

Employee Ownership of Institutional Investment Management Firms

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Abstract

We empirically examine employee ownership of institutional investment management firms. We show that employee ownership is common, and the majority of firms in this industry are employee owned. The distribution of employee ownership is consistent with an optimal contracting equilibrium. It is more prevalent when it is less costly, more efficient, and when alternative incentives are less attractive. The level of employee ownership does not predict risk-adjusted returns, also consistent with an optimal contracting equilibrium. Finally, we show that employee ownership predicts risk taking. Portfolios managed by employee owners have significantly higher tracking errors, betas, and standard deviations even after controlling for firm characteristics.

JEL Classifications: G11, G23, G32

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Institutional investment management firms are the single largest category of investors in the U.S. equity market. These firms manage portfolios on behalf of institutional clients such as pension funds, university endowments, and charitable foundations. As of December 2005, institutional investment management firms (IIM firms) managed \$5.8 trillion worth of U.S. equities, almost a trillion dollars more than the second largest category of investors, mutual funds¹. Despite the massive amount of wealth controlled by these firms, surprisingly little academic research has focused on this industry.

Although IIM firms all offer the same primary service, delegated portfolio management, many different organizational structures coexist within the industry. One structure which varies widely is employee ownership². Slightly over half of the firms in this industry are wholly employee owned, 29% have no employee ownership, and the rest are partially employee owned. In this paper, we address the questions: Why do so many different employee ownership structures coexist among firms providing similar services? Does the variation in employee ownership structures predict performance or investment behavior?

We take an optimal contracting approach to answering these questions. We view employee ownership as one tool IIM firms use to reduce agency problems with their employees. Of course, IIM firms can use other incentives to motivate their employees. They will select employee ownership only when the benefit of employee ownership outweighs the cost relative to alternative incentives. We identify variables measuring these costs and benefits and analyze the determinants of employee ownership.

We begin by examining aggregate employee ownership at the firm level. Consistent with an optimal contracting equilibrium, employee ownership is lower when it provides less benefit,

¹There is some double counting between these two categories of investors. Many mutual funds outsource portfolio management to IIM firms. For example, Vanguard markets the Vanguard Wellington Fund. Stock selection for this fund is outsourced to Wellington Management Company. The Vanguard fund is counted as part of mutual fund assets, and these assets are counted again as part of Wellington's assets.

²Throughout this paper we use the term ownership to refer to ownership of investment management firms. We do not use this term to describe the holder of portfolio securities.

which we measure in several ways. First, when many people contribute to the success of the firm the free rider problem is greater and the incentive effect of employee ownership is weaker. We find strong support for this argument. Employee ownership is decreasing in the number of professional employees, the number of investment styles offered by the firm, and the amount of assets under management. Second, one benefit of employee ownership is that it reduces the need for firms to monitor employees, but this benefit is small when the cost of monitoring is low. Consistent with this idea, employee ownership is lower in firms with a large proportion of indexed funds.

Our next step is to look within firms, and examine several factors which predict individual employee ownership. First, we find that portfolio managers who manage a large proportion of their firms' assets and portfolios, and thus generate a large proportion of their firms' profits, have higher ownership. Second, when an employee has multiple roles within the firm, ownership will be an attractive incentive, because it rewards the value maximizing allocation of effort across tasks. Consistent with this idea, we find that portfolio managers who are also firm executives have significantly higher ownership. Third, employee ownership creates a strong link between the firm and the employee. This is less costly when there is low uncertainty about employees' quality. We find that portfolio managers with longer tenure have higher ownership. Fourth, ownership provides a coordinating incentive that encourages cooperation within firms. We find that portfolio managers whose investment style overlaps with their firms' dominant style have higher ownership, which we interpret as due to the benefits of creating an incentive to share information and methodologies. These results hold even after including firm fixed effects.

If firms and employees optimally allocate ownership, then employee ownership will not predict performance. If employee ownership predicted performance, then firms would alter their ownership structure and clients would alter their investment flows to eliminate the outperformance. However, because ownership rarely changes shocks to the economic envi-

ronment may have resulted in suboptimal ownership structures. This does not appear to be the case. Consistent with equilibrium, we find no relationship between firm level employee ownership and risk adjusted performance. After controlling for firm characteristics, there is no evidence that portfolio managers' ownership of IIM firms predicts performance.

Employee ownership alters firms' risk taking incentives in two ways. First, employee ownership reduces risk sharing decreasing employees' incentive to take risk. Second, employee owners are less likely to be terminated, reducing their career concerns and increasing their ability to bear risk. We test which of these effects dominates by regressing portfolio risk on employee ownership of IIM firms. The results show that portfolios managed by employee owned firms, and portfolios managed by individual employee owners, have higher tracking errors, betas, and standard deviations. Even after including firm fixed effects, portfolios managed by employee owners have higher risk.

Our work contributes to the literature on agency problems in delegated portfolio management. Most of the existing literature has focused on the agency problem between portfolio management firms and investors. For example, Almazan, Brown, Carlson, and Chapman (2004) show that explicit investment restrictions are a substitute to other control mechanisms used to protect investors. Chen, Goldstein, and Jiang (2008), Del Guercio, Dann, and Partch (2003), Khorana, Tufano, and Wedge (2007), Meschke (2006), and Tufano and Sevick (1997) show that mutual funds boards' characteristics explain fee setting and restructuring decisions. Deli (2002) empirically examines mutual fund contracts and finds that variation in fund fees is consistent with rational contracting.

While there have been many studies of the agency problem between investors and portfolio management firms, there has been far less research on agency problems within portfolio management firm. Clearly these agency problems are linked. To minimize agency problems with investors, portfolio management firms must control their employees. The earliest studies of agency problems within portfolio management firms, Chevalier and Ellison (1999) and

Khorana (1996) focus on the role of career concerns in aligning employees' interests with the firm. Specifically, they show that poor performance leads to termination. Gervais, Lynch, and Musto (2005) derive a model explaining these empirical findings. They assume that mutual fund families are better informed about portfolio managers' quality, and they can credibly signal their information to investors by terminating some portfolio managers.

In addition to disciplining portfolio managers through termination, investment management firms can reward employees for good performance. Kempf and Ruenzi (2008) find that relative performance within mutual fund family results in risk shifting, which they attribute to competition among portfolio managers for promotion and access to resources. Farnsworth and Taylor (2006) survey portfolio managers about compensation. They show that performance based bonuses are widespread. Interestingly, bonuses are usually discretionary rather than formula based, and investment performance is not the primary determinant. Khorana, Servaes, and Wedge (2007) show that mutual fund managers who invest in their own funds have positive risk-adjusted performance.

Our paper continues this line of research on agency problems within portfolio management firms. We make several novel contributions. Most importantly, this is the first study of the role of employee ownership in portfolio management companies. Employee ownership is related to firms' economic structure and investment behavior, and is widespread but it has not received any prior academic attention. This is also the first study of agency issues within the institutional investment management industry.

More generally, our results contribute to the literature on employee ownership and its role in controlling agency problems. There is an old debate in the finance literature on the effect of employee ownership on performance. McConnell and Servaes (1990) and Morck, Shleifer, and Vishny (1988) argue that employee ownership of publicly traded corporations has an observable effect on firm value. On the other side, Demsetz (1983), Demsetz and Lehn (1985), and Himmelberg, Hubbard, and Palia (1999) argue that competitive pressure forces

firms to optimally allocate ownership, and that employee ownership varies depending on its costs and benefits. Further, they believe that any observed relationship between ownership structure and firm value is the result of an omitted variable bias caused by failing to include factors which affect ownership. Our results are consistent with the optimal allocation of ownership within firms, and we do not find a relationship between employee ownership and performance. Our sample includes a large number of private firms, and so we observe a much greater range of employee ownership than previous studies.

