

# Mutual Fund Performance and Governance Structure: The Role of Portfolio Managers and Boards of Directors\*

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## **Abstract**

This paper conducts a comprehensive analysis of the relation between the performance and governance structure of open-end, domestic-equity mutual funds during the 1985 to 2002 period. We show that experienced large-fund portfolio managers outperform their size, book-to-market, and momentum benchmarks, but that experienced small-fund portfolio managers underperform their benchmarks—indicating the presence of managerial entrenchment in the mutual fund industry. When we examine the role of fund boards, we find that independent directors are crucial for terminating underperforming seasoned portfolio managers, as outflows are not sufficient to pressure the management company to do so. In fact, our evidence indicates that independent boards impact pre-expense performance much more significantly than their prior-documented impact on fund fees. We also find a role for internal governance: inside directors and large management company complexes appear to better monitor performance due to “hidden actions,” as well as terminating underperforming inexperienced managers.

A good deal of attention is focused on professionals who manage money, in the form of television interviews, best-selling books, and frequent articles in the popular press. The media often focuses on the investment results of a few “star” mutual fund managers, such as Scott Schoelzel of the Janus 20 Fund during the late 1990s, or Bill Miller of the Legg-Mason Value Trust Fund during the early 2000s. In addition, the 2005 appointment of Harry Lange as the portfolio manager for the Fidelity Magellan Fund, one of the world’s largest actively managed mutual funds, generated a good deal of media attention.<sup>1</sup> The implication of the media spotlight on some managers with long records of outperformance is that portfolio managers matter in generating portfolio performance—for example, that experienced managers, or managers with a good track record, outperform other managers, in addition to passively managed funds.

Further attention has focused on the structure of fund boards of directors, in light of the recent mutual fund market-timing and late-trading scandals. However, the large number of academic papers that have analyzed mutual fund performance have largely ignored the role of the manager and the board.<sup>2</sup> In general, these papers document mutual fund underperformance, after fees and trading costs. However, they do not address whether cross-sectional differences in governance structures may lead to differences in performance. If portfolio managers play an important role in generating fund performance, then the quality of governance of a fund may be important to that fund’s performance not only through negotiating low fees with the fund advisor, but also through monitoring portfolio manager behavior, or influencing the advisor to discipline underperforming managers.

Investors appear to be influenced by the media, in that they tend to believe that fund managers are key in generating fund performance.<sup>3</sup> In addition, some of the most highly compensated professionals in the financial services industry are managers of active portfolios; many

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<sup>1</sup> See, for example, Lauricella and Hechinger (2005).

<sup>2</sup> Examples of past papers that examine mutual fund performance without considering the governance structure of funds include Malkiel (1995), Carhart (1997), Grinblatt and Titman (1989, 1993), and Wermers (2000).

<sup>3</sup> The alternative view is that the fund advisory company generates performance for its various funds through efforts in gathering and processing information by its pools of buy-side analysts or purchased research. If so, then the fund manager is much less important in generating performance. For example, the Janus family, during the late 1990s, advertised itself as having a family-wide approach that digs deeper into the business plans of firms in which it invests.

mutual fund managers earn in excess of \$5 million per year. Although some of this compensation may be due to entrenchment of overpaid managers, it seems unlikely that all highly compensated managers are simply entrenched.

This paper analyzes the relation between the governance structure and portfolio performance of U.S. open-end, domestic-equity mutual funds that are actively managed. Specifically, we analyze whether manager characteristics, such as experience and performance track-record, predict future fund performance. In addition, we look at whether the structure of the fund board of directors impacts performance, both in the ongoing operations of the fund and in their role in replacing underperforming managers.

There are a few papers that touch on the issues of motivating portfolio managers to generate performance, as well as the quality of governance in the mutual fund industry. Chevalier and Ellison (1999) find that younger managers are more likely to be terminated for poor risk-adjusted performance, and that these unseasoned managers respond by herding and avoiding idiosyncratic risk. Khorana (1996, 2001) studies the turnover of open-end managers, and finds some evidence that underperforming fund managers with decreasing inflows are replaced more frequently.

Other prior research supports our focus on portfolio managers in our study of the importance of fund governance. Specifically, Chevalier and Ellison (1999a), find that the level of manager education impacts fund performance, while Baks (2001) examines fund manager changes over the 1992 to 1999 period, and finds evidence supportive of a major role of portfolio managers in generating fund performance.

Our contribution, in this paper, is to study the characteristics of mutual fund boards jointly with the characteristics of management companies to determine the influence of each on disciplining underperforming mutual fund managers and improving fund performance. Specifically, we assemble a manager database that covers the 1985 to 2002 period for all U.S. domestic-equity mutual funds. This database, which is the longest time-series of manager data assembled to date, includes the starting and ending dates of the manager's tenure with each fund she managed over her career. We merge this manager database with a quarterly mutual fund stockholdings dataset, allowing us to build

several new characteristics of managers at each point in time, such as the stockpicking track record of the manager over her entire career (i.e., over all funds managed). We further augment this manager/fund database with information on the board of directors for each fund during three years, 1995, 1999, and 2002. This director data includes the name and affiliation of each fund director, which allows us to build characteristics that describe the independence of the board.

Our results provide several new insights into the role of governance in the performance of mutual funds. First, we document that fund managers have a strong influence in generating portfolio performance. For instance, we find that higher managerial experience positively predicts future stockholdings-level performance of larger mutual funds. Further, we find that fund manager track-record persists, when measured as the average track-record of all funds within the same management company. These findings augment Khorana, Servaes, and Wedge (2007), who find that manager ownership of their funds is associated with better fund performance.

While experienced large-fund managers are important in generating superior performance, which indicates effective governance of these funds, we also find evidence that many poorly performing managers are entrenched. Specifically, more experienced managers of smaller funds underperform their benchmarks, indicating that they have become entrenched by an ineffective governance system. Talented mutual fund managers normally progress through their careers in one of two ways. First, they are either promoted to a larger mutual fund within (or, occasionally, outside) the management company, which represents a larger stake for the company. Or, second, they leave the mutual fund industry to manage assets for the hedge fund industry—a career track that has opened in a widespread fashion only recently (see Kostovetsky (2007)).

However, what happens to mutual fund managers with more modest talents or who do not fully express their talents by applying the large amount of effort necessary to pick stocks? In many cases, these underperforming managers are fired, or demoted to a smaller fund (Chevalier and Ellison (1999), Khorana (1996)). But, does this labor market work in a fully efficient way, or is there significant portfolio manager entrenchment? And, is any observed entrenchment related to the

governance of the fund, whether external (fund flows) or internal (the structure of the board of directors)?

Our investigation asks these questions, using our large panel of mutual fund managers over an 18-year period, along with a panel of fund boards over three years sampled from the latter half of this period (when board information became available via SEC's Edgar). As such, our paper is the first to investigate the role of boards in incentivizing mutual funds to generate performance.

Our first major result is that, while underperforming fund managers are, on average, terminated, those underperforming fund managers who are more seasoned are much less likely to be terminated. While Chevalier and Ellison (1999) also note that older fund managers are less likely to be terminated, we investigate whether this finding is evidence of fund manager entrenchment—more seasoned managers are more likely to have built “empires” within a fund management company, potentially allowing them to survive long periods of poor performance.

Specifically, we set out to find the determinants of effectively governed funds. Weisbach (1988) shows a stronger relation between prior performance and the probability of corporate CEO replacement for companies with outsider-dominated boards than for companies with insider-dominated boards. In the mutual fund industry, effective fund governance can be facilitated by “internal” (board) or “external” (fund inflows) sources, as shown by Khorana (1996).

Accordingly, we implement logit regressions of manager replacement, and find that both strong internal and external governance forces are necessary to eliminate underperforming fund managers. During the early stages of a manager's career, we find that fund outflows by investors are sufficient to motivate a management company to replace the manager. Specifically, among fund managers with less than 10 years of career experience who underperform (defined by a negative three-year alpha), those with net outflows during the prior year are much more likely to be terminated than those with net inflows. Notably, independent directors do not contribute additional pressure to terminate underperforming fund managers; apparently, management companies respond promptly to the signal represented by fund outflows when evaluating inexperienced managers. This

effect is especially strong in large management companies, where the potential for brand externalities is high.

However, we find that fund outflows are ineffective at forcing out poorly performing experienced managers; the flow variable is insignificant in logit replacement regressions for fund managers with at least 10 years of experience.<sup>4</sup> Here, independent directors play a strong role in forcing out underperforming fund managers. Specifically, an increase in the number of independent directors on a fund board increases the probability of termination of an underperforming manager. Notably, this benefit of additional independent directors is present even at very high percentages of such directors on a board, which provides support for the proposed SEC rule of at least 75% independent fund directors. However, we find no evidence that an inside director serving as board chair reduces the frequency of underperforming fund manager terminations.

Finally, given the importance of the structure of fund boards for replacing underperforming managers, we set out to determine the impact of board structure on fund performance in general. Tufano and Sevick (1997), using a sample of fund board data from 1992, find that small boards that are dominated by independent directors set more competitive fund fees. We confirm their findings during the three years of our study period for which we have director data (1995, 1999, and 2002), but also find that the impact of independent directors on fund fees is much smaller than their impact on pre-expense performance. Specifically, while Tufano and Sevick find that an additional independent director increases fund expenses by about 7 basis points per year (attributable to an increase in the board size), we find that this additional director increases pre-expense performance by at least twice this level, 14 basis points per year. Therefore, the benefit of adding more independent directors outweighs the penalty of a larger board, indicating a heretofore neglected but important role for independent fund directors—their effective monitoring of the skills and effort of portfolio managers.

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<sup>4</sup> We find that about 110 months appears to be the point at which there is a regime-shift. This finding is also consistent with the low sensitivity of the flows to past performance documented by Sirri and Tufano (1998). Fund management companies appear to understand that fund flows do not present a fully effective disciplinary force.

Interestingly, more outside directors increases performance and manager replacements without limitation—as long as the fraction of inside directors is not too small. Therefore, we may infer that the value of the additional information gathered by an additional outside director exceeds her costs, at least for the range of board sizes that we observe in our sample—an empirical application of the Harris and Raviv (2005) theory of board structure. Overall, our results show evidence of managerial entrenchment in the mutual fund industry, and a strong role for outside directors in improving fund performance and minimizing manager entrenchment.

The remainder of this paper is organized in four sections. We discuss how mutual fund directors can influence fund performance in Section I, followed by a discussion on the construction of our database and our measures of manager characteristics and fund performance in Section II. Section III presents empirical findings on mutual fund managers. Section IV discusses the role of mutual fund board of directors in fund governance and fund performance. We conclude the paper in Section V, and provide the detailed method used in constructing the mutual fund manager and board of directors database in the Appendix.

## **I. The Influence of Mutual Fund Directors on Performance**

The most straightforward mechanisms through which mutual fund boards impact the performance of funds that they oversee is through their direct responsibilities to (1) choose the management company (investment advisor), and (2) negotiate fees with this chosen management company (Sevick and Tufano (1997) study fee-setting by boards). Strictly speaking, mutual fund portfolio managers are employees of the management company, and the company sets incentive contracts, and hires and fires fund managers. However, fund directors monitor the investment performance of the funds that they oversee (often using consultants) as the primary indicator of output quality of the fund—which is then used as the main determinant of retaining or firing the management company, as well as (jointly) negotiating the fee upward or downward. Indeed, Berk and Green (2004) model fund fees as being directly related to fund performance in a competitive mutual fund market. Thus, effective directors will closely monitor fund performance to properly set

fees at a competitive level (or to replace the advisor in cases of very poor performance) which, in turn, motivates the management company to set strong incentives for portfolio managers to outperform their benchmarks.

These incentives can take the form of performance-sensitive compensation contracts and/or the threat of manager termination upon poor performance. Since the compensation contracts of mutual fund managers are not publicly available during the period of our study, we do not know how performance-sensitive these contracts might be. However, Chevalier and Ellison (1999) and Khorana (1996) find a strong inverse relation between the probability of manager termination and fund performance, indicating that management companies believe that their managers are largely responsible for the underperformance and, on average, effectively discipline their managers. In addition, fund managers appear to respond to the imminent threat of dismissal through either herding or window-dressing. Thus, management companies appear to respond to the incentives provided to them by the fund directors in monitoring and disciplining their portfolio managers, and fund managers appear to respond (sometimes perversely) to the resulting incentives set by management companies.

Besides pressuring a management company to fire an underperforming manager, the board may take other, more moderate approaches, as described by Management Practice Inc., a consulting firm specializing in mutual fund governance.<sup>5</sup> These approaches involve pressuring the management company to add more managers or more research analysts to an underperforming fund. Such remedies are much more likely to be available at large management companies with large pools of analysts and portfolio managers, giving such large companies additional options to improving fund performance without firing the fund manager.

