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Internal versus External Replacement of Mutual Fund Managers

Linlin Ma

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Internal *versus* External Replacement of Mutual Fund Managers

BY

LINLIN MA

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

Of

Doctor of Philosophy

In the Robinson College of Business

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ACCEPTANCE

This dissertation was prepared under the direction of *LINLIN MA's* Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctoral of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

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ABSTRACT

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I use a unique dataset of 1,808 mutual fund manager replacements to study the determinants and the subsequent impact of the choice between hiring the successor from within (internal hire) and outside (external hire) the fund family. I find that fund families prefer to replace their top performers with internal hires and bottom performers with external hires. External hires demonstrate superior ability to turn around bottom performing funds, but exhibit inferior ability to maintain the record of top performing funds. I find no cross-sectional difference in post-replacement performance between internal and external successors, indicating fund families, in general, make their replacement decisions optimally. I do, however, find that funds that deviate from the optimal decision have subsequent sub-par performance. Overall, the evidence suggests that portfolio managers play a pivotal role in determining mutual fund performance.

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JEL Classification: G23, J24, M54

Keywords: Fund Manager, Fund Families, Manager Replacement, Fund Performance

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I. Introduction

Mutual fund managerial replacement is a critical event that often draws much attention. It consists of two parts: the displacement of the predecessor, and the placement of the successor. Prior literature has largely focused on the former.[1] Relatively little is known about how fund families make their succession decisions. In this paper, I assemble a unique dataset of 1,808 managerial replacement events between 1996 and 2010 to study the choice between hiring the successor from within (internal hire) and outside (external hire) the fund family. In particular, this study provides evidence on three related questions. (1) What are the factors that drive the decision of successor origin (i.e. internal *versus* external hire)? (2) Do factors such as the manager's industry experience and educational background matter for the hiring decisions? (3) Do successor attributes relate to post-turnover fund performance? The answers to these questions shed light on the importance of portfolio managers to mutual fund performance.

My analysis consists of three parts. The first part studies the determinants of internal *versus* external hire in light of the hiring models in labor economic theories. As summarized by Oyer and Schaefer (2011), hiring is the outcome of a matching process hindered by labor market frictions, such as asymmetric information, search costs, and training costs. An external hire possesses skills and traits that are desirable for funds in need of changing the *status quo*, but involves costly search and information asymmetry.

[1] The literature on fund managerial turnover focuses primarily on how effectively mutual fund families dismiss poorly performing managers. See, for example, Khorana (1996), Chevalier and Ellison (1999a), Lynch and Musto (2003), Gervais, Lynch and Musto (2005), Ding and Wermers (2009), and Kostovetsky and Warner (2012). However, management changes can occur for reasons other than discipline. For instance, well-performing managers may leave in pursuit of more attractive job opportunities. Kostovetsky (2009) documents an increasing flight of top-performing managers from mutual funds to hedge funds. Hu, Hall and Harvey (2000) also suggest that well-performing managers can be promoted to a "better" (in their definition, larger) fund.

An internal hire provides the benefits of grooming the successor which greatly eases the transition and promotes continued good performance. The training costs associated with the grooming, however, can be non-trivial. The optimal choice of successor origin is determined by trading off the benefits against the costs.

In support of the above arguments, I find that fund families prefer to replace their top performers with internal hires and bottom performers with external hires, suggesting fund families choose successors with traits to match the needs of the fund. Further, the probability of hiring externally decreases with family size and predecessor tenure but increases with fund family's geographical proximity to a financial center. This finding indicates training costs and search costs influence hiring decisions in the labor market of mutual fund managers. I also find that publicly observable managerial traits, such as industry experience and educational background, play a particularly important role in the hiring of external managers since fund families must rely on more observable information when evaluating the ability of these managers.

In the second part of my analysis, I examine the impact of successor origin on the subsequent fund performance. To justify the incentive of mutual fund families to hire externally, which is to turn around the poorly performing funds, I posit that external successors should exhibit a superior ability to improve the poorly performing funds compared to the internal ones. In contrast, when fund families replace a manager with an internal candidate for the well-performing funds, the value of grooming will predict that the internal successors are better at promoting continued good performance.

Consistent with my expectations, I find that over the subsequent three years, external successors improve the annual abnormal performance (alpha) of the bottom-quartile

funds by 4.1% more than the internal ones do. When it comes to the top-quartile performing funds, however, external successors deteriorate the performance by 2.6% more than the internal ones do. This result is not simply driven by the mean-reversion in fund performance. Further, in support of the premise that external hires are more likely to change the job's *status quo*, I show that external successors trade more frequently than the internal ones and have a greater tendency to diverge from fund's original investment objectives. These findings remain after adjusting for the potential selection bias arising from the fact that the impact of successor origin choice on fund performance can be confounded by some unknown factors affecting the choice itself.

In the last part of my analysis, I exploit cross-sectional differences in the post-turnover performance between internal and external hires. Taken together, the above evidence confirms that there are benefits as well as costs associated with internal and external replacement of mutual fund managers. The decision of whether to hire from within or outside involves a trade-off between various benefits and costs. These benefits and costs differ across the sample funds, and such differences predict variations in the choice of successor origin. If the choice is optimally determined in equilibrium, we should observe no cross-sectional difference in the post-turnover performance between internal and external successors. Nevertheless, if, for some reason, a fund deviates from the optimal choice, we would expect that the sub-optimal decision leads to subsequent sub-par performance.

Consistent with my hypotheses, I find external successors produce risk-adjusted returns that are indistinguishable from the ones produced by internal successors, indicating fund families, in general, make their replacement decisions optimally. I do,

however, find that funds that deviate from the expected decision (i.e. choose to internally hire when external hire is expected or vice versa) have subsequent sub-par performance. Further, I show that fund investors are cognizant of the deviation and punish such funds by withdrawing their capital.

The purpose of this study is threefold. First, while the causes of managerial turnover have been studied in the mutual fund literature, the consequences of this critical event have not been carefully examined. Khorana (2001) finds that the performance of underperforming (well-performing) funds significantly improves (deteriorates) after managerial turnover using univariate comparisons. Kostovetsky and Warner (2012), however, find no evidence of performance improvement after managerial turnover using multivariate regression approach, raising doubts about fund families' rationale for costly turnover of their portfolio managers. In this study, I strive to capture replacement decision more completely than previous research has and to enhance our understanding of the economic incentive of managerial replacement decisions. The argument I advance here is that it is not the manager turnover *per se*, but rather the succession decision that impacts the subsequent fund performance. Without taking the nature of the succession into account, the previous studies ignore an important part of the replacement decisions, and therefore generate inconsistent findings.

Second, from a broader perspective, this paper aims to address the question of whether portfolio managers play a pivotal role in generating mutual fund performance. Popular press pays much attention to portfolio managers, reporting their profiles, researching their investment philosophies, and tracking their job changes. The high media coverage suggests that portfolio managers are critical to value creation for the fund. In

addition, when mutual fund families describe their investment process, most of them claim that the portfolio managers have the final say when it comes to buying or selling a stock in the portfolio (Kacperczyk and Seru, 2012). Yet, existing empirical studies typically rely on fund-, family-, and market-level characteristics to explain fund performance and largely ignore the possible role that individual managers may play in generating the performance outcomes. One of the reasons could be the widespread belief that mutual fund managers lack stock picking skills. Starting with Jensen (1968), prior studies consistently find actively managed mutual funds, on average, underperform their benchmarks and therefore conclude that active managers do not have skills. Moreover, while several papers find persistence in fund performance over short horizons of one to three years,[2] Carhart (1997) argues that the persistence of performance is largely driven by the persistence in fees and momentum in stock returns.

