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 mutual funds during the 1985 to 2002 period. Specifically, we analyze the role of fund managers in generating portfolio performance, as well as the role of fund boards, both in the ongoing performance of the fund, and in replacing underperforming managers. We find evidence that growth-fund managers with more experience and better track-records outperform their peers, which indicates that manager characteristics are key in explaining portfolio performance for these funds. Further, we find evidence of efficiencies in the labor market for fund managers, in that replaced managers underperform their peers, on average. Specifically, the incoming manager outperforms the replaced manager by one percent per year; in addition, we find that poorly performing fund managers are more likely to be replaced by funds having larger numbers of outside directors on their boards, indicating that the structure of the board is an important determinant of governance quality. However, we also find evidence consistent with manager entrenchment. That is, experienced managers perform well only when they manage large funds—experienced small fund managers underperform their less-seasoned counterparts. Overall, our findings add new insights to the ongoing debate on fund governance.

I. Introduction

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 Bill Miller of the Legg-Mason Value Trust Fund or Scott Schoelzel of the Janus 20 Fund. The implication of the media spotlight on star managers is that experienced managers, or managers with a good track-record, outperform other managers in addition to passively managed funds.

Further attention has been focused on the structure of fund boards of directors, in light of the recent mutual fund market-timing and late-trading scandals. Yet, little academic research has been conducted on the relation between the governance structure of a fund and its portfolio performance. On the contrary, the large number of papers that have analyzed mutual fund performance have largely ignored the role of the manager and the board.[1] In general, these papers indicate that mutual fund performance is, at best, about zero after fees and trading costs. However, these papers do not address whether subgroups of funds with better governance structures may outperform their benchmarks. If managers play an important role in generating fund performance, then the quality of governance of a fund may be very important to that fund's performance.

There are many reasons why we might believe that portfolio managers are key in generating performance for a fund.[2] For instance, some of the most highly compensated professionals in the financial services industry are managers of active portfolios; many mutual

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[1] 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).
[2] 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, in recent years, has advertised itself as having an approach that digs deeper into the business plans of firms in which it invests.

fund managers earn in excess of $5 million per year. If this level of compensation is not based purely on entrenchment of managers, then past studies of performance have omitted an important explanatory variable in studying the cross-section of mutual fund returns.

This paper analyzes the relation between the governance structure and portfolio performance of U.S. open-end, domestic-equity mutual funds. 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.

Some past evidence supports our choice of manager characteristics in this study. Specifically, Chevalier and Ellison (1999), using a sample of mutual funds over a short time period, are the first to analyze the impact of experience on fund performance. Baks (2001) examines fund manager changes over the 1992 to 1999 period to measure the influence of the fund manager on fund performance.

Our contribution, in this paper, is to follow the manager over her entire career in order to build more precise measures of manager characteristics at each point in time. We examine both the stockholdings and the net returns of each manager, over her entire career, to build these measures. Further, we study the characteristics of mutual fund boards jointly with the characteristics of managers to determine the influence of different board structures on manager performance.

Specifically, we assemble a manager database that covers the 1985 to 2002 period for all U.S. open-end, domestic-equity mutual funds. This database, which is the longest time-series of manager data assembled to date, includes basic information about a manager, such as the

manager's name, starting and ending dates with each fund managed over her career, and the age and CFA designation of the manager. Second, we merge this manager database with a mutual fund stockholdings dataset that allows 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 a dataset that contains comprehensive information on the board of directors for each fund during fiscal year 2002-2003. This dataset includes the name, affiliation, and compensation 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 fund governance in generating portfolio performance, before fees and trading costs. First, we find a strong role for fund managers in generating this performance. Specifically, we find that managerial experience and stockpicking track-record are important predictors of the future stockholdings-level performance of mutual funds, controlling for other characteristics of these funds, such as investment style or fund size. Although these variables only show a weak influence on following-year performance in a univariate setting, they become significant in a joint regression setting that includes some interaction terms of manager- and fund-level characteristics. Most importantly, we find that fund size has an important interaction influence on experience and track record.

Specifically, we find that following-year performance is negatively correlated with manager experience and positively correlated with track record. Further, these relations are strongly related to the size of the managed fund. That is, when we add an interaction variable that captures the correlation between experience and fund size in our regression tests, we find that, for larger funds, experience is positively correlated with performance. That is, experience is a positive influence only for managers who are promoted to larger funds; those who are not

promoted appear to have no particular stockpicking skills—indicating, in turn, evidence of entrenchment of these managers in smaller funds. The opposite result holds for managers of large funds with good track records—the track record of these managers has a negative influence on future performance, indicating that they find it difficult to match their past performance when they are promoted to a larger fund (consistent with the diseconomies-of-scale in fund management, as shown by Chen, Hong, Huang, and Kubik (2004)).

These findings are only present among growth-fund managers—we find no influence of manager characteristics on the performance of income-oriented funds. Thus, manager experience predicts success in picking stocks, especially growth stocks, perhaps because of the difficulty in accurately forecasting earnings growth for these stocks. Growth-oriented managers may either develop specialized skills over time (perhaps by developing a team of analysts), or, alternatively, they develop relationships with corporate managers that give them access to private information on future earnings.

We next investigate why some underperforming managers are not replaced, as indicated by our finding of a negative influence of experience on fund performance. When we examine the records of managers who are replaced, we find that they are replaced by better-performing managers, indicating that fund governance is at least partially effective. Specifically, the replacement of a manager substantially improves the performance of a fund, as the new manager has a substantially better track record than the replaced manager (and skills tend to be persistent). When we further investigate the role of boards in the replacement of underperforming managers, we find that this replacement of underperforming managers is concentrated in funds having boards with certain characteristics. Specifically, these funds have boards that are larger in size and have more outside directors, indicating that these monitoring devices are useful in improving

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fund performance through their replacement of underperforming managers. In fact, we find evidence of a threshold effect for the fraction of outside directors on the board—when the proportion of outside directors is below 75 percent for a fund, an increase in this proportion increases the probability of replacement of an underperforming manager; however, above 75 percent, this probability decreases.[3] Further, we find that director compensation is not related to manager replacement, which indicates that higher levels of pay are not inducing directors to tolerate underperforming managers. Overall, our result show evidence of managerial entrenchment in the mutual fund industry, and a strong role of the structure of the fund board in explaining this entrenchment.

The remainder of this paper is organized in four sections. The construction of our database and our measures of manager characteristics and fund performance and costs are discussed 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 database in the Appendix.

II. Data and Methodology

A. Databases of Mutual Funds and Mutual Fund Managers

Our mutual fund characteristics data are extracted from 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 2002, CDA-CRSP contains data on various fund statistics, such as the monthly net return, total net assets,

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[3] Interestingly, the SEC recently required all mutual funds to install a board having a least 75 percent outside directors, as well as an outside chairman.

annual expense ratio, annual turnover ratio, and quarterly stock holdings of each fund. This database is the longest time-series having both stockholdings and net returns/characteristics of U.S. domestic equity mutual funds assembled to date. 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. The detailed method used in constructing the fund manager database is reported in the Appendix. The information contained in the manager database includes manager name, fund name, manager start and end dates at the fund, manager's 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.

