The Selection and Termination of Investment Management Firms by Plan Sponsors

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ABSTRACT

We examine the selection and termination of investment management firms by 3,400 plan sponsors between 1994 and 2003. Plan sponsors hire investment managers after large positive excess returns but this return chasing behavior does not deliver positive excess returns thereafter. Investment managers are terminated for a variety of reasons, including but not limited to underperformance. Excess returns after terminations are typically indistinguishable from zero but in some cases positive. In a sample of round-trip firing and hiring decisions, we find that if plan sponsors had stayed with fired investment managers, their excess returns would be no different than those delivered by newly hired managers. We uncover significant variation in pre- and post-hiring and firing returns that is related to plan sponsor characteristics.

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Allen (2001) argues that financial institutions matter for asset pricing and laments the lack of attention to their behavior. Despite this clarion call, academic research has focused on two types of institutions, banks and mutual funds. There are good reasons for this. Banks have been a historically important component of the economy, and mutual funds are a relatively new but sizeable channel for retail investors to participate in capital markets. In addition, good data for both these types of institutions are widely available, permitting researchers to tackle issues with precision. However, another category of institutions, namely plan sponsors and institutional asset managers, is equally if not more important. At the end of 2003, there were 47,391 plan sponsors in the United States (corporate and public retirement plans, unions, endowments, and foundations), which were responsible for delegating investment of $6.3 trillion to institutional investment managers (Money Market Directory (2004)). At that time, there were 7,153 equity, bond and hybrid mutual funds with total assets of $5.4 trillion (Investment Company Institute ((2004)). The enormity of the assets under the jurisdiction of plan sponsors and their potential impact on asset prices are compelling reasons to examine their behavior.[1] Moreover, the fact that the assets managed by many plan sponsors fund the retirement incomes of their beneficiaries makes studying their behavior important from a personal and public policy perspective.

A comparison of institutional investment to the more widely studied retail marketplace provides some perspective. There are three basic streams to the retail investment / mutual fund literature: (a) investigations of performance, including persistence, (b) studies of the relationship between fund flows and returns, and (c) analyses of investment choices made by individual investors. The general conclusion that emerges from these streams is that the level of excess performance and the degree of persistence is weak and elusive, the relationship between flows and returns is convex, and retail investors make investment choices that can be construed as suboptimal by some and simply noisy by others.[2]

In the institutional realm, the streams are rivulets. Lakonishok, Shleifer, and Vishny (1992) provide the first investigation of performance and persistence. They persuasively argue that there are significant conflicts of interest in the money management industry and use proprietary data to examine the performance of 769 all-equity funds run by 341 investment

managers. They paint a bleak picture of performance and argue, "[that] when all is said and done, we doubt that an industry that has added little if any value can continue to exist in its present form." Coggin, Fabozzi, and Rahman (1993) also use proprietary data to study a sample of pension fund managers and find that they have limited skill in selecting stocks. Christopherson, Ferson, and Glassman (1998) find evidence of persistence among institutional equity managers using conditional methods and Busse, Goyal, and Wahal (2007) find that persistence exists in domestic equity and fixed income portfolios. Del Guercio and Tkac (2002) examine the relation between asset flows and returns and find that excess (as opposed to raw) returns are the relevant metric for the flow-performance relationship in the institutional arena. With one exception, the third stream, the actual investment choices by plan sponsors, is dry. The exception is Heisler, Knittel, Neumann, and Stewart (2006), who indirectly study why plan sponsors hire and fire investment managers by examining asset flows and accounts. Ex ante, one might expect that the level of expertise of plan sponsors in delegating assets to institutional investment management firms is higher than that of individual investors picking retail mutual funds. Whether this expertise generates excess returns or not is ultimately an empirical question. Our paper is the first to tackle this issue directly in the institutional marketplace.

Plan sponsors have certain investment goals and, working under self or externally imposed restrictions, allocate funds across asset classes in an attempt to achieve their goals. Within each asset class, mandates of specific dollar amounts are then delegated to investment management firms to be invested in a particular investment style. The raison d'être of a plan sponsor is then two-fold: (a) to conduct asset allocation, and (b) to hire managers to deliver benchmarked returns, monitor, and if necessary, fire investment managers.[3] It is this second task, that is, the hiring and firing of investment managers by plan sponsors, that we focus on in this paper.

We compile a unique database of 8,755 hiring decisions by 3,417 plan sponsors that delegate $627 billion in mandates between 1994 and 2003. We examine benchmark-adjusted cumulative excess returns, information ratios, and calendar time alphas from factor models up to three years before and after hiring. All measurement methods show that for domestic equity and fixed income mandates, pre-hiring returns are positive, large, and statistically significant, but that

post-hiring returns are statistically indistinguishable from zero. For international equity mandates, however, both pre- and post-hiring excess returns are positive and large.

Plan sponsors hire investment managers either because new inflows need to be invested or to replace terminated investment managers. Our sample of terminations consists of 869 firing decisions by 482 plan sponsors that withdraw almost $105 billion in mandates between 1996 and 2003. The number of terminations is substantially smaller than hiring decisions because data sources are geared towards assisting investment managers in obtaining new business, and because there is a natural disinclination to report terminations. One obvious reason for terminating investment managers is underperformance. But we find that plan sponsors also terminate investment managers for a host of reasons unrelated to performance. Non-performance terminations are related tot the plan sponsor (such as reallocations from one investment style to another or the merger of two plans), or events at the investment management firm (such as personnel turnover, the merger of two investment management firms, or regulatory actions). Excess returns prior to firing are negative for performance-based terminations but not for others. Post-firing excess returns for the entire sample are statistically indistinguishable from zero in the first two years after termination, but positive in the third year. Three-year post-firing returns are also positive for performance-based terminations.

To gauge the opportunity costs associated with both hiring and firing decisions, one has to compare post-hiring returns with the post-firing returns that would have been delivered by fired investment management firms. Since there are a multitude of complicated mechanisms by which firing and hiring decisions are coordinated, we build a sample of "round-trip" firing and hiring decisions manually. We identify 412 round-trip decisions between 1996 and 2003. For these decisions, the return difference between hired and fired managers prior to the round-trip is positive. After the round-trip the return differential is negative but with large standard errors.[4]

The aggregate results described above mask considerable variation in selection and termination. There are a number of different types of plan sponsors that run the gamut from defined benefit corporate plans to unions, foundations, public and private universities, and local- and state-level public plans. They vary in size from tiny multiemployer union plans like the Detroit Ironworkers Local #25 to behemoths such as the California Public Employees Retirement

System. Size brings with it scale economies and perhaps expertise in selection and monitoring of investment managers. Consistent with this we find that larger plans are less likely to retain consultants to assist them in the selection process and have higher post-hiring excess returns than their smaller counterparts. Also important is the notion of "headline risk" in which some sponsors are sensitive to public scrutiny in the event of underperformance. We find that headline risk-sensitive sponsors are likely to chase investment styles with high returns in the past three years, to retain consultants to assist them in their hiring decisions, and to terminate managers for poor performance. But they have lower post-hiring returns than those that are headline risk-resistant or neutral. Moreover, although consultants add value to hiring decisions on average (i.e., consultant-advised decisions have higher post-hiring returns), they destroy value in advising large plan sponsors. Lakonishok, Shleifer, and Vishny (1992) and Hart (1992) argue that overfunded corporate plans have little incentive to generate superior performance. Underfunding of plans, on the other hand, could generate large risk-taking incentives. For a limited sample of corporate and public plans for which we obtain funding ratios, we find that overfunded plans are less likely to engage in style-chasing and have lower post-hiring returns than underfunded plans. Underfunded plans are more likely to fire underperforming investment managers than overfunded plans. Finally, we also construct an asset allocation index that proxies for the lack of restrictions from investment policy statements and find that this index is positively correlated with post-hiring excess returns. The general picture that emerges from this cross-sectional analysis is that economic fundamentals such as size, the potential for adverse publicity, restrictions, and funding demands "matter," in the sense that they influence various aspects of hiring and firing.

Notwithstanding this variation, the conclusion to be drawn from our broad results depends largely on one's view of performance persistence, and of the role of frictional costs. Since all of our hiring decisions are for active investment managers, they represent an unsuccessful attempt by plan sponsors to seek excess post-hiring returns. This lack of success could be because there is no persistence in investment manager returns. But Christopherson, Ferson, and Glassman (1998) and Busse, Goyal, and Wahal (2007) show that there is persistence in institutional portfolios over one to two years. The fact that there is some persistence justifies

the plan sponsor's conditioning of hiring on returns, at least on an ex ante basis. Zero post-hiring excess returns indicate that, on average, plan sponsors have no timing ability.

For hiring decisions necessitated by the termination of incumbent investment managers, one has to judge the hired manager's returns against the returns that the fired manager would have delivered (i.e., the opportunity costs described above), as well as frictional costs in moving portfolios. Since the difference between pre-hiring and pre-firing returns is large, hiring and firing decisions can be justified ex ante by plan sponsors. Ex post, there are some opportunity losses. Addressing the issue of how much transaction costs add to these losses is more difficult because there are no publicly available data on the costs of moving portfolios. The process of moving assets from the legacy portfolio of the fired investment manager to the target portfolio of the hired manager is frequently outsourced to "transition management firms" that attempt to minimize the costs associated with the transition. Estimates of transition costs by practitioners in the public press suggest that average costs range between 2% and 5% of the portfolio, with a standard deviation of 1% (see, for example, Proszek (2002), Bollen (2004), and Werner (2001)). Private estimates of all-in transition costs provided to us by an anonymous large transition management firm vary between 1.0 and 2.0%. This firm also indicates that transition costs are much higher for international, fixed income, and small-cap transitions, and when the legacy and target portfolios are in different asset classes. Regardless of the actual magnitude, the size of this transition business, estimated by some observers to be almost $2 trillion annually, suggests that transaction costs are substantial.[5]

Given our results, a reader could reasonably ask why plan sponsors make decisions that, ex post, appear to be costly. There are three plausible explanations. One is the hubristic belief among plan sponsors than they can time hiring and firing decisions successfully. We stress that this behavior is not necessarily irrational, especially since there is persistence in performance. A second explanation is job preservation; to quote Lakonishok, Shleifer, and Vishny (1992) (p. 342), "those in charge of the plan must show that they are doing some work to preserve their position." Simply put, if plan sponsors did not hire and fire, their raison d'être would be non-existent. We find that elements of hiring and firing tendencies, pre-event return thresholds, and post-event performance are related to plan sponsor attributes that reflect these agency

relationships; broadly, the cross-sectional evidence is closely tied to this possibility. A third possible explanation is that these decisions are not as costly as our evidence would indicate because we are unable to fully measure the benefits. For example, it may be that termination disciplines fired investment managers and causes them to improve returns in the future. Indeed, investment managers who lose a larger fraction of their assets have higher post-termination returns. It may also be that termination disciplines incumbent (not fired) as well as potential investment managers. Unfortunately, we have no way of measuring this potentially offsetting benefit. Thus, while our results shed light on the efficacy of hiring and firing, we cannot necessarily conclude that these decisions are inefficient. The above explanations are not mutually exclusive. It is quite likely that all three play some role in the process.[6]

Our paper proceeds as follows. In Section I, we provide a brief description of the institutional marketplace and investment process. In Section II, we describe data sources and sample construction procedures. We present results on the selection of investment managers in Section III, and the termination of investment managers in Section IV, and round-trips in Section V. Section VI concludes.

I. Institutional Details

In this section, we describe the institutional marketplace and the investment process followed by most plan sponsors. A more detailed description of the pension fund industry can be found in Fabozzi (1997), Lakonishok, Shleifer, and Vishny (1992), Logue and Rader (1998), and Travers (2004).

A. The Institutional Marketplace

There are basically two types of plan sponsors, those that manage retirement assets and those that manage non-profit assets. The former include corporate plans, public plans for employees at the city, county, or state level, single-employer plans, and Taft-Hartley multi-employer plans for organized labor.[7] The latter include foundations and endowments, including those for universities. Retirement plans can be set up as defined benefit plans, defined contribution plans, or both. In a defined benefit plan, beneficiaries receive a fixed set of

payments upon retirement. The trustees of the plan are responsible for investing the beneficiaries' contributions to ensure that future benefits can be paid. In defined contribution plans, beneficiaries receive variable payments upon retirement. The plan sponsor typically selects providers of various investment options (such as Vanguard or Fidelity) who then allow beneficiaries to directly invest their assets in various funds. Some firms offer both defined benefit and defined contribution plans.

