.031)	(0.051)	(0.069)	(0.085)
Team Size	0.003***	0.006***	0.009***	0.012***	0.002***	0.005***	0.007***	0.010***
	(0.001)	(0.001)	(0.002)	(0.003)	(0.001)	(0.001)	(0.002)	(0.003)
Log(Manager Age)	0.014	0.025	0.033	0.049	0.002	0.002	0.001	0.003
	(0.016)	(0.030)	(0.045)	(0.059)	(0.013)	(0.026)	(0.038)	(0.049)
Log(Manager Tenure)	0.003	0.004	0.006	0.005	0.004	0.006	0.008	0.006
	(0.004)	(0.007)	(0.010)	(0.014)	(0.003)	(0.006)	(0.008)	(0.011)
Log(Manager Experience)	0.011*	0.021*	0.030*	0.039*	0.015***	0.026***	0.037***	0.047***
	(0.006)	(0.011)	(0.016)	(0.021)	(0.005)	(0.010)	(0.014)	(0.017)
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	49,847	48,220	46,591	44,926	72,275	69,886	67,478	65,055
Adjusted R2	0.026	0.043	0.057	0.066	0.027	0.043	0.055	0.065

**Table 6: Continued**

<u>Panel B: Quant</u>		<u>Dependent Variable: Fund Flow (t+k1:t+k2)</u>							
Variables	3 months	6 months	9 months	12 months	3 months	6 months	9 months	12 months	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Quant	-0.003	-0.007	-0.011	-0.016					
	(0.004)	(0.007)	(0.011)	(0.014)					
Diversity Quant					0.013	0.025	0.038	0.044	
					(0.010)	(0.019)	(0.027)	(0.036)	
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Observations	125,061	120,725	116,322	111,889	78,133	75,663	73,160	70,604	
Adjusted R2	0.029	0.045	0.058	0.068	0.031	0.050	0.066	0.077	

  

<u>Panel C: Finance</u>		<u>Dependent Variable: Fund Flow (t+k1:t+k2)</u>							
Variables	3 months	6 months	9 months	12 months	3 months	6 months	9 months	12 months	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
Finance	-0.002	-0.005	-0.009	-0.013					
	(0.004)	(0.008)	(0.012)	(0.016)					
Diversity Finance					0.001	0.003	0.002	-0.005	
					(0.007)	(0.014)	(0.021)	(0.027)	
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Time Fixed Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Observations	125,061	120,725	116,322	111,889	78,133	75,663	73,160	70,604	
Adjusted R2	0.029	0.045	0.058	0.068	0.031	0.050	0.065	0.077	