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 to be reported prior to 1988, and, second, some funds that are team-managed fail to disclose portfolio manager names in the fund prospectus.[4] Nevertheless, we believe our manager database represents the most complete information on U.S. open-end, domestic-equity mutual fund managers compiled to date.[5,6] For this paper, a long time-series is crucial, as we track each

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[4] Recently, the SEC has stipulated that mutual funds must disclose all (at least four portfolio managers in a team) in the fund prospectus.
[5] 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) use a much 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. Both data sources are subsets of our database.
[6] 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.

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 the 1985 to 2002 period. Counts of lead 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 CDA-CRSP funds and 3,136 lead managers in our matched manager/fund databases. Growth funds account for the majority of the fund universe, and about 80% of the fund managers have experience in managing at least one growth fund (funds with an investment objective of aggressive-growth or growth) 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 manager increases slightly from 1.2 at the end of 1985 to 1.4 at the end of 2002.

To check the completeness of our matched manager/fund database, we further examine CDA-CRSP funds that fail to 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 during 1985 to 2002 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. Fifteen percent of the funds that exist at the end of 1985 have missing manager data, but this fraction steadily declines over the first five years of our sample period, then stabilizes at about 4% during later years.[7] 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 the total net assets under management and the net return between funds having manager data and funds with missing manager data at the end of 1985, 1991, 1997, and 2002. Although funds with missing managers are, on average smaller, these differences do not seem to be especially significant. Also, there is no significant difference in net returns between funds having manager data, and those with missing manager data. 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 our all funds in CDA-CRSP.

B.   Measures of Mutual Fund Manager Characteristics

Since the fund manager is the unit of analysis for our study, we construct measures that quantify various manager characteristics, such as experience, track record in picking stocks, risk-taking, and aggressiveness in trading stocks. The richness of our manager database and the fund characteristics and portfolio holdings data available from CDA-CRSP allow us to design several measures that accurately capture these proxies for various attributes that might be associated

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[7] The predominant reason of missing manager information in the late 1990s is that only team management or committee management is reported in the fund prospectus without having specific names of portfolio managers disclosed.

with superior stockpicking skills. In this section, we describe these measures, and then present summary statistics on the measures in the next section.

The first manager characteristic of interest is experience, which is defined as the length of time since a fund manager first managed a fund. The career experience of fund manager i at month t is defined as

$$EXP_{i,t} = t - t_{0,i} \qquad (1)$$

where $t_{0,i}$ is the month when fund manager i first becomes a fund manager of any mutual fund in our database.

To capture the career track record of a fund manager, we develop the following two measures. The first track record variable is the time-series average of monthly the stockpicking talent of the fund manager, as defined by the Characteristic Selectivity measure of Daniel, Grinblatt, Titman, and Wermers (1997) (henceforth, DGTW), where mutual fund performance is evaluated against characteristic-based benchmarks. Specifically, we use the time-series average of a manager's Characteristic Selectivity (CS) measure (henceforth, CS measure), over the entire career of the manager, to measure the manager's track record in picking stocks. The CS track record measure *CST* for manager i at month t is calculated as

$$CST_{i,t} = \frac{1}{EXP_{i,t}} \sum_{\tau=t_{0,i}}^{t} \sum_{j=1}^{J_\tau} w_{j,\tau} \left(R_{j,\tau} - R_\tau^{b_{j,\tau}} \right) \qquad (2)$$

where $w_{j,\tau}$ is manager i's portfolio weight on stock j at the end of the calendar quarter just preceding month τ; $R_{j,\tau}$ is the month τ's return of stock j; $R_\tau^{b_{j,\tau}}$ is the month τ's return stock j's characteristic-matched portfolio (matched on market capitalization, the ratio of book-equity to market-equity, and the prior one-year return on stocks); $J\tau$ indicates the number of stocks held in the fund managed by manager i at the end of the quarter preceding month τ. An advantage of the

CS measure is that it uses portfolio holdings information, which DGTW argue provides a more precise measurement of performance relative to regression-based methods. Also, in calculating the *CS* measure, we only require a fund to have at least one quarter's stockholdings. This would substantially reduce the degree of loss of observations as compared to return-based alpha measures which usually require at least one year's monthly returns data.

The second measure that we use to proxy for the track record of a fund manager is the time-series average of monthly net returns adjusted by the S&P500 index return. This measure for manager *i* at month *t* is

$$ERT_{i,t} = \frac{1}{EXP_{i,t}} \sum_{\tau=t_{0,i}}^{t} \left(R_{i,\tau} - R_{\tau}^{S\&P500} \right) \tag{3}$$

where $R_{i,\tau}$ and $R_{\tau}^{S\&P500}$ are fund *i*'s return and the S&P500 index return for month τ, respectively. We choose the S&P 500 index as our first benchmark, since this benchmark is the most common one used as a benchmark by the U.S. fund industry.

A manager's risk-taking behavior may determine her choice of stocks to hold in the managed fund portfolio, and, thus, may affect fund performance. In some cases, managers may take on, or avoid, risk in response to labor-market incentives (see, for example, Chevalier and Ellison (1997) or Brown, Harlow, and Starks (1996)). The measures we use to characterize a fund manager's risk attitude are, respectively, the standard deviation of her monthly excess return and the standard deviation of her monthly investment objective-adjusted return, i.e.,

$$RISK_{i,t} = \sqrt{\frac{1}{EXP_{i,t}} \sum_{\tau=t_{0,i}}^{t} \left(R_{i,\tau} - R_{\tau}^{S\&P500} - ERT_{i,\tau} \right)} \tag{4}$$

Some managers may be more aggressive in trading stocks than others, perhaps because they have better private information about stock values than others, because they believe they

have superior stock-picking skills (perhaps due to overconfidence), or because they simply take more risk than other fund managers in using their private information. We would believe that such aggressiveness would lead to higher trading frequency and volume. As such, a manager's aggressiveness in managing her portfolio is measured as the time-series average turnover ratio of the fund(s) managed by her.[8] The expression for the aggressiveness of manager i through month t is

$$AGG_{i,t} = \frac{1}{t - t_{0,i}} \sum_{\tau = t_{0,i}}^{t} TURNOVER_{i,\tau} \tag{5}$$

C.   Summary Statistics of Mutual Fund Managers

Table II provides measures of several manager characteristics, averaged across all mutual funds existing at four different points in time. Specifically, the average career: experience (*EXP*, in years) of the lead fund manager, defined to be the manager with the longest current-fund tenure; characteristic selectivity measure (*CST*, in percent per year); risk-taking measure (*RISK*, in percent per year); and turnover (*AGG*, in percent per year) are shown across all managers existing at the end of 1985, 1991, 1997, and 2002.

