

Is Your Fund's Board Watching Out for You?

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Abstract

We examine the relation between the performance of mutual funds and the board of directors effectiveness in disciplining underperforming funds and safeguard shareholder interest. Mutual fund boards have a clear mandate under federal securities law to monitor potential conflicts of interest, approve fund documents, protect the interests of fund shareholders and ensure that advisers provide satisfactory returns with reasonable fees. Investor advocates argue that mutual funds allow too many directors to seat on too many boards. Directors, who usually attend between four and eight board meetings a year, are paid an average salary of \$250,000 annually at the largest mutual fund companies. Critics state that millions of shareholders have already suffered the cost of poor governance, in the form of poor performance. In 2011, only 23% of actively managed equity funds beat their benchmarks. Over the past five years, 61% of equity funds have lagged the Standard & Poor's 500 index. Our results show evidence that most mutual funds take some kind of action to revert underperformance, but the majority of them are not able to beat their benchmarks three years afterwards.

JEL Classification: G10, G11, G23

Keywords: Mutual funds; Control mechanisms; Fund Governance; Management turnover.

I. Introduction

This paper provides evidence on the internal control mechanisms in mutual funds by analysing the relation between the underperformance of mutual funds and the behaviour of the mutual fund board. We hypothesize the presence of an inverse relation between the probability of a fund action and the past performance of the fund. By examining a sample of 38,160 open-end, equity funds that are actively managed and registered in the U.S. between 1970 and 2012, we document the probability of a mutual fund action on poor performance and its effectiveness. In addition, we analyze whether manager and fund characteristics predict future fund performance.

A large number of academic papers document, in general, mutual fund underperformance, after fees and trading costs. But they do not address whether their funds take any action to reverse this performance. The governance of a fund is relevant to that fund's performance not only through negotiating low fees with the fund advisor, but also replacing the advisor in case it does not fulfill its obligations, through monitoring fund manager profitability, or deciding the merge or liquidation of the fund. There is an emerging literature researching the effectiveness of several characteristics of governance in the fund industry. Our paper adds to this literature being the first to examine the role and reaction of boards in relation to fund performance.

Our results provide several new insights into the role of boards in the performance of mutual funds. First, we document that most mutual funds take some action when a fund consistently underperform (defined by a negative three-year alpha), we find that the most common action is to replace the manager. Further, we find that the majority of funds that have been affected by its previous fund decision still present a negative performance three years afterwards, although performance has improved. Hence, the overall results indicate that internal control mechanisms are an effective means of reverting fund performance but not sufficient to beat the fund's benchmark.

Prior research analyzes the relation between portfolio managers and performance. Chevalier and Ellison (1999b) find that younger managers are more likely to be removed due to poor performance. Khorana (1996, 2001) examines the turnover of

managers, and provides evidence that underperforming fund managers with decreasing inflows are more likely to be terminated. Baks (2003) states that portfolio managers play a major role in generating fund performance. While Chevalier and Ellison (1999a) show that the level of manager education affects fund performance.

Understanding the consequences of fund actions on subsequent fund performance is useful for several parties: i) the SEC and other regulatory authorities may be interested to know the pre- and post-action performance effects to obtain information about the effectiveness of internal and external corporate control in mutual funds; ii) fund investors may be interested in knowing whether a fund action affects future fund performance; iii) fund advisors may want to know whether fund actions alters asset inflows in the post-action period.

The paper is organized as follows. Section 2 outlines the institutional background and the underlying hypothesis. Section 3 describes the data sources and sample selection procedure. Section 4 elaborates on the methodology employed. Section 5 provides a discussion of the empirical results. And Section 6 concludes. The Appendix provides the detailed methodology used in constructing the risk-adjusted factors for international funds.

II. Institutional background and hypothesis

A. Institutional background on mutual fund governance

A mutual fund is a corporate entity, which consists of the board of directors (or trustees), the investment advisor, the fund manager, and the shareholders. The shareholders of the fund select the trustees, who are responsible for the control of the fund. Each fund has a board of directors, although a number of the directors could be employed by the advisory company. The responsibilities of the advisor include portfolio management, marketing the fund, selling and redeeming fund shares, regulatory compliance, and monitor of the fund's transfer agent. The close association between the directors and fund advisors might reduce the supervision role performed by the directors.

The fund's board of directors has a fiduciary responsibility to its shareholders. The board is composed of both inside and independent outside directors, although the majority of them consist of independent directors. Most mutual funds rely on the SEC's exemptive rules, for which half of the directors need to be legally independent. Under Section 15 (c) of the Investment Company Act of 1940, the fund's board of directors has to meet annually to evaluate the advisory contract, and to decide whether it is renewed, although usually board meetings take place quarterly.¹

Shareholders are the owners of the funds with voting rights. They choose funds that satisfy their underlying investment objective and buy shares in different ways through retirement pension plans, brokerage accounts, or insurance policies. The board of directors represent the interests of the mutual fund shareholders, they also negotiate the contracts with the investment advisor for the fund's management. Fund managers are employed by the fund advisor, and their compensation is decided by the advisor.

The compensation contract of the investment advisor provides the motivation for the advisor to monitor the performance of the fund manager. The advisor obtains a management fee based on a percentage of average net assets held during the year, thus the investment advisor compensation is related to the fund's size. As documented by Ippolito (1992) or Sirri and Tufano (1992) asset inflows and outflows are highly correlated with the performance of the fund manager. Consequently, fund managers with a poor performance are likely to be dismissed if underperformance persists.

In most cases, boards do not terminate the management contract, they will usually express their dissatisfaction with a manager, renegotiating the fee or by merging one fund into another. The approval of the fund's shareholders is not normally required in order to merge two funds. Under Rule 17a-8 of the SEC, the target fund needs the acceptance of most of its shareholders only in case that outside directors of the target fund are not the majority of the outside directors of the acquiring fund, if the acquiring fund's investment strategy or advisory contract is different from that of the merged fund, or if 12b-1 fees increase as a consequence of the merger. In most cases, fund mergers imply board decision making, hostile takeovers are not usual in the fund industry. Thus,

¹ Mutual funds are regulated by the Investment Company Act of 1940, this was amended in 1970 and 2001, and by Securities and Exchange Commission (SEC) Rules.

even for mergers that must be approved by shareholders, the merger would not prosper without the consent of the board.

There are two kind of fund mergers: in-family mergers which imply a combination of two different funds within the same family, and across-family mergers that happen when the acquiring and target funds are from different fund families. Fund mergers can be initiated by the intention to eliminate a poorly performing fund, with impact of fund performance considered a primary motive for in-family mergers. Across-family mergers are more complex and can be motivated by strategic objectives, as fund families are willing to reorder the set of product offerings via a merger. Previous research shows that fund mergers are usually the result of poor performance (see Jayaraman, Khorana, and Nelling (2002), and Zhao (2005)), and usually benefit target shareholders (Khorana, Tufano, and Wedge (2007)).

B. Fund Manager Incentives and Fund Governance

There are several ways to develop incentives for fund managers. The first method is through the compensation contract. The remuneration and bonus of the fund manager is usually based on fund performance. Information and data about the compensation contract is not publicly available. Individual investment performance is the most important factor determining bonuses, although the investment performance and profitability of the organization are also important. There is not a clear consensus about the strength of the link between remuneration and investment performance, as Farnsworth and Taylor (2006) point in their compensation survey of portfolio managers.

The second method is redundancy. Fund managers that underperform can be dismissed. Fund managers who perform poorly are more likely to be removed from their job as shown by Khorana (1996), Chevalier and Ellison (1999b), and Ding and Wermers (2009), they also explain that the strength of this link depends on several manager and fund characteristics.

The third method is to change the fund management company by the board of directors of the fund. Although Khorana, Tufano, and Wedge (2007) explain that this has

occurred only in very few cases. This will lead to the removal of the fund manager as is employed by the fund management company.

While the fund manager bears the responsibility for the daily portfolio decisions of the fund, the fund's board is responsible for managerial oversight. Mutual fund boards influence the performance of funds choosing the investment advisor and negotiating the fees with them. The performance of the funds is the main determinant to fire the investment advisor and negotiating the fee upward or downward. This will motivate the management company (investment advisor) to set strong incentives for fund managers to outperform their benchmarks.

Chevalier and Ellison (1999b) show that manager termination is less performance-sensitive for older and more experienced managers. Ding and Wermers (2009) also find the same evidence in their article, and explain that is consistent with entrenchment of poorly performing managers. They explain that large management organizations outperform smaller ones due to the options (besides termination) available at a big organization.

Fama and Jensen (1983) state that investors can reduce their investment and subsequently reducing the advisor's fee income, thus they explain that boards are less important for open-end mutual funds than for operating companies. Although the evidence points that a proportion of fund investors are ill-equipped to monitor available information on fees, performance, and internal regulation, and to take rational decisions (see Frazzini and Lamont (2008)). Furthermore, investors whose retirement accounts invest in mutual funds are usually restricted by their plan sponsors in transferring the capital to funds with better performance or lower fees. Thus, board supervision of mutual funds play a relevant economic purpose in the presence of informational and institutional frictions.

In this article, we study the behaviour and relation between the fund board and fund performance in conjunction with many of the fund performance measures discussed above.

III. Data and Descriptive Statistics

A. Sample Selection

We use the CRSP survivor-bias-free mutual fund database in our analysis of mutual fund returns. The CRSP database contains monthly net returns (after expenses) and annual data on portfolio turnover and expense ratios for all mutual funds existing at any time in our sample period, between January 1, 1970 and December 31, 2012. The reinvestment of dividend distributions is computed at the ex-date. Returns are not adjusted for sales charges, front- or back-end load, and redemption fees. The CRSP mutual fund database provides information about the fund's turnover ratio, net returns, expense ratio, investment objective, and total net assets under management for each year included in our sample period. In addition, the database also provides fund manager data which includes manager name, manager start date at the fund, management company name, and fund advisor name. To the best of our knowledge, our manager database is the largest on US-registered open-end, equity mutual fund managers compiled to date.