It is notable that Chevalier and Ellison (1999) find that manager termination is much less performance-sensitive for older, more experienced managers. We also find evidence of this in our dataset, and show that it is consistent with entrenchment of poorly performing managers. With

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<sup>5</sup> For an excellent overview of alternative methods that boards can use to remedy underperforming managers, see [mfgovern.com/reports/3-directresp.html](http://mfgovern.com/reports/3-directresp.html).

entrenchment, we would expect large management organizations to outperform smaller complexes, due to the range of options (besides termination) that are available at a big complex.

To summarize, fund directors likely play a big role in providing incentives to portfolio managers, both direct and indirect. In this paper, we will address the relation between the board structure and fund performance as well as underperforming fund manager termination. In addition, funds that are part of a large complex give the management company more alternatives to respond to an underperforming manager, besides termination. Therefore, we will also investigate the relation between management company size and fund performance.

## **II. Data and Methodology**

### **A. Mutual Fund and Mutual Fund Manager Data**

Our mutual fund characteristics data are extracted from an updated version of the merged Thomson/CDA-CRSP mutual fund database (henceforth, CDA-CRSP) of Wermers (2000). For each open-end, U.S. domestic-equity fund that exists anytime between January 1975 and December 1999, CDA-CRSP contains data on various fund statistics, such as the monthly net return, total net assets, annual expense ratio, and annual turnover ratio, as well as containing the quarterly stock holdings of each fund. We extend data for funds existing at the end of 1999 to include data through the end of 2002. See Wermers (2000) for more information on the construction and limitations of an earlier version of this database.

In addition, we construct a proprietary mutual fund manager database over the period 1985 to 2002 from several electronic and printed sources, including Morningstar, Thomson/Wiesenberger, CRSP, various mutual fund publications, and fund prospectuses filed with the SEC. While we have some fund manager data from earlier years, fund managers of nonsurviving funds are largely missing during years prior to 1985. The detailed method used in constructing the fund manager database is reported in Appendix A. The information contained in the manager database includes manager name, fund name, manager start and end dates at the fund, and (for a small subset of fund managers) some biographical information such as gender, birth date, birth city,

marital status, education background (degrees and schools from where degrees are received), CFA designation and date, and previous employers and positions held.

Although we make every attempt to create a complete dataset, our sources do not allow every manager to be documented. The reasons for this are, first, fund manager information is not required by the SEC to be disclosed prior to 1988, and, second, (even after 1988) funds that are team-managed are not required to fully disclose names of each team member to shareholders or the SEC.<sup>6</sup> Nevertheless, we believe our manager database represents the most complete information on U.S. open-end, domestic-equity mutual fund managers compiled to date.<sup>7,8</sup> For this paper, a long time-series is crucial, as we track each fund manager over her career, and measure manager attributes at various points during this career.

For mutual funds that are team-managed, we identify the manager having the longest tenure with that fund. This manager is deemed the “lead manager,” and we measure only the characteristics of this lead manager for our empirical tests—our assumption is that the longest-tenure manager likely has the highest level of control of a fund. For example, we measure the lead manager's career experience for tests of the relation between performance and manager experience—if, however, non-lead managers play a significant part of the decision-making process of a mutual fund, then our tests will lack power in detecting such relations. However, for the majority of our funds, there is only one fund manager at each point in time, making this a minor issue.

We merge CDA-CRSP with this new manager database over the 1985 to 2002 period. Counts of mutual funds and lead portfolio managers over the entire time period, as well as counts at the end of 1985, 1991, 1997, and 2002 are presented in Table I. There are a total of 2,689 mutual

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<sup>6</sup> Mutual funds are required to disclose information about each manager in a team (up to at least four of the members) in the fund prospectus starting from February 2006.

<sup>7</sup> The earliest manager in our database is Paul Cabot of the *State Street Investment Trust* with a start date of July 29, 1924 and end date of January 1, 1962. Chevalier and Ellison (1997, 1999) provide some of the first studies of fund managers, using a more limited set of manager data obtained from Morningstar that covers managers existing between 1992 and 1995. Baks (2001) uses manager data from CRSP, which contains several errors and omissions, and only covers fund managers starting in 1992.

<sup>8</sup> Also, our manager database does not suffer from survivor-bias, as we consult original publications in order to backfill information on managers of non-surviving funds.

funds and 3,136 lead managers in our matched manager/fund databases (Panels A and B).<sup>9</sup> Growth-oriented funds (funds with an investment objective of aggressive-growth or growth) account for the majority of the fund universe, and about 80% of the fund managers have experience in managing at least one growth-oriented fund during 1985-2002. Not surprisingly, the number of funds and fund managers grows rapidly with the expansion of the fund industry during our sample period. The average number of funds lead-managed by a given portfolio manager increases slightly from 1.2 at the end of 1985 to 1.4 at the end of 2002.<sup>10</sup>

We further examine CDA-CRSP funds that could not be matched with any fund manager, and report statistics on these funds in Panels C and D of Table I. Overall, we are able to identify the lead manager during at least one point in time over the 1985 to 2002 period for more than 98 percent of funds in CDA-CRSP. In addition, about 95 percent of all fund-months during 1985 to 2002 contain information about the lead manager.

A close look at the number of missing managers at four different points in time reveals more detailed information. At the end of 1985, 15.1% of the funds have missing manager data, but this fraction drops substantially over later years.<sup>11</sup> In Panel D, a further comparison is provided between funds with complete manager data and funds that have missing manager data. This panel presents data on total net assets under management (TNA, in \$Millions) and net returns between funds having manager data and funds with missing manager data at the end of 1985, 1991, 1997, and 2002. Most of the differences are not statistically significant, using a *t*-test for the mean of fund return and a non-parametric test for the median of fund TNA. We conclude that funds with missing managers, which are a very small proportion of our fund dataset, do not appear to have characteristics that are substantially different from the entire domestic-equity universe in CDA-CRSP.

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<sup>9</sup> The total, 2,689, does not equal the sum of the categories because some funds changed investment objectives over the 18-year period.

<sup>10</sup> The average number of funds lead-managed by a manager over the whole sample period of 1985-2002 is higher than at the end of a particular year due to managers running different funds over the sample period.

<sup>11</sup> The predominant reason for missing manager information in the late 1990s and early 2000s is that some funds report “team management” without any further details, as mentioned previously.

## B. Measures of Mutual Fund Performance

We implement three different measures of performance of individual mutual funds in this study. The first two measures use the intercept (alpha) from a four-factor model introduced by Carhart (1997) and used in many prior mutual fund studies,

$$R_{jt} - R_{ft} = \alpha_j + \beta_j^{MKT} MKT_t + \beta_j^{SML} SML_t + \beta_j^{HML} HML_t + \beta_j^{MOM} MOM_t + \varepsilon_{jt} , \quad (1)$$

where  $R_{jt}$  is the net return of fund  $j$  during month  $t$ ;  $R_{ft}$  is the one-month T-bill rate in month  $t$ ; and  $MKT_t$ ,  $SML_t$ ,  $HML_t$ , and  $MOM_t$  are the monthly returns on the mimicking portfolios for the market, size, book-to-market, and momentum factors, respectively—available from Ken French’s website. The first performance measure uses  $\alpha_j$  from the net return regression above, i.e., net of the expense ratio. The second uses  $\alpha_j$ , adding back the expense ratio, i.e., gross of the expense ratio.

The third performance measure uses alpha at the portfolio holdings level, as defined by the characteristic selectivity ( $CS$ ) measure of Daniel, Grinblatt, Titman, and Wermers (DGTW; 1997), where mutual fund holdings are benchmarked with characteristic-matched portfolios of stocks. Specifically, the  $CS$  measure for fund  $i$  during month  $\tau$  is calculated as

$$CS_{i,\tau} = \sum_{j=1}^{J_{\tau-1}} w_{i,j,\tau-1} \left( R_{j,\tau} - R_{\tau}^{b_{j,\tau}} \right) , \quad (2)$$

where  $w_{i,j,\tau-1}$  is the portfolio weight of stock  $j$  held by manager  $i$  at the end of the month  $\tau-1$ ;  $R_{j,\tau}$  is the month  $\tau$  return on stock  $j$ ;  $R_{\tau}^{b_{j,\tau}}$  is the month  $\tau$  return on stock  $j$ ’s characteristic-matched portfolio (matched, at the previous June 30<sup>th</sup>, on market capitalization, the ratio of book-equity to market-equity, and prior one-year return); and  $J_{\tau-1}$  indicates the number of stocks held by the fund at the end of month  $\tau-1$ . This performance measure, while depending on portfolio holdings data—which are less frequently disclosed than net returns—approximates performance before both trading costs and expense ratios. With these three performance measures, we can evaluate the effectiveness

of different forms of mutual fund governance using alpha before trading costs, after trading costs, and after expenses and trading costs.

### C. Measures of Mutual Fund Manager Characteristics

Since the lead fund manager is the unit of analysis for our study, we construct measures that serve as proxies for lead manager talent and, perhaps, for lead manager entrenchment.<sup>12</sup> We are guided by Chevalier and Ellison (1999a, b) in our choice of the first characteristic, which is manager experience, defined as the length of time since the lead fund manager first managed any mutual fund. Chevalier and Ellison find that career experience is highly related to risk-taking activity as well as performance of managers. We define the career experience of lead fund manager  $i$  at the end of month  $t$  as

$$EXP_{i,t} = t - t_{0,i} , \quad (3)$$

where  $t_{0,i}$  is the month when lead fund manager  $i$  first becomes a fund manager (lead manager or not) of any domestic-equity mutual fund. Total career experience may have two different effects for the impact of the portfolio manager on fund performance. First, a manager may, over time, develop skills in analyzing stocks or develop contacts with sell-side analysts or CEOs of a corporation (to be) invested. For instance, Cohen, Frazzini, and Malloy (2008) find evidence consistent with fund managers developing networks with CEOs who are same-school alumni. Thus, experience may be a proxy for the ability to gather private information about stock valuations. Second, an experienced manager may gain power within a mutual fund management company, which may lead to a low-ability manager becoming entrenched, especially within small management companies, where the fund manager is more likely to hold a high-level executive position.

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<sup>12</sup> Here, entrenchment refers to a manager who does not have active management skill, but has accumulated political power in the fund management company so that (s)he is not optimally replaced following poor performance.

The second characteristic is the past performance record of the lead manager. Several studies, such as Kosowski, Timmermann, Wermers, and White (2006), document persistence in fund-level performance, which motivates us to look at persistence in manager-level performance. To construct a proxy for past success, we compute the time-series average (monthly) performance of the fund manager, as defined by the characteristic selectivity ( $CS$ ) measure of Daniel, Grinblatt, Titman, and Wermers (DGTW; 1997). Using Equation (2) to compute the monthly measure,  $CS_{i,\tau}$ , we compute the characteristic selectivity track-record ( $CST$ ) as the average  $CS_{i,\tau}$  measure over the manager's entire career (up to the end of month  $t$ ), including her performance record in other mutual funds in our dataset:

$$CST_{i,t} = \frac{1}{EXP_{i,t}} \sum_{\tau=t_{0,i}+1}^t CS_{i,\tau}, \quad (4)$$

where  $t_{0,i}$  equals the end of the first month that the person managed any mutual fund, and experience, in months, is  $EXP_{i,t} = t - t_{0,i} + 1$ <sup>13</sup> Most importantly, evaluating the performance at the level of stockholdings allows us to examine manager talents before trading costs and other fund fees and costs, which are almost always outside the control of the portfolio manager.

#### D. Summary Statistics for Mutual Fund Managers

Panel A of Table II provides average manager characteristics across all mutual funds existing during different subperiods of our sample. Specifically, the average career experience (in years) and track-record (in % per year), both measured at the end of each year, of the lead fund manager (defined to be the manager with the longest tenure at a given fund at that time) is computed across three-year intervals.

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<sup>13</sup> Note that  $EXP_{i,t}$  in Equation (4) is computed including only months where holdings information is available for a given manager; we have holdings data back to December 31, 1974.

The results show that the level of career experience is fairly consistent throughout our sample period—about 6-7 years in mean and 4-6 years in median. Also, the mean manager track record (*CST*) is slightly positive, but declining over time, consistent with Barras, Scaillet, and Wermers (2008)—with the exception of the recession period of 2000-2002.<sup>14</sup> In unreported tests, we also find that fund managers tend to be more aggressive, as reflected in their tracking-error relative to the S&P 500 index and their fund turnover levels during the latter subperiods of our sample. However, it is not clear whether this increased risk-taking and trading activity is related to greater manager skills, lower trading costs, or whether fund managers merely engage in these costly activities in order to appear to have talents (see, for example, Brown, Harlow, and Starks (1996)).