The results show that the career experience is fairly consistent throughout our sample period—about 7-9 years in duration. Consistent with the findings of Wermers (2000), the mean and median manager track records (*CST*) are slightly positive, with the median performance level amounting to about one percent per year. Interestingly, fund managers in the latter part of our sample tend to be more aggressive, as reflected in their career risk-taking and aggressiveness measures at the end of 2002, relative to earlier years. However, it is not clear whether this increased risk-taking and trading activity is related to greater manager skills, or whether fund

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[8] The annual turnover ratio of a fund is defined as the lesser of securities purchased and sold, divided by average monthly total net assets during the year.

managers merely engage in these costly activities in order to appear to have talents (see, for example, Brown, Harlow, and Starks (1996)).

III. Results

A. Manager Experience and Fund Performance

We begin with an analysis of the effect of manager experience on mutual fund characteristics and performance. The extant literature, in general, has not examined whether more seasoned managers have better skills in picking stocks. We might believe 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 stock 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.[9] On the other hand, if managers become entrenched due to poor fund governance, then experience may have no correlation with performance. Further, a negative correlation is also possible if skilled fund managers voluntarily leave for asset management jobs with a greater incentive-based system, such as hedge funds.

To test the effect of manager experience on the performance and characteristics of a mutual fund, we sort all funds, at the end of each calendar year, on the level of career experience of the lead manager of the fund (defined as described in Section II.A). We then measure the characteristics and performance of each ranked fractile of funds during the following calendar

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[9] Chevalier and Ellison (1999) study the impact of the experience on the managerial stock-picking 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, the short time-series contained in their database of managers prevents them from following individual fund managers over their entire careers.

year--the process is repeated at the end of each year, starting December 31, 1985 and ending December 31, 2001.

For example, for the year ending December 31, 1985, we rank all domestic-equity funds on the number of months of career experience of their lead managers. Then, funds are placed in fractile portfolios, and various average characteristics and measures of performance are computed for these fractiles during the following test year. In computing test-year measures for statistics that are available at least quarterly (such as net returns or performance measures), we compute, for each quarter of the test-year, the equal-weighted measure across all funds in a given fractile. If a fund disappears during the test year, we include it in the appropriate fractile portfolio until the beginning of the quarter in which the fund disappears, then we rebalance the fractile portfolio for the next quarter. This procedure minimizes survival biases in our measures.

For return or performance measures, we compound these rebalanced equal-weighted measures over all four quarters of the test year. For non-return characteristics, such as managerial turnover, the quarterly measures are cumulated over the test year. In computing test-year measures for statistics that are available only annually (such as portfolio turnover), we compute the equal-weighted average measure across all funds having data for that measure during the test year. The reader should note that all tables that follow will use these procedures for computing test-year average measures.

Table III shows the results of the characteristics of the fractile portfolios over the year following the sort of funds on career manager experience. Specifically, the table shows the number of funds in each fractile, average career experience of the lead manager, the average total net assets of funds in the fractile, the average Characteristic-Selectivity measure, the average net returns in excess of the S&P500 index, the average expense ratio, the average net flows, the

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average portfolio turnover level, and the average Carhart's α. The most experienced managers (the Top 5% fractile) have 27.5 years of experience, while the least experienced managers (the Bottom 5% fractile) have only 18 months.

The table also shows that more experienced lead managers oversee much larger pools of mutual fund assets than their less-experienced counterparts. For example, the five percent of managers with the most experience manage, on average, funds that are about eight and half times the size of funds managed by the least experienced five percent of managers ($1.7 billion vs. $209 million, respectively). More experienced managers trade much less frequently than their counterparts during this stage of their careers, which is likely due to these managers holding much larger portfolios than their less-experienced counterparts. That is, high-experience managers may simply be avoiding high levels of turnover of their large positions in order to avoid large trading impacts.

The resulting CS measures show that more experienced managers generate higher levels of performance than their less-seasoned counterparts, even though they manage larger funds. Specifically, the most experienced decile of managers outperforms the least experienced by one percent per year. However, the relation between experience and performance seems somewhat weak, which might be due to differences in the characteristics of the funds they manage. For example, experienced managers may exhibit higher levels of performance, controlling for the size of the mutual fund that they manage. Alternatively, this might be evidence of managerial entrenchment, that is, experienced managers who underperform may not be replaced effectively by the fund advisory company.

To summarize our results from this section, experienced managers tend to manage much larger funds, and exhibit lower levels of trading activity than inexperienced managers. Our

results also provide some support for the hypothesis that the stockpicking skills of fund managers improve over their careers. But the improvement does not seem to be particularly large. This finding seems somewhat surprising, since we might reasonably believe that a manager without stockpicking talents would be forced to leave the industry before the latter part of her career, as investors become more certain from the longer time-series of manager returns available, that the manager does not have talent.

B.   Manager Track Record and Fund Performance

While our last section may be consistent with the presence of manager entrenchment by finding a weak correlation of experience with talent, we are also interested in whether some managers, at any experience level, have persistent stockpicking skills. These tests focus on the role of the manager in generating persistent performance—we next investigate this issue by examining whether lead fund managers with the best career stockpicking records have skills that persist during the following year. We measure career stockpicking talent using our characteristic selectivity track record (*CST*) for each manager, as described by Equation (2). Analogous to the ranking procedure of the last section, we sort all fund managers, at the end of each calendar year starting December 31, 1985 and ending December 31, 2001, on their *CST* measure at the end of that year. Then, we measure the following-year characteristics and performance of each fractile that results from this sorting procedure.

In Table IV, we present the characteristics of these manager career-record fractiles. The table shows that managers with the best track records do not have substantially more experience (4.9 years) than those with the worst track records (5.0 years). Thus, experience, by itself, does

not appear to be associated with career stockpicking talent; consistent with the results of the prior section. The results also show that managers with extreme stockpicking track records (either good or poor) tend to exhibit higher levels of portfolio turnover than other managers (shown in the "Portfolio Turnover" column). Managers with the best track records may know that their talents will persist, and, therefore, may trade frequently to capitalize on their talent. Alternatively, these managers may be exhibiting overconfidence based on their past success, which would result in unnecessary costly trading of stocks in the future. On the other hand, managers with poor track records also exhibit higher levels of turnover during the test year, which indicates that they may be trading frequently in order to try to reverse their fortunes.

An examination of consumer inflows to the various fractiles provides some interesting results. While managers with good track records have only slightly higher net returns than other managers, these "star" managers attract much higher levels of cash inflows. For example, the top quintile of managers experience an average yearly inflow equal to 28 percent of the beginning-of-year TNA of their funds, while the manager of the average fund attracts only 11 percent. This finding indicates that consumers appear to prefer to invest their money in a fund managed by a "star," independent of the immediate past net return of the fund. This finding is also consistent with various papers that have found that the Morningstar "stars" system is influential in attracting money flows to new funds—the stars ratings are based on three-, five-, and ten-year fund returns.

Also, the following-year performance (CS) of fund managers with the best track records is only slightly higher than that of other managers, and this difference is not statistically significant. Thus, fund manager performance does not seem to persist, although this could be due to differences in the characteristics of the funds they manage. Alternatively, this could be further

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evidence that talented managers leave the mutual fund industry for higher-compensation jobs, while managers having no talent become entrenched.