We limit our analysis to funds registered in the U.S. that hold local or international equity portfolios. Our sample includes both domestic funds (funds that invest primarily in U.S. stocks) and international funds (funds that invest primarily in stocks of countries different from the U.S.). We restrict the sample to actively managed equity funds and exclude all other funds: funds-of-funds, closed-end, index tracking, bond funds, and offshore. Our analysis in this paper uses a mutual fund as the basic unit and not individual share classes. The CRSP database includes monthly data on net returns for each share class of every open-end mutual fund since January 1, 1962. For each open-end U.S. equity fund, we estimate monthly net returns by weighting the returns of each share class by the proportion of fund total net assets at the beginning of each month. All share classes at the beginning of a given month are included in the estimation for that month. At least 24 monthly observations of fund returns are required for inclusion in our sample. This is to ensure that we have enough observations to estimate performance measures. For mutual funds that are team-managed, we identify the "lead manager", who is the manager having the longest tenure with that fund. It is not always clear

whether all the managers listed as members of a management team contribute equally to the management of the fund. We consider that the longest-tenure manager has the greater level of management of a fund, thus we take into account only the characteristics of this lead manager for our study. Although our database do not allow every manager to be documented, as funds that are team-managed are not required to disclose the names of each team to the SEC or the fund shareholders. However, for most of our funds, there is only one fund manager per fund, making it simpler for our empirical tests.

B. Descriptive Statistics

Panel A of Table 1 provides summary statistics for the mutual fund database, we present a breakdown of our mutual fund universe into the investment objectives included in our study. We use investment objective information and other fund information from Lipper database, which is available from the CRSP database. Panel A shows the number of funds in the database during our sample period, the average portfolio turnover, expense ratio, and total assets for each investment objective. These variables are described in the Table 1 footnotes. The descriptive statistics are reported separately for different investment objectives. To eliminate any survivorship bias, we consider monthly net returns for each mutual fund that exists during a given month, regardless of whether that fund survives the entire year. Including only surviving funds could bias our findings, as Malkiel (1995) shows that non-surviving funds underperform funds that survive. The total number of equity mutual funds in the database is 38,160 distinct funds that existed sometime during the 42-year period. This includes both funds that survived until the end of 2012 and funds that were discontinued due to a merger or liquidation.

Panel B of Table 1 presents summary statistics on the main explanatory variables employed in our regression specifications. On average, 1.80% of managers leave per month (21.6% per year). Around 78% of these exits, 1.80% of managers monthly, are due to departures and the remaining exits are a consequence of fund closures. The average fund has earned 0.49% per month (or 5.88% on an annual basis) in net returns over the whole sample period, and 1.02% per month over the prior twelve months. Finally, the manager-level variables show that a typical manager at a mutual fund has been managing the fund for 4.1 years, and 2.12 are the average number of named managers who are managing a fund.

We include a single-manager dummy in our models to control that managerial ownership is not only proxying for differences in performance between funds managed by individuals and those managed by multiple managers. As many funds are managed by teams, we estimate separate models for funds with single managers and funds managed by multiple managers (see Chen, Hong, Huang, and Kubik (2004)).

From Table 1 we can appreciate some relevant points. The turnover ratios for the telecommunications, science and technology, Japanese, global science, equity leverage, and consumer services categories of funds are significantly larger than for any other investment objective. The expense ratios for these categories are also higher, well above 1%, as a result of the quick portfolio turnover activity undertaken by their fund managers. In contrast, expense ratios for other funds are under 1%.

C. Definition of Mutual Fund Board Actions

Our goal is to determine whether mutual fund boards take actions when a fund presents persistence in poor performance, which means negative annual alpha estimates in three consecutive years. For the funds performing below the benchmark, we define the different actions that could be taken by fund boards as:

- i) Change fund managers: When a manager exists and the fund continues operating under different management.
- ii) Change fund advisors: When the fund advisor managing the fund exits and the fund continues operating under different advisor.
- iii) Liquidate or merge the fund: When the fund closes and the remaining assets are liquidated or merged into another fund.
- iv) Reduce the fees: When a decision is made to reduce the fees charged by the fund.

Although decisions i) and iv) could be made by the fund advisor, the mutual fund board is the responsible for monitoring the fund performance, and is accountable in case that poor performance persists and no decision is made to correct it. In this sense, Tufano and Sevick (1997) point out that fund boards have an indirect impact on performance.

IV. Methodology and Variable Construction

A. Measurement of Fund Performance

Based on the academic literature on fund performance, we analyse performance using the following performance measures: i) one-factor CAPM and four-factor Carhart performance measures, ii) an objective-adjusted performance, and iii) Fama-MacBeth analysis. We describe these performance measures in detail in the following section.

1. One-Factor and Four-Factor Models

We use raw returns and risk-adjusted returns in local currency to measure mutual fund performance. The estimation of total returns assumes that dividends are immediately reinvested. Raw returns are gross of taxes and net of total expenses. We control for differentials across the respective fund by using the Capital Asset Pricing Model (CAPM) and Carhart model as the underlying models. Our aim is to evaluate if standard measures are used in making mutual fund board decisions.

Thus, consistent with the studies on fund performance measurement, we use the one-factor Capital Asset Pricing Model and Carhart's (1997) four-factor model:

$$R_{it} = \alpha_{it} + \beta_{1,it} \text{VWRF}_t + \varepsilon_{it} \quad (1)$$

$$R_{it} = \alpha_{it} + \beta_{1,it} \text{RMRF}_t + \beta_{2,it} \text{SMB}_t + \beta_{3,it} \text{HML}_t + \beta_{4,it} \text{PR1YR}_t + \beta_{it} \varepsilon_{it} \quad (2)$$

where R_{it} is the fund return in excess of the one-month Treasury bill return; VWRF is the excess return on the CRSP value-weighted index; RMRF is the value-weighted market return on all NYSE, AMEX, and NASDAQ stocks in excess of the risk-free rate (one-month Treasury bill); SMB, HML, and PR1YR are returns on value-weighted, zero-investment, factor-mimicking portfolios for size, book-to-market equity, and one-year momentum in stock returns. For the U.S. we use the factors constructed by Fama and French (1993).²

² The U.S. factors are drawn from French's website: <http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/>

For international funds, we use the value-weighted average of market excess returns for all countries in the region in which the fund invests. We follow Bekaert et al. (2009) and Ferreira et al. (2012) taking a region-based rather than country-based approach to risk adjustment. The fund investment region is based on the Lipper geographic criteria. We use four regions for our estimations (Europe, Asia-Pacific, North America, Emerging Markets), and the World for global funds. We calculate size, value, and momentum factors for each region. They are calculated as value-weighted averages of each factor for all countries in the region (See the appendix for a detailed explanation).

2. Objective-Adjusted Performance

The objective-adjusted return (OAR) of a fund is estimated as the annual holding period fund return in excess of the annual holding period return on the benchmark portfolio of other funds in the matched investment objective. Thus, the OAR measures fund performance compared to other managers in the peer group.

We use the objective-adjusted return to complement measures of abnormal fund performance estimated with multi-factor models. We incorporate the objective-adjusted performance measure as Morck, Shleifer, and Vishny (1989) explain that a firm benchmarks a manager's performance against other firms in the industry when they make their managerial replacement decisions. The specific objectives used in computing the objective-adjusted returns are listed in Table 1.

The advantage of estimating objective-adjusted returns is that it is not needed a long time series of returns to calculate abnormal performance. The disadvantage of this measure is that it does not adjust for risk, and there could be a large dispersion in risk levels in the same objective. Therefore, we could capture differences in risk instead of differences in performance. Thus, we also estimate abnormal returns using multi-factor models to account for this effect.

3. Fama-MacBeth Analysis

To provide a more comprehensive analysis in our regression analysis, we also use the cross-sectional time-series procedure developed by Fama-Macbeth (1973). As Coval

and Stafford (2007) find that the Fama-MacBeth coefficient estimates are more precise than pooled OLS estimates. We want to examine whether our pooled OLS results are statistically, and qualitatively similar to our Fama-MacBeth results.

We estimate the relation between mutual fund board actions and performance using the Fama-MacBeth two-step approach to account for cross correlation in returns: First, we regress returns against the explanatory variables in the cross section for each period and then take a time series average of the cross-sectional estimates.

B. Probit Regression Specification

To evaluate the relation between a mutual fund board action and fund performance, we define decisions as a dichotomous dependent variable in a probit regression. The dichotomous dependent variable equals one for the sample of funds affected by mutual fund board actions (funds that change managers, funds that change advisors, funds that liquidate or merge, or funds that reduce fees) and zero for the funds that are not affected by the board decisions.

Our probit regressions examine which return metrics and whether the lag structure of these metrics predicts mutual fund board actions. We estimate a series of probit models which allows us to identify the main determinants of mutual board decisions once the variables affecting mutual fund performance are allowed to simultaneously interplay.

The response probability of a mutual fund board action is modeled as a binary outcome Y (taking value 1 if action occurs, 0 otherwise), and then estimated conditional upon a set X of explanatory variables. We aim to single out the effects of explanatory variables within a more standard parametric setting. We use a probit model, where the action probability is assumed to depend upon the covariates X . The probit regression is computed as follows:

$$\text{Prob}(Y = 1 | X) = \Phi(X\beta) \tag{3}$$

Where $\Phi(\cdot)$ is the cumulative distribution function of a standard normal variable, with associated density $\phi(\cdot)$. Several variations of equation (3) are explored including different lags of returns.