Panel A also indicates the replacement rate of lead portfolio managers during each subperiod. During the average year, 10-15% of lead managers are replaced—and, the replacement rate of portfolio managers increases over time. While this indicates that funds may effectively eliminate underperforming managers, many of these managers may leave due to retirement or to manage private money (such as hedge fund portfolios), especially during the latter years of our sample. We will explore the impact of a manager replacement on fund performance in a later section of this paper.

We also explore the correlation of our two manager characteristics with fund size. If the fund industry is characterized as having effective governance, then we would expect that more experienced managers would have better average skills than newer managers (since low-skill managers are eventually fired), and that they manage larger funds (due to the higher difficulty as well as higher fee income associated with running large funds). In addition, managers with better past stockpicking success would manage larger funds, since past performance is a (noisy) indicator of portfolio manager skills. For example, Khorana (1996, 2001) shows that poorly performing mutual

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<sup>14</sup> However, some backfill bias exists during the earlier years, since we backfill returns—prior to 1985—to build a longer career track-record for our later tests. Since our later tests are conducted on all funds existing after 1984, except for some funds with missing manager data, there is no survival bias in these tests.

fund managers are (on average) replaced, resulting in improved post-replacement performance, which is consistent with effective governance (on average) in the mutual fund industry.

In Panel B, we rank all U.S. open-end, actively managed domestic-equity mutual funds existing at the end of each year on the number of months of career experience (attained by managing any domestic-equity fund, as defined by Equation (3)) of the lead manager. Then, we (conditionally) rank funds within each manager experience quintile on the career track-record (as defined by Equation (4)) of the lead manager (as of that date). Next, we compute, for each of the 25 double-sorted portfolios, the average fund size at the same date, and present the time-series average size measures for each portfolio.<sup>15</sup>

The results show evidence consistent with effective governance in the mutual fund industry in that fund size differs substantially along the experience and track-record dimensions. Specifically, the most experienced managers, and managers with the best track-records, manage much larger funds than other managers. For example, the quintile of most-experienced managers (which have an average of 18.5 years of experience) run, on average, funds that are over 5 times the size of the funds managed by the least-experienced quintile (which have an average of 1.3 years of experience)—\$1.236 billion vs. \$229 million. Large differences in size are also present between high and low track-record managers. These results indicate that governance is effective, in that well-performing managers and experienced managers are promoted to larger funds, either by a promotion to a larger fund by the management company, or by the growth of the same fund through inflows (i.e., presumably indicating that experienced managers have better skills).

Importantly, the panel also indicates that we should control for the size of funds when measuring the relation of manager characteristics with manager talents, as funds have substantial diseconomies-of-scale (as shown by Chen, Hong, Huang, and Kubik (CHHK; 2004)). For example, an experienced manager with skills will find it much more difficult to generate the same level of performance as an inexperienced manager, as the experienced manager will generally be managing a

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<sup>15</sup> In unreported results, we also compute the CPI-adjusted time-series average fund size. The results are quite similar to the unadjusted results shown in Panel B.

much larger fund. If we do not control for the size of the fund, then experience will appear to be negatively related to fund performance.

### **III. Results**

#### **A. Manager Characteristics and Fund Performance**

If lead portfolio managers are crucial for generating fund performance, then we would expect to find persistent skills at the manager level. However, if governance of mutual funds is only partially effective, then we would expect to find that some managers with high levels of experience are entrenched, and do not exhibit persistent skills. While some prior studies have attempted to find persistence in manager skills, almost none have examined the relation of experience to persistent manager skills.<sup>16</sup>

For example, suppose that manager entrenchment is widespread in the open-end fund industry, such that managers with poor current skills (whether or not they performed well in the past) are retained. In this setting, managers with good current skills are more likely to leave the industry (for higher compensation) than managers with poor current skills. Therefore, we would expect that managers with more experience should underperform newer managers, controlling for track-record. On the other hand, suppose that governance is effective, so that managers are fired when they exhibit poor skills. Here, we might expect that bad managers leave the industry (through termination) more frequently than talented ones, so that managers with greater experience outperform (since their abilities are more precisely measured with a long track-record).<sup>17</sup> In either

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<sup>16</sup> For example, Baks (2007) studies the role of the portfolio manager in generating performance. He finds a wide range of 10 to 50% of fund performance that can be attributed to fund managers. Chevalier and Ellison (1999b) study the impact of experience on managerial risk-taking behavior, approaching the issue from the perspective of career concerns of fund managers. They find that young managers take less risk and are more likely to herd in picking stocks. However, this risk-aversion could exist both in a well-governed or poorly governed industry with asymmetric information.

<sup>17</sup>It is also possible that a manager gains skills in picking stocks as her career progresses, from perhaps several sources. For example, it may take some time for the manager to assemble and train her buy-side analysts, or to learn how to best use the analysts already in place at a fund complex. Also, over time, managers may develop relationships with corporate managers that provide them with privileged information on the prospects of firms. This issue was especially important prior to the implementation of Regulation FD by the SEC, which occurred during the last part of the period covered by this study.

case, experience provides a useful signal, in addition to career track-record, for locating skilled (or entrenched) managers.

Since Panel B of Table II indicates that levels of experience and track-record are highly correlated with fund size, we implement simple portfolio tests that attempt to control for differences in size. As mentioned earlier, this control is important, as prior research by CHHK shows evidence of significant diseconomies-of-scale in mutual fund management.

Specifically, Panel A of Table III focuses on the largest quintile of mutual funds, where mutual fund size (TNA, in \$millions) is measured at the beginning of each calendar quarter. After segregating these largest funds, we implement a double-sort on experience and track-record to provide evidence on the interaction of these two variables, in terms of their impact on performance at the stockholdings level (i.e., before expenses and trading costs). In particular, all top size-quintile actively managed domestic-equity mutual funds existing at the beginning of a given calendar quarter are first sorted on the number of months of career experience (attained by managing any domestic-equity fund, as defined by Equation (1)) of the lead manager, then (conditionally) on the career track record (career average characteristic selectivity measure, *CST*, as defined by Equation (2)) of that lead manager (as of that date). We then compute the stockholdings-level performance (CS measure) for each fractile during the following 12 months, equal-weighted across all funds in a given fractile. During this test year, we rebalance portfolios each month, and include each fund that exists for the full month (whether or not it survives beyond that month) to minimize survival bias. The time-series average performance (across all portfolio formation quarters) is presented in the panel.

For example, the panel shows that the most experienced managers among these large funds (see “Top 20%”) have 24.3 years of experience, while the least experienced (“Bottom 20%”) have only 2.8 years. Further, managers with the best track-records have a prior career performance averaging 6.88 percent per year above their size, book-to-market, and momentum benchmarks. At the intersection of these two characteristics, the top-experience, top track-record fractile exhibits a following-year performance level of 1.87%. By contrast, managers with the lowest levels of experience and worst track-record have following-year performance of 0.2%.

In general, as shown by the “Top 20% - Bottom 20%” row and column, experience has a positive and significant correlation with following-year performance. For example, across all track-record fractiles, the most experienced managers (“Top 20%”) outperform the least experienced (“Bottom 20%”) by 0.92% per year. However, across all experience fractiles, the best track-record outperform the worst track-record managers by an insignificant 0.02% per year. Further, experience and track-record appear to interact, as the largest impact of experience is present among funds with the best average career track-record.

In general, these results indicate that manager skills persist. In addition, among large mutual funds, governance appears to be effective in that managers with current skills are retained, while managers with poor skills are quickly replaced—indicating that experience is a useful signal in addition to track-record.

However, fund governance does not appear to be completely effective. Specifically, experienced managers with poor track-records survive for long periods of time. For example, the top experience/bottom track-record cell shows that managers with a yearly performance of only 0.12%—hardly enough to cover trading costs and expenses—survive in the industry for over 24 years, on average.

In panels B and C, we repeat the tests of panel A, across funds in smaller size quintiles. Specifically, we repeat the double-sort tests of panel A for each fund size quintile, two through five. Panel B shows the results for quintiles two through four (averaged across these three quintiles for brevity), while panel C shows results for quintile five (the smallest funds). Panel B shows that experience and track-record play a less reliable role in identifying skilled managers among middle-sized funds. Further, Panel C shows that, among the smallest quintile of funds, experience and track-record appear to have no consistent predictive power for future performance. Of course, this set of small funds has much more volatile performance than the larger funds shown in the prior panels.

To summarize, our findings of this section reveal evidence of effective governance structures among large open-end funds, in that experienced managers exhibit better skills than their less-seasoned counterparts. However, we also find evidence consistent with manager entrenchment, in

that some experienced managers—especially those in smaller funds—exhibit poor stockpicking skills.

## **B. Multivariate Regression Tests**

Do mutual fund management companies (e.g., Fidelity) discipline underperforming fund managers? Our next multivariate tests explore this theme by regressing fund performance on several manager-, fund-, and advisor-level characteristics.

Our results of Tables II and III motivate us to include variables that interact lead-manager experience and career track-record with fund size ( $EXPER * Log(TNA)$  and  $CST * Log(TNA)$ ), respectively). Further, CHHK find diseconomies-of-scale among funds, but economies-of-scale among fund management companies in generating performance, and Gaspar, Matos, and Massa (2005) show that larger management companies may transfer performance between funds. Therefore, in addition to the individual fund size,  $Log(TNA)$ , we include the number of funds managed by the same management company,  $NUMFUNDS\_ADVISOR$  as a proxy for management company size. Finally, to test whether larger fund management companies provide effective discipline for underperforming managers, we include an interaction variable between the number of funds in the management company and the career experience of the lead portfolio manager of a given fund,  $NUMFUNDS\_ADVISOR \times EXPER$ . The model of Gervais, Lynch, and Musto (2005) predicts that larger fund management companies are more likely to fire portfolio managers with inferior skills to increase the credibility (in the eyes of investors) that remaining managers have skills. If larger management companies provide effective discipline, this interaction variable should exhibit a positive coefficient—indicating that experienced managers outperform when they are employed by a larger management company (i.e., low-skill managers are fired before they become experienced).

Regressions (1) and (2) of Table IV present results from a regression of yearly portfolio-level fund performance (using the characteristic selectivity measure, CS) on these measures of manager-, fund-, and advisor-level characteristics. Our cross-sectional Fama-MacBeth (1973) tests proceed as

follows. For each year, starting in 1986 and ending in 2002, we run a cross-sectional regression of fund CS measure, averaged across all four quarters of that year, on our manager-, fund-, and advisor-level control variables, all measured at the beginning of the year. We then average the coefficient estimates over all years, and report this average as well as time-series t-statistics.

First, our results confirm the CHHK findings—performance exhibits a negative and significant relation with fund size, but a positive and significant relation with management company size. Next, we find that fund manager experience has no impact on portfolio-level performance, unless interacted with TNA. Thus, only experienced managers who are promoted to larger funds outperform their peers. This finding provides some evidence of effective governance, since fund managers with skills are promoted to larger funds. However, there is no evidence at the portfolio level that management company size is related to effective governance, since the interaction term,  $NUMFUNDS\_ADVISOR \times EXPER$ , is insignificant. Finally, performance is persistent at the manager level, as shown by the significantly positive coefficient on lead-manager career track-record ( $CST$ ). Note that the interaction term,  $CST * \text{Log}(TNA)$ , is significantly negative, which reflects that high performance managers promoted to larger funds experience a drop in performance (due to diseconomies-of-scale).

Regressions (3) and (4) use the annualized four-factor alpha adapted from Carhart (1997), shown in Section II.B., plus expenses, as the dependent variable. We create the pre-expense measure by adding the annual expense ratio to the annualized alpha. As described by Kacperczyk, Sialm, and Zheng (2007), this measure of manager performance includes the impact of “hidden actions” of the fund manager, both good and bad, while the portfolio-holdings measure (CS) does not. For instance, the four-factor alpha includes the effect of interim trading (trading between dates for which portfolio holdings are reported) as well as transactions costs—both of which could be either value-increasing or destroying (relative to peer funds)—while the CS measure captures the performance impact of neither of these effects.

The results in Regression (3) show that larger diseconomies-of-scale are present when we measure performance using four-factor alphas, relative to the CS measure. Specifically, the

coefficient on  $\text{Log}(TNA)$  of -0.22 for Regression (2) indicates that a fund that is 10 times the size of another fund has an expected CS measure that is 51 basis points per year lower. However, Regression (4) indicates that the expected alpha (before expenses) is 131 basis points per year lower. This bigger diseconomy in alpha is likely due to the greater difficulty of large funds trading their big positions—an effect which is not reflected in the portfolio-holdings performance measure (CS), which is measured before trading costs.