Finally, in unreported results, we find that managers with extreme stockpicking track records (either good or poor) experience higher managerial replacement rates. For managers with the best records, we would expect that they depart from a fund to either retire or to manage a larger fund, based on their past success. For managers with the worst records, we would expect a large proportion of dismissals or transfers to smaller funds. Baks (2001) studies this issue and provides findings that are consistent with this.

C.   Mutual Fund Performance Surrounding Manager Replacement

As discussed by Baks (2001), the replacement of a manager provides a unique opportunity to study the impact of the manager on the performance of a fund, independent of the fund's other characteristics. In our study, we also view a replacement event as a unique chance to view the effectiveness of the governance structure of a fund. If a manager is replaced by a manager with a higher performance level, then there is some evidence of effective fund governance. On the other hand, if underperforming managers are not replaced with better managers, then we conclude that some level of managerial entrenchment may also be present.

In this section, we examine the characteristics and returns of funds during the periods immediately before and after a lead manager is replaced. Each year, we separate funds into those having a lead manager change during the year, and those with no change in lead manager. Then, we measure the returns and characteristics of the equal-weighted portfolio of funds in each group, during the year of the potential change, and during the following three years. Table V presents the results of this test.

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Panel A shows that managers are replaced during years when their stockpicking talents are significantly worse than those of all other managers. Specifically, the characteristic selectivity measure is 0.7 percent lower, on average, for a fund during the year of manager replacement, compared to all funds with no manager change during that year. Further, the arrival of a new fund manager is very good news for a fund: the new manager brings stockpicking talents that are statistically indistinguishable from the talents of all other managers during the three years following the managerial change. Panel B shows that the incoming manager reduces turnover, relative to the replaced manager. In particular, the average portfolio turnover drops from a level of 99 percent, during the managerial replacement year, to 89 percent during the third year following the managerial replacement. These results indicate that the manager who is replaced may be engaging in heavy trading during the final year of her tenure at a fund in an attempt to "gamble" as a last resort.

D. Multivariate Regression Results

Our results from prior sections point to weak correlations between stockpicking talents and manager characteristics—specifically, career experience and career stockpicking record. These findings are consistent with managerial entrenchment, although we did not control for differences in fund-level characteristics in those sections.

We next test whether our prior univariate investment-based results still hold in a multivariate setting. Here, we conduct Fama-McBeth (1973)-type multivariate regressions. For each year, starting in 1986 and ending in 2002, we run a cross-sectional regression of a fund's CS measure, averaged across all four quarters of that year, on the manager's level of experience and stockpicking track-record (*CST*), both measured at the end of the prior year. We then average

the coefficient estimates over all years, and report this average, as well as the time-series t-statistic.

The resulting regressions in set (1) of Table VI show that neither experience nor career stockpicking track-record appear to be important, in a joint setting, in explaining future stockpicking success, while fund size matters for Growth-oriented funds. This is consistent with the results reported in Chen et al. (2004)—a strong diseconomy-of-scale in fund performance. However, when interaction terms between LOG(TNA) and manager characteristics are included in the regressions, as shown in set (2), manager track-record becomes positive and significant. Specifically, a one-percent increase in the annual career track-record of a manager corresponds to a 0.18 percent increase in the following-year fund performance level. However, the interaction term (of career track-record with fund size) is marginally negatively related to fund stockpicking return, indicating that, for larger funds, the career stockpicking track-record is a less reliable predictor of future stockpicking returns. This finding indicates that successful managers who are promoted to larger funds have difficulty in continuing to achieve outperformance. However, in general, performance strongly persists when we control for the interaction of fund size and track record.

Interestingly, career experience exhibits an opposite pattern in predicting fund future performance. In general, managers tend to exhibit lower stockpicking skills when they become more experienced. Specifically, one additional year of experience reduces the performance of a fund by six basis points during the following year. However, for larger funds, more experienced managers tend to show better stockpicking skills. These findings are consistent with some level of managerial entrenchment, where successful experienced managers are promoted, while unsuccessful experienced managers are not promoted, but neither are they replaced. Large funds

are often flagship funds for their fund families, as well as being a major source of fees for the fund advisory company. Thus, underperforming managers would expose managers to more scrutiny and make it hard for them to become entrenched. In addition, the very existence of a seasoned manager in a large fund indicates that the market has deemed this manager as being skilled, in that inflows have helped to grow the fund beyond its investment-based returns.

We also 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.

Thus, this section has shown that managerial skills strongly persist, controlling for fund-level characteristics. However, we have also shown that experience can either be a positive or negative influence on performance, indicating that some level of managerial entrenchment exists. In the next section, we explore why underperforming managers may not be efficiently replaced, leading to the negative correlation between experience and performance that we have found.

III. The Role of Mutual Fund Directors in Fund Performance and Fund Governance

Mutual fund governance has long been discussed by fund investors, regulators, fund industry, and academics. Recently, the debate on the fund governance has been heated up due to the alleged widespread mutual fund market timing and late trading activities. At issue is why mutual fund boards of directors failed to protect shareholders from market timers and late traders. Or more broadly, what is the role of mutual fund board of directors in fund governance?

Indeed, Fama and Jensen (1983) regard board monitoring as an important controlling force to ensure managers act in the best interests of shareholders. Tufano and Sevick (1996) find

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. Khorana (1996) reports that funds replacing managers tend to have poor performance in the past, which supports the notion that the fund governance mechanism is well-functioning.

In this section, we address the role of board of directors in fund management by examining the impact of board characteristics on the manager replacement decision and on fund performance. Although a manager replacement decision is made by the fund management company, board of directors may exert direct influence to the fund management company in regard to the decision of retaining and hiring fund managers. For example, when a fund underperforms relative to market or peer funds, board directors may directly show dissatisfaction with the fund management company, and pressure the company to replace the incumbent manager with a new manager having a better track record. We expect to see that funds with more effective boards are more likely to replace underperforming managers and are associated with better fund performance.

A.   Mutual Fund Board of Directors Data and Measures of Board Characteristics

We obtained fund board data for 18,154 funds during fiscal year 2002-2003 from Lipper. The board characteristics we study are board size, independence, compensation, and activeness. We use the total number of directors and number of non-interested directors to proxy for the board size.[10] Board independence is measured by the percentage of non-interested board

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[10] Non-interested directors are defined as the directors who are not affiliated with the mutual fund management company and do not have the direct business relations with the company. We use "non-interested directors," "outside directors," and "independent directors" interchangeably. Likewise, we use "interested directors" and "inside directors" interchangeably.

directors. Director compensation is measured by the total director expenses (including salary and meeting expenses) divided by average net assets. To characterize how active the board is, we use the number of board meetings in a year.