C. Impact of Asset Flows on Fund Board Actions

We follow Khorana (2001) and examine the impact of asset flows on mutual fund board actions. We evaluate whether shareholders redirect money flows away from funds with negative performance in the pre-action period. As Khorana (2001) explains, this analysis is interesting for several reasons. It is very important for the investment advisor of a poorly performing fund to generate improvements in post-action performance, as the main source of income for the investment advisors is the advisory fee received for managing the fund. Furthermore, comparing the pre- and post-action relation between performance and asset flows for the overperforming sample shows evidence on market participants' beliefs about the fund's ability to exhibit performance persistence. In this sense, we examine whether investors redeem assets as a consequence of the departure of the superior manager.

Similar to Khorana (2001), we compute inflows net of returns (NETFLOWS), using the following approach:

$$\text{NETFLOW}_{i,t} = [\text{ASSETS}_{i,t} - \text{ASSETS}_{i,t-1} \times (1 + R_{i,t})] / \text{ASSETS}_{i,t-1}, \quad (4)$$

where $\text{ASSETS}_{i,t}$ represents the total assets in fund i at the end of year t , and $R_{i,t}$ is the return of fund i during year t . Using this formula, we aim to measure the growth in assets above the change in value of the fund's asset base at the beginning of the year. Thus, this measure is not affected by the returns generated by the portfolio manager during the year.

We examine the relation between net inflows to a fund and fund performance using the following model:

$$\text{NETFLOW}_{i,t} = f\{\text{Objective flows}_i; \text{Fund performance}_{i,t-1}; \text{Risk}_{i,t-1}; \\ \text{Expenses}_{i,t-1}; \text{Log(Assets)}_{i,t-1}; \text{Negative performance indicator variable}; \\ \text{Pre-action indicator variable}; \text{Interaction effects}\} \quad (5)$$

We use objective flows to control for the effect of flow variations in the different investment objectives. Performance is measured based on alphas from CAPM and Carhart models. We include lagged fund performance to capture the effect of fund returns on future inflows. Risk is estimated as the standard deviation of returns over 12-month period.

To examine the impact of positive vs. negative performance, we use a positive (negative) risk-adjusted performance variable with all the positive (negative) alpha values. Furthermore, we incorporate several variables to capture differences in the performance flow relation across the pre- and post-action period and across the samples of negative performance and positive performance managers. NPI is a negative performance indicator variable that equals one if the fund belongs to the negative performance group, and equals zero otherwise. PRE is the pre-action indicator variable that equals one for years -2,-1 and year zero (the action year), and equals zero otherwise. [NPI] x [PRE] is an interaction term to examine if the asset flow relation is different for underperforming funds in the pre-action period and whether asset flows change after the action from the mutual fund board.

V. Results

A. Performance and Fund Characteristics

We measure risk-adjusted fund performance with the CAPM, one of the most commonly used measures. Furthermore, we employ two additional multi-factor models: the Carhart four-factor model, and the Carhart model augmented with the Pastor and Stambaugh (2003) liquidity factor.

Panel A of Table 2 contains the basic regression models, it shows pooled OLS regressions of raw returns, objective-adjusted returns, and three different factor models

on manager and fund-level variables. We find a negative relationship between expenses and performance, and between fund age and performance. We find a positive relation between fund size and performance as well as for the fund's portfolio turnover and performance. We do not find a relation between performance and whether a fund is managed by a single manager or a team, we also find no significant relation between manager tenure and fund performance. The adjusted R^2 of the models show that about half of the variation in raw returns, objective-adjusted returns, and risk-adjusted returns can be explained by fund and manager characteristics. In Panels B, C, D, and E, we perform our regression analysis for different sub-periods, and our findings are virtually identical, our results persist.

In Table 3, we employ the Fama-MacBeth regression to contrast our analysis. We run a cross-sectional regression of fund returns averaged across all months of the year, on our manager and fund variables measured at the beginning of the year. We do the same every year, from 1970 until 2012. Our results confirm the previous findings using multi-factor models, performance shows a negative and significant relation with fund expenses and fund age, but a positive and significant relation with fund size and portfolio turnover. We also find that single manager dummy and manager tenure has no impact on performance.

B. Actions taken by mutual fund boards

In this section we explore the action taken by mutual fund boards when there is systematic poor performance, we define a poor performance when a fund presents a negative alpha for three consecutive years. Our motivation is to see whether boards are reacting to the unsatisfactory performance we have identified.

Panel A of Table 4 shows that 63% of funds present consistent negative alpha after 3 years in our sample period, ranging from 59% in the nineties to 63% in the seventies. Of these funds with negative performance: 13% change their advisors as a measure to improve performance, ranging from 7% to 17% in different sub-periods, 45% change their fund manager, ranging from 26% in the last decade to 63% in the seventies, 1.06% liquidate or merge the fund, ranging from 0.8% to 1.3% during our sample period, and 4% reduce fees, with a range from 3% to 8% in different sub-periods. Thus, adding up all

the percentage of funds that take action, we find that 63% of funds take some action to try to reverse their fund performance, and replacing the fund manager is the most common action taken to improve performance.

In Panel B of Table 4, we examine the performance of funds two and three years after each action. We find that 66% of funds still present negative performance two years after the manager has been replaced, and 68% of funds show negative performance three years afterwards. Thus, only 34% and 32% of funds that change their managers are able to achieve a positive performance two and three years after the decision. With respect to the other actions taken: we find that 66%, 69%, and 67% of funds still present negative performance after two years; and 69%, 73%, and 69% present negative performance after three years of their advisor replacement, fund merge and fee reduction, respectively. On average, 67% (70%) of funds still perform poorly two years (three years) later, irrespective of the action taken.

Thus, we can conclude that most mutual funds take some action to correct their poor performance, although the majority of funds still underperform two and three years after these actions in all cases.

C. Performance Changes surrounding Fund Board Actions

We examine the impact of the board actions on fund performance based on the changes in our performance measures during the period of three years before and after the decision. We report separate results for the positive and negative performance sample of funds. Table 5 presents changes in mean performance for every action across different years.

As expected, funds in the negative performance sample present a constant underperformance in the pre-action period. On the other side, positive performance funds show marginally positive annual performance in the pre-action period. We find similar results in all our models. Thus, consistently negative underperformance results in a mutual fund board action. Examining the post-action performance will help to determine whether the decisions taken are reflected on the fund returns. We are interested in the magnitude and direction of performance in the post-action period.

Our results indicate an increase in performance in the post-action period. The change in performance is robust across the different performance measures. Although the funds in the negative performance sample continue to present underperformance in the post-action period in all our measurement models. Funds in the positive performance sample experience a slight improvement in the post-action performance, with the exception of funds that replace the manager that show a small deterioration in the post-replacement performance. Thus, there is evidence of reversion in fund performance after board actions.

In conclusion, we can state that our findings contribute to the hypothesis that the internal market for corporate governance and control is efficient in correcting poorly performing funds. By taking actions, mutual fund boards are able to improve performance, although not to reach a positive abnormal performance.

D. Probit Regressions

Table 6 presents results of probit regressions of the probability of a fund action on past fund performance, and a set of fund and manager-related variables. In each regression, the dependent variable equals one for funds that take an action during a given year, and zero otherwise. Our aim is to examine how relevant is past performance when funds decide to take actions. We find that performance up to five years is statistically significant in determining fund actions, with negative coefficients for all previous years. The magnitude of these coefficients tends to be higher for performance intervals immediately preceding the action.

Results of the different regressions from Table 6 show that single manager dummy and portfolio turnover are not significant explanatory variables. We find a negative and statistically significant relation between manager tenure and previous fund performance. We also find a consistent negative and statistically significant relation between fund assets and fund actions, while evidence is mixed for other variables: expenses are a significant and negative determinant of the advisor replacement, and the reduction in fees; manager tenure is a significant and negative determinant of the manager replacement, fund liquidation or merge, and a reduction in fees; advisor tenure is a

significant and negative determinant of the manager replacement, fund liquidation or merge, and a reduction in fees; while fund age is a significant and positive determinant of the manager replacement, fund liquidation or merge, and a reduction in fees.

E. Relation between Asset Flows and Fund Board Action

We examine the relation between asset flows and fund actions using a multivariate regression approach in the spirit of Khorana (2001), we control for lagged fund returns, the risk level of the fund, fund size, expense ratio, and contemporaneous flows in the objective-adjusted performance. We distinguish differences in flows in the negative performance and positive performance samples and between pre- and post-action flows.

Using risk-adjusted returns from CAPM and Carhart models, we find that asset inflows to a fund are positively related to contemporaneous flows in the investment objective and to lagged fund performance. These results are reported in Table 6, our results are similar to Sirri and Tufano (1998) and Khorana (2001). We also find that higher previous expenses and higher past return volatility have a significantly negative effect on net asset flows. In addition, smaller funds attract larger net asset flows.

We show that overperforming funds receive more funds than the underperforming sample, we can appreciate that in the behavior of the coefficients for the positive and negative performance variables in models ii, iii, v and vi. Furthermore, we find that the interaction term $[NPI] \times [PRE]$ is negative and statistically significant, which means that underperforming funds in the pre-action period receive even lower asset inflows.

VI. Conclusion

Mutual fund boards have a clear mandate under federal securities law to monitor potential conflicts of interest, approve fund documents, protect the interests of fund shareholders and ensure that advisers provide satisfactory returns with reasonable fees. Given the many recent studies about the ineffectiveness of mutual fund board, we examine whether boards look for the shareholder interests. Our objective is to

understand whether actively equity funds that do not beat their benchmarks take any action, measured in a variety of ways, to correct poor performance.