All plan sponsors share one common feature: the trustees of the plan are charged with the task of managing assets in the best interests of their beneficiaries. However, organizational structure and incentives can generate tremendous variation in behavior across plan sponsors. In corporate defined benefit plans, if the plan is overfunded, the excess funds belong to the corporation. This creates incentives for the treasurer's office (the trustee) to generate superior performance. But, Lakonishok, Shleifer, and Vishny (1992) argue that firm's implicit contracts with employees may be such that excess funds are effectively handed over to employees. Hart (1992) argues that even if the excess funds belong to the corporation, considering agency issues, there is little incentive for management to generate superior performance. If the plan is underfunded this might provide an incentive to invest in risky assets, in part because, in the event of bankruptcy, the Pension Benefit Guarantee Corporation (PBGC) insures the benefits (up to a statutory limit) if the corporation has insufficient assets to cover its obligations. Lakonishok, Shleifer, and Vishny (1992) note that this structure produces a bias against passive investment management (since it reduces the potential power of the treasurer's office), and against internal investment management (since it is easier to blame another organization for poor performance). In federal, state, or local government pension plans, the residual claimant is the government authority (and ultimately the taxpayer), and the trustees of the plan are political appointees and/or bureaucrats. Similarly, the residual claimants at single-employer union plans are union members and the PBGC provides downside protection. Trustees are drawn from members. However, in multiemployer Taft-Hartley plans, if one employer files for bankruptcy, the shortfall is assumed by solvent companies remaining in the plan. Nonretirement plans such as endowments and foundations do not receive any protection from the PBGC and do not have a residual claimant per se. Cash outflows for endowments and foundations have more of a

discretionary element to them than retirement plans. If a foundation's performance is weak, it can lower distributions and curtail charitable activity whereas a retirement system has to fulfill its cash outflow obligations. Incentives are also provided by the market for human capital. Superior performance in managing the investment process can increase salaries and generate improved external employment opportunities. This appears to be the case, especially for endowments, where even though the residual claimant is not well defined, executives that manage the investment process effectively generate significant human capital.[8]

B. The Investment Process

The above discussion suggests that the goals of a plan sponsor are influenced by the structure of claims and the nature of payouts. The investment process followed by plan sponsors is designed to achieve those goals. Typically this process begins with an investment policy statement drafted by the investment committee, often spearheaded by a chief investment officer. The investment policy statement describes the goals of the plan sponsor, the roadmap for reaching those goals, and any restrictions on the investment process. The restrictions originate from a desire to control risk and return profiles and can take a variety of forms, varying from broad strategic asset allocation decisions to tactical adjustments around strategic targets. They can influence the quantity and quality of asset classes available. For instance, certain asset classes (such as hedge funds or real estate) may be excluded or capped at a particular percentage of total assets. There may also be restrictions on specific securities to be held within qualified asset classes. Quality restrictions, for example, might involve excluding "sin" stocks or including only dividend-paying securities. Effectively, asset allocations can be thought of as one realization of the goals and restrictions in the investment policy statement.

Plan sponsor size also generates variation in the investment process across plan sponsors. Larger plan sponsors likely benefit from economies of scale in generating information and managing the investment process. In addition, large plan sponsors have an advantage in that they may be allowed preferential access to certain funds because they can provide large amounts of capital; most investment management firms have minimum investment requirements that small plan sponsors may not be able to meet.

C. The Hiring and Firing Process

Once broad asset allocations have been established, the search for managers begins. The plan sponsor puts out an RFP (request for proposals) and may retain a consultant to assist in the search. The process involves screening investment managers who provide investment products in the mandate stated by the plan sponsor. The mandate can be either broad (e.g., domestic equity) or narrow (e.g., small-cap equity value). The list of candidate managers is then culled based on relative performance. The list is further trimmed with written questionnaires and interviews, and the investment committee or trustees make a final choice.

For an investment manager, being part of the initial list of managers is a critical hurdle. As a result, most organizations voluntarily provide information to various databases that record performance and other characteristics. Such databases are produced by independent organizations, such as iisearches (affiliated with Institutional Investor publications) or Nelson's Directories (affiliated with Thomson Financial), as well as by pension consultants such as Mercer Investment Consulting. A list of common databases is contained in Travers (2004).

Since different plan sponsors conduct manager searches that are correlated in time and investment mandate, pension consultants can reap economies in gathering information. To the extent that larger plan sponsors make more hiring/firing decisions, they may be less likely to employ consultants. Plan sponsors may also employ a consultant to shield themselves from adverse publicity associated with negative outcomes from hiring decisions.

Once an investment management firm has been hired, its performance is generally monitored on a quarterly basis. If performance relative to a benchmark deteriorates over consecutive evaluation horizons, the firm may be put on a "watch list." If performance improves, the firm is removed from the watch list. Continued deterioration in performance may result in the firm's contract being terminated. If the firm is terminated, the assets are transferred to the newly hired investment manager's portfolio by a transition organization. Large investment houses, such as State Street Global Advisors and Barclays Global Investors, provide such transition management services, the aim of which is to minimize the frictional loss in transitioning between the legacy and target portfolios.

Aside from performance, there are other reasons why an investment management firm may be terminated. The plan sponsor may view the superior performance of the investment manager's portfolio as being directly attributable to a particular individual. If such an individual(s) leaves the firm, the plan sponsor may decide to terminate its relationship with the investment management firm. For example, in 1996 the two principal partners of Apodaca-Johnston Capital Management separated to start their own investment management firms. As a result, the Los Angeles County Employees Retirement Association terminated its contract with the firm. In addition to personnel turnover, mergers between investment management firms can also prompt terminations. Finally, reasons that are specific to the plan sponsor, rather than the investment management firm, can cause terminations. For instance, a reorganization of the sponsor (perhaps because two corporations merged) may cause the reorganized plan to fire some investment managers. Alternatively, if the plan sponsor decides to change asset classes or investment styles, it may terminate investment managers in mandates that are downsized.

Hiring of investment managers also takes place for several reasons. The replacement of a fired manager or an increase in asset allocation to a particular mandate can trigger hiring. Additionally, if the size of the plan sponsor's asset base increases, it may hire new investment managers rather than increase allocations to existing managers.

II. Data Sources and Sample Construction

A. Selection and Termination Data

We obtain data on the selection and termination of investment managers from three different sources: the "Tracker" database developed by Mercer Investment Consulting, the "iisearches" database created by Institutional Investor Publications, and electronic searches of articles published in Pensions and Investments (P&I). The Tracker and iisearches databases are used by investment management firms to market their services to plan sponsors. These sources provide: the name of the plan sponsor, the type of the plan sponsor, the name of the investment manager hired, the name of the consultant(s), the type and amount of the investment mandate, and a hiring date. Although similar in spirit, the two databases differ in three key ways. First, the Tracker database does not record the termination of investment managers. The iisearches

database does record parallel information on investment managers that are fired, but the firing data are sparse and record only single matching firing and hiring decisions. Therefore, round-trips cannot be extracted in a straightforward way from the database. Second, iisearches provides a column containing textual information about the hiring/firing that can help in identifying the reason for the termination. Here again, the data are sparse – only some records contain textual information. As a result, we use manual searches in trade journals to fill in the gaps. Third, the Tracker database contains data from 1994 through 2003, whereas the iisearches database starts in 1995.

We also perform electronic searches for articles in P&I, a widely used and respected source of weekly information for this industry. It reports on searches and terminations by major plan sponsors, often providing contextual information that is not recorded in the Tracker or iisearches databases. We perform keyword searches of all issues of P&I between 1996 and 2003 using the following phrases: "hiring," "firing," and "termination." We then read these articles and manually record the same data elements as Tracker and iisearches.

We remove all non-U.S. plan sponsors from each of these databases and discard observations where the hiring (or firing) concerns custodians or record keepers. We also remove observations for employee-directed (defined contribution) retirement plans. This results in 15,940 hiring observations from Tracker, 11,537 hiring observations from iisearches, and 1,184 observations from P&I.

We use these data sources to create as comprehensive a sample as possible and to cross-check information. To eliminate duplicates, we first create master files that uniquely identify different permutations and spellings of plan sponsor, investment manager and consultant names. We then splice the data sets together, from which we identify duplicate observations as those in which the same plan sponsor hires/fires the same investment manager within 90 days of each other. When data sources disagree on other aspects of the hiring/firing, we use a reasonable algorithm to determine the final value for the field (for instance, taking the minimum value of the mandate amount). Where the data sources disagree on the investment mandate, we treat the mandate as unknown.

B. Plan Sponsor Information and Asset Allocation Data

We use Nelson's Directory of Plan Sponsors, the Money Market Directory of Investment Managers and Plan Sponsors, and internet searches to classify each plan sponsor into nine categories: corporate, endowments and foundations, local public plans that represent general retirement interests for cities and counties, state public plans that refer to statewide plans such as the California Public Employees Retirement System, miscellaneous public plans that include police, fire, and municipal employee retirement plans for cities and counties, unions (including Taft-Hartley plans), public universities, private universities and a miscellaneous category that includes insurance plans, health and hospital plans, trusts, and anonymous plans.

For corporate plans, we calculate funding ratios for the year prior to hiring/firing based on the procedure outlined in Franzoni and Marín (2006), except that rather than scaling by market capitalization, we use the ratio of fair value of plan assets to the projected benefit obligation. For public plans, we manually collect funding ratios from plan sponsor websites, relying especially on the public retirement systems website (www.prism-assoc.org). Not surprisingly, there is a reporting bias: only large plans report this information. Since the obligations of nonretirement plans are largely discretionary, the notion of a funding ratio is not well defined. Therefore, our funding ratio tests are only for corporate and public plans.

We obtain information on asset allocations for plan sponsors from two sources. P&I surveys the largest 1,000 corporate and public retirement plans in each year and records information on broad asset allocations in the following general categories: domestic equity, domestic fixed income, international equity, international fixed income, cash, private equity, real estate, mortgages, and "others" (including distressed debt, oil and gas, timber, etc.). These data also contain the percentage of assets that are indexed and that are managed internally. There are several important qualifications to these data. First, they include only retirement plans and specifically exclude endowments, foundations, unions, and insurance plans. Second, prior to 1996, only the largest 200 plan sponsors are surveyed. Third, the asset class categories and gradations change over time. For example, in some years, only allocations to equity, rather than domestic and international equity, are recorded. Similarly, allocations to private equity are not recorded until later in the time series. We supplement these data with hand-collected

information from Nelson's Directory of Plan Sponsors (2005). Nelson's coverage of plan sponsors is better in that it includes endowments, foundations, and union plans. However, its gradation of asset classes is not as fine as P&I and we only observe allocations at the end of our sample period.

C. Returns and Asset Size Data

We obtain return information from Mercer's Manager Performance Analytics database. This database contains quarterly returns (gross of fees) on approximately 9,000 products offered by 1,200 investment managers for the period 1981 to 2005. These are "composite" returns for unrestricted portfolios. The actual returns earned by a plan sponsor may differ slightly from these composite returns if the plan imposes significant restrictions on the portfolio. The returns data are self-reported by investment management firms. Given that a successful track record of returns is critical for hiring, it is possible that some investment management firms "amend" prior year's returns in updating return information. We ensure that this is not the case – Mercer informs us that investment managers provide each quarter's return soon after the end of the quarter and are not permitted to update prior returns. In addition, the investment management firms in our sample comply with the performance reporting standards established by the CFA Institute (see http://www.cfainstitute.org/centre/ips).

Another potential concern is one of survivorship bias. We perform three checks to determine if survivorship bias influences our results. First, we compute attrition rates of investment managers and ensure that return histories disappear over time. Tabulations of return histories show an attrition rate of approximately 4% per year in our sample (by comparison, Carhart et al. (2002) report an average annual attrition rate of 3.6% for mutual funds). Second, we calculate the number of instances where pre-firing returns are available but post-firing returns are not. We find that the loss in data is trivial (10 observations for a 1-year horizon), suggesting that post-firing returns do not disappear from the sample because the pre-firing returns are negative. Third, we reexamine the portion of our firing database for which we have no returns (either pre- or post-firing). The vast majority of firing decisions for which we have no returns

are where the mandate is unknown or in an asset class not covered by our returns database (private equity, venture capital, real estate, etc.).

Mercer provides multiple benchmark return indices appropriate for each product category. For example, for the small-cap product category, Mercer provides 13 different benchmark indices. The correlation coefficients between these different indices are generally very high. Therefore, we select one index for each product category that we believe best describes the investment objective of that category. A list of each product category and the chosen index, along with a brief description, is provided in Table A1. We obtain asset information from the Money Market Directory of Investment Managers. This database contains the investment management firms' name and the total assets under management in each year from 1996 to 2003.

D. Sample Construction

We match the hiring/firing database with the return data in two steps. We first match the names of investment management firms across the two databases. We use Nelson's Directory of Investment Managers (2004), the Money Market Directory of Investment Managers and Plan Sponsors (2004), and Internet searches to ensure that acquisitions of investment management firms are correctly accounted for in both databases. Second, we match information on the investment mandate from the hiring/firing database to one of the products in the returns database. This process results in a loss of some data for three reasons. First, Mercer's return database may not have returns for a particular investment management firm. Second, Mercer's return database may not have returns for the mandate for which the investment manager was hired or fired. This is often the case for "alternative asset" mandates that include venture capital and private equity. Third, we remove passive mandates from our sample since investment managers for these mandates are selected for their ability to provide low cost passive exposure rather than beating a particular benchmark.