Further, Regressions (3) and (4) show that manager career experience has a significantly negative impact on alpha, except when interacted with fund size. For instance, Regression (4) predicts that, for a same-size fund, a manager with 10 years of experience will underperform a new manager by 140 basis points during the following year. However, between two managers with 10 years experience, the one managing a fund that is 10 times the size of the other will outperform by 41 basis points ( $0.018 \times 10 \times \log(10)$ ) during the following year.

It is interesting that this finding indicates both effective governance (in promoting skilled managers) and ineffective governance (in retaining, although not promoting, low-talent managers). Large funds are often flagship funds for their fund families, as well as being a major source of fees for the fund advisory company. For example, a good deal of attention is paid to Fidelity's Magellan Fund, and it apparently has spillover effects to the reputation of the hundreds of other Fidelity funds. Thus, underperforming managers may well be tolerated for a shorter duration among large funds. In addition, the very existence of a seasoned manager in a large fund indicates that the market has also deemed this manager to be skilled, in that inflows have helped to grow the fund beyond its investment-based returns.

Finally, Regression (4) indicates that larger management companies provide more effective governance, since lead portfolio manager experience is positively related to fund performance, when interacted with management company size, consistent with Gervais, Lynch, and Musto (2005). Note, also, that the size of the management company alone ( $NUMFUNDS\_ADVISOR$ ) does not predict fund performance; the transferring of performance documented by Gaspar, Matos, and Massa (2005) is a zero-sum game at the management company level.

The final Regressions (5) and (6) present results when alpha, net of expenses, is the dependent variable. In general, the results are quite similar to those for pre-expense alphas (Regressions (3) and (4)). Note, however, that diseconomies-of-scale are lower (see the coefficients for  $\text{Log}(\text{TNA})$ ), reflecting that some economies-of-scale are present in expense ratios.

In unreported tests, we run the above regressions separately for growth-oriented funds and income-oriented funds. We find that the above results hold only for growth-oriented funds. We do not find any significant role of manager characteristics in income fund returns. This finding is consistent with past studies (e.g., Chen, Jegadeesh, and Wermers (2000)), who find little evidence of performance among income funds.

To summarize, this section has shown some evidence of effective governance by mutual fund management companies—underperforming experienced managers are less likely to exist within large management companies. However, the evidence also indicates ineffective governance in general, since lead portfolio manager experience negatively predicts fund performance, both at the stockholdings level and at the fund alpha level. This finding indicates that some level of managerial entrenchment exists.

In general, internal governance mechanisms do not appear to be completely effective among mutual funds. However, do external mechanisms provide further discipline? For example, do investors provide discipline through the threat of heavy outflows? Do fund directors assist by providing oversight? Do independent directors provide even better discipline? In the next section, we explore these issues by addressing the impact of fund flows and fund boards on fund performance. A major part of this analysis lies in determining whether boards with different characteristics have varying levels of effectiveness in governance, which should result in better portfolio performance.

### **C. The Impact of Fund Manager Replacement**

Our prior results indicate that characteristics of lead portfolio managers predict mutual fund performance. In this section, we directly examine the impact of lead manager replacement events on

performance. Specifically, at the beginning of each year from 1986 to 2002, we rank all actively managed domestic-equity mutual funds on their 3-year stockholdings-level performance, using the CS measure.

The evidence in Table V suggests that the probability that a manager is likely to be replaced is negatively correlated with the fund's past performance. For instance, 17.5% of bottom-quintile managers are replaced during a given year, on average, while only 12.9% of top-quintile managers are replaced. In addition, performance, as measured by the CS measure, is mean-reverting following a manager replacement, consistent with Khorana (1996, 2001).

#### **IV. Mutual Fund Governance and Fund Performance**

The recent mutual fund market-timing and late-trading scandals have increased the focus on the effectiveness of fund governance. At issue is whether certain governance structures, such as predominantly independent mutual fund boards, are more capable in providing the discipline to protect shareholders from performance-reducing actions, such as market-timing or late-trading. For example, Fidelity's independent directors exhibited effective governance in the recent \$42 million reimbursement from Fidelity to its mutual funds, which followed a report commissioned by independent directors that found that Fidelity traders had improperly accepted gifts from brokers (presumably for order flow).

In our context, we wish to examine the effectiveness of different governance structures in providing incentives for fund outperformance, as well as in disciplining underperforming managers. As such, we focus on the broad impact of boards on overall performance, and not on the specific impact on fraudulent fund activities (which, in most cases, have a very small effect on overall fund performance). Indeed, based on our findings of the prior section and those of Baks (2007), portfolio managers have a big impact on mutual fund performance, even before expenses and "hidden actions" are taken into account. Thus, governance is likely to be extremely important in providing incentives for managers to expend effort, and in replacing managers without skills.

There are three potential sources of effective governance for a mutual fund. First, investor flows—“external governance”—reward outperforming, and, to a lesser extent, discipline underperforming mutual fund managers. Sirri and Tufano (1998) show that flows chase winners more strongly than they leave losers, indicating only partially effective governance by flows. Further, Johnson (2007) finds that mutual fund investors leave underperforming mutual funds only if they are attracted by another outperforming fund.

Second, mutual fund management companies (e.g., Fidelity)—“family governance”—provide inside directors for mutual fund boards; in addition, portfolio managers are employees of management companies and not of the mutual funds themselves. Therefore, fund management companies—through inside directors and through other means of monitoring portfolio managers—may provide effective governance for a mutual fund.

Third, independent (outside) directors within the mutual fund—“internal governance”—can add another layer of governance. Since flows have been shown to be an imperfect governing mechanism, as mentioned above, and since fund management companies may not have sufficient incentives to discipline portfolio managers, outside directors may be necessary to implement effective governance.

While we include the impact of fund flows, our study focuses on the role of the management company and board outsiders. Our empirical analysis of board insiders vs. outsiders is motivated by Harris and Raviv (HR; 2008), who model the optimal choice of board structure by shareholders in a general corporate setting. Indeed, some of the implications of the HR model are directly applicable to our specialized investment company (mutual fund) setting. Specifically, HR predict the influence of increasing numbers of outside directors in a setting where outsider-controlled boards are mandated, as in the mutual fund industry where funds are currently required to have a simple majority of outsiders on the board.<sup>18</sup> In such a setting, outsiders already control the board, which

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<sup>18</sup>Although Section 10(a) of the Investment Company Act of 1940 requires that a minimum of 40 percent of directors be non-interested, over 99% of funds in our sample have a board composed of at least 50% non-interested directors. Indeed, recently adopted Rule 10(f)-3(b)(11)(i) now requires at least 50% non-interested directors on a mutual fund board as of July 1, 2002.

allows them to control all important decisions made by the board, thus mitigating the agency problems associated with insiders serving on the board (assuming that agency problems do not exist for outside directors as well, that is, that their interests are perfectly aligned with shareholders through, perhaps, being paid a share of profits).

Further, when outside directors must expend effort to gather information about the firm, the HR model predicts that there will be opposing effects when the number of outsiders is increased above a simple majority. On one hand, more outsiders allow more independent gathering of information about the firm's operations, collectively allowing the outsiders to make more informed decisions about firm operations. In a mutual fund setting, outside directors gather information about the performance of the fund as well as the manager's strategy and investment decisions, which allows them to make inferences regarding the likelihood that the manager is talented and works hard, and will produce good future performance. On the other hand, more outsiders increases the free-riding problem—since each outsider only benefits by a fraction of her efforts in collecting information, each tends to underinvest in costly effort due to the positive externality created by it. And, additional outside directors replace inside directors, who presumably have much better knowledge of fund operations and portfolio manager skills. Indeed, Gervais, Lynch, and Musto (GLM; 2005) model the management company as being an effective monitor of portfolio manager skills, since the management company has information that is not available to outside directors or investors.

In our setting, the HR model predicts that there is an optimal level of outside directors for a mutual fund company, and this optimum exceeds a simple majority as long as each outside director infers that her share of the expected benefit of her effort exceeds the cost.<sup>19</sup> We next address whether this empirical prediction seems to be supported in our fund sample.<sup>20</sup>

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<sup>19</sup> One of the benefits is the normal compensation of being an independent director. For example, current US Defense Secretary Robert Gates received compensation of \$362,250 from Fidelity in 2004 for his service as an independent director. At least in theory, independent directors are well-compensated for representing the interests of fund investors.

<sup>20</sup> Little research has been conducted on the influence of fund boards. A notable exception is Tufano and Sevick (1996), who find (as mentioned earlier) that smaller boards and a higher fraction of independent directors are associated with lower fees, indicating that smaller boards with higher independence are more effective in dealing with agency conflicts.

We address these empirical implications by first examining the impact of board structure on manager replacement decisions for a mutual fund to determine whether this is an important mechanism through which outside directors influence ongoing fund performance. Then, we examine the impact of board structure on ongoing fund performance, which provides insight into whether board structure impacts fund performance, beyond their impact on manager replacements.

Motivated by the models of HR and GLM, we create the following two hypotheses.

1. **The Managerial Entrenchment Hypothesis.** Management companies have an incentive to retain some low-skill managers (and to fire only a portion of low-skill managers), since firing a manager may reveal that the management company may have other low-skill managers (see GLM).<sup>21</sup> Also, portfolio managers may become powerful in the internal management company organization. Therefore, the Managerial Entrenchment Hypothesis predicts that funds that are members of larger management complexes and funds with more inside directors will exhibit worse performance and will less frequently replace underperforming managers.

On the other hand, management complexes may have superior information on the skills of a portfolio manager, giving them an advantage in identifying skill. This leads to our second hypothesis:

2. **The Informational Advantage Hypothesis.** As modeled by HR, inside executives at fund management complexes likely know more about the skills and effort exerted by their mutual fund managers. They also provide pools of research analysts to fund managers, so the management complex knows more than outsiders about the strategies implemented by their portfolio managers. Due to this informational advantage, management complexes are better able to monitor and discipline underperforming mutual fund managers, as well as to incentivize skilled managers, especially due to performance that is derived from “hidden actions” of the managers (such as interim trading that is not reported in fund filings), compared to outside directors (or investors). Further, portfolio managers within large management complexes are more likely to compete with other same-complex managers to attain promotions and perquisites, and larger fund complexes may have a

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<sup>21</sup> For instance, the Putnam funds all suffered substantial outflows following the public revelation that certain portfolio managers had market-timed some Putnam funds.

bigger penalty to performance-reducing actions by one of their funds. Therefore, the Information Advantage Hypothesis predicts that funds with more inside directors and funds that are members of larger management complexes will exhibit better performance and more frequently replace underperforming managers, especially with regard to net return performance (which includes the impact of hidden actions).

Although these two hypotheses may be viewed as competing, they are not necessarily mutually exclusive. For instance, each hypothesis may be partially correct—fund insiders may be able to exploit their private information about fund manager skills, but may suboptimally (from the point-of-view of fund investors) fire underperforming fund managers due to other incentives. To test these hypotheses, we use a unique dataset of mutual fund board compositions—we describe these data next.

## **A. Board Data and Board Characteristics**

We obtained board data for our domestic-equity funds during fiscal years 1995, 1999, and 2002 from Lipper and from fund filings on the SEC Edgar site. These data are further described in Appendix B.

The board characteristics that we attempt to model are the relative power of independent vs. inside directors. We use the total number and percentage of independent directors as proxies for independent board power, as well as the affiliation of the board chairman and the presence of “unitary” board structures (funds with overlapping boards).<sup>22</sup> Funds with an insider chair and having a unitary board are deemed to have less independence.

Table VI shows summary statistics for our three-year sample of board characteristics. Panels A, B, and C provide mean and median counts of the total number of directors on a board

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<sup>22</sup> Non-interested directors are those who are unaffiliated with the mutual fund management company, defined as not having a direct business relationship. We use the terms “non-interested directors,” “outside directors,” and “independent directors” interchangeably. Likewise, we use “interested directors” and “inside directors” interchangeably. Because the minimum legal requirement of the percentage of non-interested directors serving on a mutual fund board is 40%, we throw out 30 fund-years that have the percentage lower than this minimum (either these data are flawed or these funds might be in a transitional period when they filed their report).

(*NUMDIR*), number of independent directors (*NUMINDEP*), and number of inside directors (*NUMINSIDER*) for 1995, 1999, and 2002, respectively, as well as the percentage of independent directors (*FRACINDEP*) and the percentage of boards with an inside director serving as the board chairperson (*INSIDERCHAIR*). The table also shows the percentage of funds with either an inside board chair or a management company president serving on the board (*INSIDERLEAD*), the percentage with an independent board chair (*INDEPCHAIR*), and the percentage with a unitary board—defined as having at least two board members who are on at least one other fund board within the same management company (*UNITARY*).

The average number of directors on a fund board has increased from 7.6 in 1995 to 8.2 in 2002—completely due to an increase in the average number of outside directors, which grow from 5.5 in 1995 to 6.2 in 2002. By 2002, the average (and median) fund has more than 75% outside directors. However, only about 18% of funds have an independent chair by 2002. In addition, over 80% of funds have a unitary board by 2002.