The final contribution of our paper is that we provide a detailed description of the structure and organization of institutional investment management firms. The few prior studies of IIM firms have primarily focused on performance persistence. Busse, Goyal, and Wahal (2007), Christopherson, Ferson, and Glassman (1998), Coggin, Fabozzi, and Rahman (1993) and Lakonishok, Shleifer, and Vishny (1992) all find evidence of IIM firm performance persistence. Del Guercio and Tkac (2002) focus on fund flows rather than performance persistence, and show that the performance fund flow relationship is linear for IIM firms. With our focus on employee ownership we provide a far more detailed description of the structure IIM firms than prior papers.

1. The Institutional Investment Management Industry

Like mutual funds, institutional investment management (IIM) firms provide delegated portfolio management services to their clients. However, IIM firms differ from mutual funds in several important ways. First, mutual funds directly own their portfolios, and mutual fund shares represent claims on these portfolios. IIM firms provide security selection services, but typically their clients directly own the securities. Second, IIM firms have large minimum investments, and their clients are institutional investors and wealthy individuals. Third, unlike mutual funds, the portfolios do not have a board of directors to protect investors' interests, and there currently exists little SEC regulation.

Figure 1 shows the basic structure of one fairly typical institutional investment management firm, River Road Asset Management. In 2006, the firm was owned by a professional services company, River Road Partners, and the Dutch bank ABN AMRO. In turn, River Road Partners was owned by James Shercliff and R. Andrew Beck, the CEO and President of River Road Asset Management, respectively. The firm offers portfolio management services in several distinct investment styles, such as River Road Small Cap Fund. Clients allocate funds to this product and pay a fee for portfolio management services.

More generally, all IIM firms offer their clients portfolio management products, which represent security selection services in a specified investment style. Frequently, within a product each client's assets are held in separate accounts. A product's performance is a value-weighted composite of the constituent accounts. Each account in a composite will hold the same portfolio, subject to some variation resulting from differences such as social responsibility screens and diversification restrictions.

2. Theory and Hypotheses

Ownership structures vary widely in the institutional investment management industry. Our goal is to understand why this variation occurs, and its relation to investment behavior. To examine these questions, we use an optimal contracting perspective. We view employee ownership as one tool IIM firms use to align employees' interests with the firm. In equilibrium, IIM firms and employees will jointly determine ownership by trading off the costs and benefits, while also considering alternatives.

The IIM industry is highly competitive for two reasons. First, the barriers to entry are low. Second, clients can withdraw funds under management. The combination of these two factors creates strong product market competition. Fama and Jensen (1983a) argue that firms with the lowest cost structure will be the ones to survive competition. Failure

to efficiently solve agency problems will result in higher prices or worse performance, and eventually firm failure. To survive, IIM firms must optimally allocate ownership.

2.1. The Costs of Employee Ownership

Fama and Jensen (1983b) and Demsetz and Lehn (1985) state that employee ownership is costly because it requires risk-averse employees to hold undiversified portfolios. As a result, equity is worth substantially less to employees than to diversified outsiders. Employee ownership may also distort incentives and encourage employee owners to invest in low risk projects to reduce their personal risk, even if these investments are inferior. Empirically this implies that, all else equal, firms with lower risk will have higher employee ownership³. As many of the firms in our sample are private, we do not directly observe firms' equity price volatility, and we do not directly observe profits. However, profits are a function of assets managed⁴, so the volatility of a firm's assets under management will be strongly correlated with firm risk.

Employee ownership provides a strong incentive when a small number of individuals control the key decisions that determine firm performance. However, Fama and Jensen (1983a) argue that when decision making is dispersed throughout the firm, the incentive effect of ownership is diluted, and free riding will occur. As decision making becomes increasingly dispersed throughout the firm, individual specific incentives such as salary and bonuses, become relatively more efficient. Thus we expect employee ownership to decrease as the number of business segments, employees, funds, and breadth of products offered increases.

Employee ownership reduces or eliminates a firm's ability to terminate an employee. This is not entirely a bad thing. Chevalier and Ellison (1999) show that fear of termination causes portfolio managers to herd. By reducing the probability of termination, employee ownership

³Another important consideration is that employees' outside wealth should influence their willingness to own their employer. Unfortunately we cannot observe employees' wealth.

⁴Most firms are compensated as a percentage of assets under management. Many firms also offer clients the option of paying partially through incentive fees.

helps to create the correct ex ante incentives. However, ex post, once a firm has acquired additional information about an employee's skill, the option to terminate is valuable. Because employee ownership makes termination costly or impossible, it reduces the firm's options. When the firm is certain that an employee's quality is high, it is less costly to give up the option to terminate the employee. Since the firm learns about employee quality over time, employee ownership should be higher for employees with long tenure.

Lakonishok, Shleifer, and Vishny (1992) show that the IIM industry is composed of two segments: a small set of large firms which offer generic products and compete by offering low costs and stability, and a large number of small boutique firms offering specialized niche products. Economies of scale are more important for generic low cost products. Since high employee ownership limits firms' ability to raise external capital, we expect that employee ownership will be low for large firms offering generic products and high for small specialized firms.

2.2. The Benefits of Employee Ownership

The most obvious benefit of employee ownership is that it creates an incentive to exert effort. Of course there are other incentives, such as bonuses, profit sharing, and career concerns. We expect employee ownership to be high when the benefits of employee ownership are high and the costs are low relative to alternatives.

Relative to other incentives, an advantage of employee ownership is that it correctly aligns employees' incentives with the firm. This will be especially important when employees have multiple roles within the firm, and the correct allocation of effort across roles depends on employees' information. This information asymmetry will weaken other incentives. Bonuses will be inefficient because the firm does not know how the employee should allocate their effort, and profit sharing will cause employees to trade long term value creation for short term profits. Fama and Jensen (1983a) argue that when decision rights and decision control

are held by a single individual it is optimal for them to have ownership. As a result, we expect employees who manage multiple portfolios or who manage the firm to have higher employee ownership.

In the previous subsection, we stated that employee ownership is a diluted incentive because its value depends on the actions of all employees. However, this can be beneficial if the firm needs to coordinate employees' actions. There is evidence that cooperation within portfolio management firms is important. Farnsworth and Taylor (2006) show that firm performance has a larger effect on bonuses than individual performance in IIM firms. Pomorski (2008) shows that information sharing between mutual funds within a family is important, and that information sharing is higher when funds have similar styles. Since information sharing is more valuable for products with similar styles, we hypothesize that employee ownership should be higher when a firm's product offerings are concentrated in a narrow range of investment styles.

Fama (1980) argues that career concerns will align employee interests with the firm. However, Holmstrom (1982) shows that when effort is unobserved and output is noisy, career concerns will usually fail to fully align incentives. For example, career concerns diminish close to retirement resulting in reduced effort. Morrison and Wilhelm (2004) develop a model of partnerships, which closely resemble many of the IIM firms in our sample. In their model, firms benefit when senior employees mentor young employees to transfer soft skills. However, because mentoring is unverifiable and noncontractible, senior employees will underinvest in mentoring. Employee ownership is a solution to this problem, as senior employees can sell their equity to the younger employees at retirement⁵. The price paid at retirement will depend on the retirees' prior investment in mentoring. Because employee ownership can be sold at retirement, it provides an incentive for older employees. Empirically this implies that

⁵Anecdotally, we are told it is common for retiring employee owners to sell their equity to junior employees. We thank Steven M. Levitt of Park Sutton Advisors for helpful discussions on this point.

longer tenure employees will have higher ownership.

Employee ownership is the only incentive that does not require external monitoring. This implies that employee ownership should be high when there are large benefits to aligning incentives and external monitoring is difficult. Chen, Goldstein, and Jiang (2008) and Cremers, Driessen, Maenhout, and Weinbaum (2006) argue that monitoring is more valuable and more difficult when products hold risky assets, actively trade, and have high turnover. Thus, we expect to see higher employee ownership for firms managing portfolios with these characteristics. Cremers et al. also argue that there are economies of scale in portfolio monitoring, which suggests that employee ownership will be higher for firms with less assets under management.

2.3. Employee Ownership and Performance

Does employee or portfolio manager ownership reliably predicts performance? Intuitively it seems that employee ownership and skill should be positively related. Portfolio managers who know their skill is high will form their own firms and existing firms will offer their most skilled employees ownership. However, this does not necessarily imply an observable relationship between employee ownership and alpha.