Sometimes, mandate information in the hiring/firing database is available only at a broad level while the returns are available at a refined level. For instance, a hiring record may indicate that XYZ Investment Partners was hired for a large cap equity mandate. Our returns database

may record return information for XYZ Investment Partners for large-cap growth, large-cap value, and large-cap core products. In such situations, we use an equally weighted average return across all the relevant products and match it to the investment mandate. We perform all our tests without this averaging and note that it does not affect our conclusions.

The intersection of the two databases produces a sample of 8,755 hiring decisions by 3,417 plan sponsors. These hiring decisions involve 602 investment managers hired to manage a total of $627 billion between 1994 and 2003. The firing database consists of 869 decisions by 482 plan sponsors between 1996 and 2003. These decisions involve the withdrawal of $105 billion from 247 investment managers.

E. Performance Measurement

We identify quarter zero as the quarter in which the hiring/firing takes place and then measure performance in several different ways. We calculate cumulative excess returns for the mandate (portfolio) of the investment manager as

$$CER_i(t,H) = \sum_{s=t}^{t+H-1} (R_{i,s} - R_{b,s}), \qquad (1)$$

where $R_{i,s}$ is the return on the mandate type by the investment manager i in quarter s, and $R_{b,s}$ is the return on the benchmark in quarter s. We calculate CERs for one, two, and three years before and after an event, but we focus our discussion on the 3-year horizon because shorter period returns are noisy. In addition to CERs, we also report information ratios since they are widely used in the practitioner community, and calculate them as

$$IR_i(t,H) = \frac{\overline{CER}}{\sigma_{ER}}, \qquad (2)$$

where $\overline{CER}$ is the mean excess return over the appropriate horizon and σ_{ER} is the standard deviation of the excess return.

The assessment of the statistical significance for CERs is a nontrivial matter. In our data, plan sponsors and investment managers can appear multiple times for different decisions. This repetition, in combination with overlapping periods in long-horizon returns, introduces cross-sectional and time-series dependencies that render typical standard errors unreliable. We follow

Jegadeesh and Karceski (2004) and calculate conservative standard errors based on a calendar time procedure that accounts for cross-correlations, heteroskedasticity, and serial correlation. Details of the calculations of standard errors are contained in Appendix A.

Benchmark adjustments are not risk adjustments. One alternative is to estimate factor models in the spirit of the mutual fund literature (e.g., Elton, Gruber, and Blake (1996) or Carhart (1997)). Ideally, we would want to estimate alphas from a factor model before and after each event. However, the short time series, in addition to the fact that our returns are quarterly, limits our ability to do so. To get around this problem, we follow a calendar time portfolio approach to estimating factor models. This allows us to estimate alphas for each year before and after the event. The disadvantage is that since we do not obtain alphas for each decision, we cannot examine cross-sectional variation in performance measured by alphas.

We calculate separate calendar time portfolio returns for three years to one year before and after hiring/firing decisions (in other words, we calculate six separate calendar time portfolios for each asset class). For instance, a hiring decision in December 1998 is included in the 3-year pre-hiring calendar time portfolio from December 1996 to November 1998. We then estimate alphas from factor models with the following specification for each of the calendar time portfolios

$$R_{p,t} = \alpha_p + \sum_{k=1}^{K} \beta_{p,k} f_{k,t} + \varepsilon_{p,t} , \qquad (3)$$

where R_p is the excess return on portfolio p, and f_k is the k^{th} factor return. The models are estimated separately for domestic equity, fixed income, and international equity mandates. For domestic equity mandates, we follow Fama and French (1993) and use the market, size, and book-to-market factors obtained from Ken French's website. For fixed income portfolios, we use the Lehman Brothers Aggregate Bond Index return, a term spread (computed as the difference between the long-term government bond return and the T-bill return), and a default spread return (computed as the difference between the corporate bond return and the long-term government bond). The default and term spread are obtained from Ibbotson Associates. For international equity mandates, we employ an international version of the three factor model. We obtain the international market return and book-to-market factor from Ken French. The

international size factor is computed as the difference between the S&P/Citigroup PMI World index return and the S&P/Citigroup EMI World index return, both of which exclude the United States (see http://www.globalindices.standardandpoors.com).

III. The Selection of Investment Managers

A. Sample Distribution

Panel A of Table I describes the distribution of hiring decisions. Of the 8,755 hiring decisions, 22% (1,927) originate from corporate plan sponsors. The average size of such sponsors is $3.7 billion and the average mandate is for $55 million. State-level public plans are extremely large, averaging $22.9 billion in size and present mandates that are over $200 million. Local and miscellaneous public plans are considerably smaller. Endowments and foundations are smaller than corporate and state or local public plans with an average size of only $1 billion. Their average mandate size is also smaller ($25 million). Single and multiemployer union plans represent over 10% of the sample and their average mandate is for $34 million. The miscellaneous category includes 890 hiring decisions by insurance plans, trusts, and anonymous defined benefit plans.

[Table I about here]

In Panel B, we collapse these types of plans into three categories that reflect their sensitivity to adverse publicity in the event of poor performance. This categorization is based on the premise that sponsors whose boards of directors or investment committee members are political appointments are more likely to be subject to headline risk. In the spirit of Brickley, Lease, and Smith (1988), we categorize plans into headline risk-sensitive, resistant, and neutral groups. Headline risk-sensitive sponsors include local, state, and miscellaneous public plans, unions, and public universities. In such public institutions, appointments to boards are either direct placements by elected officials (e.g., in the case of gubernatorial appointments at state plans) or take place via a process that involves behind-the-scenes political maneuvering. Headline risk-neutral sponsors include non-university endowments and foundations, and headline risk-resistant sponsors are corporate plans, private universities, and miscellaneous plans. The objectives of the latter group are well defined and the political influence in the board

appointment process is not as large as for headline risk-sensitive sponsors. Headline risk-sensitive sponsors are larger, in part because they include the extremely large state public plans.

In Panel C, we report size and mandate statistics for plans that are over- or underfunded in the year prior to the hiring decision. Since the residual claimant and the nature of the guarantees (PBGC versus taxpayers) are quite different for corporate versus public plans, we report separate statistics. Over- and underfunded corporate plans are quite similar in terms of size and mandate, but in the case of public plans, overfunded plans are significantly larger with bigger mandates.

Before RFPs can be issued and an investment management firm hired, a plan sponsor must create an asset allocation plan that incorporates its investment goals and restrictions. Unfortunately, to our knowledge, there is no database of restrictions and/or investment policy statements. Even though we cannot measure the restrictions imposed on a plan sponsor directly, we create a proxy by examining asset allocations. The idea is that plan sponsors that are relatively unrestricted are more likely to invest larger amounts in riskier asset classes; in effect, asset allocations represent a realization of constraints and investment policy statements. For instance, an endowment that allocates a large percentage of its assets to hedge funds is likely to be less restricted than one that is prohibited from such investments. To capture this idea, we create a simple allocation index that is the average of the allocation to equity (both domestic and international), alternative assets, non-indexed assets, and externally managed assets.[9] For plan sponsors without data on indexation or externally managed assets, the average is computed only from available data elements.[10]

Panel A of Table II shows average asset allocations for the different types of plan sponsors. Since our data sources provide different and not always consistent classifications of assets, we collapse all allocation information into five asset classes: domestic equity, fixed income, international equity, alternative assets (buyout funds, venture capital, and hedge funds), and other assets (balanced, GICs, cash, real estate, timber, oil and gas, etc.).

[Table II about here]

Allocations to fixed income generate a more predictable stream of cash flows than those to equity. Therefore, plan sponsors that need to pay retirees might make higher allocations to

fixed income than those whose outflows are more flexible. Consistent with this, public and union plans allocate between 33.6% and 37.6%t of their assets to fixed income portfolios compared with endowments that only allocate 29.7%, and to public and private universities that allocate 26.3% and 21.5%, respectively. By this metric, allocations by corporate plans are relatively aggressive, allocating 48.5% of their assets towards domestic equity and only 26.8% to fixed income. Allocations to international equity portfolios are quite high from corporate and public plans (over 10%), particularly compared to unions that invest only 2% of their assets in international equity. Corporate plan and endowment allocations to alternative assets are also high, but surprisingly, allocations from union plans are also large.

Panel A also reports the percentage of assets that are indexed and managed internally. Since these data elements are only available from P&I, the sample does not match that for asset classes. In the available subsample, the data show that state public plans manage a significant proportion of their assets internally (19%) and also pursue indexation policies (25%), consistent with the increase in indexation reported by Lakonishok, Shleifer, and Vishny (1992). In contrast, union plans rarely index and never manage their own assets.

The allocation index is highest for corporate plan sponsors (0.65). This is again consistent with the idea that corporate plan sponsors can be more aggressive in asset allocation because they are the residual claimant and because they are less constrained than other sponsors. Panel B shows asset allocations and the allocation index for plan sponsors classified by headline risk and Panel C shows the same data for public and corporate plans that are either over- or underfunded. Headline risk-resistant plan sponsors have higher allocations to domestic equity and alternative assets, and a significantly higher allocation index than for headline risk-sensitive plan sponsors. Interestingly, headline risk-neutral plan sponsors have the lowest allocation index. The correlation between funding status and asset allocation could reflect two opposing forces. It could be that plans with more restrictions become underfunded because these restrictions prevent them from constructing optimal portfolios. Or, it could be that plans with lower restrictions become underfunded because they unsuccessfully invested in riskier securities. Empirically, we find that funding status does not vary with asset allocations.

The last columns in Panels A, B, and C show variation in the use of consultants. For example, headline risk-sensitive sponsors are more likely to employ a consultant (73%) than headline risk-resistant sponsors (4%). But, such effects are likely correlated with other attributes such as the size of the plan sponsor or the asset class of the mandate. To provide a more complete description of this, we estimate multivariate probit models that predict the use of consultants in Panel D. The independent variables in these probit models proxy for the ideas discussed above. Plan sponsor size captures the notion that larger sponsors may have economies in hiring. We include the age of the portfolio managed by the investment management firm because consultants typically require a return history before recommending a portfolio to a sponsor. We also include indicator variables for headline risk-resistant and sensitive plan sponsors, and allow the headline risk-neutral category to be picked up by the intercept. Since selection of investment managers in certain asset classes might require more expertise, we include indicator variables for domestic equity, international equity, and fixed income mandates.

Three versions of the probit model are reported in Panel D. Standard errors are reported in parentheses below the coefficients. The first model is estimated on the full sample and shows that headline risk-resistant (sensitive) plan sponsors are significantly less (more) likely to use a consultant. The implied probability changes from the coefficients are -10% for headline risk-resistant sponsors and 15% for headline risk-sensitive sponsors. The logarithm of plan sponsor size is negatively correlated with the use of consultants, consistent with our priors. Similar models augmented with an indicator variable for whether the plan is overfunded in the prior year for public (corporate) plans are also reported. The funding indicator is insignificant for public plans but positive for corporate plans.

B. Pre-Hiring Performance

Plan sponsors hire investment managers to invest new asset inflows and to replace terminated investment managers. We examine pre-hiring performance in two ways. First, we modify the investment manager CERs described above to calculate style CERs. Our purpose is to determine the degree to which plan sponsors engage in style-chasing. Lakonishok, Shleifer, and Vishny (1992) argue that the structure of this industry and the agency relationships within

causes sponsors to allocate funds to different styles, rather than following a specific style or indexing. Barberis and Shleifer (2003) argue that style investing is particularly attractive to plan sponsors because style categorizations make it very easy to evaluate investment managers. Ideally, to detect style-chasing, we would like to directly examine shifts in asset classes and styles for each plan sponsor and correlate them with lagged market movements. Absent this information, we can provide some indirect evidence to bear on this issue by computing style excess returns and correlating them with hiring decisions. Specifically, we compute style CERs by cumulating the return of the investment style ($R_{b,s}$) minus the return of a broad index that reflects the return for that asset class. For example, to compute the style CER for small-cap growth, we cumulate the return difference between the small-cap growth benchmark (Russell 2500 Growth) and the Russell 3000 index. Second, we calculate investment manager CERs as described in Section II.E. Panel A of Table III shows style and investment manager excess returns one, two and three years before hiring with standard errors in parentheses.

[Table III about here]

There is some evidence of style chasing in domestic equity: the 3-year pre-hiring return is 1.20%, albeit with a standard error of 3.59%. In contrast, there is no style-chasing in either fixed income or international equity. In terms of pre-hiring performance, the cumulative excess returns for investment managers are consistently positive across all horizons and for all asset classes. They are the largest for international equity with a 3-year pre-hiring return of 17.05% and smallest for fixed income with a 3-year pre-hiring excess return of 3.55%. Clearly, and not surprisingly, plan sponsors condition their hiring decisions on the performance of investment managers.