A strand of recent literature, however, provides some evidence of managerial skill in the mutual fund industry. For instance, Wermers (2000) finds that the stocks that mutual funds hold outperform broad market indices. Chen, Jegadeesh, and Wermers (2000) find that the stocks that mutual fund managers buy outperform the stocks that they sell. Cremers and Petajisto (2009) show that the amount a fund deviates from its benchmark is positively associated with fund performance. There is also evidence suggesting where the skills come from. For instance, Chevalier and Ellison (1999b) and Gottesman and Morey (2006) document a positive relation between manager educational background and fund performance. Coval and Moskowitz (2001) find that geography matters as funds that invest in more local stocks do better. Kacperczyk, Sialm, and Zheng (2005), and Huang

[2]See, for example, Hendricks, Patel and Zeckhauser (1993), Goetzmann and Ibbotson (1994), and Brown and Goetzmann (1995).

and Kale (2013) find that funds with better product market information perform better. Cohen, Frazzini, and Malloy (2007) find that portfolio managers perform significantly better on the holdings for which they are connected through social network. Agarwal, Boyson, and Naik (2009) find that mutual fund managers with experience implementing hedge fund strategies perform better. These studies suggest that managerial superior performance is likely due to superior knowledge and information. These studies, however, do not provide direct evidence on managers' effects on fund performance. The superior performance can be simply due to implementation of strategies that are chosen by fund families. Since one can never observe performance outcomes of managers and funds independently, but instead only in conjunction with each other (Baks, 2003), "the empirical distinction between funds and managers need not be trivial" (Chevalier and Ellison, 1999b).

In this paper, I take a new approach to investigate the extent to which portfolio manager matters for fund performance by looking into the performance consequences following managerial replacements. This identification strategy has two potential advantages. First, by focusing on managerial replacements, I can compare the fund performance before and after the event, which is a more direct way to quantify the effect of different managers on fund performance. Second, in the setting of managerial replacements, it is reasonable to argue that the funds and families stay the same, with the managers being different. Thus, any change in fund performance should be more likely due to the manager effect.

Third, my study adds to a growing body of labor economic literature that recognizes the importance of hiring decisions in the labor market. While extensive theoretical work

is devoted to understanding firms' hiring decisions, few empirical studies underpin the theoretical development.[3] One obvious reason is data limitation. My work contributes to this strand of literature by examining the empirical implications of hiring models using a unique yet unexplored setting: labor market for mutual fund managers. The labor market for mutual fund managers appears to be an attractive setting to study the hiring decision for at least three reasons. First, the employment history of portfolio managers is publically available, so tracking their personal traits is relatively easy. Second, there is a direct link between managerial actions (investment decisions) and outcome (fund performance), which allows me to clearly identify the impact of hiring on subsequent fund performance. Last, but not least, mutual fund companies are human capital intensive and hiring the right manager is an important (if not the most important) determinant of their success (Barney, 1991).

The rest of the paper is structured as follows. Section II develops the hypotheses. Section III describes the data, variable construction, and summary statistics. Section IV presents the results on the determinants of successor origins. Section V examines the impact of successor origin on the subsequent change in fund performance. Section VI analyzes the cross-sectional difference in the post-turnover performance between internal and external hires. Section VII concludes the paper.

II. Hypotheses Development

A. Benefits

[3] There is a reasonably large empirical literature on hiring decisions for chief executive officers (CEO). Oyer and Schaefer (2011), however, claim that the market for CEOs is markedly different from other rank-and-file employees and this literature needs more studies in other "specific labor markets".

Labor economists have long identified the main economic problem in any type of hiring decisions (therefore succession decisions included) involves matching in the presence of frictions in the labor market, such as asymmetric information, search costs, and training costs (Oyer and Schaefer, 2011). Job matching theory (see among others, Jovanovic, 1979a, 1979b; Rosen, 1982; Allgood and Farrell, 2003; Eisfeldt and Kuhnen, 2013) suggests that there are neither good workers, nor are there good employers; there are only good matches. Good matches are formed when firms with idiosyncratic needs for employee skill sets hire a job candidate with the required set of skills. Good matches are value-enhancing. In equilibrium, firms hire an external (internal) candidate when they believe the attributes of the external (internal) candidate best match their specific needs for the vacant job.

One well documented attribute that differentiates external candidates from internal candidates is their ability to significantly change the job's *status quo* (e.g., Parrino, 1997; Khurana and Nohria, 2000; Allgood and Farrell, 2003; Jin and Scherbina, 2010; Pan and Wang, 2012). On one hand, external candidates, by virtue of their experience at other firms, are more likely to bring new ideas and fresh perspectives. On the other hand, external candidates, who have zero contribution to the job's *status quo* and no political alliances with coworkers, are less constrained to implement those new ideas.

In the setting of mutual fund managers, job matching theory therefore suggests that a key determinant of external hiring is fund performance. When the managerial turnover is following a period of underperformance (most likely forced turnover of the predecessor), fund companies prefer to hire externally so that the incoming manager brings new perspectives and investment philosophies that help to turn around the bad performance.

In contrast, internal hiring is more likely when the fund is performing well (most likely a voluntary turnover of the predecessor) and therefore a continuation of good performance is needed. In the case of internal replacements, the successor has the opportunity to obtain "on-the-job training" from the predecessor. The "grooming" can greatly ease the manager transition and promote continued good performance. The above argument forms the basis of my first two hypotheses.

Hypothesis 1: Mutual fund advisors are more likely to hire externally for the underperforming funds and internally for the well-performing funds.

Hypothesis 2: External successors exhibit superior ability to turnaround the underperforming funds, whereas internal successors demonstrate better ability to maintain the good record of well-performing funds.

B. Costs

In a perfect labor market, the matching process leads to an *ex-ante* optimal manager-fund match at all times. However, labor market frictions such as training costs and search costs hinder the efficient matching. For instance, unlike large fund advisors such as Fidelity, who have a complete internal training system (interns to buy-side analysts to portfolio managers), smaller fund families, who have limited resources, may not be able to afford the internal training costs. This limitation on internal talent can impede hiring from within and thus reduce the incidence of internal replacements for smaller advisors. By the same token, the supply of external candidates can play a key role in determining the choice of successor origin. Fund advisors who are located in close proximity to the financial centers such as Boston or New York have access to a larger pool of external candidates, and thus are less constrained to hire from outside. The same argument,

however, cannot be made for advisors that are distant from those financial hubs. In addition, predecessors who have longer tenure at the fund may have a greater opportunity to groom their successors from inside the fund families. Thus, I expect greater likelihood of internal succession for funds with longer-tenured predecessors. I formalize my third hypothesis as follows.

Hypothesis 3: The probability of observing external replacements decreases with family size and predecessor tenure but increases with advisor's geographical proximity to a financial center.

Another labor market friction, namely asymmetric information, may also impede efficient matching (Greenwald, 1986). In general, asymmetric information refers to the situation where two trading partners have different information about the economic transaction. Regarding hiring in the labor market, asymmetric information arises when job candidates have more information about their productivities than the firm does and firms cannot costlessly verify the information. As a result, job candidates, the better informed party, can exploit the information advantage at the expense of overall efficiency. For instance, potential job candidates may misrepresent their quality by fabricating their credentials or over-polishing their resumes.

Labor markets are, of course, heterogeneous. The extent to which asymmetric information is prevalent is likely to vary. One can argue that asymmetric information is less severe in the hiring decisions of portfolio managers since their past performance and partial investment decisions are publically observable. However, Fama and French (2010) claim that part of the fund performance can be attributed to luck rather than skill.

Lakonishok et al. (1991), among others, show that portfolio managers can window-dress their disclosed portfolio. Therefore, asymmetric information remains a concern.

Given the concern of information disadvantage, firms should prefer to hire candidates about whom they have more accurate information on. As a result, internal candidates have an advantage over external candidates in filling the vacant position, *ceteris paribus*. This is because not only firms have more information about the internal candidates: the information they have is also less noisy. One way firms can reduce the uncertainty regarding external candidates is to require stronger observable indicators of abilities. Though not an exhaustive list, such indictors include manager's industry experience and educational background. Both industry experience and educational background are expected to be positively related to managerial ability for the following three mutually non-exclusive reasons. First, managers with longer industry experience and better educational background may have superior innate ability (Chevalier and Ellison, 1999b). Because of the superior ability, they self-select to attend a better school and are more likely to survive longer in the industry. Second, managers can obtain knowledge from both the experience and the education, and thus enhance their trading skills. Third, the social networks acquired through professional activities and schooling may help managers obtain private information which in turn help the stock picking (Cohen, Frazzini, and Malloy, 2007).

I summarize the above argument in the following hypothesis.

Hypothesis 4: External hires have stronger observable indicators of ability, such as industry experience and educational background, than internal hires.