The corporate governance literature suggests a positive relationship between the effectiveness of governance and firm performance, and identifies individual attributes of governance that could be associated with corporate performance. If a more independent board improves fund governance, then we will see higher performance for funds with a higher percentage of non-interested directors. The relationship between director compensation or ownership and fund performance should be positive because directors have more incentive to work hard for shareholders. The relationship between board size and fund performance would be an empirical question. On the one hand, it would be hard for fund managers to control larger boards, and therefore larger boards may be related to better performance by monitoring the managers better. On the other hand, when the board size is large, the coordination among board members may be more difficult and the board may lack efficiency in taking actions to monitor managers. We test these hypotheses in the following two sections.

B.   The Effect of Board Characteristics on Fund Performance

Our prior belief about the relationship between board characteristics and fund performance is that a fund with more effective board monitoring performs better than a fund with less effective board monitoring, because managers are more likely to work hard for the shareholders. To test this hypothesis, we run simple linear regressions of fund annual net return and fund *CS* measure in 2002 on board characteristics variables for all CDA-CRSP funds. The regressions results, as shown in Table VII, seem to support that larger boards are related to significantly higher fund performance. In particular, an increase of one director from a nine-director board to ten-director board would result in about 0.3% increase in annual fund *CS* measure and annual net

return. However, the percentage of non-interested directors on board is not significantly related to fund performance.

C. The Effect of Board Characteristics on Manager Replacement Decision

C.1. Hypotheses, Research Design, and Descriptive Statistics

Following the literature, we hypothesize that smaller size, higher fraction of non-interested directors on board, lower director compensation, and more board meetings are attributes of a more effective mutual fund board. We identify 104 funds in the CDA-CRSP mutual fund database that experience manager replacement in 2002.[11] We compare this group of funds with another sample of randomly selected 104 funds that do not experience manager replacement in 2002. We intend to examine the difference of the two groups of funds in board characteristics and study how board characteristics are related to manager replacement decision.

We manually match the 208 sampled funds with Lipper's funds. We succeed in 80 funds with manager replacement and 84 comparison funds without manager replacement. A brief description of the board characteristics data for the 164 funds is showed in Table VIII. Funds with manager replacement have ten directors in median, two more directors than their counterpart, which is significant with *p*-value less than 1% in both *t*-test and Wilcoxon signed rank test. Comparing the median numbers of non-interested directors and interested directors for the two groups of funds, we find that the two more directors are mostly non-interested, indicating that increasing non-interested directors may lead to a stronger fund governance. However, the percentage of non-interested directors is not significantly different for the two groups of funds. This may be due to the legal requirement that a minimum of two-thirds of directors be non-

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[11] In this section, we define manager replacement as the situation where the whole management team is replaced by a new team.

interested, and therefore there is not much variation in the fraction of directors being non-interested. Funds with manager replacement have lower director expenses per asset than funds without manager replacement. But the difference is not significant. Lastly, on average, boards of funds that replace managers hold 1.7 more meetings than their counterparts in fiscal year 2002-2003, indicating that they are more active in monitoring manager's efforts and performance.

C.2.   Logit Regressions of Occurrence of Manager Replacement

We then run cross-sectional logit regressions of the probability of manager replacement on the 164 matched funds, to test how the incidence of manager replacement is related to the board characteristics. The dependent variable is a dichotomy variable equal to one for funds that replace managers in 2002 and equal to zero for funds that do not. We include as independent variables the four board characteristics variables that proxy for board size, independence, compensation, and activeness.

The results are shown in Table IX. Although we expect that a smaller board would be better at monitoring managerial performance, as is the case for traditional corporate board, a fund with larger board is more likely to replace its managers. When the total number of directors is included in the regression, board independence is not significantly related to the probability of manager replacement, probably due to the regulatory requirement that at least two-thirds of directors on board are non-interested and there is not much variation in the percentage of non-interested directors after the total number of directors is controlled for.

However, a spline regression, as shown in Regression (2), indicates that, when the fraction of non-interested directors is below 75%, an increase in outside directors leads to a

higher probability of manager replacement. After the fraction goes above 75%, the probability-fraction sensitivity is significantly lower. This result fully supports the latest SEC requirement that the minimum fraction of independent directors increases from two-thirds to three-quarters.

When the number of non-interested directors is included in Regression (3), the fraction of non-interested directors becomes marginally negatively significant, indicating that when the number of non-interested directors is fixed, increasing inside directors would lead to better monitoring, perhaps because these inside directors have necessary experience and expertise in monitoring that are needed by independent directors. (This is also shown in Regression (4).)

The activeness of a board seems to be unrelated to the likelihood of manager replacement. However, in unreported tests, we find that when board size is not included, the board activeness variable is significant. Since Panel B of Table VIII shows that the Pearson correlations between the board size and board activenss are high, around 0.4 to 0.6 and rejecting the hypothesis that they are uncorrelated at the one percent significance level, a board with more directors is more active in monitoring the fund. But when the total number of directors on board is fixed, having more board meetings would not increase the chance of manager replacement significantly. The incidence of net outflows experienced by a fund leads to a higher probability of getting its managers removed.[12] Interestingly, the reaction of non-interested directors and interested directors to fund underperformance relative to the S&P500 index falls apart (not significantly, though). When a fund's past year return is below the S&P500 index return, increasing the number of non-interested directors would lead to a higher probability of manager replacement, while increasing the number of interested directors would lead to a lower probability. Finally, director expenses as a percentage of average net assets is significantly

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[12] Funds completely replacing managers in 2002 are more like to experience net outflows than those that do not completely replace managers.

related to the occurrence of manager replacement, which is consistent with the results from descriptive statistics as shown in Panel A of Table VIII.

IV. Conclusion

In this paper, we have presented evidence on the role of mutual fund managers of directors in generating mutual fund performance as well as the manager replacement decision. While our study also has implications for the newly adopted SEC regulations, this topic has received relatively little attention in the academic literature, with the exception of Chevalier and Ellison (1999) and Baks (2001). Our study uses the longest cross-sectional database of fund managers available to date, extending from 1985 to 2002, and includes both the stockholdings, net returns, and other characteristics of each managed fund. This database allows us to investigate several issues of interest regarding the role of managers, including the importance of experience and past track record in generating future performance.

We find that experience and stockpicking track record of a fund manager are correlated with following-year performance, however, this relation indicates some evidence of manager entrenchment. We also find that the replacement of a manager is good news for a fund, as the pre-replacement performance of the fund is reliably lower than its counterpart funds, while the post-replacement performance is statistically indistinguishable from the counterpart performance. Finally, we find that the board size is positively related to fund performance as well as the likelihood of underperforming managers getting replaced.

Our study, while providing new insight on the performance and governance structure issues that have been a focus of academic research for decades, also opens up possible new studies on the behavior of fund managers. Our database allows the study of these behavioral

issues through an analysis of the stock trades of fund managers having various characteristics.

We believe that this is an important new direction for future research.

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Appendix
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 Weisenberger 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.[1] The Morningstar electronic sources contain manager information for funds that exist after around 1992.[2] 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

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[1] 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 mains a managerial characteristics database starting from the early 1990s, which include fund manager bio, education, CFA designation, etc.

[2] Morningstar backfills manager information for most of the funds existing after 1992 back to at least the mid-1980s, though.

their fund prospectus filings in late 1980s. Although we 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.[3]

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.[4] 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.[5]

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[3] 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.