It is also noteworthy that funds that replaced managers have more independent directors than non-replacement funds, which results in a higher proportion of independent directors. Prima facie, this indicates that higher numbers of independent directors exert more discipline in firing underperforming managers; however, several other interpretations are also possible, such as higher levels of skilled managers leaving the industry among larger funds (which generally have larger boards). However, the proportion of funds (who replaced their managers) having an independent chair is not consistent higher than other funds.

Panel D shows cross-sectional correlations between board characteristics, where the three years are pooled to form the cross-section. It is noteworthy that a very high correlation exists between the number of independent directors and the total number of directors, indicating that funds grow larger mainly because they wish to add more independent directors. Most other variables, while showing significant correlations, have enough independent variation to allow for conclusive multivariate tests.

## B. Board Independence and Manager Replacement

Certain types of governance structures, such as a supermajority of independent directors, may be more effective at providing incentives for managers to expend effort to research stocks, as well as disciplining managers without skills. While the incentive compensation structure for portfolio managers is proprietary and unavailable to the public during the period of our analysis, we can observe the replacement of managers from our database.

Our cross-sectional tests look for variables that predict manager replacement, noting that a manager replacement event (as seen in the last section) is an imperfect proxy for an effective governance action. Although we cannot perfectly see the reason for a manager replacement (i.e., termination or leaving for higher compensation), we are motivated to examine manager replacements because of the possibility that the structure of boards may matter more when a decision about manager replacement must be made.

Table VII presents results for several cross-sectional logit regressions, pooled across 1995, 1999, and 2002, of the probability of manager replacement on several governance-related variables. In each regression, the dependent variable equals one for funds that replace managers during a given year (1995, 1999, or 2002), and zero otherwise. Our regressions are similar, in spirit, to the mutual fund manager replacement regressions of Chevalier-Ellison (1999), except that we focus on governance and organizational size variables.<sup>23</sup> Governance variables include number (*NUMINDEP*) and percentage (*FRACINDEP*) independent directors, a dummy slope,  $D_{75\%} = \max(0, PCTINDEP - 75\%)$ , and dummy variables for the presence of an inside director serving as board chair (*INSIDERLEAD*) and for the presence of a unitary board structure (*UNITARY*). *UNITARY* equals one if at least two directors on a particular fund board also serve on another fund board in the same complex. Organization size is represented by the number of funds within the same management company (*NUMFUNDS\_ADVISOR*). Following Chevalier and Ellison (1999),

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<sup>23</sup> Chevalier and Ellison (1999) include past performance and manager age, as well as the interaction of these two variables. In unreported tests, we confirm their findings on our dataset. All of our results to follow are qualitatively similar if we include these variables in our regressions.

we add year dummy variables, in case the job market for portfolio managers is systematically tighter during different calendar years within our three-year sample. Also following Chevalier and Ellison (1999) and Khorana (2001), we assume that manager replacements following a negative alpha (in our case, we choose a negative lagged three-year four-factor alpha) are terminations—and limit our regressions to funds having a negative alpha to model terminations rather than the more general case of manager departures.<sup>24</sup> Other regressors include fund size ( $\log(TNA)$ ) and a dummy variable equal to one only if investor flows during the prior year are negative ( $D_{OUTFLOW}$ ). This outflow dummy captures the disciplining force of investor flows.

Regressions 1 and 2 present results, limited to managers having fewer than 10 years of career experience managing funds where the lagged three-year four-factor alpha, prior to expenses, is negative. The results show that terminations are significantly predicted by investor outflows during the prior year, and by the number of funds within the same management complex. The number of independent directors has no explanatory power, indicating that independent directors are ineffective at terminating underperforming unseasoned managers, perhaps because of the large uncertainty inherent in evaluating a short performance record.

Regressions 3 and 4 present results, limited to negative-alpha managers (before expenses) with at least 10 years of experience. Regression 3 shows that a greater number of independent directors (NUMINDEP) is crucial for terminating underperforming managers, as no other variable significantly predicts such terminations; for instance, prior-year outflows ( $D_{outflow}$ ) and management company size (NUMFUNDS\_ADVISOR) load insignificantly, indicating that flows are an ineffective disciplinary force when managers are experienced in both large and small management companies—indicating that entrenchment is present among portfolio managers with a lot of experience. In Regression 4, the number of independent directors becomes insignificant because of collinearity with the percentage of independent directors. Regression 4 also indicates that a high

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<sup>24</sup> Khorana (2001) found that three-year lagged alphas are negative for replaced managers, on average. He also finds that flows are significantly lower than normal prior to replacement.

percentage of independent directors is not detrimental to terminating underperforming managers—the coefficient on  $D_{75\%}$  is insignificant as well as positive.

Regressions 5 through 8 repeat these regressions, limiting the analysis to managers with negative three-year lagged four-factor alphas, *net of expenses*—since managers may be evaluated by their ability to surpass their expense levels. The results are qualitatively similar to those presented in regressions 1 through 4, which are prior to expenses.

In untabulated tests, we compute the proportion of underperforming fund managers (those with a negative three-year net-of-expense four-factor alpha) that are replaced in our sample with different numbers of independent directors. Across the 305 underperforming managers in funds with fewer than 8 independent directors, only 22 (7.2%) are terminated the following year. In contrast, across the 79 underperforming managers in funds with at least 8 independent directors, 15.2% are terminated. A greater number of independent directors roughly doubles the likelihood that a poorly performing manager will be replaced.

A small number of mutual funds in our sample have boards with fewer than 50% independent directors—SEC regulations required a minimum of 40% until 2002, when a minimum of 50% was implemented. In untabulated results, we include a dummy variable for these funds in our logit manager replacement regressions. We find a 9% probability of manager replacement during a given year for the average fund with at least 50% independent directors, but only a 3% probability for the average fund with fewer than 50% independent (this difference is statistically significant).

Since the proportion of outside directors has no (or a weak) relation with manager replacement, we may infer that the additional information gathered by an additional outside director exceeds her costs, at least for the range of board sizes that we observe in our sample. This result provides an interesting empirical outcome for the Harris and Raviv (2005) theory model of board structure.

### **C. Board Characteristics and Fund Performance**

Our final tests investigate whether mutual fund governance structures impact fund performance. Khorana (1996, 2001) finds that performance improves following the replacement of a fund manager—which, as our prior tests show, occurs much more frequently with prior-year outflows, a more independent board, and a larger management complex. In this section, we test whether such governance structures substantially impact fund performance in general, as well as during years when the manager is not replaced. If we find evidence of improved performance during years when the manager is not replaced, this is evidence that fund managers are motivated to expend more effort with certain structures, perhaps due to the fear of being terminated.

We measure fund performance using two different approaches. First, we measure performance at the stockholdings level, which focuses on fund manager skills in picking stocks. Here, performance is measured with the CS measure of Section II.B.

Second, we measure performance at the net return level, using the four-factor alpha of Section II.B. As in the last section, this alpha is measured both before and after expenses—pre-expense alphas are measured by adding back the yearly expense ratio to the annualized four-factor alpha. These performance measures, besides capturing manager stockpicking skills, also capture the effect of “hidden actions,” which can be either performance-increasing or reducing. Hidden actions are those that potentially affect fund performance, but are not observable using periodic portfolio holdings reports.

For instance, Puckett and Yan (2008) show that interim trading (trading between portfolio report dates) contributes to increased average fund performance, while Kacperczyk, Sialm, and Zheng (2007) show that net returns also contain performance-reducing hidden actions (such as poor trade execution and window-dressing motivated interim trades).

First, we implement cross-sectional regressions of portfolio-holdings level stockpicking performance (CS measure), pooled across the three years for which we have director data (1995,

1999, and 2002), on our board characteristics—in Regressions (1) through (4) of Table VIII.<sup>25</sup> Regression (1) indicates that the fraction of independent directors does not significantly matter, while Regressions (2) through (4) indicate that the number (rather than the fraction) positively impacts performance. One additional independent director is associated with a 16 basis points per year (bps/year) increase in performance.

In regressions (3) and (4), we add a dummy variable that equals one only if the portfolio manager is replaced during the prior year, to control for these events on following-year performance ( $D_{\text{MGR\_REPLACE(YEAR-1)}}$ ). Note that a manager replacement insignificantly impacts following-year performance, since a large number of manager departures are not due to firing following poor performance.

Also, note that, above 75%, independent directors have a detrimental effect on fund performance ( $D_{75\%}$  is a dummy slope that equals  $\max(0, \text{FRACINDEP}-0.75)$ ).<sup>26</sup> For instance, Regression (2) indicates that a fund having more than 75% independent directors exhibits 60 bps/year lower CS measure. Also, note that almost no underperformance is present in funds with an inside board chair—only .07 bps per year. Thus, performance at the portfolio holdings level generally benefits from greater board independence, which is consistent with the Managerial Entrenchment Hypothesis (with the caveat that the board should have some minority representation from insiders).

Regressions (5) through (8) use the annual four-factor alpha, plus expenses, as the dependent variable—which includes both stockholdings-level performance, trading costs, and performance derived from hidden actions (such as interim trading). Independent directors are similarly important for generating pre-expense net return alpha, as shown by the coefficients on *NUMINDEP*, which are similar across Regressions (2) through (4) and (6) through (8). Note, however, that board

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<sup>25</sup> Note that we exclude manager-level variables in these regressions, since they may serve as proxies for effective governance, which we wish to capture with our board-level characteristics. For instance, if governance is effective among most funds, then we would expect manager experience to have a positive influence on stockpicking performance (which we find in a previous section for large funds). Such outperformance may be associated with funds having, for instance, more independent boards, which is what we wish to capture in this section.

<sup>26</sup> Interestingly, the SEC proposed a requirement of 75% board independence, but this requirement has yet to be implemented.

independence above 75% is more harmful to performance at the net return level, as shown by the larger (negative) coefficients on  $D_{75\%}$  in Regressions (6) through (8). This finding indicates that inside directors are important for controlling performance-reducing hidden actions of portfolio managers.

Further, the positive impact of the number of funds within the same management company ( $NUMFUNDS\_ADVISOR$ ) indicates that larger management companies more effectively govern fund managers, consistent with large complexes having better information about fund manager skills and strategies. Larger complexes have bigger pools of executives, with potentially diverse viewpoints about the likely talents and success of a given portfolio manager—making inferences about fund manager talents more precise. This translates into better performance among funds in larger complexes. In addition, large management companies experience larger negative externalities from an underperforming fund, as it can result in investors viewing other funds negatively.

For instance, a fund managed by a company with 100 funds generates an alpha that is (on average) 1.6% per year greater than a fund managed by a company with only 20 funds ( $80 \times 0.02$ ). This finding is consistent with the management company economies-of-scale documented by Chen, Hong, Huang, and Kubik (2004)—our results show that this effect is driven mainly through the ability of larger management companies to monitor “hidden” fund manager actions. While this large complex effect could be due to explicit setting of fund manager contracts to incentivize good fund performance, it could also be due to the larger competitions (tournaments) among pools of fund managers at large complexes, forcing fund managers to exert more effort to keep their jobs.

Finally, unitary boards are harmful to performance at the pre-expense net return level, perhaps due to the limited attention that each board member can provide to each fund. A fund with a unitary board underperforms by almost one percent per year, on average.

Regressions (9) through (12) repeat the analysis, using the four-factor alpha net of expenses. Results are similar to those of the pre-expense alpha (Regressions (5) through (8)).

In untabulated tests, we regress yearly fund expenses on the governance variables of Table VIII, and confirm the findings of Tufano and Sevick (1997): a larger fraction of independent board members as well as a smaller board are associated with funds having lower fees. However, the

impact of fund governance structures on fees is much smaller than its impact on pre-expense performance. For instance, unitary boards are related to lower fees, but the coefficient on UNITARY is only -0.09, consistent with the difference in the coefficient on UNITARY between Regression (8) and Regression (12). Thus, we believe that the form of fund governance is much more important for monitoring portfolio managers than in setting fees.

In general, our net return alpha Regressions (5) through (12) are consistent with the Informational Advantage Hypothesis. Although independent directors remain important, insiders also play an important role in monitoring and rewarding (or disciplining) fund managers.

## **V. Conclusion**

In this paper, we have presented evidence on the role of mutual fund managers in generating portfolio performance, as well as the role of directors in the ongoing performance of funds and in the replacement of underperforming managers. Our study is timely, in that it has implications for the newly proposed SEC regulation on fund director independence and the newly adopted SEC regulation on fund manager disclosure.