Our results suggest that most mutual funds take actions to reverse their fund performance, up to 63%. Removing the fund manager is the most common action taken seeking to reverse performance. However, we do find that the majority of funds still perform poorly two and three years later. In particular, we find that 64% of funds present negative alphas two years after an action and 58% of funds underperform three years afterwards. In the case of replacing the fund managers, we show that 63% and 57% of funds still present negative performance two and three years after the manager has been replaced. In addition, we analyze the importance of measures of fund performance in conjunction with manager characteristics and find evidence that they are significantly related to future performance. Specifically, we find a relation between expenses, fund age, fund size, portfolio turnover and fund performance.

We show that post-action performance improves relative to the past performance of the fund. However, based on alphas from a four-factor Carhart model, these funds continue to underperform in the post-action period. We also document that the sample of overperforming funds in the pre-action period experience deterioration in the post-action performance. Thus, internal corporate monitoring is effective in reversing the performance of poorly performing funds, although the actions taken do not generate enough superior performance compared to standard performance benchmarks.

We examine the relation between prior performance and funds actions using probit regressions. We find a strong connection between fund action and prior underperformance, we document that risk-adjusted returns going back as far as five years are statistically significant determinants of fund actions. However, the most recent performance years prior to the fund action tends to have a greater impact on the underlying action probability. Finally, we show that the performance flow relation suggests that fund actions are preceded by lower asset flows, thus limiting the investment advisory fees charged by funds in the pre-action years. This also suggests that external markets can influence the fund action decision.

In summary, the majority of mutual funds take actions when a fund underperforms. Although performance improves, still negative performance persists after three years. Thus, mutual fund actions tend to be a value-enhancing activity for shareholders of the fund but cannot achieve a positive performance.

One important area for future research is to test whether funds that do not beat their benchmarks share directors on fund boards. Former SEC chairman Arthur Levitt points out: “Being on a mutual fund board is the most comfortable position in corporate America”. Investor advocates state that mutual funds allow too many directors to serve on too many boards. It's not uncommon for a board member to oversee 100 funds or more.

Appendix: Calculation of international factors of fund performance

We construct the benchmark factors for each country (except U.S.) using all stocks included in the Worldscope database. Our regions are Europe, Asia-Pacific, North America, Emerging Markets, and World. The market factor for each region is constructed using the value-weighted average return of all countries' market returns in the region. The market return for each country is constructed using the value-weighted average return in local currency of all stocks in each country.

We follow the methodology of Fama and French (1993) to create the size and book-to-market equity portfolios. For each country, we estimate the Fama-French factors using 6 value-weight portfolios formed on size and book-to-market. The SMB (Small Minus Big) factor is the average return on the three small portfolios minus the average return on the three big portfolios:

$$\text{SMB} = 1/3(\text{Small Value} + \text{Small Neutral} + \text{Small Growth}) - 1/3(\text{Big Value} + \text{Big Neutral} + \text{Big Growth})$$

The HML (High Minus Low) factor is the average return on the two value portfolios minus the average return on the two growth portfolios:

$$\text{HML} = 1/2(\text{Small Value} + \text{Big Value}) - 1/2(\text{Small Growth} + \text{Big Growth})$$

The investment region SMB and HML factors are the monthly value-weighted average of all countries' factors in the region. The size breakpoint is the median market capitalization of each country as of the end of June of year t . Half of the firms are classified as small market capitalization and the other half as big market capitalization. For the book-to-market equity classification, the breakpoints are the 30th and 70th percentiles of book-to-market equity in each country as of the fiscal year in $t - 1$. The bottom 30% is designated as the value portfolio, the middle 40% as neutral, and the highest 30% as growth

We calculate the Momentum factor (MOM) using six value-weight portfolios formed on size and prior (2-12) returns. The portfolios, which are formed monthly, are the

intersections of 2 portfolios formed on size (market equity, ME) and 3 portfolios formed on prior (2-12) return. The monthly size breakpoint is the median market equity in each country. The monthly prior (2-12) return breakpoints are the 30th and 70th percentiles in each country. The MOM factor is the monthly average return in local currency on the two high-prior return portfolios minus the monthly average return on the two low-prior return portfolios:

$$\text{MOM} = 1/2(\text{Small High} + \text{Big High}) - 1/2(\text{Small Low} + \text{Big Low})$$

The investment region MOM factor is the monthly value-weighted average of all countries' factors in the region.

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Table 1: Descriptive statistics for the entire database of mutual funds

Descriptive statistics on fund-specific characteristics for the whole database of mutual funds in existence from January 1970 to December 2012. Funds are classified by investment objective. Panel A includes variables describing the fund management characteristics, mean figures are reported.

Panel A: Fund management characteristics				
Investment objective	Sample size	Portfolio Turnover ^a	Expense Ratio ^b	Total Assets ^c
Utility funds	210	75.24	0.85	235.18
Telecommunication funds	73	215.75	1.28	310.34
Specialty/Miscellaneous funds	248	45.2	0.78	101.51
Small-Cap Funds	2621	31.39	0.85	288.71
Balanced funds	4830	78.45	1.22	538.92
Balanced target maturity funds	282	100.23	0.73	53.81
Convertible securities funds	508	47.56	0.95	173.80
Diversified leverage jobs	95	87.44	1.21	88.29
Flexible portfolio funds	2907	49.48	1.28	333.76
Global small-cap funds	387	62.67	1.14	494.71
Science and technology funds	523	159.66	1.02	238.95
Real estate funds	460	52.75	1.59	237.18
Precious metals funds	25	28.78	0.98	988.32
Pacific region funds	97	29.52	1.01	252.95
Pacific ex-Japan funds	137	32.18	0.92	279.95
Natural resources funds	197	41.22	0.72	333.45
Mid-cap funds	1851	58.77	1.10	355.85
Micro-caps funds	152	23.33	1.35	289.81
Long/short equity funds	151	38.51	0.97	202.97
Latin American funds	70	31.21	1.04	435.62
Japanese funds	96	193.71	1.08	245.03
International small-cap funds	217	65.36	1.45	294.54
International real estate funds	33	80	0.94	151.64
International funds	2162	34.96	0.98	581.72
Industrial funds	30	60.35	0.85	251.77
India region funds	5	50.6	0.82	285.68
Health/Biotechnology funds	305	44.74	0.76	318.55
Growth funds	5143	60.66	0.78	547.13
Growth and Income	3247	62.07	0.85	723.70
Gold oriented funds	89	97.34	0.82	344.72
Global small-cap funds	103	46.59	0.89	345.33
Global science/technology funds	40	164.93	1.15	118.78
Global real estate funds	59	113.39	0.74	201.64
Global natural resources funds	77	69.61	0.87	604.02
Global health/biotechnology funds	27	69.5	0.83	671.28
Global funds	924	83.3	0.87	614.38
Global flexible port funds	871	64.34	0.8	646.67
Global financial services funds	23	45.86	0.77	131.96
Financial services funds	215	87.34	0.79	181.41
European region funds	269	72.3	0.92	265.80
Equity market neutral funds	62	87.7	1.3	305.74
Equity leverage funds	23	156.5	1.1	68.07
Equity income funds	607	83.7	0.97	618.70
Emerging market funds	587	122.3	1.13	547.40
Dedicated short bias funds	138	81.73	1.15	118.38
Consumer services funds	24	163.03	1.16	4230.10
Consumer goods funds	20	109.9	1.23	320.45
Commodities funds	76	108.21	0.45	1800.23
China region fund	100	130.1	0.95	261.29
Capital appreciation	756	66.34	1.08	520.22
Income funds	676	50.11	0.73	756.72
Canadian funds	6	122.22	1.01	45.67
Basic materials funds	20	90.98	1.34	287.39
Other funds	5305	97.87	1.07	486.78

Panel B includes summary statistics for all of the variables used in the analysis presented. Fund age is the number of years since the fund was created. Team size is the number of managers who are managing the fund. Net monthly returns present the average monthly fund return, net of expenses, over the entire period of study. Net monthly returns, prior 12 months presents the average monthly fund return over the past 12 months. Manager tenure is the number of years that the manager has been managing the fund. Advisor tenure is the number of years that the advisor has been managing the fund. Manager left is a dummy variable which equals one if the manager has left the fund at the end of the month and zero otherwise. Manager left/fund survived is a dummy variable which equals one if the manager left the fund but the fund did not close and zero otherwise. Management fee is average annual fee paid to the fund's investment adviser. 12b-1 fee is the annual charge that is used to pay for marketing and distribution costs.

Panel B: Summary Statistics of fund variables

Variable	Mean	Median	Std. Dev.
Fund age (years)	10.10	6.34	9.74
Team size	2.12	1.85	1.58
Net monthly returns	0.49%	0.44%	1.10%
Net monthly returns, prior 12 months	1.02%	1.00%	3.20%
Manager tenure	4.1	3.6	4.6
Advisor tenure	5.3	5.1	5.7
Manager left (monthly)	2.14%	0%	15%
Manager left/fund survived (monthly)	1.95%	0%	13.80%
Management fee	0.63%	0.52%	1.06%
12b-1 Fee	0.01%	0.01%	0.02%

^aThe portfolio turnover ratio measures the fund's trading activity as a percentage of the fund. It is measured as the minimum (of aggregated sales or aggregated purchases of securities), divided by the average 12-month Total Net Assets of the fund.

^bRatio of total investment that shareholders pay for the fund's operating expenses, management fees, and 12B-1 fees, excluding sales charges. It is measured over the most recently completed fiscal year.

^cTotal assets is the market value of assets held by all funds in the fund category at the start of the month.