In Panel B, we investigate how different attributes of plan sponsors are correlated with the return threshold at which investment managers are hired. The endogeneity of consultant use (see results in Panel D, Table II) necessitates a procedure that corrects for selectivity. We follow Madalla (1983) and estimate the following model:

$$y_j = \beta x_j + \delta z_j + \varepsilon_j, \tag{4}$$

where y_j represents 3-year pre-hiring cumulative style or investment manager excess return, x_j is a vector of explanatory variable, and z_j is a dummy variable for whether a consultant was employed. The selection equation is modeled as

$$z_j^* = \gamma w_j + u_j, \tag{5}$$

where $z_j = \begin{cases} 1, if\ z_j^* > 0 \\ 0, otherwise \end{cases}$ and w_j is a vector of explanatory variables. The regressions are estimated via a two-stage procedure and standard errors account for clustering, where an investment management firm is hired for a mandate in the same style and period by different plan sponsors.

The selection equation that we use is identical to the first model in Panel D of Table II and not shown in Table III. The independent variables (x_j) in the return regression measure plan sponsor attributes that, based on the discussion in Section I, we expect to be correlated with pre-hiring return thresholds. We present three regression models. The first model includes an indicator variable for headline-sensitive plan sponsors, the logarithm of plan sponsor size, a consultant indicator (from the first-stage regression) and an interaction effect between the consultant indicator and the headline-sensitive sponsor indicator. This base specification shows that sponsor size plays no role in style-chasing but that headline risk-sensitive plan sponsors engage in style-chasing. Sponsors that employ consultants also engage in more style-chasing than those that do not. An interaction effect between the two indicates that the presence of a consultant accentuates the style-chasing behavior in headline risk-sensitive plan sponsors rather than reducing it. In the second model, we add an indicator variable for whether the plan is overfunded. This drops the sample size since funding information is only available for a small sample of public and corporate plans. The overfunded indicator variable is significantly negative, indicating that overfunded plans do not engage in style-chasing, most likely because they have little incentive to do so. In the third model, we add the allocation index to the base model to see if our proxy for restrictions influences style returns. It does not.

We also study variation in investment manager pre-hiring returns using the same sets of models. The base model suggests that larger sponsors condition their hiring on larger investment manager returns. Similarly, the presence of consultants is positively correlated with pre-hiring investment manager returns. But neither funding levels nor the allocation index are related to pre-hiring investment manager returns. Overall, the data suggest that there is some style-chasing and that plan sponsors condition their hiring decisions on investment manager performance. The

magnitudes of these effects are different for headline risk-sensitive plan sponsors and those that are advised by consultants. We turn now to an investigation of post-hiring performance.

C. Post-Hiring Performance

Table IV shows cumulative excess returns (Panel A), information ratios (Panel B), and alphas from factor models (Panel C) one, two, and three years after hiring. For comparison purposes, we also show pre-hiring returns over the same horizons. To ensure that changing sample sizes between the pre- and post-period do not drive our results, we report excess returns for a balanced sample in which returns can be computed for matched horizons before and after hiring. In addition to the full sample, we also show separate results for domestic equity, fixed income, and international equity.

[Table IV about here]

As before, pre-hiring performance is significantly positive using all three measures of excess returns. For the full sample, post-hiring performance is statistically flat. Cumulative excess returns one, two, and three years after hiring are 0.4%, 1.1%, and 1.8% with standard errors of 0.6%, 0.8%, and 1.1%, respectively. The only case in which post-hiring excess returns are positive and statistically significant is for international equity mandates. This effect for international equity appears to be quite robust for all performance measures.

Recall that the sample of hiring decisions is for active mandates in which, presumably, plan sponsors hope to earn future excess returns. Our results suggest that, on average, plan sponsors are unsuccessful in this endeavor. It could be that some plan sponsors are more successful than others because of differences in the nature of agency relationships and incentive structures. For example, the degree of headline risk faced by a plan sponsor could influence it's ability to successfully pick managers that beat their benchmark. We study the degree to which such plan sponsor attributes result in superior post-hiring excess returns through selectivity-corrected return regressions analogous to those in Table IV. The dependent variable is the 3-year post-hiring cumulative excess return. The base regression model contains three-year pre-hiring cumulative excess returns, plan sponsor size, consultant indicator, and headline risk-resistant, sensitive, and neutral indicators as explanatory variables. Since all the headline risk indicators

are included, the model is estimated without an intercept. Fixed effects for detailed investment styles (not shown) allow for intercept shifts in post-hiring returns that are not picked up by the benchmark used to compute excess returns.[11]

The base regressions in Table V show strong evidence of return reversal. The negative coefficients on the pre-hiring return variable do not imply negative post-hiring returns, just that post-hiring returns are smaller than pre-hiring returns. Larger plan sponsors appear to generate superior post-hiring performance, consistent with scale economies at the plan sponsor level. The sensitivity to headline risk could influence hiring decisions in two opposing ways. It could be that increased public scrutiny improves incentives and results in higher post-hiring performance. Alternatively, headline risk sensitivity could be a response to the lack of incentives for plan sponsors to generate superior performance. Consistent with the latter explanation, we find that the performance of headline risk-sensitive plan sponsors is generally negative, particularly when compared to sponsors that are neutral to such risk. Finally, post-hiring returns are higher for decisions in which a consultant was used in selecting the investment manager.

[Table V about here]

The above results indicate that smaller plan sponsors have lower post-hiring performance and that consultants add value. Since larger plan sponsors are less likely to employ consultants, it is also interesting to examine whether consultants add more or less value for them. In the second model, we find that the interaction effect between sponsor size and consultant use is negative. This suggests that consultants add value for smaller plan sponsors but are detrimental to the post-hiring performance of larger plan sponsors. This could be because consultants do not bring scale economies or expertise to larger plans and are instead used as a shield in the case of poor hiring decisions.

Scale diseconomies could be present for investment managers. Consider, for example, a small-cap growth manager that is at capacity with $1 billion under management. If this manager then receives a $200 million mandate from a state-level plan sponsor, its future returns could deteriorate because of higher trading costs. In the third model, we add the size of the mandate obtained by the investment manager, scaled by (lagged) assets under management. Mandate size scaled by assets is negatively related to post-hiring returns. In the fourth model, we augment the

base regression with the asset allocation index. The regression shows a strong positive relation between post-hiring returns and the allocation index, suggesting that the imposition of restrictions is detrimental to performance. Finally, we would like to add the funding status of the plan in the year prior to the hiring decision to these regressions. But since these data are available only for a subset of public and corporate plans, we estimate such regressions separately for these sponsors (and accordingly drop the headline risk indicator variables). For both corporate and public plans, the overfunded plan indicator is negative and significant, consistent with Hart's (1992) argument that overfunded plans have little incentive to generate superior performance.

The economic magnitude of some of these effects is quite large. From the base specification, the average impact of a one-standard deviation increase in 3-year pre-hiring returns (with other variables evaluated at their mean) implies a decrease in 3-year post-hiring cumulative excess returns of 4.7%. Headline risk-sensitive sponsors have excess returns that are lower by 1.7% than their counterparts and the use of a consultant leads to an increase in 3-year post-hiring returns by over 2.0% depending on the specification. Lower performance for overfunded plans (compared to underfunded plans) varies from 1.6% for public plans to 0.3% for corporate plans.

D. Discussion

Our aggregate results show that plan sponsors condition their hiring decisions on superior performance. However, post-hiring performance is essentially flat. One way to think about these results is to consider the role of persistence in investment manager returns. If there is little or no persistence in the performance of investment managers in general, then on average, hiring decisions should produce zero excess returns. This does not necessarily mean that plan sponsors achieve their objectives, since they hire investment managers in our sample to deliver excess returns. However, it does imply no ex post losses. A full scale analysis of persistence is beyond the scope of our paper. However, Christopherson, Ferson, and Glassman (1998) and Busse, Goyal, and Wahal (2007) undertake such an analysis for institutional investment managers and find evidence of persistence among winners for up to one year, and in some cases, longer. Their

persistence results indicate that plan sponsors *could* generate excess returns by appropriately timing hiring decisions but apparently, they do not.

However, the aggregate results mask considerable cross-sectional variation, not only in elements of pre-hiring decisions (return thresholds, style-chasing, consultant use), but also in post-hiring performance. This variation is tied to plan sponsor attributes which reflect agency problems and incentive structures across plans.

IV. The Termination of Investment Managers

A. Reasons for Termination

Our firing sample consists of 869 termination decisions. The number of termination decisions captured by the data collection process is substantially smaller than hiring decisions for three reasons. First, the data sources that we use (which to our knowledge are the only publicly available sources) serve a marketing function, that is, they are designed to inform subscribers that a plan sponsor is searching for an investment manager in a particular asset class / mandate. These sources are not designed to track performance or to assign blame. As such, the emphasis is on new accounts and revenue. Second, termination decisions are generally viewed with some distaste and there is a natural disinclination to report terminations. Certainly, investment managers have no incentive to report their own terminations. Plan sponsors may choose not to publicize terminations because they may employ the same manager for another mandate, either currently, or in the future. Third, there has been an increase in the assets under the administration of plan sponsors over the sample period. Ergo, the number of hiring decisions in the population is likely to be larger than of firing decisions.

Panel A of Table VI shows the distribution of termination decisions by type of plan sponsor and within headline risk category. Also shown are statistics on plan sponsor and mandate size. All major categories of sponsors except private universities are represented in our data. The number of terminations by endowments and foundations (in the headline risk-neutral category) are quite small. The size and mandate statistics are similar to those reported for hiring decisions. Although we do not show the time-series distribution, the number of firing

observations increases over time because our data sources do a better job of capturing such decisions in the later years.

[Table VI about here]

We use the textual information in our data sources to manually categorize the reasons for the termination of the investment manager into six categories. Four of those categories are related to activities/events specific to the investment management firm: the merger of two investment management firms, regulatory action against the investment management firm, personnel turnover, and performance. Two of the categories are related to the plan sponsor itself: either a reorganization of the plan sponsor or a reallocation across asset classes.[12] If the text of the termination decision indicates that the plan sponsor executive willfully refused to provide the reason for the termination, we identify it as "not reported." This is different from "missing" because that category contains terminations for which we cannot find any information.

Only 34% (297 observations) of the total terminations (including those with unidentified reasons) are due to the performance of the investment manager. Activities and events at the investment manager firm that are unrelated to performance (mergers, regulatory action, and personnel turnover) account for another 14%. Plan sponsor changes (reorganizations and asset reallocations) are responsible for almost 17% of terminations.

There are two caveats associated with the termination reasons described above. First, the reasons are self-identified by the plan sponsor. Second, elements of current or future underperformance could creep into nonperformance categories. An acquisition of one investment management by another might take place after underperformance. Alternatively, a plan sponsor may terminate an investment manager after the departure of key personnel because it believes that the departure will cause underperformance in the future.

Panel C shows the distribution of firing decisions, sponsor size, and mandates by the funding status of corporate and public sponsors. Out of the 112 terminations from corporate plan sponsors, we only have funding information for 42, which are roughly evenly split between under- and overfunded plans. The underfunded corporate plans are considerably larger than the overfunded plans. Of the 546 public plans in the termination sample, we have funding information for 258, and a significant majority of those are underfunded (70%).

In Table VII, we present a two-way frequency tabulation of the reasons for termination and plan sponsor attributes. As with hiring decisions, our purpose is to determine if headline risk, funding status, size, and consultant use influence the degree to which plan sponsors terminate investment managers for various reasons. Before presenting the results, we alert the reader to two important facts. First, some of the sample sizes for termination reasons are quite small. Although we report all cuts of the data, we only make inferences when sample sizes are reasonable. Second, our priors are well formed primarily for two termination reasons, performance and regulatory action. For example, we expect that headline risk-sensitive plan sponsors may be more likely to terminate managers for poor performance or regulatory action than headline risk-resistant sponsors. We cannot a priori make the same claim for plan sponsor reorganizations/reallocations or even for investment manager personnel turnover. Again, we make inferences only where we have sensible priors.