If employee ownership is optimally determined in equilibrium, two forces will prevent employee ownership from predicting performance. First, if employee ownership caused outperformance competition would cause firms to alter their ownership structures until the outperformance was eliminated. Second, clients select firms based on expected net-of-fee alpha. Even if employee ownership predicts, but does not cause outperformance, it would affect fund flows. Berk and Green (2004) show that if there are decreasing marginal returns to scale in portfolio management, then in equilibrium clients will allocate money to firms with predictably positive alphas until expected alpha is zero. Given that Chen, Hong, Huang, and Kubik (2004) and Pollet and Wilson (2008) show that mutual funds have di-

minishing marginal returns to scale, this suggests that fund flows will eliminate performance predictability. However, employee rarely changes and fund flows may not fully eliminate predictability and so we test if employee ownership predicts performance.

2.4. Employee Ownership and Risk Taking

Fama and Jensen (1983b) argue that risk-averse employee owners will choose to reduce firm risk, because of their undiversified holdings. However, employee ownership reduces or eliminates firms' ability to terminate employees, which decreases employees' career concerns⁶. Prior studies show that mutual fund managers' career concerns affect portfolio risk. Chevalier and Ellison (1999) show that younger managers, whose termination-performance relationship is stronger, take on less unsystematic risk and hold more conventional portfolios. Khorana (2001) shows that following poor performance, portfolio managers increase portfolio risk prior to termination. These papers suggest that employee ownership will affect risk taking, but the direction of the relationship is unclear. Ownership will increase employees' rewards from positive outcomes. But for negative outcomes the ownership has two competing effects: employee owners will suffer direct losses if their firms' products underperform, but they have lower career concerns. Whether higher potential rewards and lower career concerns outweigh potential capital losses is an empirical question.

There are two types of investment risk affecting IIM firms: asset price volatility and tracking error. Since fees are based on a percentage of assets managed, revenue will fluctuate along with asset prices. Firms can control this risk by managing their portfolios' betas and standard deviations. Fund flows are heavily influenced by performance relative to a benchmark as shown by Del Guercio and Tkac (2002) and James and Karciski (2006) show that institutional funds have a linear performance-flow relationship⁷ and underperforming a

⁶In our sample, we find a very strong negative relationship between employee ownership and termination, for both key personnel and portfolio managers. Results are available from the authors upon request.

⁷Del Guercio and Tkac (2002) and James and Karciski (2006) show that the performance- fund flow relationship is linear for IIM firms' products. We find a similar result in our sample.

benchmark results in significant outflows. Portfolio managers can reduce the risk of outflows by tracking the benchmark closely.

3. Data

We use two datasets in this study: a panel of Form ADVs⁸ filed with the SEC, and the PSN Database produced by Informa Investment Solutions. All IIM firms with at least \$25 million in assets under management are required to file Form ADV⁹. Firms must file Form ADV at least annually and more frequently if there are material changes to the firm, including changes to owners controlling more than 5% of the firm. We have a panel of all Form ADV filings from 2000¹⁰ through 2006, including the filings of defunct firms. This panel should be comprehensive and survival bias free, because firms are legally required to file Form ADV.

The PSN database¹¹ is designed for plan sponsors and consultants to identify potential asset managers. It contains information on investment performance as well as firm and portfolio characteristics. Although the PSN Database begins in 1979, we use only the portion that overlaps with our Form ADV data from 2000-2006.

3.1. Employee Ownership of Institutional Investment Management Firms

We obtain information on employee ownership of IIM firms using information from SEC Form ADV. Schedule A of Form ADV requires each firm to list all direct owners with a

⁸Active IIM firms' most recent Form ADV filings are available at : http://www.adviserinfo.sec.gov/IAPD/Content/Search/iapd_OrgSearch.aspx.

⁹Intentional misstatement, deliberate omission, or failure to file Form ADV is a federal crime. In practice, criminal prosecution is rare and firms are brought into compliance by the threat of legal action.

¹⁰We have all Form ADV filings from January 1, 2000. However, firms can file as little as once per year, and so we use Form ADV information from the beginning of 2001 to be certain our sample is complete.

¹¹Berzins and Trzcinka (2005) and Del Guercio and Tkac (2002) use Mobius Group's M-search database. In 2006 Informa Investments purchased and integrated the Mobius database into the PSN Database.

stake greater than 5%, as well as all executive officers and directors regardless of ownership. Each owner is required to list their title or status within the firm. Schedule B identifies indirect ownership, which is common as many employees own equity through layers of trusts and holding companies. Both schedules report ownership by categories rather than exact percentages. We impute ownership using an algorithm described in the Appendix. Because non-executive owners with less than 5% ownership are not required to report, we do not observe ownership stakes below 5% for non-executives. However, we will observe employee ownership that represents meaningful control rights over firms' operations.

Employee ownership of firms is common in the institutional investment management industry. Table 1 Panel A shows 72.6% of firms have employee ownership greater than zero. We include three measures of employee ownership: the largest position, the sum of the three largest positions, and total employee ownership. The summary statistics are calculated conditional on employee ownership greater than zero. Clearly, employee ownership is concentrated. The average largest position is 56.8%, the average top three positions is 78.2%, and average total employee ownership is 89.5%.

We also look within firms, and measure individual portfolio managers' ownership. By combining Form ADV data with portfolio manager names from the PSN database to identify portfolio managers who are also employee owners. Table 1 Panel A shows that 17.5% of the products in the sample are managed by portfolio managers with at least a 5% ownership stake in their firm. Conditional on non-zero ownership, the average portfolio manager's ownership is 52.1%.

3.2. Institutional Investment Management Firms

Table 1 Panel B shows there are 1,118 firms in the intersection of the Form ADV sample and PSN database. Table 2 Panel A shows the firms divided into four categories: zero employee ownership, minority employee owned, majority employee owned, and wholly em-

employee owned. The majority of firms are wholly employee owned and 28.8% have no employee ownership. Majority employee ownership is about twice as common as minority employee ownership.

Table 2 Panel A shows that firms with zero employee ownership have far more professional employees and manage more separate products. Minority employee owned firms have moderately more professional employees and products than majority and wholly employee owned firms.

From Form ADV we observe if firms have additional business segments engaged in the following business activities: broker-dealer, registered representative of a broker dealer, commodity trading, real estate, insurance, banking, and other financial products. We calculate the variable, Other Business Segments, as the sum of the number of additional business segments. Index % is the percentage of the firms' assets under management in index products. Table 1 Panel A shows that very few firms offer index products. This segment of the market is dominated by a few large firms. Firm Portfolio Turnover is the value weighted annual turnover across a firm's products.

We measure the homogeneity of a firm's products with the variable Style Herfindahl. This is the sum of the squared percentage of total assets under management invested in each equity style. We use 12 equity style categories based on four size categories: all, large, mid and small, and three style categories: value, growth, and core. The average Style Herfindahl is 0.89 indicating that most firms focus on a narrow sector of the equity market. Style Herfindahl is higher for employee owned firms.

Form ADV requires firms to list additional services provided to portfolio clients from the following list: financial planning, pension consulting, selection of other advisors, publications of periodicals or newsletters, security rating or pricing services, market timing services, and other. Non-Portfolio Services is the sum of the additional services provided to portfolio clients. The majority of firms in our sample do not provide any additional services.

Average assets under management is \$17.8 billion but this figure is highly skewed, median assets under management is only \$1.2 billion. Table 2 Panel A shows that firms with zero employee ownership are much larger than the other firms. Minority employee owned firms are considerably larger than majority or wholly employee owned firms.

Equity is the largest component of assets under management and more than half the firms have only equity products. Employee owned firms are more focused on equity products. Table 2 Panel A shows that employee owned firms manage fewer international products, more small cap products, and marginally fewer core equity products.

3.3. Portfolio Manager Ownership of Institutional Investment Management Firms

In the combined PSN and ADV sample, we observe all portfolio managers who own at least 5% of their firm. Table 1 Panel C shows there are 3,118 distinct portfolio managers in our sample, who on average manage 1.9 products.