Table 2: Fund performance regressions on fund characteristics

This table reports pooled OLS regression of fund performance on fund characteristics. Performance is measured based on the annual raw returns net of fees, annual objective-adjusted return (relative to all funds in the matched investment objective), annualized regression intercepts of the CAPM model, the Carhart four-factor model, and the Pastor and Stambaugh (2003) liquidity factor added to the Carhart model. Panels B, C, D and E use the same regressions specifications for the sub-periods 1970-1979, 1980-1989, 1990-1999, and 2000-2012 respectively. Single manager dummy is equal to one in the fund is managed by one manager and zero otherwise. The other variables are defined in Table 1. Heteroskedasticity-robust p-values, allowing for clustering by fund, are reported in parenthesis. Joint significance of the fund variables is examined with an F-test. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Full Period

Fund variables	Raw return	Objective- adjusted return	CAPM	Carhart	Carhart + P/S Liq.
Constant	-0.038*** (0.00)	-0.041*** (0.00)	-0.299*** (0.00)	-0.294*** (0.00)	-0.296*** (0.00)
Single manager dummy	-0.003 (0.37)	-0.004 (0.39)	0.009 (0.40)	-0.056 (0.41)	-0.059 (0.40)
Expenses	3.084 (0.34)	-2.007*** (0.00)	-1.214*** (0.00)	-1.019*** (0.00)	-1.138*** (0.00)
Manager's tenure	0.008 (0.29)	-1.046 (0.26)	0.474 (0.24)	0.459 (1.10)	0.460 (0.54)
Log (Portfolio turnover)	0.224*** (0.00)	0.274*** (0.00)	0.006*** (0.00)	0.001*** (0.00)	0.013*** (0.00)
Log (Fund assets)	1.122*** (0.00)	0.123*** (0.00)	0.763*** (0.00)	0.072*** (0.00)	1.077*** (0.00)
Log (Fund age)	-0.063*** (0.00)	-0.087*** (0.00)	-1.470*** (0.00)	-1.464*** (0.00)	-0.465*** (0.00)
Observations	96440	96440	96254	96251	96245
Adjusted R2	0.56	0.43	0.54	0.65	0.64
F test	54.17	61.24	57.00	55.20	56.16
Prob > F	0.00	0.00	0.00	0.00	0.00

Panel B: Sub-period 1970-1979

Fund variables	Raw return	Objective- adjusted return	CAPM	Carhart	Carhart + P/S Liq.
Constant	-0.094*** (0.00)	-0.008*** (0.00)	-0.094*** (0.00)	-0.098*** (0.00)	-0.091*** (0.00)
Single manager dummy	-0.033 (0.11)	-0.012 (0.77)	-0.356 (0.77)	-0.364 (0.12)	-0.362 (0.26)
Expenses	0.138 (0.34)	-0.761*** (0.00)	-0.133*** (0.00)	-2.138*** (0.00)	-1.127*** (0.00)
Manager's tenure	0.083 (0.11)	0.093 (1.41)	0.836 (1.64)	0.873 (0.34)	-0.836 (0.11)
Log (Portfolio turnover)	0.346*** (0.00)	0.860*** (0.00)	0.346*** (0.00)	0.137*** (0.00)	0.347*** (0.00)
Log (Fund assets)	0.334*** (0.00)	0.027*** (0.00)	1.033*** (0.00)	0.032*** (0.00)	1.321*** (0.00)
Log (Fund age)	-0.213*** (0.00)	-0.311*** (0.00)	-1.213*** (0.00)	-1.214*** (0.00)	-1.124*** (0.00)
Observations	23999	23948	23789	23740	23580
Adjusted R2	0.46	0.44	0.52	0.75	0.79
F test	44.06	51.21	51.08	55.20	57.16
Prob > F	0.00	0.00	0.00	0.00	0.00

Panel C: Sub-period 1980-1989

Fund variables	Raw return	Objective- adjusted return	CAPM	Carhart	Carhart + P/S Liq.
Constant	-0.023*** (0.00)	-0.005*** (0.00)	-0.006*** (0.00)	-0.016*** (0.00)	-0.008*** (0.00)
Single manager dummy	-0.002 (0.23)	-0.003** (0.04)	0.001 (0.12)	-0.002 (0.34)	-0.007 (0.56)
Expenses	-0.846*** (0.00)	-0.003 (0.43)	-2.002*** (0.00)	-1.810*** (0.00)	-0.901*** (0.00)
Manager's tenure	0.001* (0.07)	0.231 (1.20)	1.203 (0.23)	1.023 (0.32)	0.085 (0.42)
Log (Portfolio turnover)	0.032** (0.03)	0.805*** (0.00)	0.027*** (0.00)	0.218*** (0.00)	0.311*** (0.00)
Log (Fund assets)	1.082*** (0.00)	0.001*** (0.00)	1.092*** (0.00)	1.202*** (0.00)	0.782*** (0.00)
Log (Fund age)	-0.342*** (0.00)	-1.095*** (0.00)	-1.302** (0.00)	-1.045** (0.00)	-1.502*** (0.00)
Observations	22340	22999	22150	22339	22559
Adjusted R2	0.49	0.40	0.62	0.43	0.50
F test	41.00	47.99	38.77	41.30	48.16
Prob > F	0.00	0.00	0.00	0.00	0.00

Panel D: Sub-period 1990-1999

Fund variables	Raw return	Objective- adjusted return	CAPM	Carhart	Carhart + P/S Liq.
Constant	0.013*** (0.00)	0.021*** (0.00)	0.014*** (0.00)	0.002*** (0.00)	0.010*** (0.00)
Single manager dummy	-0.003 (0.23)	-0.006 (0.42)	-0.002 (0.15)	-0.003 (0.34)	-0.003 (0.15)
Expenses	-0.144*** (0.00)	-1.220*** (0.00)	-0.001 (0.42)	-2.153*** (0.00)	-1.008*** (0.00)
Manager's tenure	0.081 (0.39)	0.341 (0.63)	1.003 (0.18)	1.008 (0.15)	1.201 (1.16)
Log (Portfolio turnover)	0.131*** (0.00)	0.241*** (0.00)	0.241** (0.03)	0.323*** (0.00)	0.183*** (0.00)
Log (Fund assets)	1.203*** (0.00)	0.872*** (0.00)	0.771** (0.03)	0.243*** (0.00)	0.995*** (0.00)
Log (Fund age)	-0.505*** (0.00)	-1.337*** (0.00)	-1.002*** (0.00)	-1.055*** (0.00)	-0.737*** (0.00)
Observations	24872	24799	24966	24999	24799
Adjusted R2	0.74	0.43	0.58	0.54	0.70
F test	167.34	42.03	43.77	78.10	66.33
Prob > F	0.00	0.00	0.00	0.00	0.00

Panel E: Sub-period 2000-2012

Fund variables	Raw return	Objective- adjusted return	CAPM	Carhart	Carhart + P/S Liq.
Constant	-0.012*** (0.00)	-0.056*** (0.00)	-0.007*** (0.00)	-0.038*** (0.00)	-0.014*** (0.00)
Single manager dummy	-0.002 (0.17)	-0.013 (0.25)	-0.002 (0.18)	-0.002 (0.34)	-0.005 (0.18)
Expenses	-0.141*** (0.00)	0.027 (0.21)	-2.141*** (0.00)	-1.108*** (0.00)	-1.054*** (0.00)
Manager's tenure	0.097 (0.18)	0.074 (0.27)	0.124 (0.68)	0.197 (0.39)	0.218 (0.11)
Log (Portfolio turnover)	0.132** (0.02)	0.745*** (0.00)	0.072*** (0.00)	0.114*** (0.00)	0.815*** (0.00)
Log (Fund assets)	1.205*** (0.00)	1.017*** (0.00)	0.509*** (0.00)	1.305*** (0.00)	0.063*** (0.00)
Log (Fund age)	-0.023*** (0.00)	-0.323*** (0.00)	-0.016*** (0.00)	-1.303*** (0.00)	-1.014*** (0.00)
Observations	26999	26907	26910	26974	26988
Adjusted R2	0.65	0.62	0.63	0.66	0.63
F test	110.13	76.67	57.00	74.10	87.88
Prob > F	0.00	0.00	0.00	0.00	0.00

Table 3: Fama-MacBeth regressions on fund characteristics

This table presents time-series average regression coefficients from cross-sectional regressions of annual fund performance on fund characteristics. Performance is measured as explained in Table 2. Variables are defined in Table 1 and 2. For each variable, the first row presents the time-series average of annual coefficient estimates and the second row presents the time-series p-values. The time-series average sample size (Avg. Observations) are also reported as well as the time-series average adjusted R² of the cross-sectional regressions. Heteroskedasticity-robust p-values, allowing for clustering by fund, are reported in parenthesis. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Fund variables	Raw return	Objective- adjusted return	CAPM	Carhart	Carhart + P/S Liq.
Constant	-0.754*** (0.00)	-1.547*** (0.00)	-0.785** (0.04)	-0.578*** (0.00)	-0.876*** (0.00)
Single manager dummy	-0.888 (0.89)	0.978 (1.88)	1.224 (1.78)	-1.889 (0.74)	-1.567 (1.07)
Expenses	-0.033* (0.07)	-0.054** (0.00)	-2.478*** (0.00)	-2.778** (0.00)	-2.554*** (0.00)
Manager's tenure	-0.005* (0.07)	0.017 (0.87)	-0.023 (0.77)	1.875 (1.77)	2.485 (0.68)
Log (Portfolio turnover)	2.365*** (0.00)	1.889*** (0.00)	1.334** (0.03)	2.578*** (0.00)	2.447** (0.03)
Log (Fund assets)	3.008*** (0.00)	0.889** (0.04)	2.447*** (0.00)	1.776*** (0.00)	3.557** (0.03)
Log (Fund age)	-3.454*** (0.00)	0.004 (0.12)	-2.554*** (0.00)	-1.875*** (0.00)	-1.879*** (0.00)
Avg. Observations	22078	22078	21845	21830	21830
Avg. Adjusted R2	0.47	0.53	0.48	0.60	0.51

Table 4: Actions taken by mutual fund boards

This table reports the percentage of funds with negative annual alpha estimates in three consecutive years. Results are presented for the entire sample period as well as for several sub-periods. Panel A presents the different actions taken by fund boards for the funds performing below the benchmark. Possible actions taken by fund boards include: change advisors, change fund managers, liquidate or merge the fund, or reduce the fees. Panel B shows the percentage of funds with persistent negative alpha 2 and 3 years after the replacement of the fund manager.