We find that experience and (advisor-level) stockpicking track-record of a fund manager are correlated with following-year performance, however, this relation indicates some evidence of manager entrenchment. That is, experience negatively predicts following-year portfolio performance, unless the highly experienced manager runs a large mutual fund. We also find that larger boards (which are comprised of larger numbers of independent directors) are associated with better performance as well as with a higher likelihood of underperforming manager replacement, when the manager has more than 10 years of experience. Finally, we find that insiders are important for monitoring the “hidden actions” of portfolio managers (those actions not reported in quarterly portfolio holdings reports).

Our study, while providing new insight on the relation between fund governance and performance, also opens new avenues for research that examine the labor market for fund managers

as well as the dynamic aspects of fund boards over time. We leave these important issues for future research.

## Appendix A: Construction of Mutual Fund Manager Database

In constructing our database of managers, we focus on U.S. equity funds, that is, funds having a self-declared investment objective of Aggressive Growth (AG), Growth (G), Growth and Income (GI), or Income (I) at the beginning of a given calendar quarter. The fund manager data is assembled from electronic databases, mutual fund industry publications, as well as mutual fund SEC filings. The electronic databases we use include a survivor-bias free manager database that was obtained from Morningstar in August 2004, the monthly Morningstar Principia Pro CDs (1995--2002), the annual Morningstar OnDisc CDs (1992-1994), the CRSP Survivor-Bias Free Mutual Fund Data Base covering fund characteristics through 2003Q1, a database of fund managers that was purchased from Thomson/Wiesenberger in 1999. The Morningstar manager database and CDs constitute the main sources of our manager data, as CRSP only lists managers beginning in 1992 and Wiesenberger only lists fund manager information for funds existing in 1999, although, for these surviving funds, the succession of managers is listed as far back as the early 1970s.<sup>27</sup> The Morningstar electronic sources contain manager information for funds that exist after around 1992.<sup>28</sup> Because of the resulting missing manager data from pre-1992, we augment the merged dataset with manager information obtained from a few other printed sources. These sources include Investment Dealers' Digest's Mutual Fund Directory (1987-1991), the Handbook for No-Load Fund Investors (1984-1991), the Morningstar Mutual Fund Sourcebooks (1984-1991), the Morningstar Mutual Fund Values (1986-1989), and Standard & Poor's/Lipper Mutual Fund Profiles (1987-1991). For some funds, we request to the SEC for their fund prospectus filings in late 1980s. Although we

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<sup>27</sup> Spot checks among the three sources indicate that Morningstar is fairly more accurate and complete in reporting manager information (name, start date) than the other two sources. Also, Morningstar maintains a managerial characteristics database starting from the early 1990s, which include fund manager bio, education, CFA designation, etc.

<sup>28</sup> Morningstar backfills manager information for most of the funds existing after 1992 back to at least the mid-1980s, though.

attempted to obtain manager data starting in 1975 (since we have fund holdings data starting at this date), none of the printed sources had reliable and complete information before roughly 1986.<sup>29</sup>

We combine the fund manager data from these sources based on manager's name and the name of the managed fund to ensure that we create a manager database that is as complete as possible.<sup>30</sup> Specifically, for each fund manager, we collect her name, the names of funds managed by her during her career, the start and end dates for that manager at each fund over her career, and other manager characteristics, including CFA designation, universities attended, prior analyst experience, and other items such as marital status and personal interests. The fund manager data are then matched with the CDA-CRSP database of portfolio holdings, net returns, and fund characteristics. In conducting our study, we focus our attention on the lead manager of each mutual fund, assuming that this manager has the greatest decision-making power for that fund. As a proxy to identify the lead manager, we choose the manager with the longest tenure at a given fund (if team managed) to decide on which manager is the lead manager.<sup>31</sup>

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<sup>29</sup> One reason for this is that mutual funds have been required to report the portfolio manager information in fund prospectus starting from around 1987, according to the Investment Company Institute, the trade association of the mutual fund industry in Washington, DC.

<sup>30</sup> We note that in some (rare) cases, there are inconsistencies in manager's first name due to nick name (e.g. Robert vs. Bob) and name suffix (none vs. Jr.) in the three fund manager data sources. In these cases, we use other information, such as historical name of the manager, fund name, dates of start and end, to ensure the accuracy of matching.

<sup>31</sup> If there is tie in the start date, we use the career experience as the tie-breaker, that is, we pick as the lead manager the manager who becomes a fund manager (of any fund) at the earliest date.

## Appendix B: Mutual Fund Board of Directors Data

We obtain the board of directors data for 2002 from Lipper's Director's Analytical Data. Section V of Volume I of the Lipper's data reports directors' compensation information, which includes number of "interested" directors, number of "non-interested" directors, approximate number of board meetings held by each fund annually, standing committees of the board of directors, total amount of directors' compensation paid by the fund, directors' compensation, and whether the fund complex has a deferred compensation agreement with its directors/trustees. However, the Lipper data does not have the information about chairman of the board and whether a fund complex adopts a unitary board or a clustered board to monitor its member funds. We further augment this dataset by collecting this chairman information directly from mutual funds' filings from the SEC/EDGAR web site at <http://www.sec.gov/edgar>.<sup>32</sup> The unitary board information is inferred by checking all filings made by a fund complex during a year.

Mutual funds are required to report the board of directors information in the statement of additional information (SAI) contained in fund prospectus filed in Form 485APOS or 485BPOS at least once a year.<sup>33</sup> The detailed board of directors information is usually contained in the section of "Management of the Trust" or "Directors and Officers," which includes director name, address, age (or date of birth), position in the board, whether interested or non-interested director as defined in the Investment Act of 1940, principal occupations in the past five years, committee membership, cash compensations, ownership in the fund and fund complex, etc.

Mutual funds usually make filings with the SEC under a filer name different than the fund name. Moreover, a mutual fund filer may contain multiple funds in its filings.<sup>34</sup> In collecting the board of directors information, we first find the filing entity name for each fund in TFN/CDA-CRSP by searching the SEC/EDGAR filing archive database and looking into the filings made by

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<sup>32</sup> After 1994, mutual funds are required to make filings on SEC/EDGAR electronically.

<sup>33</sup> Although funds may disclose the board of directors information in other filings (e.g. N-30D), Form 485 is the most reliable source for board information and contains the most comprehensive information about directors.

<sup>34</sup> For example, both Fidelity Capital Appreciation Fund and Fidelity Value Fund are filed under the name of Fidelity Capital Trust with Central Index Key (CIK) of 275309.

potential filer entity candidates. After obtaining the fund entity name for each fund, we then download their Form 485 filings for 1995, 1999, and 2002 from the SEC/EDGAR site.<sup>35</sup> Finally, for each downloaded Form 485 filing, we manually collect the director information and generate the board of directors characteristics for each fund based on the collected directors information.

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<sup>35</sup> A fund may file Form 485 more than once in a year, in which case, we use the latest filing as the Form 485 filing for that year.

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**Table I**  
**Summary Statistics for Mutual Fund and Mutual Fund Manager Database**

This table presents summary statistics of mutual funds and lead managers in the merged mutual fund and fund manager databases from 1985 through 2002 (inclusive). The mutual fund data are drawn from the merged Thomson/CDA-CRSP mutual fund database (CDA-CRSP). Panel A reports the number of mutual funds at the end of 1985, 1991, 1997, and 2002, as well as during the whole sample period, 1985-2002 (“All Funds” for 1985-2002 does not equal the sum of categories due to some funds changing categories over time). Reported are statistics for the whole fund universe, as well as for the subgroups of aggressive growth (AG), growth (G), and growth and income or income funds (these two similar groups are pooled together; GI & I). Panel B presents counts of lead managers and the average number of funds managed by a lead manager at the end of 1985, 1991, 1997, and 2002 as well as during 1985 through 2002. The lead manager of a team management is defined as the manager who starts to manage the fund earliest. A lead manager is included in a subgroup of an investment objective (e.g., AG) for one point in time (e.g., the end of 2002) if she is the lead manager of at least one fund with that objective at that time. Some managers may lead-manage several funds with different investment objectives at one time. Panel C reports the number of funds missing managers. For instance, the 1985 column in Panel C reports the funds that exist at the end of 1985, but do not have managers matched in 1985. The percent of funds missing managers is calculated as the number of funds missing managers divided by the number of funds existing at that time expressed in percentage. Panel D provides a comparison of median total net assets (TNA) and mean excess returns between the funds with manager data and funds with missing manager data. To test the difference in characteristics of funds reporting manager information and funds missing manager information, a Wilcoxon two-sample signed rank test is done for TNA (median) and a *t*-test is done for net returns (mean).

<b>Panel A: Counts of Mutual Funds</b>					
	1985	1991	1997	2002	1985-2002
All Funds	324	648	1,594	1,698	2,689
AG	70	169	178	276	533
G	165	345	1,129	1,137	2,084
GI & I	89	134	287	285	561

**Panel B: Counts of Mutual Fund Managers**

	1985		1991		1997		2002		1985-2002	
	N	Avg. No. of Funds Lead-Managed	N	Avg. No. of Funds Lead-Managed	N	Avg. No. of Funds Lead-Managed	N	Avg. No. of Funds Lead-Managed	N	Avg. No. of Funds Lead-Managed
All Funds	239	1.2	499	1.3	1,133	1.3	1,079	1.4	3,136	1.9
AG	55	1.3	143	1.4	158	1.8	224	1.8	824	2.8
G	132	1.2	288	1.4	860	1.4	797	1.5	2,371	2.1
GI & I	72	1.2	120	1.4	248	1.5	224	1.7	860	2.4

**Panel C: Summary Statistics of Mutual Funds Missing Lead Managers**

	1985		1991		1997		2002		1985-2002	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
All	49	15.1	21	3.2	80	5.0	164	9.7	106	3.9
AG	10	14.3	3	1.8	5	2.8	23	8.3	16	3.0
G	25	15.2	15	4.4	62	5.5	114	10.0	84	4.0
GI & I	14	15.7	3	2.2	13	4.5	27	9.5	13	2.3

**Panel D: Comparison of Mutual Funds Reporting Managers and Mutual Funds Missing Managers**

	1985		1991		1997		2002	
	Median TNA (\$Million)	Mean Return (%)	Median TNA (\$Million)	Mean Return (%)	Median TNA ((\$Million)	Mean Return (%)	Median TNA (\$Million)	Mean Return (%)
All Funds	111	27.2%	93	36.4%	147	22.6%	144	-21.6%
Funds Reporting Managers	104	27.4%	93	36.3%	154	22.7%	158	-21.3%
Funds Missing Managers	117	26.2%	130	39.0%	61	21.6%	65	-24.6%

**Table II**  
**Summary Statistics for Mutual Fund Manager Characteristics**

This table presents summary statistics for mutual fund lead-manager characteristics. Panel A presents lead-manager characteristics, averaged over three-year periods, where characteristics are measured at the end of each year. These characteristics include career experience (measured as the length of time since a manager becomes a portfolio manager) and career track record (measured as the average *CS* performance over a manager's career; performance is measured as far back as possible for all managers existing in 1985). In addition, the average yearly proportion of funds experiencing a lead-manager replacement event is presented (year 1985 is not included in the average for 1985-1987 due to a high percentage of funds missing manager information for 1985). Panel B presents the average total net assets managed by lead-managers double-sorted by career experience and career track-record. All managers are double-sorted at the beginning of each year, first on career experience, and then (conditionally) on career track-record. Time-series average statistics are presented in the panel. \*\*\*, \*\*, and \* indicate significance at the levels of 1%, 5%, and 10%, respectively.