Key Person is an indicator variable that equals one if a portfolio manager is also an executive officer of the firm. Table 1 Panel C shows that 18% of portfolio managers are also executive officers. Table 3 Panel A shows that portfolio managers who are also executive officers are more likely to have an equity stake in their firm.

We include two variables to measure the importance of a portfolio manager within the firm. Proportion of Products Managed is the number of products managed by a portfolio manager divided by the total number of products offered by their firm. Proportion of Firm's Assets Managed is the total value of assets controlled by a portfolio manager divided by the total value of assets managed by their firm. Table 3 Panel A shows that both of these variables are higher when the portfolio manager is an owner. Tenure is the number of years the portfolio manager has been at the firm. Table 1 Panel C shows that on average portfolio

managers have been at their current firm for 10 years. Table 3 Panel A shows that portfolio managers with an ownership stake have longer tenure than non-owners

PM Index is the proportion of assets managed by a portfolio manager in index products. Very few portfolio managers control index products. PM Turnover is the portfolio managers' value weighted average turnover across the products they manage. Table 3 Panel A shows that portfolio managers with an ownership stake have lower turnover.

We include two variables that measure the similarity between a portfolio manager's products and their firm's products. PM Style Complement is the percentage of the firm's total assets under management in the same equity style as portfolio manager's products. For example, if a portfolio manager controlled a single small cap value portfolio, and 35% of the firm's assets under management were invested in small cap value products, this variable would be 0.35. For portfolio managers with multiple products it is the value weighted average across their products. PM Asset Class Complement is calculated in the same way, but measures the asset class overlap between firms and portfolio managers' products. Portfolio managers with an ownership stake in their firm have higher values of both variables.

Table 3 Panel A shows that portfolio managers with an ownership stake usually are more focused on equity, but the differences in equity style are not large. These results are generally consistent with the firm level findings.

3.4. Product Performance

The product returns reported in the PSN Database are a composite of returns on clients' accounts. Accounts within the same product can have different returns for a variety of reasons, such as social responsibility screens and diversification criteria. A products' return is a value-weighted average of all an IIM firm's accounts with a similar investment style¹². The SEC checks reported returns during random audits of IIM firms. Table 1 Panel D shows

¹²For the rules governing the calculation of composite returns see <http://www.gipsstandards.org/>.

summary statistics of the returns reported to the PSN Database. The mean monthly return is 0.72%. To risk adjust returns, we use two variations of the Carhart (1997) four factor model¹³.

$$R_{it} = \alpha_i + \beta_{1i}(R_{Mt} - R_{ft}) + \beta_{2i}SMB_t + \beta_{3i}HML_t + \beta_{4i}PR12_t + \epsilon_{it} \quad (1)$$

In the first version, denoted Forward Carhart Alpha we estimate the Carhart model over the 24 months following the measurement of ownership. We also estimate a one period Carhart alpha as:

$$\alpha_{it} = Return_{it} - [\beta_{1i}(R_{Mt} - R_{ft}) + \beta_{2i}SMB_t + \beta_{3i}HML_t + \beta_{4i}PR12_t] \quad (2)$$

where the coefficients are estimated using data from the previous 24 months i.e. t-24 to t0. As a robustness check, and because it is common practice in industry, we include benchmark adjusted abnormal returns¹⁴. We calculate this benchmark, denoted as Russell alpha, as the geometric mean return on the fund over the 24 months after measuring ownership, minus the geometric mean return on the appropriate style matched index. Table 2 Panel C shows that the returns and alphas are similar for firms with different levels of employee ownership, and Table 3 Panel B shows returns and alphas are similar regardless of portfolio managers' ownership of their IIM firm.

3.5. Comprehensiveness and Survival

The fact that participation in the PSN database is voluntary may create two problems: selection bias and survival bias. Selection bias will occur if firms' decision to participate in

¹³Factor returns are from Ken French's webpage.

¹⁴We assign each fund to one of 12 size/style groups. There are three styles: core, growth, and value, coupled with four size groups: large, mid, small, and all. We use the appropriate Russell size/style index except for large core, where we use the S&P 500 index, as the PSN reports that the S&P 500 is the most widely used index for this group. Russell Indexes are the most common benchmark for all other groups.

the PSN database is correlated with characteristics of interest. To examine this issue, we compare the PSN data with statistics from the Conference Board (2007) report. We take the percentage of the total U.S. equity market managed by all institutions and subtract off mutual fund and hedge fund holdings. The remainder is IIM firms' holdings, and direct stock ownership by insurance companies, pension funds, and endowments. PSN firms manage 90% of this remainder. Because the remainder contains direct ownership by other institutions, it should be larger than the value of funds managed in the PSN database. Since the unexplained remainder is relatively small, it is suggestive that the PSN dataset is reasonably comprehensive.

Because participation is voluntary the PSN dataset may contain a survival bias. There are three forms of survival bias: backfilling, liquidation bias, and non-reporting. Liquidation bias occurs if the terminal returns reported for a fund do not include the terminal returns from dissolving the fund. Non-reporting bias occurs when a firm strategically ceases reporting following poor performance. As discussed in Busse, Goyal, and Wahal (2007), the PSN database has not permitted backfilling since 1994. We use only post 1994 data in our sample and so backfilling is not an issue. In their study, Busse, Goyal, and Wahal (2007) examine the PSN database and conclude that it does not have a meaningful survival bias.

Table 4 Panel A shows summary statistics of annualized firm level survival. On average 3.5% of firms cease reporting each year. We divide disappearing firms into two categories: cease filing Form ADV, and continue to file. The majority of firms that exit the PSN dataset also cease reporting to the SEC, suggesting that they have genuinely not survived. However, each year 1.3% of firms exit the PSN database while continuing to file Form ADV. It is possible these firms cease managing institutional money but continue other activities requiring them to file Form ADV, so 1.3% is an upper bound on the firm level survival bias. Even if some surviving firms exit the PSN database, this will only bias our results if exit is correlated with employee ownership. The differences in survival across ownership categories

are not statistically significant.

Table 4 Panel B shows summary statistics of annualized product level survival. Product exit is lower than firm exit because large firms have more products and higher survival rates. In an average year, 1.8% of products exit the PSN database. Slightly over half of these cases occur when the firm managing the product exits the PSN database, but 0.7% of products exit while the managing firm continues to report other products to PSN. Unfortunately there is no way to determine if the firm has genuinely closed the product or if the product still exists and is not reported. The non-survival of products in this dataset is lower than that of mutual funds reported in Carhart (1997), suggesting that non-survival in this dataset is relatively low. Once again, the differences in survival across ownership categories are not statistically significant.

Studies examining performance persistence are concerned about survival because performance has a strong negative correlation with survival. As a result, survival bias causes researchers to overestimate persistence. Our focus is employee ownership and so our concern is whether there is a relationship between employee ownership and survival. To test this relationship, we regress non-survival on employee ownership using a random effects panel probit model. The dependent variable equals one if it is the last period the product reports. The results in Table 4 Panel C show that the relationship between employee ownership and non-survival is not significant. Given the absence of backfilling, the similarity between non-survival of IIM firms mutual funds, and the fact that ownership and non-survival are uncorrelated, we conclude it is unlikely that survival bias affects our results.

4. Determinants of Institutional Investment

Management Firm Ownership

Table 5 examines the determinants of IIM firm employee ownership. We use three definitions of employee ownership: the largest position, the sum of the three largest positions, and total employee ownership. Because employee ownership is bound between 0% and 100% we use a random effects panel Tobit model.

The logarithm of the number of professional employees is negative and statistically significant in all specifications. This result is consistent with the idea that when many employees contribute towards the value of the firm, ownership's incentive effect is diluted. Since each employee receives a smaller benefit from their effort, free riding occurs. For all models, a one standard deviation decrease in the number of professional employees implies an increase in employee ownership of greater than 20% relative to the mean.

The logarithm of the number of products and the Other Business Segments index are also included primarily as measures of firm focus. Concentrated employee ownership is lower when there are many products, as the number of products grows firms either disperse equity across more employees, or avoid employee ownership entirely. Other Business Segments has a significant and positive relationship with the largest employee ownership position, but is insignificant in the other two specifications.