C. Costs/benefits Trade-off

Taken together, the above hypotheses suggest that there are benefits as well as costs associated with both internal and external replacement of mutual fund managers. The decision of whether to hire within the fund family or to search outside involves a trade-off between various costs and benefits. These benefits and costs differ across the sample funds, and such difference predicts variations in their choice of successor career origins. If the choice is optimally determined in equilibrium, then we should observe no cross-sectional difference in the subsequent performance between the internal and external successors, after controlling for fund and manager characteristics. If internal (external) hires produced systematically higher risk-adjusted returns than external (internal) ones, we would expect all funds to hire internally (externally). The external (internal) hiring mode will be completely competed out of the marketplace. This is, obviously, not consistent with what we observe empirically. Thus, I hypothesize that:

Hypothesis 5: Internal successors produce risk-adjusted returns that are indistinguishable from the risk-adjusted returns produced by external successors.

Note that this hypothesis is built on the assumption that mutual fund industry is perfectly competitive. This may not be true as pointed out by Warner and Wu (2004). Market frictions such as search and switching costs can deter investors from punishing the funds. It is conceivable, then, some funds might deviate from the optimal decision without being immediately competed out of the marketplace. If, for some reason, a fund reaches a sub-optimal succession decision (i.e. choose to hire internally when external hire is optimal or vice versa), we should expect this decision to lead to subsequent sub-par performance. This argument leads to the following hypothesis.

Hypothesis 6: The performance of funds that are predicted to have an external (internal) hire and hired from outside (within) should outperform the ones are predicted to have an external (internal) hire but hire from within (outside).

III. Data, Variable Construction, and Summary Statistics

A. Data

My primary data source is the Morningstar Direct Mutual Fund (Morningstar) database. This survivorship-bias-free database covers the U.S. open-end mutual funds and provides information about fund names, family names, returns, assets, expense ratios, portfolio turnover ratios, manager names, manager biographies, investment objectives, fund tickers, fund CUSIPs, and other fund characteristics. I rely primarily on the Morningstar database rather than on the Center for Research in Security Prices (CRSP) Mutual Fund database for two reasons. First, manager name, a key input of this study, is more accurate in the Morningstar database compared with the CRSP database (Massa, Reuter, and Zitzewitz, 2010). Second, a short manager biography is provided to describe each manager's industry experience and educational background in the Morningstar database. This information is not available in the CRSP database. My initial sample consists of 4,096 U.S. open-end equity mutual funds managed by 7,686 portfolio managers in 1,265 mutual fund companies, covering 33,014 fund-year observations between 1996 and 2010.[4]

To construct the sample of funds with managerial replacement, I track the changes of manager names to identify managerial turnover. I use the month in which at least one

[4]Multiple share classes are listed as separate funds in the Morningstar database. To avoid multiple counting, we aggregate the share-class level data to portfolio level, using the identifier, *FundID*.

manager name is different from the one(s) in the previous month as the event month for my empirical analyses. I exclude the cases when there are multiple managerial replacements for one fund. To avoid cases of interim replacement, I require that (a) the predecessor has at least 6-month tenure in the funds preceding the turnover, and (b) the successor stays with the fund for at least 6 months after the replacement. I also require information on the industry experience and educational background available for the succeeding managers. Using this criterion, the replacement sample includes a total of 1,808 managerial replacement events.

B. Variable Constructions

B.1. Performance Measures

To evaluate the mutual fund performance, I use *four-factor alpha* ($\alpha_{i)}$ estimated using the Carhart (1997) model:

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_{i,m}(R_{m,t} - R_{f,t}) + \beta_{i,s}SMB + \beta_{i,h}HML + \beta_{i,mom}MOM_t + \varepsilon_{i,t} \qquad (1)$$

where $R_{i,t} - R_{f,t}$ is the return of the fund *i* in month *t* minus the risk free rate; and $R_{m,t} - R_{f,t}$ is the excess return of the market over the risk free rate; *SMB* is the return difference between small and large capitalization stocks; *HML* is the return difference between high and low book-to-market stocks, and *MOM* is the return difference between the stocks with high and low past returns.[5] The factor loadings are calculated using fund net-of-fee returns in the previous 36 months. The four-factor alpha has been widely used in the literature to measure the risk-adjusted performance of mutual funds.

[5] I thank Professor Kenneth French for making the returns on the market, risk-free rate, and the three factors (size, book-to-market, and momentum) available on his website: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

As a robustness check, I also compute the *category-adjusted return* which equals the monthly fund return less the average monthly return of all the funds in the corresponding Morningstar Category. The use of the category-adjusted return is consistent with the argument that, in making managerial replacement decisions, mutual fund companies benchmark a manager's performance against the performance of "similar" funds in the industry. All of my results are robust to this alternative performance measure. Both the statistical and economic significance are consistent and qualitatively similar.

B.2. Flows Measures

I construct my net flows measure following Sirri and Tufano (1998). It is defined as the growth in total net assets (TNA) net of internal return as in equation (2), assuming all dividends and other distributions are reinvested at the realized annual return for the fund. Berk and Tonks (2007) claim that the way Sirri and Tufano (1998) construct net flows is incorrect because it attributes some of the change in flows to the change due to internal growth. They propose a new measure of net flows where it has $TNA_{i,t-1}\ (1+r_{i,t})$ rather than $TNA_{i,t-1}$ in the denominator. My results are consistent and qualitatively similar, no matter which measure I employ.

$$NetFlows_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1}(1+r_{i,t})}{TNA_{i,t-1}} \qquad (2)$$

B.3. Successor Attributes

Successor attributes are hand-collected from managers' biographies provided by the Morningstar database. Three publicly observable managerial traits are considered in the paper. The first one is *career origin* which refers to whether the new manager comes from inside or outside the mutual fund companies. A manager is categorized to be

external successor if she is hired from outside the fund company and internal if she is hired from within. Another important managerial characteristic is *industry experience* which is defined as the number of years that a manager has been working in the asset management industry. Three variables are generated to capture manager's *educational background*. The first is the median composite SAT score (as of 2010) for the manager's undergraduate institution. Most schools report upper and lower bounds for the reading, math, and writing sections. The bounds are supposed to be constructed so that the median students lie in between. Following Chevalier and Ellison (1999b), I approximate each school's composite SAT score as the sum of the average of the upper and lower bounds for the three sections. The second variable is the median composite GMAT score (as of 2010) of the graduate institution attended by the manager, if available, following Gottesman and Morey (2006).[6] Lastly, I construct an MBA dummy that equals one if the successor has an M.B.A. degree and zero otherwise. These three variables of managerial educational background are used to proxy the manager's innate ability, connections, and the quality of her training.

The following is an example that illustrates how I obtain the information on successor attributes. In November 2009, T. Rowe Price replaced its veteran manager Charles Ober with Timothy Parker, an equity analyst at T. Rowe Price, for the New Era Fund. In Morningstar database, a short biography is provided for Timothy Parker. It says that "Mr. Parker joined the Firm in 2001. He has served as an equity research analyst and then a portfolio manager (beginning in 2010)". From the biography, I also learn that Mr.

[6] To construct the composite SAT score, I mainly use the website: http://www.collegeboard.org/. To obtain the composite GMAT score, I mainly use the website: http://businessschools.college-scholarships.com/. I also use some schools' websites as supplementary data sources.

Parker earned an M.B.A. degree as well as a B.S. degree from University of Virginia. Based on the above sketches, I conclude that Timothy Parker is an internal successor, has 10 years of industry experience, and went to an M.B.A program that requires median GMAT score of 680 and an undergraduate institution with 2,040 median composite SAT score requirement.

B.4. Other Variables

Other variables are defined as follows. *Fund Assets* is the market value of assets held by the fund at the end of each month. *Expense Ratio* equals the fund's operating expenses divided by the average monthly assets. Portfolio *Turnover Ratio* is computed by taking the lesser of purchases or sales by the fund and dividing it by the average monthly net assets. *Family Assets* is the market value of assets held by all the equity funds in the family at the end of each month. *Team* is an indicator variable that equals one if the fund is managed by a team of portfolio managers and zero otherwise. *Tenure* is the number of years that a manager has been at the helm of a mutual fund.

C. Summary Statistics

On average, 1.3% of portfolio managers get replaced each month which translates into an annual manager turnover rate of 15.6%. While mutual fund families mainly rely on the internal labor markets to fill their staffing needs (68.1% of the sample), a significant fraction of positions are filled from the outside (31.9%).