[Table VII about here]

With those qualifications in mind, Table VII presents the frequency of termination decisions across subcategories of sponsors in Panels A through F for each termination reason. Correct interpretation of these frequencies requires one to compare the frequency distribution across a subcategory and reason with the unconditional distribution across that subcategory (reported in the last column). For example, to determine if headline risk-sensitive plan sponsors are more likely to terminate for underperformance than headline risk-resistant sponsors, we compare their frequency distribution (79% versus 18.8%) to that for all terminations (75% versus 21%). Consistent with our expectations, headline risk-sensitive sponsors are more likely to terminate investment managers for poor performance (79%) than headline risk-resistant sponsors (18%); the *p*-value for this difference is 0.00. Overfunded plans may be less likely to terminate underperforming managers because they have some slack. Alternatively, they may be more likely to terminate for poor performance if they achieved overfunding via good firing decisions. We find that overfunded plans are less likely to terminate for poor performance than their counterparts, suggesting that the first effect dominates. Consultant-advised plans may be more likely to terminate underperforming managers because consultants want to distance themselves from the poor performance of investment managers. But we find that consultant-advised plans

are no more likely to terminate investment managers for poor performance (and regulatory action) than those without consultants.

B. Pre- and Post-Firing Performance

In Table VIII, we show average cumulative excess returns for investment managers prior to the termination. Panel A shows the excess returns and standard errors for all terminations as well as by the reason for termination. The average excess return for all terminations is not different from zero: the 3-year (1-year) excess return is 0.33% (-0.72%) with a standard error of 1.27% (0.68%). This reflects the heterogeneity in the reasons for termination. The excess returns prior to performance-based firing are significantly negative (-4.1% over three years with a standard error of 1.2%). In fact, poor performance and regulatory action are the only termination reasons that have negative pre-firing returns, although returns for the latter are not statistically significant. Excess returns prior to terminations due to mergers are positive but returns for the other termination reasons are statistically indistinguishable from zero. In Panel B we investigate whether headline risk, funding status, sponsor size, the allocation index, and consultant use are related to pre-firing returns using selectivity-corrected regressions similar to those employed earlier. These regressions are estimated for performance-based terminations only since that is where we expect such effects to be important. None of the variables that were important for pre- and post-hiring returns are important here, although it is entirely possible that the small size limits the ability of the regression to detect meaningful differences.

[Table VIII about here]

In Table IX, we show cumulative excess returns (Panel A), information ratios (Panel B), and calendar time alphas from factor regressions (Panel C) after termination. To allow for easy comparisons, we also show pre-firing results in the same table and break up the results for domestic equity, fixed income, and international equity. As before, pre-firing returns are generally statistically indistinguishable from zero. After firing, in the first two years, the cumulative excess returns are positive but with large standard errors. In some cases, in the third year, the excess returns are large and statistically significant; for the full sample, the three-year cumulative excess return is 3.3% with a standard error of 1.4%.

[Table IX about here]

Investment manager termination could be correlated with changes in portfolio risk before and after termination and affect our inferences. For example, Brown, Harlow, and Starks (1996), Chevalier and Ellison (1999), and Busse (2001) show that underperforming mutual fund managers increase portfolio risk in an attempt to generate superior returns. Gallo and Lockwood (1999) show correlated changes in investment style. Such behavior may be prevalent in institutional investment management firms as well. Our calendar time factor models allow us to test if these pre- and post-event betas are different from each other. Although we do not display the results, we mostly fail to reject the null hypothesis of constant beta. We suspect two reasons for this. First, most investment management firms have a large stable of clients. Losing one or two clients is unlikely to dramatically influence risk-taking incentives. Second, plan sponsor monitoring of tracking error (Del Guercio and Tkac (2002)) is likely to reduce incentives to change risk profiles dramatically.

C. Discussion

As a whole, our data appear to indicate that plan sponsors show limited timing ability in terminating investment managers. In the case of nonperformance terminations, a priori, one should not expect over- or underperformance subsequent to termination. In untabulated results, that is exactly what we find; post-firing excess returns for nonperformance based firings are essentially zero. In the case of performance-based termination, expectations of post-firing excess returns depends on the perspective of the evaluator. The plan sponsor terminating the investment manager presumably expects post-firing returns to be negative. Counterfactually, we find that the 3-year post-firing excess return for performance-based terminations is 4.20% with a standard error of 1.87%. An independent observer could argue that post-firing excess returns should be zero (under mean reversion) or even positive, either under diseconomies of scale in investment management or if termination disciplines the investment manager. The diseconomies channel is simply that if the manager is capacity constrained, then removal of a mandate might allow the investment manager to improve returns, perhaps through lower trading costs. The disciplinary channel implies that termination improves performance by inducing greater effort. Both

channels imply that post-firing returns should be correlated with the size of the lost mandate scaled by assets under management. In unreported regressions with post-firing excess returns as the dependent variable, we find that the coefficient on this scaled mandate is positive and significant (the coefficient is 0.008 with a *t*-statistic of 1.96), even in the presence of other control variables.

The extent to which such (mis)timing damages the performance of the plan sponsor depends on the performance of the investment managers hired to replace terminated managers. In other words, the appropriate comparison is the returns that the plan sponsor earned (post-hiring) relative to what it would have earned (post-firing). Although it is tempting to simply compare post-hiring returns in Table IV with post-firing returns in Table IX and conduct a cross-sectional analysis, we refrain from doing so because firing and hiring decisions are coordinated using complicated mechanisms. We proceed to an analysis of such "round-trips" below.

V. Round-trip Termination and Selection of Investment Managers

The best way to illustrate the complexity of a round-trip termination and selection decision is by way of examples.

Example 1

In the first quarter of 2000, the St. Louis Employees Retirement System terminated 1838 Investment Advisors for its core long-term fixed income portfolio, reportedly because of poor performance. It then hired Reams Asset Management to handle this $45 million portfolio. Watson Wyatt Investment Consulting assisted in the search.

Example 2

In the first quarter of 2002, the Arapahoe County Employees Retirement System hired Barclays Global Investors to manage $15 million in passive global large-cap equity, Artisan Partners for a $10 million active international all-cap equity mandate, Brazos for $9 million in active domestic micro-cap equity, and Royce for $5 million in active domestic small-cap equity. The Barclays' hiring was funded by reallocating $15 million from a $44 million active domestic large cap growth equities portfolio managed by Fayez Sarofim. Artisan's allocation came from terminating a $10 million active international all-cap equities portfolio managed by Brinson Partners. Brazos and Royce were funded by terminating a $14 million active domestic midcap growth equities portfolio managed by Denver Investment Advisors.

The first example is a straightforward round-trip firing and hiring decision in which the mandate size and type is the same, and the reason for the decision clearly delineated. The second contains two round-trip observations: (i) Denver Investment Advisors is terminated and replaced

by Brazos and Royce. The mandates for the hired investment managers are different from the terminated investment manager and the allocation of the $14 million portfolio is not even. (ii) Brinson Partners is terminated and replaced by Artisan Partners in the same mandate. Note that the Barclays Global Investors hiring does not create a round-trip observation since it is not the result of a termination but an allocation adjustment for an ongoing investment manager.

A. Sample Construction and Description

Because of the complexity of the process described above, we cannot mechanically associate hiring and firing decisions, and therefore build a sample using manual procedures. We start with our sample of firing decisions. For each firing decision, we match hiring decisions by the same plan sponsor up to one quarter after the firing date.[13] This produces 2,206 candidate firing-hiring decisions, which contain duplications, often because a hiring decision can be associated with more than one firing decision and vice versa. For each candidate observation, we then search for articles detailing the decisions in the following trade journals: Pensions and Investments (P&I), Investment Management Weekly (IMG), Money Management Letter (MML), and Dow Jones Money Management Alert (DJMMA). We mark each round-trip with an ID that allows us to track these decisions and eliminate duplications. This process identifies 663 round-trip firing-hiring decisions. We then match these round-trip decisions with our returns database, keeping only decisions for which we have some returns. As before, this eliminates decisions involving investments in hedge funds, venture capital funds, and private equity. Our final sample consists of 412 round-trip firing-hiring decisions between 1996 and 2003.

On average, each round-trip decision is associated with the firing and hiring of 1.1 investment managers, with a maximum of 11 investment managers hired or seven investment managers fired in a particular decision. The average mandate size for firing is $116 million while the average mandate size for hiring is $102 million.

B. Round-trip Performance

If more than one firm is fired (or hired), we compute the excess return for that round-trip observation as the average across the fired (or hired) firms. In Example 2 described above, pre-

and post-firing returns for Denver International Advisors would be compared to the average of the pre- and post-hiring returns of Brazos and Royce. Both hired and fired firms are required to have returns over a particular evaluation horizon.

Panel A of Table X shows average pre- and post-event cumulative excess returns for fired and hired firms for the entire sample. Consistent with earlier results, the pre-firing returns for the overall sample fired firms are statistically indistinguishable from zero because they mix different termination reasons. Post-firing returns are positive, and interestingly, statistically significant at all three horizons. Also mirroring results from earlier tables, pre-hiring excess returns are large and positive. In general, this pattern of returns is reassuring because it suggests that our round-trip sample is similar to the earlier (larger) hiring and firing samples. In addition to hired and fired firm's returns, we also report return differences (hired firm's excess returns minus fired firm's excess returns) with corresponding standard errors. Prior to the firing/hiring decision, the return differences are large, positive, and statistically significant. The 3-year (1-year) cumulative excess return difference prior to the firing/hiring is 9.5% (4.6%) with a standard error of 2.5% (1.00%). After the hiring/firing decision, the performance of the fired firms' exceeds that of the newly hired firms' over all three horizons but with larger standard errors; the 3-year cumulative excess return difference is –1.03% but with a standard error of 1.1%.

[Table X about here]

We would like to understand the relation between the opportunity costs described above and plan sponsor attributes. Unfortunately, our cross-sectional analysis is hindered by small sample sizes; we cannot estimate cross-sectional regressions of the form reported in Table V. As a result, we report pre- and post-event return differentials for various categories of the data in Panel B of Table X.[14] *P*-values for differences in returns between subcategories are also shown. Not surprisingly, pre-event return differences are significantly higher for performance-based terminations than nonperformance-based firings. Post-event return differentials are negative for both groups, but statistically indistinguishable from each other. Pre-event return differences are also larger for round-trips that use consultants but post-event return differentials are not statistically significant. In fact, for all the categories that we examine (headline risk, sponsor

size, allocation index, and consultant use), post-event return differentials across subcategories are not different from each other.

C. Discussion

How does one interpret the overall evidence from round-trips? The opportunity costs are positive but with high standard errors. If one adds transition costs discussed in the introduction (say, 1.0% to 2.0%) to these opportunity costs, the overall costs of firing and hiring investment managers rise further.[15] Moreover, if the costs associated with hiring and firing investment managers are important, then at the margin they should play a role in retention decisions. Typically, an investment management firm is hired for a given term, but then can be "rehired" for a subsequent term. If replacement costs are relevant, then the pre-rehiring performance that justifies retention should be lower than for brand new hiring. To determine if that is the case, we create a sample of retentions. We examine a random sample of 350 plan sponsors in Nelson's Directory of Plan Sponsors (2005). Nelson's reports the name of investment managers with mandates from each plan sponsor as of 2004, the year that investment manager was originally hired, and the investment mandate. We manually record this information for investment management firms that are in our returns database, where the mandate amount is recorded and where the original hiring year is before 2000. We then assume that a retention decision is made every three years. For example, if XYZ Asset Management was originally hired by ABC Plan Sponsor in 1996, we assume a retention decision is made in 1999 and 2002. In total, our sample consists of 1,867 retention decisions. We then compute pre-retention returns in the same manner as before and compare them to pre-hiring returns for the same plan sponsors. We find that the average 1-year (3-year) cumulative excess return for retentions is 2.4% (6.1%), compared with 4.9% (14.7%) for hiring decisions by the same plan sponsors. This suggests that in making retention decisions, plan sponsors incorporate the costs associated with hiring and firing.

VI. Conclusions

To summarize, we find that plan sponsors hire investment managers after superior performance but on average, post-hiring excess returns are zero. Plan sponsors fire investment

managers for many reasons, including but not exclusively for underperformance. But, post-firing excess returns are frequently positive and sometimes statistically significant. Our sample of round-trips shows that if plan sponsors had stayed with fired investment managers, their excess returns would be no different than those actually delivered by newly hired managers.

It could be the case that the costs documented and discussed above have compensating benefits that we are unable to measure. From an efficiency perspective, terminating investment managers could be critical to maintaining discipline among incumbents and maintaining a competitive marketplace. It is also possible that the agency relationships described by Lakonishok, Shleifer, and Vishny (1992) create such high barriers to change so as to make it impossible to eliminate the costs. Some of our cross-sectional results are consistent with both of the above possibilities, especially since variation in the efficacy of hiring and firing appears to be related to the economic circumstances of plan sponsors. Although beyond the scope of this paper, there are several other analyses that could enhance our understanding of this form of delegated investment management. For instance, as pointed out by Hart (1992), it is useful to consider whether broad asset class allocations are efficient or reflect nonvalue-maximizing behavior. Given the magnitude of assets under the jurisdiction of plan sponsors, correlated shifts in asset allocations could have important implications for asset pricing. We leave this to future research.