There is a clear negative relationship between employee ownership and the percentage of a firm's assets under management in index products. There are several very good reasons for this. First, the cost of monitoring index products is very low. Index funds are simple and transparent, the portfolio manager's task is clearly defined, and performance is easy to evaluate. When the costs of alternatives to employee ownership are low, employee ownership will be low. Second, the transparency and simplicity of index funds implies very strong product market competition, reducing the need for other incentives. Third, there appear to

be large economies of scale for index funds. This segment of the market is dominated by a relatively small number of large institutions.

Chen, Goldstein, and Jiang (2008) and Cremers, Driessen, Maenhout, and Weinbaum (2006) argue that portfolio turnover is related to the need for external monitoring. High turnover implies both greater portfolio manager discretion and higher external monitoring costs, suggesting that employee owned firms will have a competitive advantage in high portfolio turnover strategies. However, the data do not support this argument. There is a significant negative relationship between employee ownership and portfolio turnover in the first column, and no relationship in the remaining two columns.

We include two variables that measure the scope of the firms' operations. Style Herfindahl is a Herfindahl Index of each firm's investment styles. Non-Portfolio Services measures the number of additional services that the firm offers to its portfolio clients. Each variable is weakly significant in one specification, but overall these variables have little significance. The logarithm of total assets under management is highly significant. Firms managing more money have significantly lower employee ownership. This effect is economically large. If the logarithm of total assets under management decreases by one standard deviation it implies an increase in employee ownership of between 15%-35% relative to the mean. This negative relationship is unsurprising. First, one way a firm becomes large is by taking in a large amount of external equity. Second, the larger the firm the more difficult it is for any one individual employee to have a large impact on firm performance. Third, Almazan, Brown, Carlson, and Chapman (2004) and Cremers, Driessen, Maenhout, and Weinbaum (2006) find evidence of economies of scale in mutual fund families' monitoring of funds, suggesting that the relative costs of alternatives to employee ownership decrease in firm size.

The remaining variables all control for the type of investment products the firm offers. The results show that broad based employee ownership, shown in column three is associated with equity investment. But there is no relationship for closely held firms. Possibly this

suggests that it is easier for employee owners to bear undiversified firm risk when this risk is spread across many employees. The clearest result is that employee owned firms invest far less in core equity products, and specialize in either value or growth products.

5. Portfolio Manager Ownership of Institutional Investment Management Firms

In this section, we examine which employees within IIM firms have ownership. Because of data limitations we limit our focus to portfolio managers. If a portfolio manager controls multiple products they are aggregated, resulting in one observation per portfolio manager per year. The first column of Table 6 is estimated using a random effects panel Tobit model. The second column is estimated using a linear panel regression model with firm level fixed effects¹⁵.

Key Person equals one if the employee is a key person as defined in Form ADV¹⁶. Key Persons have responsibility and control over the entire firm. Since they affect overall firm profits, the incentive effect of equity is not diluted. Further, employees who are portfolio managers and Key Persons have multiple roles within the firm. It would be extremely difficult to write a compensation contract specifying the allocation of effort between portfolio management and firm management. Equity ownership solves this problem, and rewards the correct allocation of effort. The Key Person variable is highly significant even with firm fixed effects included. In the Tobit model, the results suggest that Key Persons have ownership stakes about 16% higher relative to the mean. When fixed effects are included the implied

¹⁵Parametric panel Tobit models with fixed effects are not consistent. Semiparametric models for panel Tobit fixed effects are available only when the fixed effect is for the unit of observation. Since we estimate fixed effects at the firm level, and not the portfolio manager level, the semiparametric models are not applicable.

¹⁶Form ADV defines key persons as: Chief Executive Officer, Chief Financial Officer, Chief Operations Officer, Chief Legal Officer, Chief Compliance Officer, director, and any other individuals with similar status or functions.

effect is larger, implying a key person has an ownership stake 75% higher relative to the mean.

We include two closely related variables: the proportion of the firms' total assets under management controlled by the portfolio manager, and the proportion of the firm's total products controlled by the portfolio manager. When either variable is high the portfolio manager has a large effect on overall firm profitability. As predicted, the results show significant positive relationships between both variables and ownership. The implied effect of these variables is relatively modest in the panel Tobit, a one standard deviation decrease change in these variables results in decreases in portfolio manager ownership of 2.5% and 0.5% relative to the mean. However, the implied effect is much larger in the firm level fixed effects regressions. For both variables, a one standard deviation decrease is associated with more than a 25% decrease in portfolio manager ownership relative to the mean.

There is a strong negative relationship between the logarithm of firm total assets under management and portfolio manager ownership in the Tobit regression. This is consistent with economies of scale in portfolio monitoring. The results state that a one standard deviation change in a firm's assets under management is associated with 3%-4% higher portfolio manager ownership. Once firm fixed effects are included this variable is not significant.

Portfolio managers with long tenure have significantly higher ownership. There are many reasons to expect this result. First, it is less costly for the firm to eliminate its option to terminate long-term employees as there is less uncertainty about ability. Second, employee ownership makes it significantly more costly for the firm to terminate a portfolio manager, increasing tenure. Third, portfolio managers with high tenure likely have greater wealth, increasing their capacity to bear the risk of a large position in their employer. Finally, skill or some other third variable may drive both tenure and ownership. In the fixed effects regression a one standard deviation decrease in tenure is associated with a 15% decrease in employee ownership relative to the mean.

We include PM Index % and PM Portfolio Turnover as measures of the cost of external monitoring. The results are significant and negative for both variables in the Tobit regression. The result for index fund management is consistent with our hypothesis that ownership is lower when there is less need for monitoring. However, the negative result for portfolio turnover was not predicted. Once firm level fixed effects are included, neither variable is significant.

We include two variables to measure the overlap between portfolio managers' products and their firms' products. The results show a strong positive relationship between portfolio manager ownership and the complement of their equity style with their firm. The firm fixed effects regression suggests that a portfolio manager whose style complement is one standard deviation below the mean will have 9% less ownership relative to the mean. These results are consistent with Pomorski (2008), who shows that there are greater benefits to sharing information when portfolio styles overlap. Portfolio manager ownership is higher in firms which manage primarily equity. However, once firms' asset class focus is controlled for with fixed effects, portfolio managers with both pure equity funds and balanced funds are more likely to be IIM firm owners.

We include controls for the asset class and investment style of the portfolio managers' products. The panel Tobit regression small cap portfolio managers have higher ownership. Once firm fixed effects are included neither style or market cap is related to portfolio manager ownership.

6. Employee Ownership and Alpha

Beginning in this section we limit our sample to U.S., actively managed, equity products. Most prior empirical results in the managed funds literature are for equity products, and so restricting our sample allows for greater comparability with the existing literature and established benchmarks.

We test if employee ownership predicts performance using both firm level employee ownership and portfolio manager ownership. For each product, we estimate alpha using the three benchmarking methods discussed in subsection 3.4. We use two methods to test for significance: pooled OLS regressions with standard errors clustered by product and size as recommended by Petersen (2009), and Fama-MacBeth regressions. We also form equally weighted portfolios of products based on firm and portfolio manager ownership and estimate the Carhart (1997) alpha. We include the logarithms of firm assets under management and product assets under management as control variables following the results of Chen, Hong, Huang, and Kubik (2004).

6.1. IIM Firm Employee Ownership and Alpha

Because several authors have argued there is a non-linear relationship between employee ownership and performance for publicly traded companies i.e. Morck, Shleifer, and Vishny (1988) and McConnell and Servaes (1990), we measure firm level employee ownership with a series of indicator variables¹⁷: Minority, Majority, and Wholly Employee Owned.

Table 7 Panel A shows some of the coefficients on employee ownership are significant. But it is very difficult to argue that there is a consistent or meaningful pattern of significance. Of the alpha estimates, forward Carhart alpha is the most precisely estimated. Employee ownership and forward Carhart alpha are not significantly related in the clustered regression and one coefficient is significantly negative in the Fama-MacBeth regressions. For the other alphas there is some positive significance between employee ownership and alpha, but exactly which ownership level is significant varies across the specifications. Perhaps most striking is the small size of the estimated coefficients. Most coefficients represent only a few basis points per month and so in addition to sporadic statistical significance there is little economic significance.