<b>Panel A: Lead-Manager Characteristics</b>					
	Career Experience (Year)		Career CS Track Record (% per year)		% of Funds Getting Lead Manager Replaced
	Mean	Median	Mean	Median	
1985-1987	7.1	4.3	1.64	1.21	10.2
1988-1990	7.1	4.7	0.84	0.65	10.3
1991-1993	6.5	4.8	0.82	0.88	12.2
1994-1996	5.9	4.0	0.42	0.72	13.5
1997-1999	6.1	4.3	-0.08	0.16	14.1
2000-2002	7.0	5.5	1.98	1.46	14.8

**Panel B: Average Total Net Assets Lead-Managed by Lead Managers Sorted by Career Characteristics (TNA; \$Millions)**

		Career Track Record							
		Average Career Track Record (%/year)							
			8.70	2.67	0.70	-1.18	-6.49	1.02	
		Average Career Experience (Years)	Top 20%	2nd 20%	3rd 20%	4th 20%	Bottom 20%	All Lead Managers	Top 20%-Bottom 20%
Career Experience	18.5	Top 20%	1,265	2,013	1,491	886	421	1,236	844***
	8.8	2nd 20%	1,227	723	602	530	308	688	919***
	5.4	3rd 20%	480	553	606	365	224	445	257**
	3.3	4th 20%	320	399	311	285	214	306	107
	1.3	Bottom 20%	234	283	286	202	128	229	106**
	8.0	All Lead Managers	761	860	699	468	268	617	493***
		Top 20%-Bottom 20%	1031***	1730***	1205***	684***	293***	1007***	

**Table III**  
**Following-Year Performance (CS Measure) for Funds Sorted by TNA,**  
**Manager Career Experience, and Career Stockpicking Track-Record**

At the beginning of each quarter between 1986 and 2002, we first sort all funds into quintiles by total net assets under management (TNA). Then for each TNA-quintile of funds, we sort funds by the lead manager's career experience (the length of career experience, with any fund, of the manager starting at a given fund at the earliest date). Thus, we get 25 TNA/experience double-sorted fund portfolios. To be included in the analysis, each lead manager is required to have at least one-year career experience as a mutual fund manager. Finally, we rank all funds, within each of the 25 fractiles, on the level of career stockpicking talent, as measured by the career average characteristic selectivity (CST) track record of the lead fund manager, as of the beginning of that quarter. Panel A presents the equal-weighted following-year performance (CS measure) of all funds within the largest TNA fractile, while Panels B and C present results for the 2<sup>nd</sup> through 4<sup>th</sup> (equal-weighted across all funds falling within the 2<sup>nd</sup> through 4<sup>th</sup> TNA quintiles) and the smallest quintile of funds, respectively. For each cell, the time-series average over all event quarters from January 1, 1986 through January 1, 2002 is presented. In forming all portfolios in this table, we limit our analysis to funds having a self-declared investment objective of “Aggressive Growth,” “Growth,” “Growth and Income,” or “Income” at the beginning of the test year. Significance levels are noted, based on a *t*-test of top 20% funds’ average CS measure being equal to bottom 20% funds’: \*significant at the 10% level; \*\*significant at the 5% level and \*\*\*significant at the 1% level.

<b>Panel A: CS Measure (in %/year) for Funds in Largest TNA Quintile</b>										
			Career Track Record							
		Average Career Track Record (%/year)	6.88	3.03	1.42	0.17	-2.04	1.91		
		Average Career Experience (Years)	Top 20%	2nd 20%	3rd 20%	4th 20%	Bottom 20%	All Funds	Top 20%- Bottom 20%	
Career Experience	24.3	Top 20%	1.87	1.85	1.25	0.46	0.12	1.13	1.75**	
	13.2	2nd 20%	0.62	1.10	0.64	-0.52	0.01	0.39	0.60	
	8.5	3rd 20%	-0.01	0.92	0.38	0.82	0.14	0.48	-0.15	
	5.6	4th 20%	0.26	1.08	1.04	1.40	1.42	1.03	-1.16	
	2.8	Bottom 20%	-0.42	0.79	0.00	0.07	0.63	0.20	-1.05*	
	10.9	All Funds	0.48	1.18	0.66	0.46	0.46	0.65	0.02	
			Top 20%- Bottom 20%	2.28*	1.07	1.24**	0.39	-0.51	0.92*	

<b>Panel B: CS Measure (in %/year) for Funds in 2<sup>nd</sup>-4<sup>th</sup> TNA Quintile</b>									
		Career Track Record							
		Average Career Track Record (%/year)	8.00	2.68	0.74	-1.02	-5.17	1.09	
		Average Career Experience (Years)	Top 20%	2nd 20%	3rd 20%	4th 20%	Bottom 20%	All Funds	Top 20%-Bottom 20%
Career Experience	18.0	Top 20%	1.63	0.65	0.98	0.76	-0.56	0.71	2.20**
	9.2	2nd 20%	-0.01	-0.01	0.33	1.23	0.44	0.40	-0.45
	5.8	3rd 20%	0.72	0.85	0.55	0.95	0.23	0.66	0.49
	3.8	4th 20%	0.37	0.10	0.78	1.38	0.94	0.74	-0.56
	2.0	Bottom 20%	0.37	-0.12	0.27	0.34	0.45	0.28	-0.08
	7.8	All Funds	0.63	0.29	0.58	0.95	0.29	0.56	0.34
		Top 20%-Bottom 20%	1.27	0.77	0.71	0.41	-1.01	0.42	

<b>Panel C: CS Measure (in %/year) for Funds in Smallest TNA Quintile</b>									
		Career Track Record							
		Average Career Track Record (%/year)	8.52	2.58	0.10	-2.26	-9.08	0.05	
		Average Career Experience (Years)	Top 20%	2nd 20%	3rd 20%	4th 20%	Bottom 20%	All Funds	Top 20%-Bottom 20%
Career Experience	19.4	Top 20%	-0.42	1.09	0.07	-0.92	4.49	0.57	-4.91***
	8.6	2nd 20%	0.84	0.76	1.11	0.99	0.83	0.92	0.01
	5.1	3rd 20%	4.40	2.38	1.51	1.24	0.56	2.03	3.84**
	3.2	4th 20%	0.89	2.01	2.21	2.33	0.97	1.65	-0.07
	1.7	Bottom 20%	0.94	0.64	0.66	1.14	0.17	0.67	0.76
	7.5	All Funds	1.30	1.35	1.10	0.97	1.25	1.17	0.05
	Top 20%-Bottom 20%	-1.36	0.44	-0.59	-2.06**	4.31**	-0.10		

**Table IV**  
**Fama-MacBeth Regressions of Fund Performance**  
**on Manager-, Fund-, and Advisor-Level Characteristics**

This table reports time-series average regression coefficients from cross-sectional regressions of annual fund performance on year-beginning manager-, fund-, and advisor-level characteristics. A regression is computed each year, starting in 1986 and ending in 2002. For Regressions (1) and (2), annual fund CS (in %/year), computed as compounded monthly CS measures, is the dependent variable. For Regressions (3) and (4) ((5) and (6)), annualized fund four-factor alpha gross (net) of expense ratio (in %/year) is the dependent variable. Manager characteristics include lead-manager (the manager at that fund with the most career experience) career experience (EXPER, in years), and lead-manager career CS track record (CST, annualized in % per year). Fund-level characteristics includes year-beginning log total net assets under management (log(TNA), TNA in \$millions) during the same year. Advisor-level characteristic includes the total number of actively-managed equity funds having the same advisor (NUMFUNDS\_ADVISOR) as a given fund. For each variable, the first row shows the time-series average of yearly coefficient estimates and the second row shows the time-series  $t$ -statistics. Also reported are the time-series average sample size (Avg.  $N$ ) and time-series average adjusted  $R^2$  of the cross-sectional regressions. To be included in the regressions, lead managers are required to have at least one year of career experience. \*\*\*, \*\*, and \* indicate significance at the levels of 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	1.23*	1.14	3.84***	4.14***	1.73	1.97
	1.87	1.70	3.09	3.21	1.49	1.65
Log(TNA)	-0.21**	-0.22**	-0.58***	-0.60***	-0.40**	-0.42**
	-2.67	-2.74	-3.77	-3.84	-2.78	-2.88
EXPER	-0.029	-0.021	-0.11**	-0.14**	-0.14***	-0.16***
	-0.89	-0.59	-2.28	-2.51	-2.97	-3.17
CST	0.18**	0.18**	0.081	0.090	0.11	0.12
	2.21	2.19	0.74	0.81	1.02	1.07
Log(TNA)×EXPER	0.0093*	0.011**	0.019**	0.018**	0.023***	0.021**
	1.90	2.38	2.42	2.29	3.04	2.90
Log(TNA)×CST	-0.030**	-0.031*	0.000020	-0.0015	-0.0063	-0.0075
	-1.98	-1.98	0.00	-0.08	-0.32	-0.39
NUMFUNDS_ADVISOR×EXPER		-0.0017		0.0063*		0.0055*
		-1.06		1.93		1.85
NUMFUNDS_ADVISOR	0.030***	0.041***	0.035**	0.0039	0.034***	0.0057
	3.35	3.14	2.83	0.19	2.91	0.28
Avg. $N$	778	778	771	771	785	785
Avg. Adj. $R^2$	0.04	0.04	0.04	0.04	0.04	0.04

**Table V**  
**The Impact of Lead Manager Replacement**

This table shows the frequency of lead manager replacement, as well as the performance of funds ranked on their three-year prior performance records, computed as the average monthly CS measure. Funds are ranked at the beginning of each year based on this three-year record, from 1986 to 2002. Presented in Panel A of this table, for each past-performance fractile, are the yearly average: number of funds (N), equal-weighted TNA, three-year past performance (the ranking variable), following three-year performance, and percentage of funds that experience a lead-manager replacement event. Panel B presents statistics for funds that experience a lead-manager change (during a given event-year), and panel C presents statistics for funds not experiencing a lead-manager change. Significance levels are noted, based on a *t*-test of top 20% funds' average being equal to bottom 20% funds' average: \*\*\*, \*\*, and \* indicate significance at the levels of 1%, 5%, and 10%, respectively.

Rank Variable: Prior 3-Year Annual CS	Top 20%	2nd 20%	3rd 20%	4th 20%	Bottom 20%	All	Top 20% - Bottom 20%
All Funds							
N	135	136	135	136	135	676	
TNA (\$ Mil)	925	1172	1022	781	351	848	574***
Average Prior 3-Year Annualized CS (%)	7.84	2.49	0.51	-1.35	-5.98	0.70	13.81
Average Following 3-Year Annualized CS (%) <sup>36</sup>	1.37	0.45	0.61	0.63	0.18	0.66	1.20
Difference between Prior 3-Year and Following 3-Year Annualized CS	-6.46***	-2.04***	0.10	1.98***	6.16***	-0.05	
% of Funds Changing Lead Managers	12.9	12.3	13.9	18.2	17.5	14.9	-4.7**
Funds Experiencing Lead Manager Changes							
N	19	20	20	25	25	108	
TNA (\$ Mil)	891	1274	712	620	286	732	606**
Average Prior 3-Year Annualized CS (%)	8.83	2.51	0.48	-1.38	-6.49	0.18	15.32
Average Following 3-Year Annualized CS (%) <sup>1</sup>	0.08	0.82	0.97	0.79	0.02	0.52	0.06
Difference between Prior 3-Year and Following 3-Year Annualized CS	-8.75***	-1.69***	0.49	2.17**	6.51***	0.33	
Funds Not Experiencing Lead Manager Changes							
N	116	117	115	111	110	568	
TNA (\$ Mil)	907	1163	1080	811	370	872	536***
Average Prior 3-Year Annualized CS (%)	7.73	2.49	0.51	-1.35	-5.90	0.79	13.63
Average Following 3-Year Annualized CS (%) <sup>1</sup>	1.47	0.45	0.54	0.63	0.22	0.67	1.25
Difference between Prior 3-Year and Following 3-Year Annualized CS	-6.26***	-2.04***	0.03	1.98***	6.12***	-0.12	

1. The F-test indicates that the hypothesis of the equality of the average following 3-year annualized CS across the five Prior 3-Year annual CS categories can be rejected.

**Table VI**  
**Characteristics of Mutual Fund Boards**

This table reports the characteristics of mutual fund boards of directors during fiscal years 1995, 1999, and 2002. We define “manager replacement” as occurring when the entire management team is replaced by a new management team. Board characteristics include the total number of directors (NUMDIR), number of non-interested directors (NUMINDEP), number of interested directors (NUMINSIDER), fraction of non-interested directors (FRACINDEP), insider serving as the board chairperson (INSIDERCHAIR), insider leading the board by either having an insider serving as the board chairperson or having president on board (INSIDERLEAD), an independent director serving as the board chairperson (INDEPCHAIR), and all equity funds in a complex sharing one board (UNITARY). Panels A, B, and C show board characteristics of funds experiencing a lead-manager replacement event during 1995, 1999, or 2002, respectively ( $t$ -test and Wilcoxon nonparametric tests are shown for the hypothesis that the board characteristics of the two group of mutual funds are same). Panel D shows cross-sectional correlations between board characteristics, averaged across 1995, 1999, and 2002.