[4] 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.

[5] 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.

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

This table presents the 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). The CDA-CRSP mutual fund database includes all actively managed diversified domestic equity funds (holdings, net returns, and fund characteristics) from 1974 through 2002. Wermers (2000) uses an early version of CDA-CRSP and contains a detailed description of the construction of CDA-CRSP. The fund manager data are constructed based on several sources as illustrated in Section II. 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. Reported are the whole fund universe as well as each of the following three investment objective categories---Aggressive Growth (AG), Growth (G), Growth and Income or Income (GI & I). The self-declared investment objectives are mainly collected from Thomson/CDA. Panel B presents the 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. To determine the average number of funds lead-managed by a lead manager over the period of 1985-2002, we first compute the time-series average number of funds under lead management for each lead manager and then take the cross-sectional average across all managers in the (sub)group. 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. The 1985 (1991, 1997, 2002) column in Panel C reports the funds that exist at the end of 1985 (1991, 1997, 2002) but do not have managers matched in 1985 (1991, 1997, 2002). The 1985-2002 column in Panel C reports the funds that exist at some time during 1985-2002 but do not have a matched manager throughout the period. 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 fund reports manager information and the funds do not report manager information. The 1985 (1991, 1997, 2002) column in Panel D reports funds that exist at the end of 1985 (1991, 1997, 2002) with the first row showing all of them, the second row showing those that report manager information in 1985 (1991, 1997, 2002), and the third row showing those that do not have manager information throughout 1985 (1991, 1997, 2002). The 1985-2002 column in Panel D is for the funds that exist during 1985-2002. A fund's total net assets over 1985-2002 is the time-series average of its monthly total net assets between 1985 and 2002. 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). ***, **, and * indicate significance at the levels of 1%, 5%, and 10%, respectively.

Panel A: Counts of Mutual Funds

	1985	1991	1997	2002	1985-2002
All Funds	324	648	1594	1698	2689
AG	70	169	178	276	533
G	165	345	1129	1137	2084
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	1133	1.3	1079	1.4	3136	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	2371	2.1
GI & I	72	1.2	120	1.4	248	1.5	224	1.7	860	2.4

Panel C: Counts of Mutual Funds Missing 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 the summary statistics of mutual fund lead manager career experience, career track record, career total risk-taking, and career aggressiveness at the end of 1985, 1991, 1997, and 2002. The Career Experience (*EXP*) of a lead manager is defined as the time elapsed since she first becomes a fund manager. The Career Track Record (*CST*) is defined as the time-series average monthly stockholding-level Characteristic-Selectivity measure of Daniel, Grinblatt, Titman, and Wermers (1997). Career Total Risk-Taking (*RISK*) is calculated as the standard deviation of monthly excess net return over the S&P500 index, while Career Aggressiveness (*AGG*) is defined as the average monthly portfolio turnover ratio over a manager's career up to the end of the year shown (this turnover ratio is defined as the lesser of security sales and purchase, divided by the average monthly total net assets of a fund). Experience (*EXP*) is expressed in years while all other variables are expressed in percent per year.

	1985		1991		1997		2002	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
EXP (years)	7.6	4.9	7.1	5.0	6.7	4.9	8.8	7.5
CST (%/year)	1.02	1.03	0.07	0.63	-0.61	0.18	1.70	1.32
RISK (%/year)	8.04	7.23	8.48	7.51	9.41	8.19	13.46	11.52
AGG (%/year)	80	65	88	66	86	68	98	80

Table III
Following-Year Performance for Funds Sorted by Manager Experience

A decomposition of mutual fund returns and costs is provided below for the merged manager, CDA holdings, and CRSP mutual fund characteristics/net returns databases. At the end of each calendar year, starting December 31, 1985 and ending December 31, 2002, we rank all mutual funds in the merged database that existed during the entire prior 12-month period (and had a complete data record during that year) on the level of experience of the lead fund manager (the months of career experience, with any fund, of the manager starting at a given fund at the earliest date) at the end of that year (the "ranking year"). Then, fractile portfolios are formed, and we compute average return measures (e.g., net returns) for each fractile portfolio during the following year (the "test year"). In computing the average return measure for a given test year, we first compute quarterly buy-and-hold returns for each fund that exists during each quarter of the test year, regardless of whether the fund survives past the end of that quarter. Then, we compute the equal-weighted (EW) average quarterly buy-and-hold return across all funds for each quarter of the test year. Finally, we compound these returns into an annual return that is rebalanced quarterly. The following characteristics of these sorted fractiles are presented in the table: the number of funds in each fractile, the average career experience and career CS track record of the lead fund manager, the average total net assets of funds, the fund CS measure, S&P500-adjusted return, expense ratio, fund inflows, portfolio turnover ratio, and Carhart's alpha. The number of funds (N), the career experience and career track record of the lead fund manager, and the average total net assets of funds are for the end of the ranking year, while all other characteristics are for the first year following the ranking year. This table present test year statistics, averaged over all test years from 1986 through 2002. 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," and "Income" at the beginning of the test year. All managers are required to have at least one-year experience. ***, **, and * indicate significance at the levels of 1%, 5%, and 10%, respectively.

Fractile	N	Career Experience (Year)	Career Track Record (% per year)	Avg. TNA ($ Mil)	CS (% per yare)	S&P500-Adj. Return (% per year)	Expense Ratio (% per year)	Net Flows (% per year)	Portfolio Turnover (% per year)	Carhart's Alpha (% per year)
Top 5% (Most Experienced)	47	27.5	-0.6	1723	0.89	-1.61	1.35	15	68	0.36
Top 10%	94	22.8	2.2	1488	1.37	-1.26	1.30	17	67	0.41
Top 20%	188	18.3	9.0	1315	0.85	-1.88	1.29	14	70	0.39
2nd 20%	188	9.1	10.2	733	0.01	-2.32	1.29	14	85	0.39
3rd 20%	188	5.8	14.4	490	0.73	-1.58	1.32	16	94	0.45
4th 20%	188	3.7	14.4	335	0.65	-1.23	1.37	18	95	0.47
Bottom 20%	188	1.9	4.8	234	0.21	-1.75	1.43	24	102	0.43
Bottom 10%	94	1.5	-1.0	209	0.37	-1.58	1.46	29	109	0.44
Bottom 5% (Least Experienced)	47	1.2	2.8	192	0.66	-0.96	1.40	33	110	0.47
Top-Bottom 5%	17	26.3	-3.4	1531***	0.23	-0.66	-0.05	-18**	-42***	-0.12
Top-Bottom 10%	17	21.4	3.2	1279***	1.00*	0.32	-0.16**	-12*	-42***	-0.03
Top-Bottom 20%	17	16.4	4.2	1080***	0.65	-0.14	-0.15***	-11***	-32***	-0.04
All Funds	940	7.7	10.5	723	0.57	-1.50	1.35	18	87	0.42