¹⁷If we estimate this relationship using the percentage of the IIM firm owned by employees or a quadratic specification, instead of indicator variables, the results are not significant.

There are three sets of portfolio regression results in Table 7 Panel B. The first row shows the alpha from Carhart regressions run on firm employee ownership sorted portfolios. The alphas are insignificant for all portfolios. Because the results in Panel A show that firm and product assets under management predict alpha, we perform two-way portfolio sort. First, we divide products into two categories depending on whether the managing firms' total assets under management are above or below the median. For small firms none of the alphas are significant. For large firms all of the employee ownership sorted portfolios have alphas significantly different from zero, but not significantly different from the zero employee ownership portfolio. Second, we divided products into two categories depending on whether there product total assets are above or below the median. There are no significant difference in alpha across product total asset and employee ownership sorted portfolios.

6.2. Portfolio Manager Ownership and Alpha

Since portfolio performance ultimately depends upon the portfolios manager's actions, we examine the relationship between performance and portfolio manager IIM firm ownership. The results in Table 8 Panel A do not show a clear relationship between portfolio manager ownership and performance. The coefficients are insignificant in five of the six specifications. The Fama-MacBeth regression using the forward Carhart alpha shows a significant negative relationship with portfolio manager ownership. However, given that the most reasonable ex ante prediction was for a positive coefficient and only one of six specifications is significant, we interpret these results as failing to show a meaningful relationship between alpha and portfolio manager ownership.

The portfolio regression results in Table 8 Panel B show a marginally significant positive alpha for products managed by non-owners and no significant result for the products managed by employee owners. The long-short portfolio alpha is significantly negative. The alpha of the large firm/zero portfolio manager ownership portfolio is significantly positive. After

performing a two way sort by portfolio manager IIM firm ownership and firm total assets under management there are no significant differences in alpha between portfolios. Similarly, after performing a two-way way sort with product total assets, there are no significant differences in alpha between portfolios. These results suggest that any significance between portfolio manager IIM firm ownership and alpha is driven by the correlation between portfolio manager IIM firm ownership and firm and product size.

7. Employee Ownership and Risk Taking

Employee ownership has two effects on risk incentives. First, employee owners have a large undiversified stake in their employer, which will create an incentive to reduce firm risk. Second, employee owners reap all of the gains from risk taking, and have lower termination risk. To examine the tradeoff between these considerations, we regress portfolio risk measures on employee ownership. We measure portfolio risk with three variables: tracking error, beta, and portfolio standard deviations. We measure tracking error as the standard deviation of the difference between a product's return and the benchmark return over the 24 months subsequent to measuring ownership. Table 9 Panel A shows the results of regressions of tracking error on employee ownership. We include controls for firm and product size as well as a set of indicator variables for the style and market cap of the product's holdings. In the first three columns the t-statistics are based on standard errors clustered by product and time.

The first column shows the results of regressing tracking error on firm employee ownership. There is a significant positive relationship between firm employee ownership and tracking error. The average tracking error of products managed by wholly employee owned firms is higher by 0.1% per month than products offered by firms with no employee ownership.

In columns two and three, the portfolio managers' IIM firm ownership is included as an independent variable. Portfolio manager ownership is significant, and the coefficient is twice the size of the coefficient on firm employee ownership. These results provide strong support for the hypothesis that portfolio manager ownership reduces career concerns sufficiently to affect investment behavior.

The last column of Table 9 Panel A contains results from a panel regression with firm fixed effects. After controlling for firm level fixed effects, the effect of portfolio manager IIM firm ownership is smaller, but the statistical significance is much higher. Even within a firm, products managed by employee owners have higher tracking error than products managed by non-owners. This strongly supports the notion that there is a positive relationship between ownership and risk taking.

Table 9 Panel B shows the results of regressing betas and portfolio standard deviations on employee ownership. In the first two columns, the dependent variable is portfolio beta and in the third and fourth columns the dependent variable is portfolio standard deviation. Both are estimated over the 24 months after measuring ownership. Firm level employee ownership does not significantly predict betas, but it does have a positive relationship with portfolio standard deviations. The portfolio manager results include firm level fixed effects, and find significant positive coefficient for both betas and portfolio standard deviations. The portfolio manager results include firm level fixed effects. These results strongly suggest that employee ownership is positively associated risk taking.

The causal interpretation of these results is that employee ownership reduces career concerns, resulting in greater risk taking. However, there are alternative explanations. The reverse causality explanation is that firms grant ownership as a reward for taking risk. Given that employee ownership rarely changes in our sample this seems unlikely. Another alternative is that both portfolio risk and employee ownership are driven by portfolio managers' risk aversion. Individuals with low risk aversion are more likely to form their own firms and

manage riskier portfolios.

8. Conclusion

Employee ownership of IIM firms is common, and there is large variation in ownership structures across firms. In this paper, we provide the first empirical analysis of IIM firm employee ownership. We view employee ownership as one tool that IIM firms use to control the agency problem between firms and employees, and we argue that in equilibrium firms should be driven to optimal ownership structures by market competition. This implies that employee ownership should vary cross-sectionally based on firm characteristics measuring the costs and benefits of employee ownership. However, in equilibrium there should not be an observable relationship between employee ownership and performance.

We begin our empirical tests by analyzing the determinants of employee ownership at the firm level. Then, we look within firms, and test which portfolio managers have an ownership position in their employer. Our results are broadly consistent with an optimal contracting equilibrium. Employee ownership is higher when its value is greater. Within firms, we find that portfolio managers who are also firm executives, who manage multiple products, or who manage a large proportion of their firms' assets, have significantly higher ownership.

Next we test if employee ownership predicts performance. We fail to find a consistent significant relationship between firm level employee ownership and alpha. We interpret this result as consistent with an equilibrium in which firms and employees allocate ownership optimally, and clients allocate funds correctly given the observable characteristics of firms and products.

Finally, we test if employee ownership is related to risk taking. We show that employee owned firms' products have significantly higher tracking errors and standard deviations. Within firms, products managed by employee owners have significantly higher tracking er-

rors, betas, and standard deviations than products managed by non-owners. The portfolio manager results hold even after including firm fixed effects.

While there is a large body of academic work examining agency conflicts between portfolio management firms and their clients, the agency problem between portfolio management firms and their employees has received far less attention. This is the first study to examine employee ownership of portfolio management firms as a means of controlling this agency problem. Overall, our results are consistent with an optimal contracting equilibrium, in which firms and employees efficiently trade off the costs and benefits of employee ownership.

Appendix: Data Issues and Variable Construction

Firm

The firm is defined as the investment adviser or “separately identifiable department or division” (SID) of a bank. Each firm may have one or multiple products. Firms are matched from the SEC Form ADV data to the PSN dataset using a name match and are verified using a combination of city, state and assets under management.