[Insert Table I about here]

Table I reports the summary statistics of the characteristics for all the sample funds. A typical fund in my sample has annualized four-factor alpha of -0.54% and category-

adjusted return of -0.45%. On average, the sample fund has an expense ratio of 1.34% and portfolio turnover ratio of 112.28%. The annual net flows are on average 8.4% of the fund assets. Fund assets and family assets are positively skewed, thus I use the natural logarithm of these two variables in all my empirical tests.

As far as the manager characteristics are concerned, a typical sample fund has about two team members running the fund. Portfolio managers in my sample have been working in the asset management industry for an average 13 years. The average tenure of the portfolio managers is 4.5 years. About 77% of my sample managers hold an M.B.A. degree. The average GMAT score of managers' graduate institutions is about 668 and the average SAT score of managers' undergraduate institutions is about 1,881. All the variables are winsorized at the 1st and the 99th percentile levels.

[Insert Table II about here]

Table II reports the sample distribution by Morningstar Category. Morningstar Category is assigned based on the underlying securities in the fund over the previous three years. The majority of funds in my sample are Large-Cap funds which represent 54.6% of the sample. The sample also consists of Mid-Cap funds (23.1%) and Small-Cap funds (21.1%). I also have 23 Sector funds in the sample, which represent 1% of the sample. There are 297 cases (16.4% of the sample funds) where managers change the investment objectives of the funds in the subsequent three years after the replacement event. As a result, the Morningstar Category in the post-turnover period is different from the one in the pre-turnover period. I refer to this event as "style drift" in the study. The variable *Style Drift* is a dummy variable that equals one if a fund changes its investment objective in the three years after the manager turnover, and zero otherwise.

[Insert Table III about here]

As shown in Table III, the management companies' locations span most of the major financial centers. I first rank cities by the number of fund families that are located in each for all the domestic equity funds in the Morningstar database. As can be seen, New York and Boston dominate the mutual fund landscape. There are 189 (14.9%) and 152 (12.0%) mutual fund families in New York and Boston, respectively. Other major mutual fund cities include Chicago (5.7%), Philadelphia (63%), San Francisco (4.0%), Los Angeles (3.2%), Milwaukee (2.8%), Baltimore (2.8%), and Houston (2.8%). The rest of the mutual fund families are lumped together in "Rest of Cities"; this category comprises 46.9% of the sample. Similar pattern can be found for the sample of funds with managerial replacement. To measure the geographical advantage of accessing external talent, I construct the indicator variable, *Financial Center*, which equals one if the mutual fund family is located in those top 10 cities and zero if it is located in the rest of cities.

D. Univariate Comparisons

Table IV presents a univariate comparison of various fund characteristics between internal successors and external successors. Overall, the descriptive evidence reveals significant differences in fund characteristics between the two groups. In the pre-turnover period, funds that choose to hire externally underperform the ones that acquired by an internal successor. This evidence is consistent with Hypothesis 1. Compared with the internal successors, external ones tend to acquire smaller, more expensive, and active funds. Notably, consistent with Hypothesis 3, both the family size and the predecessor tenure are greater for funds with internal successors than the ones with external hires. Lastly, I find that consistent with my expectations in Hypothesis 4, compared with

internal succession, external succession requires the incoming manager to have stronger observable indicators of ability, such as longer industry experience and better educational background, which presumably reduce the information uncertainty.

[Insert Table IV about here]

IV. Determinants of Successor Origin

As the first step in my analysis, I investigate the determinants of successor career origin (i.e. internal *versus* external hire). As discussed in the Hypotheses Development section, a key determinant of external hiring should be fund performance. When the managerial turnover is following a period of underperformance, fund companies are more likely to hire externally so that the incoming manager bring new perspective and investment philosophies that help to turn around the bad performance. In contrast, internal hire is more likely when the fund is performing well and therefore continuation of good performance is needed, as the successor has the opportunity to obtain "grooming" from the predecessor which greatly eases the transition and promotes continued good performance.

Mutual fund families are heterogeneous and face different costs associated with internal and external recruiting. Smaller families have greater training costs, thus are less likely to hire from within. Fund families that are located in close proximity to the financial centers have access to a larger pool of external candidates, therefore are less constrained to hire from outside. Predecessors who have longer tenure at the fund may have a greater opportunity to groom their successors from inside the fund families. Thus,

I expect greater likelihood of internal succession for funds with longer-tenured predecessors.

To test Hypothesis 1 and Hypothesis 3, I employ a probit regression modeling the likelihood of a fund whose manager gets replaced by an external candidate at time *t*. The probit model specification is as follows:

$$y^*_{i,t} = \beta_1 Perf_{i,t-1} + \beta_2 Tenure_{i,t-1} + \beta_3 FamSize_{i,t-1} + \beta_4 FinCenter_{i,t-1} + \gamma Controls_{i,t-1} + \varepsilon_{i,t} \quad (3)$$
$$y_{i,t} = 1\,[y^*_{i,t} > 0]$$

where *i* indexes mutual funds and *t* indexes time. The dependent variable $y_{i,t}$ is an indicator variable that equals one if a manager is an external successor and zero if she is an internal successor. I first measure the past fund performance as the four-factor alpha defined in Section III, over the past 36 months. To test the possibility that the relation between the past performance and the choice of successor origin is not linear, I also use the relative performance as alternative performance measure.

I divide the sample into three groups based on the fund's previous three year's performance. The top performance group includes the funds whose performance ranks in the first quartile. The bottom performance group includes the funds whose performance ranks in the bottom quartile. The middle two performance quartiles are combined into one group. *Top, Bottom, and Middle* are indicator variables that equal one if the fund performance belongs to the top, bottom, or middle performance group, respectively, and zero otherwise. Note that the indicator variable *Middle* is not included in the regression because the middle group serves as the base case for the top and bottom groups. The estimated coefficients for *Top* and *Bottom* show the effects of being top and bottom

performers on the likelihood of external replacement relative to being the middle performers, respectively. I control for other fund and manager characteristics including fund assets, expense ratio, portfolio turnover ratio, and whether a fund is managed by a team of managers or not. All the independent variables are measured one month prior to the turnover event. I include both the category dummies and year dummies in the regression, and cluster the standard errors at the fund level.

[Insert Table V about here]

I report the results in Table V. Consistent with Hypothesis 1, the estimated coefficient on variable Four-factor Alpha is negative (Coef. =-0.033) and significant at the 1% level, suggesting that fund families are more likely to choose an external hire over an internal hire for an underperforming fund. This finding is further confirmed in Column (2). The coefficient on the indicator variable *Bottom* is 0.761 and significant at the 1% level. In contrast, the coefficient on the indicator variable *Top* is -0.139, significant at the 10% level, suggesting internal (external) replacements are preferable for well (poorly)-performing funds. An F-test of equality of the coefficients on Top and *Bottom* is strongly rejected at 1% significance level. In terms of the economic magnitude, for a typical fund in the sample, one-standard-deviation decrease in the Four-factor Alpha is associated with an increase in the probability of external hire by 13.9%. A change of ranking from the middle quartiles to the bottom (top) quartile is associated with an increase (decrease) in the implied probability of external replacement by 27.9% (4.4%). Further, the implied probability of external hire by keeping all fund characteristics at the mean level is only 29.3%, suggesting *ceteris paribus*, fund families prefer internal hire over external hire.

Consistent with Hypothesis 3, I find that the coefficient on the natural logarithm of family size to be negative (Coef. =-0.060) and significant at the 1% level, suggesting external hiring is associated with smaller fund families. A one-standard-deviation increase in the natural logarithm of family size is associated with a decrease in the probability of external hire by 4.5%. I also find that the coefficient on the predecessor tenure is negative (Coef. =-0.032) and significant at the 1% level. This finding is consistent with the idea that longer-tenured predecessors are more likely to groom an internal candidate to be the succeeding managers. Further, the coefficient on the dummy variable *Financial Center* is positive (Coef. =0.687) and significant at the 1% level. This finding confirms that fund families that are located in close proximity to the financial centers are more likely to hire externally. I do not find any significant difference between internal and external hire for their distribution patterns in categories or years.