Panel A: Actions taken by mutual fund boards

Event	full period	70-79	80-89	90-99	00-12
% funds with negative alpha	63%	63%	62%	59%	61%
% funds change fund managers	45%	63%	60%	46%	26%
% funds change advisors	13%	17%	14%	15%	7%
% funds liquidate or merge	1,06%	1,10%	1,30%	0,85%	0,80%
% funds reduce fees	4%	4%	8%	4%	3%

Panel B: Funds with persistence negative performance

Event	full period	70-79	80-89	90-99	00-12
<u>% funds with persistent negative alpha:</u>					
2 years after replacement manager	66%	67%	63%	64%	64%
3 years after replacement manager	68%	69%	65%	68%	68%
2 years after replacement advisor	66%	65%	65%	65%	63%
3 years after replacement advisor	69%	66%	69%	66%	66%
2 years after merge	69%	69%	69%	68%	70%
3 years after merge	73%	73%	72%	70%	72%
2 years after fee reduction	67%	65%	70%	64%	65%
3 years after fee reduction	69%	68%	71%	67%	68%

Figure 1: Probability of a fund action

This figure shows the average probability that a mutual fund takes actions (change the fund manager, change the fund advisor, liquidate or merge the fund, or reduce the fees) when a fund performs below the benchmark.

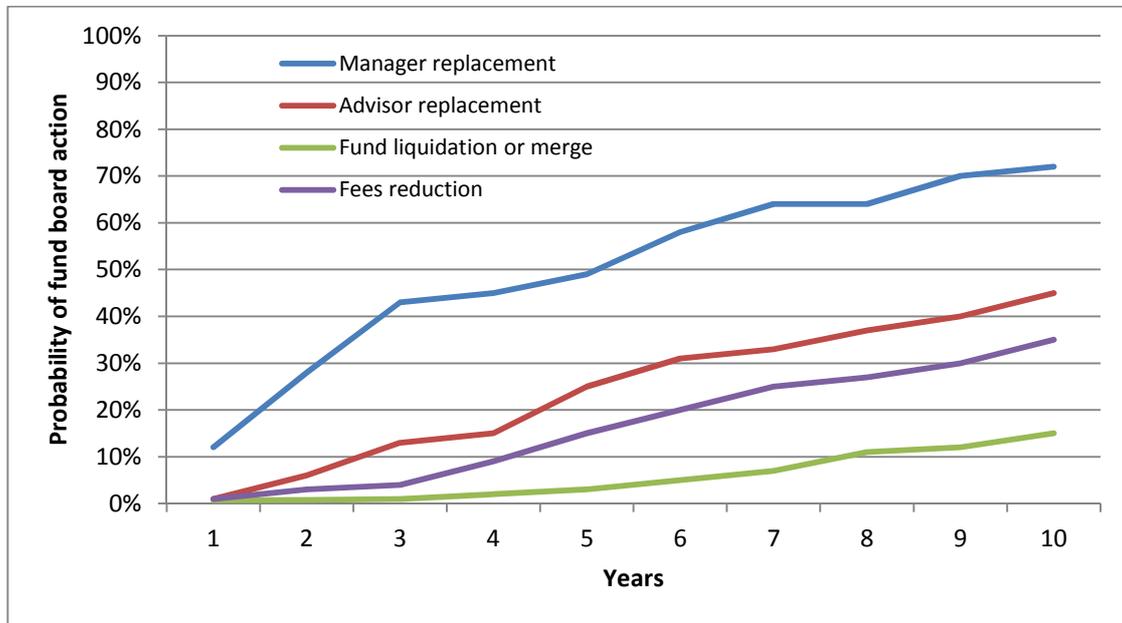


Table 5: Performance measures surrounding mutual fund board actions

This table presents the mean pre- and post-replacement performance of the sample of mutual funds affected by the actions taken by their mutual fund boards between January 1970 and December 2012. Performance is measured as explained in Table 2. Year 0 refers to the managerial replacement year. The NP (negative performance) and PP (positive performance) samples include funds with negative (positive) objective-adjusted performance in the 36-month period preceding the mutual fund board action. Panel A reports the actual values of the variables in each year surrounding the fund manager replacement. Panel B reports the actual values of the variables in each year surrounding the advisor company replacement. Panel C reports the actual values of the variables in each year surrounding the fund merge. Panel D reports the actual values of the variables in each year surrounding the reduction in fees.

Panel A: Performance measures surrounding manager replacement

		Years with respect to manager replacement						
		-3	-2	-1	0	+1	+2	+3
Raw return	NP	-0.021	-0.035	-0.047	-0.054	-0.051	-0.012	-0.007
	PP	0.028	0.043	0.025	-0.007	0.018	0.023	0.019
Objective-adjusted return	NP	-0.024	-0.029	-0.075	-0.089	-0.008	-0.005	-0.002
	PP	0.053	0.041	0.042	0.032	0.027	0.038	0.025
CAPM alpha (in%)	NP	-0.206	-0.224	-0.291	-0.294	-0.251	-0.087	-0.009
	PP	0.121	0.165	0.197	0.103	0.085	0.011	0.022
Carhart alpha (in%)	NP	-0.189	-0.248	-0.204	-0.251	-0.211	-0.021	-0.004
	PP	-0.065	0.222	0.189	0.145	0.152	-0.012	-0.025
Carhart + P/S Liq. alpha (in%)	NP	-0.174	-0.241	-0.235	-0.288	-0.241	-0.145	-0.05
	PP	-0.054	0.142	0.191	0.013	0.081	0.007	0.011
Sample size	NP	7987	7710	7867	7910	7785	7520	7762
	PP	5690	5605	5680	5770	5810	5840	5790

Panel B: Performance measures surrounding advisor replacement

		Years with respect to advisor replacement						
		-3	-2	-1	0	+1	+2	+3
Raw return	NP	-0.038	-0.095	-0.114	-0.125	-0.078	-0.046	-0.017
	PP	0.065	0.054	0.078	-0.089	0.088	0.075	0.039
Objective-adjusted return	NP	-0.077	-0.124	-0.098	-0.1129	-0.054	-0.044	-0.014
	PP	0.015	0.075	0.023	0.007	0.145	0.189	0.124
CAPM alpha (in%)	NP	-0.195	-0.211	-0.255	-0.334	-0.101	-0.042	-0.034
	PP	0.112	0.085	0.042	0.014	0.122	0.041	0.075
Carhart alpha (in%)	NP	-0.119	-0.113	-0.302	-0.332	-0.121	-0.084	-0.007
	PP	-0.065	0.222	0.024	0.005	0.152	0.012	0.025
Carhart + P/S Liq. alpha (in%)	NP	-0.196	-0.177	-0.201	-0.178	-0.123	-0.045	-0.005
	PP	-0.023	0.019	0.018	0.021	0.045	0.057	0.162
Sample size	NP	2281	2154	2275	2279	2198	2185	2190
	PP	1420	1367	1386	1455	1430	1419	1384

Panel C: Performance measures surrounding fund merge

		Years with respect to fund merge						
		-3	-2	-1	0	+1	+2	+3
Raw return	NP	-0.149	-0.089	-0.117	-0.178	-0.097	-0.043	-0.017
	PP	-0.013	-0.012	0.023	-0.014	0.018	0.023	0.019
Objective-adjusted return	NP	-0.007	-0.078	-0.142	-0.134	-0.071	-0.017	-0.014
	PP	0.084	0.034	0.019	0.008	0.054	0.019	-0.007
CAPM alpha (in%)	NP	-0.024	-0.117	-0.247	-0.332	-0.145	-0.057	-0.008
	PP	0.123	0.047	0.004	0.012	0.069	-0.008	-0.013
Carhart alpha (in%)	NP	-0.045	-0.114	-0.176	-0.126	-0.087	-0.072	-0.012
	PP	-0.023	0.055	0.174	0.007	0.123	0.034	-0.022
Carhart + P/S Liq. alpha (in%)	NP	-0.056	-0.187	-0.114	-0.067	-0.045	-0.032	0.009
	PP	-0.023	0.089	0.005	0.018	0.089	0.145	0.243
Sample size	NP	348	347	352	340	322	298	334
	PP	215	227	208	218	233	220	219

Panel D: Performance measures surrounding fees reduction

		Years with respect to fees reduction						
		-3	-2	-1	0	+1	+2	+3
Raw return	NP	-0.014	-0.028	-0.029	-0.034	-0.031	-0.023	-0.012
	PP	0.037	0.045	0.017	-0.014	0.022	0.213	0.128
Objective-adjusted return	NP	-0.018	-0.019	-0.055	-0.034	-0.014	-0.019	-0.007
	PP	0.039	0.029	0.038	0.028	0.021	0.056	0.118
CAPM alpha (in%)	NP	-0.023	-0.090	-0.087	-0.134	-0.077	-0.021	-0.011
	PP	0.087	0.154	0.122	0.076	0.062	0.123	0.155
Carhart alpha (in%)	NP	-0.066	-0.055	-0.074	-0.113	-0.076	-0.057	-0.017
	PP	-0.067	0.201	0.154	0.087	0.124	1.009	1.834
Carhart + P/S Liq. alpha (in%)	NP	-0.012	-0.034	-0.137	-0.123	-0.067	-0.009	-0.014
	PP	-0.033	0.137	0.089	0.037	0.036	0.144	0.138
Sample size	NP	710	689	744	708	690	675	681
	PP	430	477	459	453	441	410	427