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Table I
Distribution of Hiring Decisions by Plan Sponsors

Local public plans are those for cities and counties. State public plans are state-level retirement plans (such as Calpers). Misc. public plans include police, fire, municipal employee, and other such retirement plans at the city or county level. Unions include single and multiemployer unions and Taft-Hartley plans. The "miscellaneous" category includes anonymous corporate plans, insurance plans, health and hospital plans, and trusts. Headline risk-resistant plans are corporate plans, private universities, and miscellaneous plans. Headline risk-sensitive plans are local, state and miscellaneous public plans, unions, and public universities. Headline risk-neutral plans include nonuniversity endowments and foundations. Funding status for corporate pension plans is calculated as in Franzoni and Marín (2006). Funding ratios for public plans for the year prior to the hiring decision are obtained from the plan websites.

	Number of	Plan Sponsor Size ($M)			Mandate Size ($M)		
	Hirings	Mean	Median	N	Mean	Median	N
Panel A: Distribution by Type of Plan Sponsor							
Corporate	1,927	3,690	370	1,617	55	22	1,557
Endowments & Foundations	729	1,080	190	532	25	12	625
Local Public Plans	1,655	7,952	500	1,601	98	25	1,545
State Public Plans	1,032	22,954	12,000	1,006	203	120	961
Misc. Public Plans	951	4,728	830	891	87	30	858
Unions	892	1,165	250	761	34	19	815
Public Universities	351	1,297	200	324	36	12	317
Private Universities	348	369	174	321	16	10	303
Miscellaneous	890	2,659	244	597	91	20	671
All	8,755	6,482	474	7,650	82	25	7652
Panel B: Headline Risk							
Headline Risk-sensitive	4,884	9,021	800	4,583	103	30	4,496
Headline Risk-neutral	729	1,080	190	532	25	12	625
Headline Risk-resistant	3,145	3,026	300	2,535	59	20	2,531
Panel C: Funding Status							
Corporate Plans							
Underfunded	330	1,952	375	307	49	21	242
Overfunded	355	1,959	447	338	54	25	297
Public Plans							
Underfunded	736	13,288	6,100	731	170	100	700
Overfunded	381	24,468	13,650	370	278	130	356

Table II
Asset Allocations and Consultant Use

Alternative assets include buyout funds, venture capital, and hedge funds. Other assets include balanced, GICs, cash, real estate, timber, oil and gas. The number of observations across asset classes and allocation attributes are not equal because of data collection procedures and as a result, the sum of allocations is not equal to 100%. The allocation index is the average of the allocation to equity (both domestic and international), alternative assets, non-indexed assets, and externally managed assets. For plan sponsors without data on indexation and externally managed assets, the average is computed from the equity and alternative asset allocation. For probit regressions predicting the use of consultants, standard errors (in parentheses) account for clustering in observations where the investment manager is hired for a mandate in the same style and period by different plan sponsors.

	Asset Allocation Information											
	Asset Classes Allocations					Allocation Attributes			Number of Hirings (%)			Consultant
	Dom. Eq.	Fixed Inc.	Intl. Eq.	Alt. Assets	Other Assets	Indexed	Internal Mgd.	Allocation Index	Dom. Eq.	Fixed Inc.	Intl. Eq	Use (%)
Panel A: Plan Sponsor Type												
Corporate	48.5	26.8	10.6	11.9	9.5	8.5	3.3	0.65	53	20	20	50
Endow. & Found.	48.6	29.7	7.5	6.9	6.3	-	-	0.34	60	19	13	58
Local Public Plans	46.8	35.4	9.9	1.9	6.3	17.3	10.3	0.45	45	23	21	82
State Public Plans	42.4	33.6	13.3	4.4	8.5	25.0	19.2	0.54	41	23	25	68
Misc. Public Plans	45.9	34.8	10.6	2.8	7.3	20.1	6.6	0.50	49	24	19	73
Unions	41.5	37.6	2.4	10.9	12.6	8.1	0.2	0.45	61	24	4	67
Public Universities	47.5	26.3	11.3	8.4	4.6	-	-	0.35	52	25	16	64
Private Universities	55.3	21.5	6.7	7.1	6.2	-	-	0.35	60	18	17	61
Miscellaneous	49.7	24.7	4.9	14.7	5.9	-	-	0.39	50	30	14	41
Panel B: Headline Risk												
Sensitive	45.2	34.6	10.1	3.9	7.5	20.7	12.6	0.48	48	23	18	73
Neutral	48.6	29.7	7.5	6.9	6.3	-	-	0.34	60	20	13	58
Resistant	49.4	26.1	9.1	12.1	8.7	8.7	4.3	0.59	53	23	18	49
Panel C: Funding Status												
Public: Underfunded	42.5	33.0	13.7	4.5	7.5	24.4	12.7	0.59	323	171	168	75
Public: Overfunded	45.7	31.7	14.6	3.8	6.2	28.4	20.6	0.56	142	97	105	74
Corp.: Underfunded	45.8	26.2	13.4	9.3	10.8	7.6	4.9	0.66	183	65	63	50
Corp.: Overfunded	49.4	26.3	10.9	9.7	8.0	10.5	5.5	0.66	193	63	86	60

Panel D: Probit Regressions Predicting Consultant Use										
	Intercept	Plan Size	Portfolio Age	Headline Resistant	Headline Sensitive	Domestic Equity	Fixed Income	Intntl. Equity	Funding Indicator	Sample Size
Full Sample	0.40	-0.05	0.02	-0.26	0.42	0.29	0.13	0.26	-	7,328
	(0.14)	(0.01)	(0.03)	(0.06)	(0.06)	(0.07)	(0.08)	(0.08)		
Public Plans	0.76	-0.09	0.12	-	-	0.49	0.42	0.38	0.07	1,060
	(0.36)	(0.03)	(0.06)			(0.14)	(0.15)	(0.15)	(0.09)	
Corporate Plans	0.83	-0.19	0.01	-	-	0.36	0.30	0.48	0.26	615
	(0.42)	(0.03)	(0.06)			(0.27)	(0.29)	(0.29)	(0.10)	

Table III
Style and Investment Manager Excess Returns Prior to Hiring

Style excess returns are calculated by subtracting the average return for all styles in an asset class from the style return of the hiring decision. These excess returns are then cumulated over appropriate horizons. Style CERs are only shown for domestic equity mandates. Excess returns for investment managers are calculated by differencing the raw return for the manager in the hiring mandate from benchmark returns for the same mandate. Information on benchmarks is provided in Table A1. Heteroskedasticity, serial, and cross-correlation consistent standard errors are calculated using the procedure described in Jegadeesh and Karceski (2004). Panel B shows the results of regressions with style or investment manager excess returns. The return regression is $y_j = \beta x_j + \delta z_j + \varepsilon_j$, where y_j is the 3-year pre-hiring cumulative excess return, x_j is a vector of explanatory variables, and z_j is a dummy variable for whether a consultant was employed. The selection equation is $z_j^* = \gamma w_j + u_j$, where $z_j = \begin{cases} 1, \textit{if } z_j^* > 0 \\ 0, \textit{otherwise} \end{cases}$ and w_j is a vector of explanatory variables. The selectivity correction is identical to the first model in Panel D of Table II.

	Style CERs			Investment Manager CERs		
	-3 to 0	-2 to 0	-1 to 0	-3 to 0	-2 to 0	-1 to 0
Panel A: Univariate Returns						
Domestic Equity	1.20	0.95	0.49	12.21	8.54	4.21
	(3.59)	(2.62)	(1.17)	(2.50)	(2.27)	(1.52)
Fixed Income	-0.43	-0.55	-0.26	3.55	2.28	1.15
	(1.01)	(0.70)	(0.33)	(0.27)	(0.29)	(0.22)
International Equity	-0.30	-0.50	-0.58	17.05	11.80	5.70
	(1.47)	(0.85)	(0.67)	(3.61)	(2.66)	(1.37)
Panel B: Selectivity Corrected Regressions using 3-year Pre-hiring Returns						
	Style CER (-3 to 0)			Investment Manager CER (-3 to 0)		
Constant	-5.93	-1.45	-3.52	-7.49	7.79	6.23
	(2.75)	(1.56)	(4.08)	(0.78)	(2.21)	(1.32)
Headline-sensitive Indicator	3.17	5.59	1.95	-1.35	-0.27	0.29
	(1.20)	(3.10)	(1.66)	(0.74)	(1.80)	(1.11)
Log (Plan Sponsor Size)	0.17	0.63	0.11	0.37	0.24	0.23
	(0.11)	(0.43)	(0.16)	(0.10)	(0.29)	(0.14)
Consultant Indicator	9.75	11.39	4.81	1.63	0.99	1.83
	(3.97)	(7.67)	(0.54)	(0.66)	(1.53)	(1.09)
Consultant * Headline-sensitive	1.69	1.98	2.17	0.25	1.48	-0.28
	0.74)	(1.55)	(1.12)	(0.91)	(2.01)	(1.33)
Overfunded Indicator	-	-2.29	-	-	1.90	-
		(0.71)			(1.93)	
Allocation Index	-	-	0.09	-	-	2.70
			(1.04)			(1.32)
Number of Observations	7,594	1,746	4,444	6,648	1,544	3,898

Table IV
Investment Manager Excess Returns Before and After Hiring

Panel A presents average cumulative excess returns computed by summing quarterly excess returns (raw minus benchmark return). Information on benchmarks is provided in Table A1. Heteroskedasticity, serial, and cross-correlation consistent standard errors are calculated using the procedure described in Jegadeesh and Karceski (2004). Panel B shows information ratios calculated by scaling the average excess return by its standard deviation. Panel C shows estimates of alphas from calendar time regressions factor regressions with standard errors in parentheses. For domestic equity mandates, we use the Fama and French (1993) three-factor model with market, size, and book-to-market factors. For fixed income mandates, we employ a three-factor model with the Lehman Brothers Aggregate Bond Index return, a term spread (the difference between the long-term government bond return and the T-bill return), and a default spread (the difference between the corporate bond return and the long-term government bond return). For international equity mandates, we use international versions of the domestic equity three-factor models. In all pre-post return comparisons, we require a balanced sample (i.e., returns be available in matched pre- and post-hiring horizons).

	Pre-Hiring Period (years)			Post-Hiring Period (years)		
	-3 to 0	-2 to 0	-1 to 0	0 to 1	0 to 2	0 to 3
Panel A: Cumulative Excess Returns						
Full Sample	10.39	7.04	3.42	0.42	1.12	1.88
	(1.87)	(1.45)	(0.97)	(0.61)	(0.85)	(1.11)
Domestic Equity	12.54	8.72	4.25	-0.22	-0.07	0.77
	(2.85)	(2.31)	(1.52)	(0.85)	(1.31)	(1.86)
International Equity	17.11	11.83	5.71	3.32	7.09	9.00
	(3.67)	(2.69)	(1.37)	(1.27)	(1.71)	(2.62)
Fixed Income	3.72	2.32	1.16	0.30	0.65	0.80
	(0.24)	(0.29)	(0.23)	(0.23)	(0.42)	(0.55)
Panel B: Information Ratios						
Full Sample	3.69	2.61	1.59	0.45	0.78	1.05
Domestic Equity	3.14	2.31	1.34	-0.04	0.11	0.30
International Equity	4.52	3.45	2.15	1.42	2.42	2.89
Fixed Income	5.13	3.43	2.25	1.31	1.74	1.98
Panel C: Calendar Time Alphas from Factor Regressions						
Domestic Equity	1.10	1.09	1.06	-0.17	-0.13	-0.08
	(0.26)	(0.29)	(0.35)	(0.15)	(0.14)	(0.16)
International Equity	1.47	1.54	1.31	0.77	0.68	0.61
	(0.45)	(0.53)	(0.55)	(0.33)	(0.32)	(0.27)
Fixed Income	0.36	0.35	0.39	0.19	0.21	0.21
	(0.09)	(0.08)	(0.09)	(0.11)	(0.08)	(0.08)

Table V
Post-Hiring Selectivity-Corrected Excess Return Regressions

The return regression $y_j = \beta x_j + \delta z_j + \varepsilon_j$, where y_j is the 3-year post-hiring cumulative excess return, x_j is a vector of explanatory variables, and z_j is a dummy variable for whether a consultant was employed. The explanatory variables are computed as in earlier tables. The selection equation is $z_j^* = \gamma w_j + u_j$, where $z_j = \begin{cases} 1, \textit{if } z_j^* > 0 \\ 0, \textit{otherwise} \end{cases}$ and w_j is a vector of explanatory variables. The selectivity correction is done via a two-stage estimation procedure. The selection equations for the full sample, public plans, and corporate plans are as reported in Panel D of Table II and are not reported in this table. Standard errors (in parentheses) account for clustering in observations where the investment manager is hired for a mandate in the same style and period by different plan sponsors.