Table IV
Following-Year Performance for Funds Sorted by Manager Track Record

A decomposition of mutual fund returns is provided below for the merged manager, CDA holdings, and CRSP mutual fund characteristics/net returns databases. At the end of each calendar year, starting December 31, 1985 and ending December 31, 2002, we rank all mutual funds in the merged database that existed during the entire prior 12-month period (and had a complete data record during that year) on the level of career stockpicking talent, as measured by Career *CS* Track Record of the lead fund manager at the end of that year (the "ranking year"). Then, fractile portfolios are formed, and we compute average return measures (e.g., net returns) for each fractile portfolio during the following year (the "test year"). In computing the average return measure for a given test year, we first compute quarterly buy-and-hold returns for each fund that exists during each quarter of the test year, regardless of whether the fund survives past the end of that quarter. Then, we compute the equal-weighted (EW) average quarterly buy-and-hold return across all funds for each quarter of the test year. Finally, we compound these returns into an annual return that is rebalanced quarterly. The following characteristics of these sorted fractiles are presented in the table: the number of funds in each fractile, the average career experience and career *CS* track record of the lead fund manager, the average total net assets of funds, the fund *CS* measure, S&P500-adjusted return, expense ratio, fund inflows, portfolio turnover ratio, and Carhart's alpha. The number of funds in each fractile, the average career experience and career *CS* track record of the lead fund manager, and the average total net assets of funds are for the end of ranking year, while all other characteristics are for the first year following the ranking year This table present test year statistics, averaged over all test years from 1986 through 2002. 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," and "Income" at the beginning of the test year. All managers are required to have at least one-year experience. ***, **, and * indicate significance at the levels of 1%, 5%, and 10%, respectively.

Fractile	N	Career CS Track Record (%/yr)	Career Experience (Year)	Avg. TNA ($ Mil)	CS (% per year)	S&P500-Adj. Return (% per year)	Expense Ratio (% per year)	Net Flows (% of TNA)	Portfolio Turnover (% per year)	Carhart's Alpha (% per year)
Top 5% (Best Record)	37	23.49	4.9	698	0.56	-3.19	1.54	34	113	0.51
Top 10%	74	15.44	5.9	654	0.45	-2.51	1.42	32	109	0.47
Top 20%	155	10.02	6.6	723	0.43	-2.07	1.37	28	101	0.47
2nd 20%	165	2.29	9.1	926	0.46	-2.13	1.25	16	78	0.41
3rd 20%	165	0.69	9.7	817	0.32	-1.82	1.25	15	80	0.40
4th 20%	165	-0.88	8.3	510	0.71	-1.40	1.31	12	81	0.42
Bottom 20%	160	-7.77	5.5	295	0.41	-1.48	1.54	11	103	0.38
Bottom 10%	81	-12.51	5.1	301	0.09	-1.53	1.58	13	110	0.38
Bottom 5% (Worst Record)	42	-19.10	5.0	259	-0.44	-2.09	1.65	15	121	0.41
Top-Bottom 5%	17	42.59	-0.1	439***	1.00	-1.11	-0.12	19**	-8	0.10
Top-Bottom 10%	17	27.95	0.8	353***	0.36	-0.98	-0.16**	19***	-1	0.09
Top-Bottom 20%	17	17.79	1.1***	428***	0.02	-0.59	-0.16***	16***	-3	0.09

Table V
Mutual Fund Performance and Characteristics Surrounding Lead Manager Replacement

Selected mutual fund measures are provided below for the merged CDA holdings and CRSP mutual fund characteristics/net returns databases. At the end of each calendar year starting December 31, 1985 and ending December 31, 2002, we separate all mutual funds in the merged database that existed during the entire prior 12-month period and had an investment objective at the end of that year of "Aggressive Growth," "Growth," "Growth and Income," "Income" into those funds that experienced a change in lead manager (the manager with the most career experience at that fund) during the prior year (the "ranking year"). Then, fractile portfolios are formed, and we compute average measures (e.g., net returns) for each fractile portfolio during the following year (the "test year"). In computing the average measure for a given test year, we first compute the quarterly buy-and-hold measure for each fund that exists during each quarter of the test year, regardless of whether the fund survives past the end of that quarter. Then, we compute the equal-weighted (EW) cross-sectional average quarterly buy-and-hold measure across all funds for each quarter of the test year. Finally, we compound these measures into an annual measure that is rebalanced quarterly. Presented in this table are the EW-average annual: *characteristic selectivity* measure (Panel A) and turnover level (Panel B). The table presents test year statistics over years 0-3 relative to the ranking year, averaged over all event dates. The table also shows the time-series average number of funds within each category. Time-series inference tests are shown, where appropriate. ***, **, and * indicate significance at the levels of 1%, 5%, and 10%, respectively.

Panel A: Characteristic Selectivity Measure (percent per year)

	Avg. No.	Avg. TNA ($ Mil)	Year 0	Year+1	Year+2	Year+3
(1) Manager Change	108	731	-0.2	0.6	0.8	0.3
(2) No Manager Change	810	980	0.5**	0.5*	0.5	0.4*
(1)-(2)	--	--	-0.7**	0.1	0.3	-0.1
All Funds	918	951	0.4	0.5	0.5	0.4

Panel B: Portfolio Turnover (percent per year)

	Avg. No.	Avg. TNA ($ Mil)	Year 0	Year+1	Year+2	Year+3
(1) Manager Change	108	731	99.0	99.7	96.1	88.6
(2) No Manager Change	810	980	75.3	73.7	72.1	70.5
(1)-(2)	--	--	23.7***	26.0***	24.0***	18.1***
All Funds	918	951	78.1	76.8	74.9	72.6

Table VI
Fama-MacBeth Regressions of Fund Performance
on Manager- and Fund-Level Characteristics

This table reports the time-series average regression coefficients (with t-statistics) from annual cross-sectional regressions of fund CS measure (in %/yr) on year-beginning manager and fund characteristics. A regression is computed each year, starting in 1986 and ending in 2002. Manager characteristics include career experience (*EXP*) and career *CS* track record (*CST*). In all cases, the manager characteristic is measured only up to the beginning of the test year. Year-beginning total net assets under management (*TNA*) and expense ratio (*EXPENSES*) over the test year are included as control variables. 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, 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)		
	All Funds	*AG & G*	*GI & I*	*All Funds*	*AG & G*	*GI & I*
Constant	2.49**	2.75	0.54	2.86**	3.13**	0.70
	2.62	2.47	0.68	2.71	2.61	0.89
EXP (Years)	0.01	0.01	0.01	-0.06**	-0.07*	-0.01
	0.37	0.44	0.78	-2.15	-2.06	-0.30
CST (%/yr)	0.077	0.081	-0.001	0.18**	0.19**	0.08
	1.18	1.22	-0.02	2.11	2.15	0.61
LOG(TNA)*EXP				0.013***	0.017**	0.004
				2.95	2.70	0.75
LOG(TNA)*CST				-0.027*	-0.03*	-0.017
				-1.83	-1.85	-0.73
LOG(TNA)	-0.25***	-0.28**	-0.06	-0.33***	-0.37***	-0.09
	-3.07	-2.43	-0.73	-3.02	-2.65	-0.83
EXPENSES	-0.60*	-0.62***	-0.26	-0.52*	-0.52	-0.22
	-2.13	-2.10	-0.63	-1.75	-1.64	-0.56
Avg. *N*	785	631	154	785	631	154
Avg. Adj. R^2	0.04	0.04	0.01	0.04	0.04	0.00