Table 6: Probit regressions of mutual fund board actions

The table presents estimated coefficients from probit regressions of the different variables referring to decisions taken by mutual fund boards. Past performance is measured using lagged average monthly Carhart-adjusted returns. All other variables are defined in Table 1. Each specification includes time dummies for each month. The dependent variable in Panel A, *funds that change managers*, is a dummy variable which equals one if the manager left the fund (and the fund continued operating) in that month, and zero otherwise. The dependent variable in Panel B, *funds that change advisors*, is a dummy variable which equals one if the advisor left the fund (and the fund continued operating) in that month, and zero otherwise. The dependent variable in Panel C, *funds that liquidate or merge*, is a dummy variable which equals one if the fund is liquidated or merged in that month, and zero otherwise. The dependent variable in Panel D, *funds that reduce fees*, is a dummy variable which equals one if the fund reduces its fees (and the fund continued operating) in that month, and zero otherwise. Heteroskedasticity-robust p-values, allowing for clustering by date, are reported in brackets. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: Probit regressions of manager replacement on lagged returns

Prior returns and manager replacement					
Y = funds that change managers					
Predictor Variables	Probit (1)	Probit (2)	Probit (3)	Probit (4)	Probit (5)
Carhart ret., prior 12mths	-0.015*** (0.00)	-0.022*** (0.00)	-0.029*** (0.00)	-0.234*** (0.00)	-0.045*** (0.00)
Carhart ret., prior 13to24		-0.014** (0.03)	-0.027*** (0.00)	-0.123*** (0.00)	-0.119*** (0.00)
Carhart ret., prior 25to36			-0.014*** (0.00)	-0.034** (0.02)	-0.114** (0.04)
Carhart ret., prior 37to48				-0.015*** (0.00)	-0.040* (0.07)
Carhart ret., prior 49to60					-0.050** (0.03)
Single manager dummy	0.320 (0.34)	-0.100* (0.07)	-0.010 (0.12)	-0.039 (0.22)	-0.037 (0.15)
Expenses	-0.030 (0.14)	-0.138 (0.58)	-0.137 (0.15)	-0.123 (0.33)	-0.144* (0.08)
Manager's tenure	-0.060*** (0.00)	-0.005** (0.03)	-0.009*** (0.00)	-0.005*** (0.00)	-0.034*** (0.00)
Advisor's tenure	-0.054*** (0.00)	-0.018*** (0.00)	-0.023** (0.04)	-0.144** (0.04)	-0.155*** (0.00)
Log (Portfolio turnover)	-0.001 (0.20)	-0.003 (0.35)	-0.018* (0.08)	-0.080 (0.13)	-0.033 (0.11)
Log (Fund assets)	-0.023*** (0.00)	-0.030*** (0.00)	-0.050*** (0.00)	-0.081*** (0.00)	-0.132** (0.03)
Log (Fund age)	0.003*** (0.00)	0.381*** (0.00)	0.030** (0.03)	0.039** (0.04)	0.038*** (0.00)
Observations	43210	42820	42010	41630	40030
Minimum Mgr/Advisor tenure	1 year	2 year	3 year	4 year	5 year

Panel B: Probit regressions of advisor replacement on lagged returns

Prior returns and advisor replacement					
Y = funds that change advisors					
Predictor Variables	Probit (1)	Probit (2)	Probit (3)	Probit (4)	Probit (5)
Carhart ret., prior 12mths	-3.427*** (0.00)	-1.128*** (0.00)	-4.027*** (0.00)	-2.015*** (0.00)	-3.145*** (0.00)
Carhart ret., prior 13to24		-0.803*** (0.00)	-0.842*** (0.00)	-1.103*** (0.00)	-1.244*** (0.00)
Carhart ret., prior 25to36			-0.534 (0.13)	-0.944*** (0.00)	-0.734* (0.06)
Carhart ret., prior 37to48				-0.716* (0.08)	-0.626 (0.34)
Carhart ret., prior 49to60					-0.416** (0.03)
Single manager dummy	0.007 (0.15)	0.019 (0.22)	0.008 (0.34)	0.044 (0.33)	0.057 (0.57)
Expenses	0.027* (0.06)	-0.578* (0.08)	-0.589** (0.003)	-0.586*** (0.00)	-0.667*** (0.00)
Manager's tenure	-0.002 (0.33)	0.001 (0.59)	0.045 (0.39)	0.138* (0.07)	0.144* (0.05)
Advisor's tenure	-0,077 (0.44)	-0,02 (0.23)	0.172* (0.08)	-0,153 (0.26)	-0,138 (0.49)
Log (Portfolio turnover)	0.002 (0.14)	0.014 (0.32)	0.020* (0.09)	0.028 (0.15)	0.227 (0.36)
Log (Fund assets)	-0.005*** (0.00)	-0.019** (0.03)	-0.052*** (0.00)	-0.044*** (0.00)	-0.006*** (0.00)
Log (Fund age)	0.040 (0.22)	-0.030 (0.45)	0.041 (0.23)	0.034 (0.28)	0.006 (0.49)
Observations	12420	11980	11220	10430	10123
Minimum Mgr/Advisor tenure	1 year	2 year	3 year	4 year	5 year

Panel C: Probit regressions of funds liquidated or merged on lagged returns

Prior returns and funds liquidation or merge					
Y = funds that liquidate or merge					
Predictor Variables	Probit (1)	Probit (2)	Probit (3)	Probit (4)	Probit (5)
Carhart ret., prior 12mths	-0.007*** (0.00)	-0.085*** (0.00)	-0.145*** (0.00)	-0.171*** (0.00)	-0.169*** (0.00)
Carhart ret., prior 13to24		-0.001*** (0.00)	-0.018** (0.03)	-0.067*** (0.00)	-0.064* (0.08)
Carhart ret., prior 25to36			-0.024*** (0.00)	-0.052*** (0.00)	-0.052** (0.04)
Carhart ret., prior 37to48				-0.019* (0.07)	-0.044** (0.03)
Carhart ret., prior 49to60					-0.042** (0.04)
Single manager dummy	-0.003* (0.05)	-0.062 (0.54)	-0.041 (0.24)	-0.057 (0.14)	-0.085* (0.07)
Expenses	-0.061 (0.54)	-0.010 (0.23)	-0.063 (0.18)	-0.088 (0.24)	-0.067* (0.07)
Manager's tenure	-0.178*** (0.00)	-0.082** (0.03)	-0.144*** (0.00)	-0.134*** (0.00)	-0.178** (0.03)
Advisor's tenure	-0.003*** (0.00)	-0.045*** (0.00)	-0.130*** (0.00)	-0.030*** (0.00)	-0.244*** (0.00)
Log (Portfolio turnover)	-0.020 (0.54)	-0.034 (0.58)	-0.024 (0.33)	-0.029 (0.59)	-0.147 (0.65)
Log (Fund assets)	-0.012*** (0.00)	-0.045** (0.04)	-0.058*** (0.00)	-0.012** (0.03)	-0.014*** (0.00)
Log (Fund age)	0.058*** (0.00)	0.089*** (0.00)	0.068*** (0.00)	0.245*** (0.00)	0.058*** (0.00)
Observations	1150	980	875	850	835
Minimum Mgr/Advisor tenure	1 year	2 year	3 year	4 year	5 year

Panel D: Probit regressions of funds that reduce fees on lagged returns

Prior returns and reduction in fees					
Y = funds that reduce fees					
Predictor Variables	Probit (1)	Probit (2)	Probit (3)	Probit (4)	Probit (5)
Carhart ret., prior 12mths	-0.447*** (0.00)	-0.449*** (0.00)	-0.449*** (0.00)	-0.393*** (0.00)	-0.596*** (0.00)
Carhart ret., prior 13to24		-0.261** (0.06)	-0.362** (0.03)	-0.144* (0.07)	-0.444** (0.06)
Carhart ret., prior 25to36			-0.023*** (0.00)	-0.116*** (0.00)	-0.145 (0.48)
Carhart ret., prior 37to48				-0.077** (0.06)	-0.071*** (0.00)
Carhart ret., prior 49to60					-0.083** (0.03)
Single manager dummy	0.169* (0.07)	0.227 (0.12)	0.171 (0.23)	0.098 (0.14)	0.174 (0.22)
Expenses	-0.745*** (0.00)	-0.445*** (0.00)	-0.542*** (0.00)	-0.557*** (0.00)	-0.487*** (0.00)
Manager's tenure	-0.466*** (0.00)	-0.311*** (0.00)	-0.135*** (0.00)	-0.148*** (0.00)	-0.136*** (0.00)
Advisor's tenure	-0.144*** (0.00)	-0.224*** (0.00)	-0.138** (0.07)	-0.148*** (0.00)	-0.248*** (0.00)
Log (Portfolio turnover)	0.229* (0.06)	0.233 (0.12)	0.331 (0.33)	0.235 (0.44)	0.246 (0.14)
Log (Fund assets)	-0.030*** (0.00)	-0.029** (0.02)	-0.027*** (0.00)	-0.034*** (0.00)	-0.029*** (0.00)
Log (Fund age)	0.028*** (0.00)	0.251*** (0.00)	0.025*** (0.00)	0.046*** (0.00)	0.126*** (0.00)
Observations	3845	3642	3540	2980	2790
Minimum Mgr/Advisor tenure	1 year	2 year	3 year	4 year	5 year

Table 7: Flow regressions

This table presents the results of cross-sectional time-series multivariate OLS regressions of the net annual inflows into a fund on several variables: objective flows, volatility of the fund's returns, fund expenses, size of the fund, fund performance, indicator variable to distinguish between pre- and post-action years. Objective flow is the average asset inflow in the objective-adjusted performance. The positive (negative) risk-adjusted performance variable is estimated by retaining all positive (negative) performance values and setting the negative (positive) values to zero. We estimate this variable using the CAPM α for models ii and iii and the Carhart α for models V and Vi. Standard deviation measures the fund's volatility and is constructed as the standard deviation of 12-monthly returns. Expenses and Asset variables are defined in Table 1. NPI is a variable that equals one if the fund presented a negative objective-adjusted return in the 36-months preceding managerial replacement, and zero if the fund presented a positive objective-adjusted return. PRE is a variable that equals one for years -2, -1, and zero (the mutual fund board action year), and zero otherwise. ***, **, and * indicate significance at the 1%, 5%, and 10% level, respectively. P-values are reported in parenthesis. Panel A reports results for funds that change the manager. Panel B reports results for funds that change the advisor. Panel C reports results for funds that liquidate or merge. And Panel D report results for funds that reduce the fees.