	All Plan Sponsors				Public Plans	Corp. Plans
Pre-Hiring Return	-0.17	-0.17	-0.24	-0.18	-0.17	-0.01
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.05)
Log (Plan Sponsor Size)	0.61	0.99	0.37	0.25	0.32	1.04
	(0.09)	(0.14)	(0.14)	(0.13)	(0.31)	(0.44)
Headline Risk-resistant Indicator	-1.13	-2.87	1.01	-0.38	-	-
	(0.80)	(2.01)	(1.72)	(1.18)		
Headline Risk-sensitive Indicator	-1.70	-4.12	-0.22	-0.63	-	-
	(0.07)	(1.06)	(0.12)	(1.18)		
Headline Risk-neutral Indicator	0.26	2.28	1.17	1.06	-	-
	(0.95)	(1.22)	(1.19)	(1.05)		
Expected Value of Consultant	2.02	6.19	1.95	1.70	0.82	1.74
	(0.43)	(1.37)	(0.62)	(0.59)	(1.10)	(1.44)
Consultant * Plan Sponsor Size	-	-0.64	-	-	-	-
		(0.18)				
Log (Mandate / $Assets_{t-1}$)	-	-	-0.22	-	-	-
			(0.11)			
Allocation Index	-	-	-	4.11	-	-
				(1.29)		
$Underfunded\ Indicator_{t-1}$	-	-	-	-	1.51	-4.48
					(3.01)	(3.07)
$Overfunded\ Indicator_{t-1}$	-	-	-	-	-1.62	-0.30
					(0.80)	(0.14)
Number of Observations	6,170	6,170	3,184	3,633	921	513

Table VI
Distribution of Firing Decisions by Plan Sponsors

Definitions for variables in Panels A and C are the same as those reported in Table I. Panel B shows the distribution of firing decisions by reasons identified by the data sources. Investment manager mergers may be either before the termination or impending. Regulatory action against the investment manager is both announced and ongoing. Personnel turnover at the investment management firm may be forced or voluntary. Plan reorganizations occur when two plans have to be merged. Plan reallocation category refers to firings because the plan sponsor has decided to move away from the asset allocation / investment style offered by the investment manager. The "not reported" category includes terminations in which the plan sponsors was asked the reason for the termination by deliberately did not offer a reason. When no public document contains information about the termination, the reason for the determination is determined to be missing.

	Number of	Plan Sponsor Size ($M)			Mandate Size ($M)		
	Firings	Mean	Median	N	Mean	Median	N
Panel A: Headline Risk and Plan Sponsor Type							
Headline Risk-resistant							
Corporate	112	2,209	700	777	95	37	80
Private Universities	29	176	150	27	16	13	19
Miscellaneous	47	4225	350	33	197	62	35
Headline Risk-neutral							
Endowments & Found.	29	6,899	722	24	31	35	13
Headline Risk-sensitive							
Local Public Plans	238	5,716	650	197	104	50	213
State Public Plans	181	24,319	13,200	143	304	200	157
Misc. Public Plans	128	3,494	618	101	107	50	111
Unions	75	383	190	57	103	20	70
Public Universities	30	273	200	26	21	10	23
Panel B: Distribution of Firing Decisions by Stated Reason							
Manager Merger	22	5,951	1,100	19	142	55	15
Manager Regulatory Action	53	13,375	2,214	48	258	112	38
Manager Personnel Turnover	49	9,425	487	42	76	35	44
Manager Performance	297	7,062	767	238	130	50	257
Plan Reorganization	36	9,555	422	28	131	70	31
Plan Reallocation	111	4,458	675	80	218	75	89
Not Reported	104	8,181	433	88	108	38	94
Missing	197	9,081	870	142	144	55	153
Panel C: Distribution of Firing Decisions by Funding Status							
Corporate Plans							
Underfunded	22	4,198	1,200	19	198	83	16
Overfunded	20	1,494	950	13	36	30	11
Public Plans							
Underfunded	182	19,966	8,350	164	237	200	161
Overfunded	76	21,593	12,000	52	286	200	60

Table VII
Two-way Frequency Distribution of Firing Decisions

The table shows the number of firing decisions for each identified reason and subgroup (panel), as well as the percentage of observations in that column and category. For example, of the 297 terminations identified as due to poor performance, 79.1% originated from sponsors that are sensitive to headline risk. Frequency distributions are not shown for the "not reported" and missing categories. Frequencies are also not reported from intermediate groups (i.e., headline risk-neutral plan sponsors, medium-size plan sponsors and sponsors with allocations indices in the middle group). Low and high cutoffs for the allocation index are based on the bottom and top quartiles. Similarly, small and large cutoffs for sponsor size are based on the bottom and top quartiles.

	Investment Manager Reasons				Plan Sponsor Reasons		
	Merger	Regulatory Action	Turnover	Performance	Reorganization	Reallocation	Total
Panel A: Headline Risk							
Headline Risk-resistant	9.1	24.5	14.3	18.8	25.0	19.8	21.6
Headline Risk-sensitive	90.9	67.6	81.6	79.1	75.0	73.9	75.0
Number of observations	22	53	49	297	36	111	869
Panel B: Public Plan Funding Status							
Underfunded Plans	66.7	90.5	77.8	75.6	84.6	53.3	70.5
Overfunded Plans	33.3	9.5	22.2	24.4	15.4	46.7	29.5
Number of observations	6	21	18	90	13	30	258
Panel C: Corporate Plan Funding Status							
Underfunded Plans	0.0	100	33.3	64.7	0.0	20	52.4
Overfunded Plans	0.0	0.0	66.7	35.3	100	80	47.6
Number of observations	0	4	3	9	3	1	42
Panel D: Allocation Index							
Low Allocation Index	35.0	25.0	35.7	30.8	30.0	37.8	32.1
High Allocation Index	20.0	12.5	16.7	22.3	6.7	16.3	20.9
Number of observations	20	48	42	247	30	98	708
Panel E: Consultant Use							
No Consultant	22.7	15.1	20.4	22.7	30.6	21.6	22.9
Consultant	77.3	84.9	79.6	77.3	69.4	78.4	77.1
Number of observations	22	53	49	297	36	111	869
Panel F: Plan Sponsor Size							
Small Plan Sponsors	20	11.1	21.1	31.2	37.9	39.2	31.7
Large Plan Sponsors	25	37.8	26.3	21.7	27.6	20.6	21.8
Number of observations	20	45	38	263	29	97	757

Table VIII
Pre-Firing Investment Manager Excess Returns

The table shows pre-firing cumulative excess returns for investment management firms. Panel A shows returns for terminations due to each of the stated reasons. Panel B shows the results of regressions with investment manager excess returns. The return regression is $y_j = \beta x_j + \delta z_j + \varepsilon_j$, where y_j is the 3-year pre-hiring cumulative excess return, x_j is a vector of explanatory variables, and z_j is a dummy variable for whether a consultant was employed. The selection equation is $z_j^* = \gamma w_j + u_j$, where $z_j = \begin{cases} 1, if\ z_j^* > 0 \\ 0, otherwise \end{cases}$ and w_j is a vector of explanatory variables. The selectivity correction is identical to the first model in Panel D of Table II. Heteroskedasticity, serial, and cross-correlation consistent standard errors are in parentheses and are calculated using the procedure described in Jegadeesh and Karceski (2004).

	Pre-Firing Period (years)		
	-3 to 0	-2 to 0	-1 to 0
Panel A: Firing Reasons			
All	0.33 (1.27)	-2.11 (1.27)	-0.72 (0.68)
Merger	6.86 (2.74)	5.50 (1.38)	4.17 (1.51)
Regulatory Action	-2.98 (5.31)	-1.87 (3.83)	-1.45(3.19)
Turnover	4.49 (3.11)	-0.62 (4.74)	1.24 (3.52)
Performance	-4.14 (1.26)	-7.01 (1.80)	-3.71 (0.88)
Reorganization	3.22 (1.14)	0.33 (1.29)	-1.37 (0.93)
Reallocation	1.42 (1.75)	0.30 (1.13)	0.79 (1.27)
Not Reported	4.00 (2.36)	-0.38 (0.98)	-0.62 (0.70)
Missing	3.27 (2.53)	1.29 (2.45)	2.25 (1.35)
Panel B: Selectivity-corrected Regressions using 3-year Pre-firing Returns for Performance-based Firings			
Constant	-10.76	-6.15	-13.10
	(11.91)	(17.48)	(19.93)
Headline-sensitive Indicator	-5.71	-8.16	-0.52
	(9.18)	(12.61)	(8.50)
Headline-resistant Indicator	-4.15	-3.05	-
	(9.22)	(13.25)	
Log (Plan Sponsor Size)	0.68	1.39	2.35
	(0.62)	(0.83)	(1.70)
Consultant Indicator	8.41	6.42	-14.73
	(10.25)	(14.80)	(15.73)
Allocation Index	-	12.36	-
		(7.96)	
Overfunded Indicator	-	-	5.65
			(6.12)
Number of Observations	212	159	80

Table IX
Investment Manager Excess Returns Before and After Firing

Panel A presents average cumulative excess returns computed by summing quarterly excess returns. Information on benchmarks is provided in Table A1. Heteroskedasticity, serial, and cross-correlation consistent standard errors standard errors are calculated using the procedure described in Jegadeesh and Karceski (2004). Panel B shows information ratios calculated as the average excess return scaled by the standard deviation of the excess return. Panel C shows estimates of alphas from calendar time regressions factor regressions with standard errors in parentheses. For domestic equity mandates, we use the Fama and French (1993) three-factor model with market, size, and book-to-market factors. For fixed income mandates, we employ a three-factor model with the Lehman Brothers Aggregate Bond Index return, a term spread computed as the difference between the long-term government bond return and the T-bill return, and a default spread computed as the difference between the corporate bond return and the long-term government bond return. For international equity mandates, we use an international version of the domestic equity three-factor model. In all pre- and post- return comparisons, we require a balanced sample (i.e., returns be available in matched pre- and post-firing horizons).

	Pre-firing Period (years)			Post-firing Period (years)		
	-3 to 0	-2 to 0	-1 to 0	0 to 1	0 to 2	0 to 3
Panel A: Cumulative Excess Returns						
Full Sample	2.27	-2.06	-0.74	0.98	1.47	3.30
	(2.10)	(1.20)	(0.61)	(0.77)	(1.27)	(1.46)
Domestic Equity	2.63	-3.28	-1.26	0.83	1.15	3.44
	(3.41)	(1.38)	(0.71)	(1.08)	(1.76)	(2.57)
International Equity	9.15	3.72	2.42	1.52	2.66	4.10
	(0.82)	(1.87)	(1.61)	(1.35)	(3.11)	(3.59)
Fixed Income	-1.54	-1.47	-0.86	0.91	1.51	2.19
	(0.86)	(1.39)	(0.62)	(0.55)	(1.04)	(1.58)
Panel B: Information Ratios						
Full Sample	0.36	-0.37	-0.09	0.76	1.49	2.12
Domestic Equity	0.63	-0.31	-0.15	0.30	0.97	1.39
International Equity	2.18	0.74	0.67	0.12	0.66	0.62
Fixed Income	-1.09	-1.09	-0.28	2.21	3.23	4.35
Panel C: Calendar Time Alphas from Factor Regressions						
Domestic Equity	-0.06	-0.42	-0.57	0.45	0.14	0.10
	(0.22)	(0.19)	(0.21)	(0.55)	(0.36)	(0.32)
International Equity	0.42	0.01	-0.63	1.00	0.64	0.57
	(0.25	(0.26)	(0.68)	(0.52)	(0.30)	(0.27)
Fixed Income	0.03	0.15	0.19	0.33	0.30	0.30
	(0.14)	(0.11)	(0.13)	(0.09)	(0.09)	(0.08)

Table X
Round-trip Excess Returns for Investment Managers

Returns are cumulated separately for hired and fired firms. In Panel A, we show the separate returns for hired and fired investment managers, as well as the return differential for the entire sample of round-trips. In Panel B, we show only the return differential for various subsamples. Heteroskedasticity and serial correlation consistent standard errors are calculated using the procedure described in Jegadeesh and Karceski (2004) and appear in parentheses. Low and high cutoffs for the allocation index are based on the bottom and top quartiles. Similarly, small and large cutoffs for sponsor size are based on the bottom and top quartiles.