V. Successor Origin and Change in Performance

Having examined the determinants of successor origin, I now turn to examine its impact on the subsequent fund performance. To justify the incentive for mutual fund families to hire externally, which is to turn around the poorly performing funds, I posit that external successors should exhibit a superior ability to improve the bottom performing funds compared to the internal ones. In contrast, when fund families replace a manager with an internal candidate for the well-performing funds, the value of grooming will predict that the internal successors are better at promoting continued good performance.

To test the above predictions, I divide the sample into three groups based on the fund's previous three year's performance. The top performance group includes the funds

whose performance ranks in the first quartile. The bottom performance group includes the funds whose performance ranks in the bottom quartile. The middle two performance quartiles are combined into one group. For each of the subsample, I run the following test:

$$\Delta Perf_{i,t} = \beta_1 External_{i,t} + \gamma Controls_{i,t-1} + \varepsilon_{i,t} \qquad (4)$$

where i indexes mutual funds, and t indexes time. The dependent variable $\Delta Perf$ is the change of fund performance from the pre-replacement period (i.e., month *t-36* to *t-1*) to the post-replacement period (i.e., month *t+1* to *t+36*). To ascertain that the post-turnover improvement or deterioration in fund performance is related to true managerial ability rather than mean reversion in fund performance, I employ a matched-sample-based performance measure. For each fund in my sample, I identify a fund with similar performance record over the 36-month period preceding the turnover event and with same investment style, but does not experience management shakeup in the subsequent period. I then subtract the change in performance of the matched sample from the corresponding change in performance for the replacement sample fund.

The independent variable of interest *External* equals one if a succeeding manager is hired from outside the fund family and zero if she is hired from within. The regression controls for other fund characteristics such as fund size, expense ratio, portfolio turnover ratio, family size, team management, successor's experience, and successor's educational background.[7] I include both the category dummies and year dummies, and cluster the standard errors at the fund level.

[7] Note that I did not include the interaction of *External* and *Experience* (or *Education*) because the interaction terms and *External* is highly collinear.

One possible source of bias in regression (4) is that the choice of the successor types is not random. Since the selection process of the successors is unobserved, the impact of successor types on fund performance could be confounded by some unknown factors affecting the choice of the successor types. I deal with this selection problem by employing a treatment effect model à la Heckman two-step method. The first stage of the model is a probit specification as in equation (3) that analyzes how fund families make the choice of the successor career origin. The estimated parameters are used to calculate the selection hazard *Inverse Mills Ratio*, which is then included as an additional explanatory variable in regression of (4).

[Insert Table VI about here]

The results are reported in Table VI. Consistent with the incentive for mutual fund families to hire externally, I find that external successors demonstrate better ability to improve the performance of the poorly performing funds. Compared with internal successors, external ones improve the annual four-factor alpha for the bottom performers by 4.1% over the subsequent three-year window, significant at the 1% level. Similar effect can be found for the middle quartile group. For the sample of top-performing funds, however, external successors exhibit inferior ability to continue the good performance. On average, the external successors decrease the annual four-factor alpha for the top performers by 2.6% more than the internal ones do, which is significant at the 1% level. Overall, external successors, compared to the internal ones, have a greater tendency to change the fund's performance. The results for the entire sample are reported in the last column. The inverse mills ratio for the choice of external successors is significant at the 1% level. This indicates that the difference in subsequent change in performance between

internal and external successors is partially driven by the selection process. Therefore, throughout the paper, I control for the selection bias in my empirical specifications by including the Inverse Mills Ratio that estimated from equation (3).

To further test the channel through which external hires change the fund's *status quo*, I compare the level of trading activities between internal and external hires. I measure the level of trading activity using two variables. The first variable, *Style Drift*, is an indicator variable that takes a value of one if a fund changes its investment objective from the pre-turnover period to the post-turnover period, and zero otherwise. *Style drift* occurs when a fund diverges from its original investment style and is mostly caused by intentional asset reallocation by the portfolio managers. The second variable is the annual portfolio turnover ratio in the post-replacement period. It is defined as the percentage of fund holdings that have been replaced with other holdings in a given year. It is computed by taking the lesser of purchases or sales (excluding all securities with maturities of less than one year) and dividing by average monthly net assets. It is reported on an annual basis and can be retrieved from mutual fund's financial highlights in the annual report.

I use similar probit regression as in equation (3) to model the tendency to drift in style and use similar OLS specification as in equation (4) to model the difference in trading frequencies between internal versus external hires.

[Insert Table VII about here]

I report the results in Table VII. Consistent with my predictions, I find that external successors trade more frequently than the internal ones and are more likely to diverge from fund's original investment style. The estimated slope coefficients on *External* are both positive and highly significant. These findings support the premise that external

managers have a greater tendency to change the fund's *status quo*. Not surprisingly, I also find bad performance leads to more active trading in the subsequent period. Results also suggest that a manager's undergraduate quality is another variable that is positively related to the trading activity.

VI. Successor Origin and Cross-sectional Performance

As discussed in the Hypothesis Development section, there are benefits as well as costs associated with external and internal succession of mutual fund managers. The decision of whether to hire within or to search outside involves a trade-off between various costs and benefits. These benefits and costs differ across the sample funds, and such difference predicts variations in their choice of successor career origins. If the choice is optimally determined in equilibrium, then we should observe no cross-sectional difference in the subsequent performance between the internal and external successors, after controlling for fund and manager characteristics.

If for some reason, however, a fund reaches a sub-optimal succession decision (e.g. replacing its managers internally when the costs of internal hire are high and the benefits are minimal), we would expect that this deviation from the optimal decision leads to subsequent sub-par performance for the fund.

To test the above two hypotheses, I employ the following empirical specification:

$$Perf_{i,t} = \beta_1 External_{i,t}(Deviation_{i,t}) + \gamma Controls_{i,t-1} + \varepsilon_{i,t} \qquad (5)$$

where *i* indexes mutual funds and *t* indexes time. The dependent variable *Perf* is fund performance in the post-replacement period (i.e., month *t+1* to *t+36*). The first variable of interst is *Externa*l that is an indicator variable that equals one if a manager is an

external successor and zero if she is an internal successor. The second variable of interest is *Deviation* from the expected decision, which is measured by the absolute difference between the actual decision of the manager origin (0 or 1) and the predicted probability generated from probit regression (3). The intuition is illustrated in the following example. One of the funds in my sample has a sub-par performance during the past three years (Four-factor Alpha=-14.5%), belongs to a small fund family (Ln Family Assets=20.9), and is located in New York (Fin Center=1). In the probit regression (3), this fund is predicted to have a probability of 68.3% to hire externally. If indeed, the succesor is hired from outside the firm (i.e. External=1), the *deviation* measure will be 31.7%. If, however, the successor is hired from within (i.e. External=0), the *deviation* measure will be 68.3%. Greater value of the deviation measure suggests further distance from the predicted decision, and therefore may negatively affect the fund performance. To help to ease the concern of nonlinearity of the relation between fund performance and deviation, I also contruct a deviation dummy that equals one if the deviation is greater than the 50%, and zero otherwise. I also controlled for other variables that might affect the fund performance. These variables include the manager's industry experience and educational background, the fund's past performance, family size, financial center, fund size, expense ratio, portfolio turnover ratio, team management and category as well as year dummies. The standard errors are clustered at the fund level.

[Insert Table VIII about here]

The results are reported in Table VIII. Consistent with Hypothesis 5, the estimated coefficient on *External* in column one is insignificant, suggesting no cross-sectional difference in the post-turnover performance between the internal and external successors.

The coefficient on the indicator variable *External* is -0.126 and it is not statistically significant at the conventional level (p-value=66.4%). The coefficient on the deviation from the predicted probability, however, is negative (Coef. =-1.336) and significant at the 5% level, suggesting deviation from the optimal decision leads to subsequent sub-par performance for the fund. Similar conclusion can be made if I use the deviation dummy variable instead. Further, the quality of the successor's undergraduate institution positively relates to the post-turnover performance. This confirms the idea that manager's education background is positively related to their innate ability of stock picking.

As the last step of the analysis, I compare the difference in the net flows between internal and external successions. In particular, I aim to test when funds execute a sub-optimal succession decision that is far away from investor's expectation, whether investors punish the funds by withdrawing their money. The empirical specification is similar to the one used in regression (5) except the dependent variable is net flows defined as in equation (2), instead of fund performance. To account for the convex flow-performance relation (Sirri and Tufano, 1998), I include an additional control variable which is the quadratic term of the fund's past performance.