Panel A: Flow regressions on manager replacement

Explanatory Variables	Model i	Model ii	Model iii	Model iv	Model v	Model vi	Model vii
Constant	0.756*** (0.00)	0.745*** (0.00)	0.736*** (0.00)	0.734*** (0.00)	0.731*** (0.00)	0.681*** (0.00)	0.771*** (0.00)
Objective flow _t	0.447*** (0.00)	0.478** (0.02)	0.477*** (0.00)	0.574*** (0.00)	0.448*** (0.00)	0.479*** (0.00)	0.457*** (0.00)
Standard deviation _{t-1}	-0.099*** (0.00)	-0.101*** (0.00)	-0.095*** (0.00)	-0.088*** (0.00)	-0.092** (0.03)	-0.102*** (0.00)	-0.089** (0.01)
Expenses _{t-1}	-0.074*** (0.00)	-0.079** (0.00)	-0.080*** (0.00)	-0.075** (0.00)	-0.079*** (0.00)	-0.078** (0.02)	-0.085*** (0.00)
Log(Assets) _{t-1}	-0.110*** (0.00)	-0.115*** (0.00)	-0.111*** (0.00)	-0.112*** (0.00)	-0.117*** (0.00)	-0.113*** (0.00)	-0.116*** (0.00)
CAPM α_{t-1}	0.116*** (0.00)	-	-	-	-	-	-
Carhart α_{t-1}	-	-	-	0.211*** (0.00)	-	-	-
Positive risk-adjusted performance variable	-	0.465*** (0.00)	-	-	0.432*** (0.00)	-	-
Negative risk-adjusted performance variable	-	-	0.012 (0.18)	-	-	0.137** (0.04)	-
Negative performance indicator variable [NPI]	-	-	-	-	-	-	-0.042 (0.22)
Pre-replacement year indicator variable [PRE]	-	-	-	-	-	-	0.122*** (0.00)
[NPI] x [PRE]	-	-	-	-	-	-	-0.132** (0.01)
Adjusted R2	0.12	0.12	0.12	0.12	0.12	0.12	0.12
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	60876	60876	60876	60876	60876	60876	60876

Panel B: Flow regressions on advisor replacement

Explanatory Variables	Model i	Model ii	Model iii	Model iv	Model v	Model vi	Model vii
Constant	1.234*** (0.00)	1.227*** (0.00)	1.201*** (0.00)	1.198*** (0.00)	1.213*** (0.00)	1.238*** (0.00)	1.281*** (0.00)
Objective flow _t	0.845*** (0.00)	0.794*** (0.00)	0.833*** (0.00)	0.840*** (0.00)	0.815** (0.04)	0.856*** (0.00)	0.837** (0.02)
Standard deviation _{t-1}	-0.170*** (0.00)	-0.154*** (0.00)	-0.168*** (0.00)	-0.181** (0.03)	-0.172*** (0.00)	-0.187*** (0.00)	-0.159*** (0.00)
Expenses _{t-1}	-0.124** (0.02)	-0.131** (0.02)	-0.118*** (0.00)	-0.133** (0.03)	-0.138** (0.02)	-0.148** (0.01)	-0.133** (0.02)
Log(Assets) _{t-1}	-0.221*** (0.00)	-0.234*** (0.00)	-0.228*** (0.00)	-0.234*** (0.00)	-0.215*** (0.00)	-0.209*** (0.00)	-0.219*** (0.00)
CAPM α_{t-1}	0.254*** (0.00)	-	-	-	-	-	-
Carhart α_{t-1}	-	-	-	0.284*** (0.00)	-	-	-
Positive risk-adjusted performance variable	-	0.582*** (0.00)	-	-	0.542*** (0.00)	-	-
Negative risk-adjusted performance variable	-	-	0.128 (0.21)	-	-	0.256** (0.02)	-
Negative performance indicator variable [NPI]	-	-	-	-	-	-	-0.051 (0.28)
Pre-replacement year indicator variable [PRE]	-	-	-	-	-	-	0.389** (0.04)
[NPI] x [PRE]	-	-	-	-	-	-	-0.415** (0.04)
Adjusted R2	0.09	0.09	0.09	0.09	0.09	0.09	0.09
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	16616	16616	16616	16616	16616	16616	16616

Panel C: Flow regressions on fund liquidation or merge

Explanatory Variables	Model i	Model ii	Model iii	Model iv	Model v	Model vi	Model vii
Constant	1.570*** (0.00)	1.520*** (0.00)	1.508*** (0.00)	1.529*** (0.00)	1.569*** (0.00)	1.545*** (0.00)	1.598*** (0.00)
Objective flow _t	1.170*** (0.00)	1.189*** (0.00)	1.177*** (0.00)	1.165*** (0.00)	1.169** (0.04)	1.173*** (0.00)	1.095*** (0.00)
Standard deviation _{t-1}	-0.280** (0.03)	-0.274*** (0.00)	-0.259** (0.02)	-0.266*** (0.02)	-0.278*** (0.00)	-0.261*** (0.00)	-0.298** (0.01)
Expenses _{t-1}	-0.187*** (0.00)	-0.184*** (0.00)	-0.179*** (0.00)	-0.190*** (0.00)	-0.176** (0.03)	-0.171** (0.01)	-0.127** (0.04)
Log(Assets) _{t-1}	-0.187*** (0.00)	-0.196*** (0.00)	-0.193*** (0.00)	-0.178*** (0.00)	-0.180*** (0.00)	-0.177*** (0.00)	-0.192*** (0.00)
CAPM α_{t-1}	0.205*** (0.00)	-	-	-	-	-	-
Carhart α_{t-1}	-	-	-	0.314*** (0.00)	-	-	-
Positive risk-adjusted performance variable	-	0.699*** (0.00)	-	-	0.598*** (0.00)	-	-
Negative risk-adjusted performance variable	-	-	0.048 (0.39)	-	-	0.256* (0.07)	-
Negative performance indicator variable [NPI]	-	-	-	-	-	-	-0.068 (0.34)
Pre-action year indicator variable [PRE]	-	-	-	-	-	-	0.428*** (0.00)
[NPI] x [PRE]	-	-	-	-	-	-	-0.415** (0.01)
Adjusted R2	0.11	0.11	0.11	0.11	0.11	0.11	0.11
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	2483	2483	2483	2483	2483	2483	2483

Panel D: Flow regressions on fees reduction

Explanatory Variables	Model i	Model ii	Model iii	Model iv	Model v	Model vi	Model vii
Constant	0.478*** (0.00)	0.459*** (0.00)	0.455*** (0.00)	0.483*** (0.00)	0.467*** (0.00)	0.473*** (0.00)	0.435*** (0.00)
Objective flow _t	0.310*** (0.00)	0.298*** (0.00)	0.325*** (0.00)	0.307*** (0.00)	0.325*** (0.00)	0.296*** (0.00)	0.336*** (0.00)
Standard deviation _{t-1}	-0.047** (0.02)	-0.049*** (0.00)	-0.038*** (0.00)	-0.045*** (0.00)	-0.039*** (0.00)	-0.054** (0.02)	-0.045** (0.02)
Expenses _{t-1}	-0.110*** (0.00)	-0.115*** (0.00)	-0.098*** (0.00)	-0.109*** (0.00)	-0.101*** (0.00)	-0.097*** (0.00)	-0.103*** (0.00)
Log(Assets) _{t-1}	-0.135*** (0.00)	-0.142*** (0.00)	-0.137*** (0.00)	-0.139*** (0.00)	-0.148*** (0.00)	-0.127*** (0.00)	-0.125*** (0.00)
CAPM α_{t-1}	0.205*** (0.00)	-	-	-	-	-	-
Carhart α_{t-1}	-	-	-	0.345*** (0.00)	-	-	-
Positive risk-adjusted performance variable	-	0.582*** (0.00)	-	-	0.498*** (0.00)	-	-
Negative risk-adjusted performance variable	-	-	0.087 (0.51)	-	-	0.205* (0.06)	-
Negative performance indicator variable [NPI]	-	-	-	-	-	-	-0.091 (0.37)
Pre-action year indicator variable [PRE]	-	-	-	-	-	-	0.541** (0.03)
[NPI] x [PRE]	-	-	-	-	-	-	-0.415** (0.04)
Adjusted R2	0.13	0.13	0.13	0.13	0.13	0.13	0.13
p-value	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	5166	5166	5166	5166	5166	5166	5166