**Panel A: 1995 Board Characteristics**

	(1) All Funds ( $N=1107$ )		(2) Management Turnover ( $N=98$ )		(3) No Management Turnover ( $N=1009$ )		$p$ -Value for Difference between (2) and (3)	
	Mean	Median	Mean	Median	Mean	Median	$t$ -Stat	Wilcoxon
NUMDIR	7.6	7.0	8.5	8.0	7.6	7.0	0.00	0.00
NUMINDEP	5.5	5.0	6.3	6.0	5.4	5.0	0.00	0.00
NUMINSIDER	2.1	2.0	2.2	2.0	2.1	2.0	0.33	0.31
FRACINDEP	0.714	0.714	0.731	0.750	0.713	0.714	0.14	0.16
INSIDERCHAIR	0.598	1.000	0.582	1.000	0.600	1.000	0.73	0.77
INSIDERLEAD	0.862	1.000	0.867	1.000	0.861	1.000	0.87	0.92
INDEPCHAIR	0.045	0.000	0.041	0.000	0.046	0.000	0.83	0.94
UNITARY	0.837	1.000	0.776	1.000	0.843	1.000	0.08	0.27

**Panel B: 1999 Board Characteristics**

	(1) All Funds ( $N=1511$ )		(2) Management Turnover ( $N=119$ )		(3) No Management Turnover ( $N=1392$ )		$p$ -Value for Difference between (2) and (3)	
	Mean	Median	Mean	Median	Mean	Median	$t$ -Stat	Wilcoxon
NUMDIR	7.3	7.0	7.6	7.0	7.3	7.0	0.40	0.66
NUMINDEP	5.3	5.0	5.8	6.0	5.3	5.0	0.03	0.08
NUMINSIDER	2.0	2.0	1.7	2.0	2.0	2.0	0.01	0.03
FRACINDEP	0.724	0.750	0.770	0.767	0.720	0.733	0.00	0.00
INSIDERCHAIR	0.492	0.000	0.378	0.000	0.502	1.000	0.01	0.02
INSIDERLEAD	0.756	1.000	0.656	1.000	0.764	1.000	0.01	0.05
INDEPCHAIR	0.107	0.000	0.118	0.000	0.106	0.000	0.68	0.83
UNITARY	0.876	1.000	0.899	1.000	0.874	1.000	0.42	0.64

**Panel C: 2002 Board Characteristics**

	(1) All Funds (N=1443)		(2) Management Turnover (N=139)		(3) No Management Turnover (N=1304)		<i>p</i> -Value for Difference between (2) and (3)	
	Mean	Median	Mean	Median	Mean	Median	<i>t</i> -Stat	Wilcoxon
NUMDIR	8.2	8.0	9.8	10.0	8.0	7.0	0.00	0.00
NUMINDEP	6.2	6.0	7.5	8.0	6.1	6.0	0.00	0.00
NUMINSIDER	2.0	2.0	2.3	2.0	1.9	2.0	0.00	0.00
FRACINDEP	0.754	0.750	0.767	0.769	0.752	0.750	0.11	0.03
INSIDERCHAIR	0.498	0.000	0.504	1.000	0.497	0.000	0.88	0.90
INSIDERLEAD	0.738	1.000	0.612	1.000	0.752	1.000	0.00	0.01
INDEPCHAIR	0.179	0.000	0.295	0.000	0.166	0.000	0.00	0.01
UNITARY	0.845	1.000	0.885	1.000	0.840	1.000	0.17	0.39

**Panel D: Pearson Correlations of Board Characteristics Variables (Averaged Across Years 1995, 1999, and 2002)**

	NUMDIR	NUMINDEP	NUMINSIDER	FRACINDEP	INSIDERCHAIR	INSIDERLEAD	INDEPCHAIR	UNITARY
NUMDIR	1.00							
NUMINDEP	0.94	1.00						
NUMINSIDER	0.62	0.31	1.00					
FRACINDEP	0.11	0.43	-0.67	1.00				
INSIDERCHAIR	0.09	0.03	0.18	-0.15	1.00			
INSIDERLEAD	0.00	-0.09	0.19	-0.29	0.54	1.00		
INDEPCHAIR	0.08	0.13	-0.08	0.20	-0.36	-0.64	1.00	
UNITARY	-0.09	-0.12	0.02	-0.10	0.00	0.01	-0.05	1.00

**Table VII**  
**Logit Regressions of Manager Replacement on Flows, Management Company and Board Characteristics**

Pooled, cross-sectional logit regressions of the occurrence of manager replacement on the fund-, advisor-, and board-level characteristics of mutual funds are shown for the years 1995, 1999, and 2002. The dependent variable equals one if the entire management team is replaced, and zero otherwise. Regressors include the total number of independent directors on the board during the year (NUMINDEP), fraction of independent directors (FRACINDEP), as well as its interaction with a dummy variable equal to one if  $FRACINDEP > 0.75$  ( $D_{75\%}$ ), insider leading the board by either having an insider serving as the board chairperson or having president on board (INSIDERLEAD), and all equity funds in a complex sharing one board (UNITARY). In addition, three fund characteristics are included: a dummy variable equal to one if the fund experiences cash outflows from investors during the prior year ( $D_{OUTFLOW}$ ), and log total net assets under management at the beginning of the year ( $\log(TNA)$ , TNA in \$millions). Finally, log number of funds in the same fund complex (NUMFUNDS\_ADVISOR) is included, as well as year dummies ( $D_{YEAR=1995}$  and  $D_{YEAR=1999}$ ).  $\alpha$  is the four-factor alpha, measured at the net return level over the prior 36 months. For each variable, the coefficient estimate is reported in the first row and the z-statistic is reported in the second row. \*\*\*, \*\*, and \* indicate significance at the levels of 1%, 5%, and 10%, respectively.

	(1) Prior 3-year $\alpha$ +expense<0 and manager experience<10 years	(2) Prior 3-year $\alpha$ +expense<0 and manager experience<10 years	(3) Prior 3-year $\alpha$ +expense<0 and manager experience>=10 years	(4) Prior 3-year $\alpha$ +expense<0 and manager experience>=10 years	(5) Prior 3-year $\alpha$ <0 and manager experience<10 years	(6) Prior 3-year $\alpha$ <0 and manager experience<10 years	(7) Prior 3-year $\alpha$ <0 and manager experience>=10 years	(8) Prior 3-year $\alpha$ <0 and manager experience>=10 years
Intercept	-1.51*** (-2.63)	-1.60*** (-2.69)	-4.07*** (-5.09)	-4.15*** (-5.09)	-1.92*** (-3.82)	-1.99*** (-3.82)	-5.45*** (-6.34)	-5.61*** (-6.25)
NUMINDEP	0.02 (0.47)	0.01 (0.19)	0.17* (1.92)	0.13 (1.45)	0.03 (0.65)	0.02 (0.40)	0.19** (2.55)	0.15** (2.04)
D <sub>75%</sub>		0.23 (0.86)		0.51 (1.11)		0.18 (0.73)		0.61 (1.41)
INSIDERLEAD	-0.39 (-1.49)	-0.35 (-1.33)	-0.05 (-0.08)	0.04 (0.06)	-0.28 (-1.20)	-0.25 (-1.05)	0.37 (0.62)	0.45 (0.76)
UNITARY	-0.57* (-1.94)	-0.56* (-1.88)	0.23 (0.45)	0.18 (0.37)	-0.50* (-1.88)	-0.49* (-1.83)		0.59 (1.13)
Doutflow	0.81*** (2.93)	0.80*** (2.85)	-0.13 (-0.35)	-0.18 (-0.50)	0.97*** (3.95)	0.96*** (3.86)	0.25 (0.70)	0.21 (0.60)
Log(TNA)	-0.05 (-0.79)	-0.05 (-0.71)	0.07 (0.68)	0.08 (0.72)	-0.04 (-0.71)	-0.04 (-0.67)	0.07 (0.74)	0.07 (0.76)
NUMFUNDS_ADVISOR	0.01** (2.47)	0.01** (2.38)	-0.01 (-0.69)	-0.01 (-0.78)	0.01*** (2.90)	0.01*** (2.83)	-0.004 (0.65)	-0.01 (-0.62)
D <sub>YEAR=1995</sub>	-0.02 (-0.05)	-0.03* (-0.09)	1.06* (1.95)	1.05* (1.90)	-0.11 (-0.40)	-0.11 (-0.41)	1.03* (1.95)	1.04** (1.97)
D <sub>YEAR=1999</sub>	-0.53* (-1.92)	-0.55** (-2.00)	0.27 (0.49)	0.30 (0.61)	-0.42* (-1.74)	-0.43* (-1.78)	0.54 (1.12)	0.56 (1.18)
Total Number	628	628	320	320	822	822	415	415
Number with Replacement	91	91	30	30	112	112	34	34
MacFadden R <sup>2</sup>	0.07	0.07	0.05	0.05	0.07	0.07	0.05	0.06

### Table VIII Regressions of Fund Performance on Governance Variables

This table reports regression coefficients from a pooled, cross-sectional regression of contemporaneous-year fund performance measure (in percent per year) on fund-, advisor-, and board-level characteristics during 1995, 1999, and 2002. For Regressions (1) through (4), annual portfolio performance (portfolio weighted stock abnormal return (DGTW (1997) CS measure in %/year), computed as compounded monthly CS measures, is the dependent variable. For Regressions (5) through (8) ((9) through (12)), annualized fund four-factor alpha gross (net) of expense ratio (in %/year) is the dependent variable. Fund characteristics include log total net assets under management ( $\log(TNA)$ ; where TNA is measured in \$millions) at the beginning of 1995, 1999, or 2002. Advisor-level characteristics include the number of funds in the same complex (NUMFUNDS\_ADVISOR), while board characteristics include the total number of directors (NUMDIR), fraction of non-interested directors (FRACINDEP), a dummy variable equal to one if  $FRACINDEP > 75\%$  ( $D_{75\%}$ ), insider serving as the board chairperson (INSIDERCHAIR), all equity funds in a complex sharing one board (UNITARY), all during those years, and a manager replacement event during the corresponding prior year ( $D_{MGR\_REPLACE(YEAR-1)}$ ). Year dummies are also used in some regressions ( $D_{YEAR=1995}$  and  $D_{YEAR=1999}$ ). Also reported are the number of fund-years ( $N$ ) and adjusted  $R^2$ . For each variable, the coefficient estimate is reported in the first row and the  $t$ -statistic reported in the second row. \*\*\*, \*\*, and \* indicate significance at the levels of 1%, 5%, and 10%, respectively.  $t$ -Statistics use the White heteroskedasticity-consistent standard errors and covariance.

Dependent Variable

	Portfolio Performance (CS Measure, %/year)				Pre-Expense Net Return Alpha (%/year)				Net Return Alpha (%/year)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Intercept	-5.24***	-3.44***	-4.11***	-3.69***	-0.51	-2.61***	-2.52***	-1.53**	-2.60*	-4.55***	-4.45***	-3.55***
	-3.74	-6.09	-6.78	-4.89	-0.33	-4.13	-3.83	-1.86	-1.70	-7.20	-6.79	-4.35
Log(TNA)	0.16**	0.12	0.13	0.12	-0.08	-0.15*	-0.14*	-0.15*	0.04	-0.03	-0.02	-0.02
	2.21	1.58	1.60	1.56	-0.94	-1.85	-1.65	-1.72	0.50	-0.38	-0.21	-0.28
NUMINDEP		0.18**	0.16**	0.15**		0.23***	0.16**	0.14*		0.21***	0.13*	0.12
		2.53	2.16	2.03		3.12	1.98	1.73		2.85	1.64	1.42
FRACINDEP	2.86				-2.07				-1.95			
	1.40				-0.92				-0.87			
D <sub>75%</sub>	-0.72	-0.60*	-0.52	-0.53	-0.41	-1.21***	-1.44***	-1.47***	-0.44	-1.18***	-1.41***	-1.43***
	-1.49	-1.76	-1.55	-1.59	-0.78	-3.40	-3.96	-4.03	-0.84	-3.32	-3.87	-3.94
INSIDERCHAIR	-0.0007	-0.0007*	-0.0007	-0.0007	-0.0008	-0.0008	-0.0007	-0.0006	-0.0008	-0.0008	-0.0007	-0.0006
	-1.48	-1.89	-1.41	-1.36	-1.59	-1.58	-1.36	-1.24	-1.53	-1.52	-1.30	-1.19
UNITARY				-0.40				-0.96**				-0.87*
				-0.92				-2.03				-1.85
NUMFUNDS_ADVISOR			0.002	0.003			0.02**	0.01***			0.03***	0.03***
			0.24	0.31			2.44	2.60			2.64	2.78
DMGR_REPLACE(YEAR -1)			0.42	0.42			0.17	0.16			0.21	0.19
			0.77	0.76			0.29	0.26			0.35	0.32
D <sub>YEAR=1995</sub>	2.77***	2.48***	2.80***	2.77***	3.0***	3.13***	3.13***	3.07***	3.18***	3.28***	3.29***	3.22***
	5.99	7.67	5.92	5.85	5.97	6.22	6.11	5.95	6.30	6.53	6.42	6.28
D <sub>YEAR=1999</sub>	0.99**	0.72*	1.10**	1.09**	3.69***	3.86***	3.94***	3.91***	3.79***	3.94***	4.03***	4.00***
	2.33	1.84	2.48	2.46	7.90	8.24	8.21	8.15	8.13	8.44	8.40	8.35
N	3,391	3,391	3,391	3,276	3,391	3,391	3,276	3,276	3,391	3,391	3,276	3,276
Adj. R <sup>2</sup>	0.01	0.01	0.01	0.02	0.03	0.03	0.04	0.04	0.03	0.03	0.04	0.04