[Insert Table IX about here]

The results are reported in Table IX. I find no significant difference in net flows between internal and external successions. The coefficient on the indicator variable *External* is -0.195 and it is not statistically significant at the conventional level (p-value=27.9%). However, when the funds deviate from their predicted choice, investors punish the fund by withdrawing their capital. The coefficient on the Deviation from

predicted probability is -5.146, significant at the 5% level. I find similar results when I use the alternative *deviation dummy* variable.

VII. Conclusion

Departing from prior literature on portfolio manager turnover which largely focuses on the firing decisions, this paper highlights the importance of the hiring decisions. The results suggest that it is not the manager turnover *per se*, but rather the succession decisions that impact the subsequent fund performance. By shifting the focus to the choice of the successors, I extend previous research and enhance our understanding of the economic incentives of managerial replacement decisions. In particular, the evidence suggests that the match between the successor and the fund is influenced by the needs of the fund and the manager's attributes, and manager attributes in turn play a key role in determining the subsequent fund performance.

Another objective of this paper is to address the question of whether portfolio managers are important in generating mutual fund performance. Portfolio managers are heterogeneous in background, experience, innate abilities, and investment philosophies. Thus, some of them will be a better "fit" with a fund than others. Prior studies have suggested that the empirical identification of manager heterogeneity and its effect on fund performance is challenging as one can never observe the manager effect and fund effect separately. I present an empirical framework to analyze this issue by looking into the performance consequences following managerial replacements. In this setting, it is reasonable to argue that the fund stays the same, with the managers being different. Thus, any change in fund performance should be more likely due to the manager effect. I find, compared with their counterparts, successors that come from outside the fund families

demonstrate better ability to improve the performance of the bottom performers but inferior ability to maintain the performance of the top performers. Overall, the evidence suggests that portfolio managers play a pivotal role in determining mutual fund performance.

While extensive theoretical work is devoted to understanding firms' hiring decisions, relatively few empirical studies underpin the theoretical development. My work contributes to the labor economics literature by testing some of the implications of the hiring model using a unique yet unexplored setting: the labor market for mutual fund managers. This study provides evidence on how firms find the right employees in the first place. By doing so, it also sheds light on the importance of hiring decisions in the managerial labor market.

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Table I
Descriptive Statistics

This table reports the summary statistics (Panel A) and the correlation matrix (Panel B) of the characteristics for all the 1,808 sample funds. The sample period is between 1996 and 2010. *Four-factor Alpha* equals the average annulized four-factor alpha as defined in equation (1) over the previous three years. *Categoty-adj. Return* is equal to the average annual fund return less the average annual return of all the funds in the corresponding Morningstar Category, over the prior three years. *Fund Assets* is the market value of assets held by the fund by the end of the month. *Ln Fund Asset*s is the natural logarithm of one plus *Fund Assets*. *Expense Ratio* equals the fund's operating expenses divided by the average monthly assets. *Turnover Ratio* is computed by taking the lesser of purchases or sales by the fund and divided it by the average monthly net assets. *Net Flows* is defined as in equation (2), which is the net growth in fund assets beyond reinvested dividends. *Family Assets* is the market value of assets held by all the equity funds in the family by the end of each month. *Ln Family Assets* is the natural logarithm of one plus *Family Assets*. *Predecessor Tenure* is the number of years that the predecessor has been at the helm of the mutual fund. *Successor Experience* is the number of years that the manager has been working in the asset management industry. *SAT* is the median composite SAT score (as of 2010) reported by the manager's undergraduate institution. *GMAT* is the median composite GMAT score (as of 2010) of new entrants at the graduate institution attended by the manager. *MBA* is a dummy variable that equals one if the manager has an M.B.A degree and zero otherwise. All variables are winsorized at the 1st and the 99th percentile levels. Statistical significance of 1%, 5%, and 10% is indicated by ***,**, and * respectively.

Panel A: Summary Statistics

					Quartiles		
Variables	*Mean*	*Std. Dev.*	*Min*	*25%*	*Median*	*75%*	*Max*
Fund Characteristics							
Four-factor Alpha (%)	-0.54	11.4	-30.5	-4.97	-1.85	1.45	65.66
Category-adj. Return (%)	-0.45	5.77	-19.74	-3.03	-0.45	2.01	18.5
Ln Fund Assets	18.32	2.26	15.03	16	18.28	20.18	23.53
Expense Ratio (%)	1.34	0.43	0.37	1.01	1.32	1.6	2.53
Turnover Ratio (%)	112.28	88.94	3.9	55	94	141	560
Net Flows (%)	8.35	34.73	-65.13	-9.29	-2.93	18.38	174.72
Ln Family Assets	21.74	2.36	16.4	20	21.43	23.52	26.66
Manager Characteristics							
Predecessor Tenure	4.49	3.53	1	2	3.25	5.83	18.75
Successor Experience	13	7.35	2	7	12	19	34
SAT/100	18.81	2.4	13	17.4	19.05	20.9	22.35
GMAT/100	6.68	0.66	5	6.33	6.91	7.19	7.3
MBA	0.77	0.42	0	1	1	1	1

Panel B: Correlation Matrix

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*
Four-factor Alpha (1)	1											
Cat-adj. Return (2)	0.37***	1										
Ln Fund Assets (3)	-0.002	0.15	1									
Expense Ratio (4)	0.004	-0.07***	-0.62***	1								
Turnover Ratio (5)	0.03	-0.007	-0.08***	0.14***	1							
Net Flows (6)	0.23***	0.22***	-0.10***	0.02	0.02	1						
Ln Family Assets (7)	0.02	0.09***	0.56***	-0.22***	-0.01	-0.05**	1					
Tenure (8)	-0.09***	0.03	0.24***	-0.09***	-0.17***	-0.16***	0.08***	1				
Experience (9)	-0.09***	-0.06**	-0.04*	-0.01	-0.04*	-0.03	-0.07**	-0.003	1			
SAT (10)	-0.01	0.01	0.03	0.01	0.04**	0.06***	0.09***	-0.05**	0.05**	1		
GMAT (11)	-0.02	-0.02	0.08**	-0.03	0.01	-0.01	0.12***	-0.006	0.09***	0.33***	1	
MBA (12)	-0.02	0.01	0.06**	-0.02	-0.03	-0.02	0.01	0.02	-0.007	-0.04*	-0.06**	1

Table II
Sample Distribution by Category and Year

This table reports the sample distribution by Morningstar Category (Panel A) and Event Year (Panel B). The Morningstar Category is assigned based on the underlying securities in each fund over the previous three years. The Event Year is the year that the sample fund experiences managerial replacement. The sample consists of 1,808 observations over the period of 1996-2010.

Panel A

Morningstar Cat.	*Total Funds*	*External*	*Percentage*	*Internal*	*Percentage*
Large-Cap Blend	378	108	28.6%	270	71.4%
Large-Cap Growth	311	87	28.0%	224	72.0%
Large-Cap Value	298	96	32.2%	202	67.8%
Mid-Cap Blend	95	26	27.4%	69	72.6%
Mid-Cap Growth	241	78	32.4%	163	67.6%
Mid-Cap Value	81	27	33.3%	54	66.7%
Small-Cap Blend	110	45	40.9%	65	59.1%
Small-Cap Growth	190	63	33.2%	127	66.8%
Small-Cap Value	81	34	42.0%	47	58.0%
Sector	23	13	56.5%	10	43.5%
Total	1,808	577	31.9%	1,231	68.1%

Panel B

Year	*Total Funds*	*External*	*Percentage*	*Internal*	*Percentage*
1996	91	30	33.0%	61	67.0%
1997	90	31	34.4%	59	65.6%
1998	92	32	34.8%	60	65.2%
1999	126	47	37.3%	79	62.7%
2000	133	39	29.3%	94	70.7%
2001	105	39	37.1%	66	62.9%
2002	109	36	33.0%	73	67.0%
2003	127	45	35.4%	82	64.6%
2004	119	46	38.7%	73	61.3%
2005	141	51	36.2%	90	63.8%
2006	138	53	38.4%	85	61.6%
2007	158	42	26.6%	116	73.4%
2008	158	41	25.9%	117	74.1%
2009	108	18	16.7%	90	83.3%
2010	113	27	23.9%	86	76.1%
Total	1,808	577	31.9%	1,231	68.1%

Table III
Cities Ranked by Number of Fund Families (1996-2010)

This table reports summary statistics on the distribution across cities of those fund families in my sample from 1996 to 2010. I rank cities by the number of fund families that are located in each for all the U.S.-based stock funds (i.e. my initial sample) and the statistics (both #Obs. and %) for this sample are reported in column (1) and (2). I report the same statistics in column (3) and (4) for the sample of funds that experience manager turnovers (i.e. my final sample). There are 1,265 mutual fund families in my intial sample and 488 mutual fund families in my final sample. Only the top-10 cities are reported, and the rest of the mutual fund families are lumped together in "Rest of Cities".