Employee Ownership

The employee ownership variable captures the amount of the investment firm itself (i.e. not the assets under management) that is owned by employees of the firm. Our data source for investment firm ownership is SEC Form ADV. If a firm files multiple times within a month, we retain the latest filing in that month. The form must be filed annually and “other than annually” if Items 1 (Identifying Information), 3 (Form of Organization), 9 (Custody) or 11 (Disclosure Information) become inaccurate or Items 4 (Successions), 8 (Participation or Interest in Client Transaction) or 10 (Control Persons) become materially inaccurate. Schedule A contains information about direct owners and executive officers. Each CEO, CFO, COO, CLO (Chief Legal Office), CCO (Chief Compliance Officer), director must be reported. Each shareholder with a direct ownership of greater than 5%, all general partners, and those limited partners and members that have right to receive upon dissolution or have contributed more than 5% of the capital must report ownership on Schedule A. On Schedule B, all indirect owners that have a 25% interest in any entity listed in Schedule A are recorded. Using Schedule B we find the true controlling ownership stake of each entity listed in Schedule A. Based on the field “Title or Status”, we define whether each entity is an employee or non-employee. On Schedule A, the ownership is classified into 6 groups: “NA - Less than 5%”, “A -5% but than 10%”, “B -10% but less than 25%”, “C 25% but less than 50%”, “D 50% but less than 75%”, “E-75% or more”. To construct a single value for each ownership stake, we apply the following algorithm. We sum the number in each ownership group. Starting at “E-75% or more”, we build an upper and lower constraint based on the sum of each of the other groups except “E-75% or more” multiplied by the maximum and minimum possible value for each of the other groups. We then take the midpoint of the maximum and minimum possible value as the value for any entity classified as “E-75% or more”. We then construct the constraints for “D 50% but less than 75%” again as above using an upper and lower constraint based on the sum of each multiplied by the maximum and minimum possible value for each group except now we omit “D 50% but less than 75%” and use the value for “E-75% or more” as both the minimum and maximum constraint for “E-75% or more”. Again, we take the midpoint of the constraints as the value for “D 50% but less than 75%”. We proceed recursively until we obtain values for each group, finishing with the smallest ownership group. We verify the validity of the results of the algorithm by ensuring that each calculated group value falls within the prescribed range and that the values of all the stakes in a single firm sum to 100%. For the small number that do not, we correct these entries by hand. (E.g. there are reporting errors where a single individual with “E-75% or more” ownership stake is listed multiple times for multiple positions: CEO, CCO) We then sum the ownership stake associated with employees.

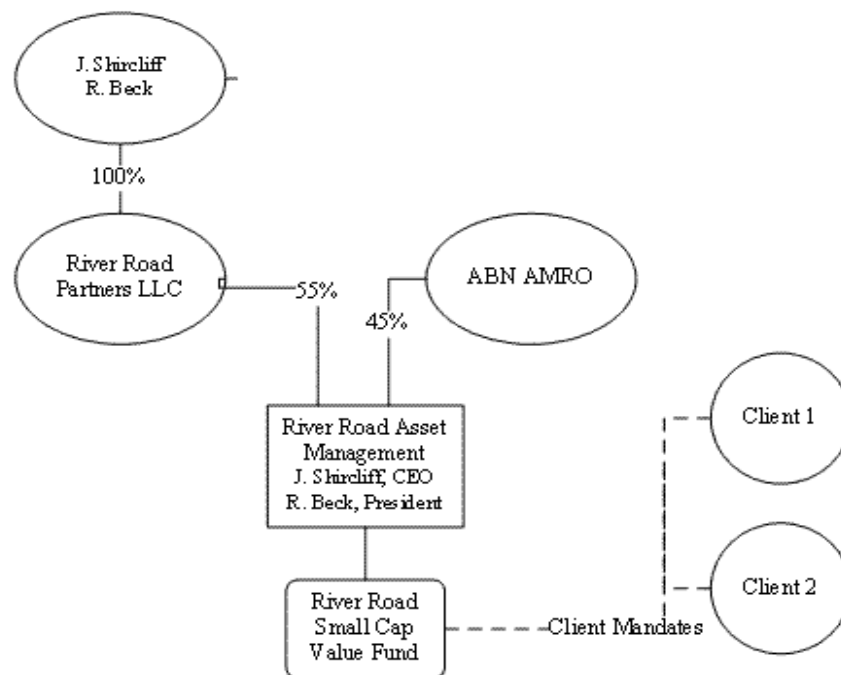


Figure 1: Example: River Road Asset Management

Table 1
Summary Statistics

Panel A shows summary statistics of employee ownership. Panel B shows summary statistics of firm level variables. Panel C shows summary statistics for portfolio manager level variables. In Panels A through C each observation is included once per year. Panel D shows product level summary statistics with monthly observations.

Panel A: Ownership					
	Mean	SD	25th%	Median	75th%
Firms with Employee Ownership	72.6%				
Avg. Largest Position > 0	56.8%	29.3	32.5	55	82.5
Avg. Top Three Positions > 0	78.2%	28	62.5	92.5	100
Avg. Employee Ownership > 0%	89.5%	23.2	100	100	100
Products with PM Ownership	17.5%				
Avg. PM Ownership > 0	52.1%	33.3	21.3	50.0	82.5

Panel B: Institutional Investment Management Firms					
	Mean	SD	25th%	Median	75th%
Total # of Firms	1,118				
Avg. # of Firms per period	843				
# of Professional Employees	50	176.8	6	13	29
# of Products	5.06	7.54	1	3	5
Other Business Segments	0.19	0.49	0	0	0
Index %	2.4%	12.9	0.0	0.0	0.0
Firm Portfolio Turnover	65.5%	64.5	26.2	46.7	82.7
Style Herfindahl	0.89	0.19	0.87	1	1
Non-Portfolio Services	0.61	0.77	0	0	1
Firm Total Assets \$M	17,783	76,110	270	1,222	5,810
Percent Equity	72.8%	37.0	47.7	100.0	100.0
Percent International	4.3%	17.5	0.0	0.0	0.0
Percent Core	32.7%	41.9	0.0	0.1	79.6
Small Cap %	16.8%	31.9	0.0	0.0	14.6

Panel C: Portfolio Managers					
	Mean	SD	25th%	Median	75th%
Total # of PMs	3,118				
# Products Managed	1.9	2.1	1	1	2
Key Person	0.18	0.38	0	0	0
Proportion of Products Managed	32.3%	34.8	5.9	16.7	50.0
Proportion of Assets Managed	24.7%	32.9	1.3	7.1	37.8
Tenure	10.5	7.9	5	9	14.7
PM Index	0.6%	6.9%	0.0	0.0	0.0
PM Turnover	53.7%	70.9	3.9	34.0	75.0
PM Style Complement	35.4%	40.6	0.0	14.2	74.8
PM Asset Class Complement	53.9%	39.4	9.0	55.9	99.2
PM Percent Equity	70.2%	44.3	0.0	100.0	100.0
PM Percent Core	22.2%	38.7	0.0	0.0	33.3
PM Percent Small Cap	23.3%	40.9	0.0	0.0	21.7

Panel D: Investment Products					
	Mean	SD	25th%	Median	75th%
Total # of Products	3,605				
Product Total Assets \$M	1,350	3,868	48.6	251.8	1,016
Unadjusted Returns	0.72%	4.56	-1.92	0.96	3.55
One Period Carhart Alphas	0.05%	1.87	-0.86	0.01	0.91
Forward Carhart Alphas	0.04%	0.48	-0.19	0.02	0.27
Russell Alphas	0.24%	2.48	-0.85	0.15	1.25
Tracking Error	1.90	1.22	1.09	1.64	2.50

Table 2
Summary Statistics by Employee Ownership Categories

This table shows pooled averages of the variables used in this paper. Each column shows pooled averages for firms that fall into a specific ownership category. Panel A shows summary statistics for firm level variables. Each firm is observed annually. Panel B contains product level variables. Each product is observed monthly.

Panel A: Institutional Investment Management Firms				
	Zero	Minority	Majority	100%
% of Firms in Category	28.8%	5.5	10.9	54.7
# Professional Employees	116.1	23.3	13.6	17.7
# of Products	9.4	4.8	3.2	3.6
Other Business Segments	0.29	0.16	0.20	0.15
Index %	4.8%	6.3	1.6	1.9
Firm Portfolio Turnover	73.0%	70.4	68.6	60.7
Style Herfindahl	0.80	0.87	0.93	0.93
Non-Portfolio Services	0.72	0.52	0.53	0.59
Firm Total Assets \$M	55,577	18,254	2,728	4,573
Percent Equity	74.1%	85.4	91.7	83.6
Percent International	13.0%	9.4	8.8	5.3
Percent Core	36.1%	34.2	32.8	30.2
Small Cap %	15.6%	21.7	26.6	19.7

Panel B: Products				
	Zero	Minority	Majority	100%
Product Total Assets \$M	1,914	936	810	898
Unadjusted Returns	0.74%	0.65	0.82	0.70
One Period Carhart Alphas	0.04%	0.06	-0.01	0.06
Forward Carhart Alphas	0.06%	0.03	0.01	0.02
Russell Alphas	0.25%	0.28	0.18	0.25
Tracking Error	1.8%	2.1	1.9	2.0

Table 3
Summary Statistics by Portfolio Manager Ownership

This table shows pooled averages of portfolio and product level variables used in this paper for two ownership categories: products managed by employees with no employee ownership, and products managed by employee owners. Panel A contains summary statistics at the portfolio manager level. Each portfolio manager is observed annually. Panel B contains summary statistics at the product level. Each product is observed monthly.