	Pre-event Period			Post-event Period		
	-3 to 0	-2 to 0	-1 to 0	0 to 1	0 to 2	0 to 3
Panel A: Cumulative Excess Returns						
Fired Firms	2.03	-1.57	-0.11	1.83	3.14	4.26
	(1.56)	(1.51)	(0.83)	(0.82)	(1.47)	(1.45)
Hired Firms	11.55	7.55	4.46	1.34	2.26	3.23
	(3.11)	(1.60)	(1.52)	(0.42)	(0.56)	(0.41)
Return Differential	9.52	9.12	4.56	-0.48	-0.88	-1.03
(Hired-Fired)	(2.47)	(2.30)	(1.00)	(0.78)	(1.33)	(1.14)
Number of round-trips	331	389	412	412	389	331
Panel B: Return Differentials (Hired-Fired Returns) for Subsamples						
Performance	13.13	12.36	6.13	-0.66	-0.56	-0.79
	(2.67)	(2.94)	(1.27)	(1.34)	(1.73)	(1.79)
Nonperformance	7.89	7.58	3.80	-0.40	-1.04	-1.14
	(2.81)	(2.35)	(0.96)	(0.60)	(1.14)	(0.88)
p-value for difference	0.06	0.10	0.02	0.81	0.56	0.73
Headline Risk-sensitive	9.55	9.57	4.55	-0.26	-0.76	-0.68
	(2.33)	(2.48)	(0.70)	(0.66)	(1.41)	(1.29)
Headline Risk-resistant	9.57	7.62	4.98	-1.46	-1.13	-2.18
	(2.51)	(2.51)	(2.72)	(1.45)	(1.85)	(2.29)
p-value for difference	0.99	0.58	0.87	0.30	0.73	0.38
Small Plan Sponsors	6.14	5.36	3.32	-0.54	-1.34	-1.39
	(1.91)	(1.62)	(1.02)	(1.14)	(1.37)	(1.33)
Large Plan Sponsors	13.21	11.68	4.80	-0.30	0.19	0.53
	(2.31)	(1.50)	(0.55)	(0.38)	(0.88)	(0.51)
p-value for difference	0.26	0.22	0.42	0.84	0.25	0.07
Low Allocation Index	11.59	10.73	4.39	-1.49	-1.79	-2.17
	(2.78)	(2.44)	(1.32)	(1.18)	(2.08)	(1.87)
High Allocation Index	10.61	9.87	5.33	0.06	-0.77	0.25
	(3.72)	(3.21)	(1.07)	(1.02)	(1.16)	(0.97)
p-value for difference	0.75	0.73	0.29	0.10	0.45	0.14
No Consultant	3.24	2.08	2.00	-1.11	-1.04	-1.11
	(1.49)	(1.04)	(1.04)	(1.03)	(0.79)	(0.79)
Consultant	10.69	10.25	4.97	-0.39	-0.86	-1.02
	(2.27)	(2.19)	(1.01)	(0.92)	(1.67)	(1.53)
p-value for difference	0.10	0.05	0.03	0.57	0.85	0.92

Table A1
Investment Mandates and Indices

Investment Mandate	Description	Index
Domestic Equity		
Largecap	Large-cap equity	S&P 500
Largecapcore	Large-cap – between growth & value	S&P 500
Largecapgrowth	Large-cap – growth	S&P 500/BARRA Growth
Largecapvalue	Large-cap – value	S&P 500/BARRA Value
Midcap	Mid-cap equity	S&P Midcap 400
Midcapcore	Mid-cap – between growth and value	S&P Midcap 400
Midcapgrowth	Mid-cap – growth	S&P/BARRA Mid Cap Growth
Midcapvalue	Mid-cap – value	S&P/BARRA Mid Cap Value
Smallcap	Small-cap equity	S&P Small Cap 600
Smallcapcore	Small-cap – between growth and value	S&P Small Cap 600
Smallcapgrowth	Small-cap – growth	S&P/BARRA Small Cap Growth
Smallcapmicro	Small-cap – value	S&P Small Cap 600
Smallcapvalue	Small-cap equity	S&P/BARRA Small Cap Value
Smid	Small to mid-cap equity	Russell 2500
Smidcapcore	Small to mid-cap – between growth and value	Russell 2500
Smidcapgrowth	Small to mid-cap – growth	Russell 2500 Growth
Smidcapvalue	Small to mid-cap – indexed	Russell 2500 Value
Equitygrowth	All equity - growth	Russell 3000 Growth
Equityvalue	All equity – value	Russell 3000 Value
Equitycombined	All equity	Russell 3000
International equity		
Emergmkteq	Emerging market equity	MSCI Emerging Mkts Free
Europeincuk	Europe incl. U.K.	MSCI Europe 15
Europeincuksm	Europe incl. U.K. – small-cap	MSCI Europe S/C
Globaleq	Global equity (incl. U.S.)	MSCI World Free
Intleq	International equity	MSCI EAFE Free
Intleqsmall	International equity – small-cap	MSCI EAFE S/C
Pacbasinincj	Pacific basin incl. Japan	MSCI AC Pacific Free
Fixed income		
Convertibles	Convertibles	Merrill Lynch Inv Grade Convertible
Fixed1-3yrs	Duration between 1 and 3 years	Merrill Lynch Govt/Corp 1-3 Years
Fixedcore	Inv. and non-inv. grade, duration 3-7 years	Lehman Aggregate
Fixedcoreinvest	Inv. grade, duration 3-7 years	Lehman Aggregate
Fixedcoreopportun	Non-inv. grade, duration 3-7 years	Lehman Aggregate
Fixedhighyield	High yield securities	Lehman High Yield Composite
Shortterm	Duration between 1 and 2.4 years	Citigroup 3-Month T-Bill
Fixedintermed	Duration between 2 and 4.6 years	Lehman Int. Aggregate
Fixedlongdura	Duration greater than 6 years	Lehman Long Govt/Credit
Mortgageb	Mortgage-backed securities	Lehman Mortgages
Fixedcombined	All fixed income	Lehman Aggregate
Emergmktdebt	Emerging market debt	JP Morgan ELMI+

Globalfixhedg	Global fixed income - hedged	Lehman Global Aggregate (Hedged)
Globalfixunhedg	Global fixed income - unhedged	Lehman Global Aggregate (Unhedged)
Intlfixedhedg	International fixed income – hedged	Citigroup Non-US WGBI (Hedged)
Intlfixedunhedg	International fixed income - unhedged	Citigroup Non-US WGBI (Unhedged)
Others		
Realestate	Real estate	NCREIF Property
Realestateselect	Real estate select	NCREIF Property
Reits	Reits	NAREIT
Taa	Tactical asset allocation	Average of S&P 500 and Lehman Aggregate
Balanced	Balanced	Average of S&P 500 and Lehman Aggregate

Appendix A: Standard Error Calculation

The sample comprises *N* hiring/firing decisions of investment managers by plan sponsors ("events"). We wish to test whether the managers exhibit excess return performance from the event date through a *H*-quarter holding period. We define the *H*-quarter cumulative excess return (C*ER*) for investment manager *i* that starts at the beginning of the event quarter *t* as the cumulative excess return:

$$CER_i(t,H) = \sum_{s=t}^{t+H-1}\left(R_{i,s} - R_{b,s}\right), \tag{A1}$$

where $R_{i,s}$ is the return on the mandate type by the investment manager *i* in quarter *s*, and $R_{b,s}$ is the return on the benchmark *b* in quarter *s*. Define:

$$\overline{CER}_{\text{sample}}(H) = \frac{1}{N}\sum_{i=1}^{N} CER_i(t,H)\,. \tag{A2}$$

Let N_t equal the number of events in the sample in qurter *t*, and let *N* be the total number of events in the sample. Therefore $N = \sum_{t=1}^{T} N_t$. Define the average abnormal return for each event quarter *t* across all events in that quarter (we refer to this group of events as a quarterly cohort) as:

$$\overline{CER}(t,H) = \begin{cases} \dfrac{1}{N_t}\displaystyle\sum_{i=1}^{N_t} CER_i(t,H) & \text{, if } N_t > 0 \\ 0 & \text{otherwise} \end{cases} \tag{A3}$$

Let $\overline{CER}(H)$ be a $T \times 1$ column vector where the t^{th} element equals $\overline{CER}(t,H)$. $\overline{CER}(H)$ is the average long-run excess return of each quarterly cohort. Define *w* as a $T \times 1$ column vector of weights where the t^{th} element is the ratio of the number of events that occur in quarter *t* divided by *N*. Specifically, $w(t) = N_t / N$. Note that the sample average excess return is equal to the quarterly weight vector *w* times the average excess return of each quarterly cohort:

$$\overline{CER}_{\text{sample}}(H) = w'\,\overline{CER}(H)\ . \tag{A4}$$

The variance of $\overline{CER}_{\text{sample}}(H)$ is given by

$$\sigma^2\left(\overline{CER}_{\text{sample}}(H)\right) = w'Vw\ , \tag{A5}$$

where *V* is the $T \times T$ variance covariance matrix of $\overline{CER}(H)$.

Our estimator for V allows for heteroskedasticity as well as serial correlation and is denoted as HSC. The st^{th} element of *HSC* is

$$hsc_{st} = \begin{cases} \dfrac{(H-l)}{l}\overline{CER}(s,H)\,\overline{CER}(t,H), & \text{if } l = |s-t| < H \\ 0 & \text{otherwise} \end{cases} \tag{A6}$$

This estimator uses the Newey and West (1987) weighting scheme and ensures that *HSC* is positive definite.

Footnotes

[1] Institutions are more likely to be marginal traders than individual investors in most markets; consequently, their impact on asset pricing could be substantial. This is eloquently described by Cornell and Roll (2005) who argue "… consumption decisions, whether to buy a television or take a vacation are made by consumers. The decision to buy IBM or Intel is delegated," and develop a simple yet elegant delegated-agent asset pricing model.

[2] A partial list of contributions in the literature on performance and persistence includes, Bollen and Busse (2005), Brown and Goetzmann (1995), Carhart (1997), Carhart et al. (2004), Daniel et al. (1997), Elton et al. (1992), Goetzmann and Ibbotson (1994), Grinblatt and Titman (1992), Grinblatt, Titman, and Wermers (1995), Hendricks, Patel, and Zeckhauser (1993), Ippolito (1989), Jensen (1968), Wermers (2000), and Zheng (1999). Fund flows and returns are studied by Chevalier and Ellison (1999), Gruber (1996), and Sirri and Tufano (1998). The third stream includes Barber and Odean (2000), Barber, Odean, and Zheng (2005), and Odean (1998, 1999). This list of citations is certainly not comprehensive. Omissions are not willful and we offer our apologies to authors not cited.

[3] Although we frequently refer to "investment managers," our unit of analysis throughout the paper is the investment management firm, not individuals at these firms.

[4] These results are similar to those of Odean (1998) for retail investors and Elton, Gruber, and Blake (2006) for 401(k) plans. Odean finds that the excess returns on winning stocks sold by individual investors are larger than the excess returns on loser stocks that could be, but are not, sold. Elton, Gruber, and Blake (2006) find that administrators select funds that did well in the past but after the change, do no better than funds that were dropped.

[5] If such frictions are important, then one would expect the return threshold for retention decisions (in which an incumbent manager is "rehired") to be lower than for brand new hiring decisions. Consistent with this, we find that pre-retention excess returns are positive but lower than pre-hiring excess returns.

[6] A fourth possible explanation is that plan sponsors are simply unaware of these costs. We deem this explanation implausible.

[7] Such plans are set up under Section 302(c) (5) of the Taft-Hartley Act, passed by Congress in 1947. Plan assets are jointly managed by a board of trustees representing labor and management. This is a sizeable

market. Brull (2006) reports that 1,600 multiemployer plans had assets totaling $333 billion in 2002, and covered almost 10 million workers in 2005. He also reports that some 30,000 single-employer plans reported assets of $1.6 trillion in 2002 and covered 34.6 million workers.

[8] Two well-known examples of this are David Swensen of the Yale University Endowment and Jack Meyer of the Harvard University Endowment.

[9] Although this allocation index measures the strategic aspect of investment policy restrictions, to the extent that strategic and tactical restrictions are correlated, it is a proxy for both.

[10] As a spot check, we check the value of this index for a handful of plan sponsors for which we obtain direct information on investment restrictions. We find that index values are indeed lower for plan sponsors that have quality and/or quantity restrictions on asset allocations.

[11] Although the dependent variable is an excess return (say, raw return of a small-cap value manager minus the return on a small-cap value index), there may still be heterogeneity in investment manager returns within small-cap value asset class. For example, one manager might invest in micro-cap securities exclusively, even though it is regarded as small-cap. These indicator variables account for such effects.

[12] We also place some very low frequency reasons in the above categories. Terminations because the consultant drops coverage of an investment manager (4 observations), because the plan sponsor is consolidating the number of managers to cut costs (22 observations), and because the plan sponsor has funding needs (5 observations) are placed in the plan reorganization category. Three observations in which investment managers are terminated for style drift are included in the performance category.

[13] We restrict our search for matching hiring decisions to one quarter after the firing to limit the amount of manual data collection required.

[14] We only report results for subcategories with reasonable sample sizes. Also, we report return differentials, rather than separate firing and hiring returns to conserve space.

[15] Subtracting a constant from the mean return obviously does not change the standard errors and will "make" the excess returns statistically significant.