	All Sample		*Replacement Sample*	
	(1)	*(2)*	*(3)*	*(4)*
City	*# Obs.*	*Percentage*	*# Obs.*	*Percentage*
New York	189	14.9%	73	15.0%
Boston	152	12.0%	57	11.7%
Chicago	72	5.7%	22	4.5%
Philadelphia	63	5.0%	34	7.0%
San Francisco	51	4.0%	13	2.7%
Los Angeles	40	3.2%	15	3.1%
Milwaukee	36	2.8%	10	2.0%
Baltimore	35	2.8%	11	2.3%
Houston	34	2.8%	12	2.5%
Rest of Cities	593	46.9%	240	49.2%
Total	1,265	100.0%	488	100.0%

Table IV
Univariate Comparisions: Internal versus External Hire

This table compares the characteristics of the sample funds that hire an internal successor (i.e. hire within the fund family) with the ones that hire an external successor (i.e. hire outside the fund family). The differences between the characteristics of the internal and external hire samples are reported in the last column. The variables are defined in Table I. The standard errors from the t-tests are clustered by fund. Statistical significance of 1%, 5%, and 10% is indicated by ***,**, and * respectively.

Variables	*Internal*	*External*	*Difference*
#Obs.	*1,231*	*577*	
Pre-turnover Characteristics			
Four-factor Alpha $_{t-1}$ (%)	1.24	-4.34	5.58***
Category-adj. Return $_{t-1}$ (%)	0.20	-1.82	2.02***
Ln Fund Assets $_{t-1}$	18.52	17.91	0.61***
Expense Ratio $_{t-1}$ (%)	1.31	1.39	-0.08***
Turnover Ratio $_{t-1}$ (%)	108.24	120.89	-12.65**
Net Flows $_{t-1}$ (%)	8.63	7.76	0.87
Ln Family Assets $_{t-1}$	21.92	21.34	0.58***
Predecessor Tenure $_{t-1}$	4.69	4.06	0.63***
Post-turnover Characteristics			
Four-factor Alpha $_{t+1}$ (%)	-1.65	-2.24	0.59**
Category-adj. Return $_{t+1}$ (%)	-0.15	0.11	-0.26
Ln Fund Assets $_{t+1}$	19.94	19.41	0.53***
Expense Ratio $_{t+1}$ (%)	1.32	1.43	-0.11***
Turnover Ratio $_{t+1}$ (%)	113.25	127.89	-14.64***
Net Flows $_{t+1}$ (%)	0.86	0.39	0.47
Ln Family Assets $_{t+1}$	22.54	22.01	0.53***
Successor Tenure $_{t+1}$	4.71	4.98	-0.27*
Successor Experience $_{t}$	11.68	15.78	-4.1***
SAT/100	18.68	19.09	-0.41***
GMAT/100	6.60	6.80	-0.2***
MBA	0.74	0.83	-0.09***

Table V
Determinants of Successor Origin

This table reports the estimated coefficients from the probit regressions modeling the choice bwtween hiring the successors within (internal hire) versus outside (external hire) the fund family. The model is specified as in equation (3). The dependent variable is an indicator variable that equals one if a manager is an external successor and zero if she is an internal successor. In column (1), I measure the performance by four-factor alpha. In column (2), I divide the sample into three groups based on the fund's previous three year's performance. The top performance group includes the funds whose performance ranks in the first quartile. The bottom performance group includes the funds whose performance ranks in the bottom quartile. The middle two performance quartiles are combined into one group. *Top, Bottom, and Middle Quartile* are indicator variables that equal one if the fund performance belongs to the top, bottom, or middle performance group, respectively, and zero otherwise. Note that the indicator variable *Middle Quartile* is not included in the regression because the middle group serves as the base case for the top and bottom groups. All the other independent variables are defined in Table I and measured one month prior to the turnover event. All specifications include category dummies and year dummies. The standard errors are clustered at the fund level. Statistical significance of 1%, 5%, and 10% is indicated by ***,**, and * respectively.

	Dependent Variable: External Hire	
Variables	*(1)*	*(2)*
Four-factor Alpha $_{t-1}$	-0.033***	
	(-5.801)	
Top $_{t-1}$		-0.139*
		(-1.864)
Bottom $_{t-1}$		0.761***
		(9.434)
Predecessor Tenure $_{t-1}$	-0.032***	-0.027***
	(-3.138)	(-2.587)
Ln Family Assets $_{t-1}$	-0.060***	-0.060***
	(-3.488)	(-3.516)
Financial Center $_{t-1}$	0.687***	0.663***
	(9.606)	(9.170)
Ln Fund Assets $_{t-1}$	-0.019	-0.009
	(-0.991)	(-0.467)
Expense Ratio $_{t-1}$	0.138*	0.069
	(1.695)	(0.845)
Turnover Ratio $_{t-1}$	0.001*	0.001
	(1.800)	(0.467)
Team Mgmt. $_{t-1}$	-0.001	0.020
	(-0.006)	(0.139)
Category Dummies	Yes	Yes
Year Dummies	Yes	Yes
#Obs.	1,808	1,808
Pseudo R^2	13.2%	14.2%

Table VI
Successor Origin and Change in Performance

This table presents the results from the second stage Treatment Effect regressions modeling the impact of successor career origin on the change in fund performance. The model is specified as in equation (4). The dependent variable is the change of fund performance from pre-replacement period (i.e., month t-36 to t-1) to post-replacement period (i.e., month t+1 to t+36). Based on the fund's previous three-year performance, I divide the sample into three groups. The top performance group includes the funds whose performance ranks in the first quartile. The bottom performance group includes the funds whose performance ranks in the bottom quartile. The middle two performance quartiles are combined into one group. The estimated coefficients for the *Top*, *Mid* and *Bottom* groups are reported in column (1), (2) and (3), respectively. The last column (4) reports the estimated coefficient for the overall sample. *External* is an indicator variable that equals one if a manager is an external successor and zero if she is an internal successor. Other independent variables are defined in Table I. All specifications include category dummies and year dummies. The standard errors are clustered at the fund level. Statistical significance of 1%, 5%, and 10% is indicated by ***,**, and * respectively.

	Dependent Variable: Δ Performance			
	(1)	*(2)*	*(3)*	*(4)*
Variables	*Top*	*Mid*	*Bottom*	*All*
External	-2.618**	1.142***	4.118***	1.678***
	(-2.547)	(2.800)	(4.159)	(3.799)
Experience	0.008	-0.037*	-0.062	-0.021
	(0.132)	(-1.809)	(-1.003)	(-0.731)
SAT/100	0.090	0.116*	0.284	0.122*
	(0.647)	(1.961)	(1.633)	(1.785)
MBA	-1.101	0.897**	1.155	0.516
	(-1.218)	(2.322)	(1.381)	(1.375)
Ln Family Assets $_{t-1}$	1.559***	0.017	1.413***	1.446***
	(7.847)	(0.140)	(5.761)	(15.887)
Financial Center $_{t-1}$	-18.418***	-1.034	-18.271***	-18.162***
	(-13.132)	(-1.053)	(-8.897)	(-22.062)
Ln Fund Assets $_{t-1}$	0.654**	0.038	1.298***	0.806***
	(1.993)	(0.371)	(5.166)	(6.074)
Expense Ratio $_{t-1}$	-4.578***	-1.279**	-6.063***	-5.422***
	(-4.417)	(-2.534)	(-5.828)	(-11.045)
Turnover Ratio $_{t-1}$	-0.034***	0.006	-0.025***	-0.023***
	(-6.541)	(1.519)	(-4.837)	(-8.891)
Team Mgmt. $_{t-1}$	-0.009	-1.936***	2.264	-0.603
	(-0.007)	(-3.054)	(0.964)	(-0.738)
Inverse Mills Ratio	-33.747***	-2.111	-41.316***	-36.057***
	(-13.402)	(-1.160)	(-11.472)	(-23.112)
Category Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Observations	452	904	452	1,808
Adj. R^2	76%	12%	50%	68%