Table VII
Regression of Fund Performance
on Fund- and Board-Level Characteristics

This table reports regression coefficients (with *t*-statistics) from cross-sectional regressions of fund CS measure and net return (in percent per year) during 2002 on fund board and fund characteristics measured at the beginning of 2002. The characteristics of the fund board include the log total number of directors on the board (*log(NUMDIR)*)) and the percentage of non-interested directors on the board (*PCTINDEP*). Fund characteristics include log total net assets under management (*log(TNA)*)) and one-year lagged performance (either characteristic selectivity measure (*CS(-1)*)) or lagged net return (*RETURN (-1)*)). Also reported are the number of funds (*N*) and adjusted R^2. ***, **, and * indicate significance at the levels of 1%, 5%, and 10%, respectively.

	Dependent Variable=Year 2002 *CS*					Dependent Variable=Year 2002 Net Return			
	Estimate	*t-Stat*	Estimate	*t-Stat*		Estimate	*t-Stat*	Estimate	*t-Stat*
Intercept	-10.9***	-4.00	-12.6***	-4.65		-25.9***	-8.89	-22.6***	-9.73
log(TNA)	-0.26	-1.52	-0.34*	-1.94		-0.79***	-4.26	-0.64***	-4.13
log(NUMDIR)	2.86***	3.38	3.84***	4.44		3.34***	3.62	3.83***	5.11
PCTINDEP	5.48*	1.87	5.76*	1.95		2.72	0.86	2.25	0.89
CS(-1)			31.8***	9.31					
RETURN (-1)								51.2***	31.16
N/Adj. R^2	1357	0.01	1273	0.07		1610	0.01	1545	0.40

Table VIII
Characteristics of Mutual Fund Boards that Replace Managers

This table reports the characteristics of boards of directors for two groups of mutual funds. The first group contains mutual funds that replace their managers during fiscal year 2002-2003. The second group contains mutual funds that are randomly selected from the CDA-CRSP mutual fund database, but do not replace their managers during 2002-2003. 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 (*NUMINSIDE*), percentage of non-interested directors (*PCTINDEP*), director expenses during fiscal year 2002-2003 as a percentage of average total net assets (*DIREXPENSE*), and number of board meetings (*NUMMEET*). Panel A shows the mean and median of the six board characteristics for the two groups of mutual funds. *t*-Test and Wilcoxon signed rank test are run to test the hypothesis that the board characteristics of the two group of mutual funds are same. The *p*-values for the pooled *t*-statistics and two-sided Wilcoxon *z*-score are reported, respectively, in Panel A. In Panel B, the Pearson correlations of the board characteristics (across all funds in both groups) are reported.

Panel A: Descriptive Statistics of Board Characteristics Variables

| | Managerial Replacement (N=80) | | No Managerial Replacement (radomly selected, N=84) | | p-Value for Difference | |
					t-Stat (pooled)	Wilcoxon (two-sided)
	Mean	Median	Mean	Median		
NUMDIR	10.2	10	7.8	8	<.0001	<.0001
NUMINDEP	7.8	8	5.9	6	<.0001	<.0001
NUMINSIDE	2.4	2	1.9	2	0.004	0.0068
PCTINDEP	76.4	71.4	75.1	75	0.45	0.37
DIREXPENSE	0.0082	0.0031	0.015	0.0044	0.12	0.22
NUMMEET	5.5	4	3.8	4	0.0023	0.007

	NUMDIR	NUMINDEP	NUMINSIDE	PCTINDEP	DIREXPENSE	NUMMEET
Panel B: Pearson Correlations of Board Characteristics Variables (*N*=164)						
NUMDIR	1.00					
NUMINDEP	0.94	1.00				
NUMINSIDE	0.62	0.32	1.00			
PCTINDEP	0.09	0.40	-0.68	1.00		
DIREXPENSE	-0.20	-0.23	-0.01	-0.20	1.00	
NUMMEET	0.58	0.53	0.41	0.02	-0.20	1.00

Table IX
LOGIT Regressions of Occurrence of Manager Replacement

Cross-sectional logit regressions of the occurrence of manager replacement on the fund board characteristics of 164 mutual funds are shown. Of the 164 funds in the sample, 80 funds replaced their manager during 2002, while the other 84 funds were randomly selected as a comparison sample that did not replace their managers during 2002. The dependent variable equals one if a fund experiences manager replacement in 2002, and zero otherwise. Independent variables include board characteristics, including log total number of directors on the board (*log(NUMDIR)*), log number of non-interested directors on the board (*log(NUMINDEP)*), log of one plus number of interested directors on board (*1+log(NUMINSIDE)*), percentage of non-interested directors on board (*PCTINDEP*) and its interaction with a dummy variable equal to one if the percentage of non-interested directors is greater than or equal to 75 percent, and zero otherwise (*D(PCTINDEP>=75%)*), director expenses as a percentage of average net assets (*DIREXPENSE*), and log of one plus number of board meetings held during fiscal year 2002-2003 (*log(1+NUMMEET)*). In addition, three fund characteristics are included: log total net assets under management at the beginning of 2002 (*log(TNA)*), a dummy variable set equal to one if a fund experiences net outflows during year 2001, and zero otherwise (*D(FLOW)*), and a dummy variable equal to one if the fund net return in 2001 is below that of the S&P500 index, and zero otherwise (*D(RETURN)*).

	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value	Estimate	p-Value
Constant	-5.51***	0.00	-10.48***	0.0003	-1.47	0.314	-3.44**	0.014
log(NUMDIR)	3.11***	<.0001	3.00***	<.0001				
log(NUMINDEP)					3.08***	<.0001	2.08***	0.0062
log(1+NUMINSIDE)							1.14	0.15
PCTINDEP	0.0061	0.74	0.093**	0.025	-0.035*	0.091		
*PCTINDEP * D(PCTINDEP>=75%)*			-0.024**	0.020				
DIREXPENSE	-8.61	0.24	-9.70	0.21	-8.57	0.25	-9.14	0.22
log(1+NUMMEET)	0.073	0.7758	-0.09	0.72	0.069	0.79	0.030	0.91
D(FLOW)	0.91**	0.023	1.05**	0.012	0.92**	0.023	0.87**	0.031
log(TNA)	-0.37***	0.0061	-0.40***	0.0051	-0.37***	0.0062	-0.37***	0.0066
D(RETURN)	-0.15	0.70	-0.22	0.57	-0.15	0.70	-1.12	0.60
log(NUMINDEP) D(RETURN)*							0.78	0.46
*log(1+NUMINSIDE) * D(RETURN)*							-0.42	0.69
N/Pseudo R^2	154	0.18	154	0.21	154	0.18	154	0.19