Table VII
Successor Origin and Trading Activity

This table reports the estimated coefficients from the Probit and OLS regressions modeling the impact of successor career origin on the level of fund's trading activity. The dependent variable *Style Drift* in column (1) and (2) is a dummy variable that equals one if a fund changes its investment objective from pre-turnover period to post-turnover period and zero otherwise. The dependent variable *Port. Turnover* column (3) and (4) is the annual turnover ratio in the post-replacement period (i.e. month t+1 to t+12). It is defined as the percentage of fund holdings that have been replaced with other holdings in a given year. The independent variables are defined in Table I. All specifications include category dummies and year dummies. The standard errors are clustered at the fund level. Statistical significance of 1%, 5%, and 10% is indicated by ***,**, and * respectively.

	Style Drift		Port. Turnover	
	(1)	(2)	(3)	(4)
Variables	Probit	Treatment	OLS	Treatment
External	0.456***	0.459***	1.962***	1.964***
	(5.169)	(5.147)	(8.942)	(8.930)
Experience	0.008	0.008	0.002	0.002
	(1.372)	(1.349)	(0.172)	(0.192)
SAT/100	0.027	0.029*	0.064**	0.064**
	(1.640)	(1.728)	(2.279)	(2.248)
MBA	0.079	0.076	-0.129	-0.127
	(0.860)	(0.824)	(-0.782)	(-0.772)
Four-factor Alpha $_{t-1}$	-0.009**	-0.035***	0.004	0.018
	(-2.003)	(-3.392)	(0.815)	(1.039)
Ln Family Assets $_{t-1}$	0.020	-0.022	-0.054*	-0.032
	(0.948)	(-0.849)	(-1.702)	(-0.758)
Financial Center $_{t-1}$	0.067	0.625***	-0.055	-0.345
	(0.782)	(2.755)	(-0.397)	(-0.893)
Ln Fund Assets $_{t-1}$	0.025	-0.001	-0.201***	-0.187***
	(1.180)	(-0.028)	(-5.765)	(-5.046)
Expense Ratio $_{t-1}$	0.148	0.273**	-0.741***	-0.803***
	(1.526)	(2.551)	(-3.973)	(-3.854)
Turnover Ratio $_{t-1}$	0.000	0.001	1.000***	0.999***
	(0.341)	(1.526)	(897.262)	(837.788)
Team Mgmt. $_{t-1}$	-0.484***	-0.468***	0.102	0.092
	(-3.617)	(-3.470)	(0.433)	(0.388)
Inverse Mills Ratio		1.127***		-0.575
		(2.694)		(-0.869)
Category Dummies	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Observations	1,808	1,808	1,808	1,808
Pseudo R^2/Adj. R^2	14.1%	14.6%	99.9%	99.9%

Table VIII
Successor Origin and Cross-sectional Performance

This table reports the estimated coefficients from the Treatment Effect Model that conduct cross-sectional comparison of post-replacement fund performance between internal successors and external successors. The model is specified as in equation (5). The dependent variable is fund's annualized four-factor alpha estimated over the subsequent three-year window (i.e. month t+1 to month t+3). *External* is an indicator variable that equals one if a manager is an external successor and zero if she is an internal successor. *Deviation* is measured by the absolute difference between the actual decision of manager origin (0 or 1) and the predicted probability generated from probit regression (4). Deviation Dummy equals to one if *deviation* is greater than 50% and zero othewise. Other independent variables are defined in Table I. All specifications include category dummies and year dummies. The standard errors are clustered at the fund level. Statistical significance of 1%, 5%, and 10% is indicated by ***,**, and * respectively.

	Dependent Variable: Performance		
Variables	*(1)*	*(2)*	*(3)*
External	-0.126		
	(-0.434)		
Deviation		-1.336**	
		(-2.017)	
Deviation Dummy			-0.699**
			(-2.439)
Experience	-0.028	-0.024	-0.023
	(-1.505)	(-1.332)	(-1.288)
SAT/100	0.112**	0.112**	0.113**
	(2.441)	(2.433)	(2.452)
MBA	0.316	0.324	0.329
	(1.145)	(1.189)	(1.209)
Four-factor Alpha $_{t-1}$	0.019	0.033	0.025
	(0.486)	(0.858)	(0.656)
Ln Family Assets $_{t-1}$	-0.035	-0.016	-0.029
	(-0.374)	(-0.176)	(-0.313)
Financial Center $_{t-1}$	0.393	0.210	0.348
	(0.501)	(0.270)	(0.441)
Ln Fund Assets $_{t-1}$	0.005	0.016	0.010
	(0.069)	(0.213)	(0.133)
Expense Ratio $_{t-1}$	-1.236***	-1.246***	-1.211***
	(-3.195)	(-3.214)	(-3.111)
Turnover Ratio $_{t-1}$	-0.002	-0.002	-0.002
	(-0.731)	(-0.932)	(-0.876)
Team Mgmt. $_{t-1}$	-0.501	-0.474	-0.485
	(-0.960)	(-0.916)	(-0.939)
Inverse Mills Ratio	0.855	0.182	0.609
	(0.581)	(0.125)	(0.415)
Category Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Observations	1,808	1,808	1,808
Adj. R^2	7.1%	7.4%	7.5%

Table IX
Successor Origin and Net Flows

This table reports the estimated coefficients from the Treatment Effect Model that conduct cross-sectional comparison of post-replacement fund net flows between internal successors and external successors. The dependent variable is fund's annualized net flows estimated over the subsequent one-year window (i.e. month t+1 to month t+12). The independent variable are defined as in Table IX. All specifications include category dummies and year dummies. The standard errors are clustered at the fund level. Statistical significance of 1%, 5%, and 10% is indicated by ***,**, and * respectively.

	Dependent Variable: Net Flows		
Variables	*(1)*	*(2)*	*(3)*
External	-1.095		
	(-1.083)		
Deviation		-5.146**	
		(-2.256)	
Deviation Dummy			-2.381**
			(-2.414)
Experience	-0.063	-0.063	-0.057
	(-0.993)	(-0.993)	(-0.923)
SAT/100	0.223	0.223	0.218
	(1.187)	(1.187)	(1.165)
MBA	0.950	0.950	0.928
	(0.880)	(0.880)	(0.867)
Four-factor Alpha $_{t-1}$	0.233**	0.233**	0.295**
	(1.975)	(1.975)	(2.485)
Four-factor Alpha^2 $_{t-1}$	-0.001	-0.001	-0.001
	(-0.800)	(-0.800)	(-1.118)
Ln Family Assets $_{t-1}$	1.450***	1.450***	1.514***
	(4.186)	(4.186)	(4.359)
Net Flows $_{t-1}$	0.226***	0.226***	0.225***
	(9.715)	(9.715)	(9.658)
Financial Center $_{t-1}$	-4.102*	-4.102*	-4.757*
	(-1.646)	(-1.646)	(-1.899)
Ln Fund Assets $_{t-1}$	-2.370***	-2.370***	-2.335***
	(-9.165)	(-9.165)	(-9.027)
Expense Ratio $_{t-1}$	-5.009***	-5.009***	-5.052***
	(-4.301)	(-4.301)	(-4.348)
Turnover Ratio $_{t-1}$	-0.010*	-0.010*	-0.012*
	(-1.700)	(-1.700)	(-1.954)
Team Mgmt. $_{t-1}$	-1.191	-1.191	-1.069
	(-0.557)	(-0.557)	(-0.502)
Inverse Mills Ratio	-8.586*	-8.586*	-10.876**
	(-1.784)	(-1.784)	(-2.214)
Category Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Observations	1,808	1,808	1,808
Adj. R^2	24.8%	25.0%	25.0%