Panel A: Portfolio Manager Level		
	Zero	PM Ownership > 0
Key Person	10.40%	55.7
Proportion of Products Managed	24.5%	71.4
Proportion of Assets Managed	11.8%	52.7
Firm Total Assets \$M	107,718	3,030
Tenure	9.8	13.0
PM Index	0.1%	0.0
PM Turnover	56.1%	43.9
PM Style Complement	0.32	0.51
PM Asset Class Complement	0.52	0.61
PM Percent Equity	68.7%	76.6
PM Percent Core	21.6%	24.9
PM Percent Small Cap	12.8%	14.6
Panel B: Product Level		
	Zero	PM Ownership > 0
Product Total Assets \$M	1,997	657
Unadjusted Returns	0.64%	0.60
One Period Carhart Alphas	0.11%	0.10
Forward Carhart Alphas	0.12%	0.06
Russell Alphas	0.26%	0.24
Tracking Error	1.90%	2.0

Table 4
Survival

This table shows annual product survival of firms and products in the PSN database. Panel A shows summary statistics of firm survival for different categories of employee ownership. Firms are considered to disappear if they no longer file SEC Form ADV. If a firm continues to file Form ADV but no longer reports to the SEC it is identified as ceasing to report. Panel B shows summary statistics of product survival for different categories of employee ownership. Panel C shows the result of random effect panel probit regressions where the dependent variable equals one if it is the firm or products' last period. The symbols *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Firm Survival Summary					
	Zero	Minority	Majority	100%	All
Survive	96.0%	96.9	96.7	96.7	96.5
Firm Ceases to Exist	2.6%	2.6	2.4	2.0	2.2
Firm Ceases to Report	1.5%	0.5	0.9	1.3	1.3
Panel B: Product Survival Summary					
	Zero	Minority	Majority	100%	All
Survive	98.5%	98.2	98.1	98.1	98.2
Product and Firm Disappear	0.7%	0.6	1.1	1.3	1.0
Product Disappears	0.8%	1.2	0.9	0.6	0.7
Panel C: Panel Probit Regressions of Survival					
	Firm Survival		Product Survival		
	Firm Disappears	Ceases Reporting	Product and Firm Disappear	Only Product Disappears	
Employee Ownership %	0.0001 (0.08)	-0.017 (1.63)			
PM Ownership %			-0.003 (1.01)	-0.001 (0.07)	
Ln(Firm Total Assets)	0.10 (-0.23)	-0.860 (4.73)***	0.159 (6.36)***	-0.285 (1.06)	
Ln(Product Total Assets)			-0.293 (-14.0)***	0.083 (-0.39)	
Lagged Alpha			-0.613 (-8.97)***	0.100 (-0.27)	
Constant	-3.897 (-9.50)***	-0.474 (0.35)	-6.256 (-25.9)***	-8.657 (-6.65)***	
# Observations	5,081	5,081	222,721	222,721	

Table 5
Determinants of Institutional Investment Management Firm
Employee Ownership

This table shows the results of random effect panel Tobit regressions where the dependent variable is IIM firm employee ownership. There is one observation per IIM firm per year. In column one, employee ownership is the single largest employee ownership position. In column two, employee ownership is the three largest positions. In column three, employee ownership is the sum of all employee ownership positions. The symbols *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

	Largest Position	Three Largest Positions	Total Employee Ownership
Ln(# Professional Employees)	-8.278 (3.32)***	-9.602 (5.30)***	-12.561 (4.48)***
Ln(# of Products)	-5.722 (3.11)***	-8.468 (4.43)***	0.957 (0.39)
Other Business Segments	4.923 (2.11)**	0.101 (0.04)	-3.041 (0.73)
Index %	-12.046 (2.36)**	-44.420 (6.25)***	-23.672 (2.11)**
Firm Portfolio Turnover	-0.061 (4.01)***	-0.018 (1.13)	-0.006 (0.23)
Style Herfindahl	-5.516 (1.08)	14.228 (2.00)**	-1.378 (0.16)
Non-Portfolio Services	-1.223 (0.29)	-1.622 (1.20)	3.618 (1.77)*
Ln(Firm Total Assets)	-7.090 (9.24)***	-7.675 (7.89)***	-4.464 (3.03)***
Equity %	-2.140 (0.39)	0.883 (0.20)	24.005 (3.33)***
Percent International	1.734 (0.35)	2.726 (0.57)	-5.454 (0.79)
Percent Core	-12.191 (2.88)***	-9.053 (3.48)***	-27.774 (7.42)***
Percent Small Cap	3.053 (0.74)	3.064 (0.94)	-3.947 (0.90)
Constant	120.954 (14.11)***	132.438 (12.86)***	128.353 (8.90)***
Pseudo R^2	0.249	0.300	0.231
Number of Observations	2,609	2,609	2,609

Table 6
Determinants of Portfolio Managers' Ownership of Institutional Investment Management Firms

This table shows the results of regressions where the dependent variable is portfolio manager ownership of their IIM firm. There is one observation per portfolio manager per year. In the first column, the coefficients are estimated using a random effects panel Tobit model. In the second column, the results are estimated using a panel regression with firm level fixed effects. The symbols *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

	Random Effects Tobit	Firm Fixed Effects Regression
Key Person	16.150 (17.54)***	6.516 (17.76)***
Proportion of Products Managed	40.131 (23.06)***	7.052 (6.80)***
Proportion of Assets Managed	4.679 (3.42)***	7.855 (12.99)***
Ln(Firm Total Assets)	-6.752 (25.40)***	-0.075 (0.26)
Tenure	0.612 (11.98)***	0.157 (8.87)***
PM Index	-18.053 (2.86)***	1.111 (0.60)
PM Portfolio Turnover	-0.017 (2.52)**	0.000 (0.06)
PM Style Complement	10.551 (7.66)***	1.992 (4.31)***
PM Asset Class Complement	7.405 (4.51)***	-2.193 (4.34)***
PM Equity %	-8.279 (5.58)***	0.413 (1.13)
PM Percent Core	0.561 (0.49)	0.229 (0.64)
PM Percent Small Cap	6.070 (4.54)***	0.283 (0.78)
Firm Fixed Effects	No	Yes
Time Effects	Yes	Yes
Constant	13.122 (4.57)***	4.017 (1.54)
(Pseudo) R^2	0.356	0.359
Number of Observations	11,283	11,283

Table 7
Employee Ownership and Alpha

This table shows the results of regressing portfolio alphas on IIM firm employee ownership. Panel A has the results where the dependent variable is individual product's alpha. We measure employee ownership with indicator variables: Minority, Majority, Wholly Employee Owned. We test significance using two methods: Fama-MacBeth regressions, and pooled regressions with standard errors clustered by time and product. Forward Carhart alphas are estimated using the Carhart (1997) model over the 24 month period following the measurement of ownership. One period Carhart alphas are estimated as the fund's actual return in the current month minus the product of lagged factor loadings times current period factor returns. Russell alphas are the difference between the product's geometric mean returns over the next 24 months and the geometric mean return on the benchmark index. Panel B has alphas from Carhart regressions using portfolios formed on the basis of IIM firms' employee ownership. In the double sorted portfolio results, 'large' and 'small' are relative to the median firm or product size respectively. The column "Long-Short" shows the alpha of a portfolio long wholly employee owned firms' products and short zero employee ownership firms' products. The symbols *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Firm Level Regressions						
	Clustered			Fama-MacBeth		
	Forward Carhart Alpha	One Period Carhart Alpha	Russell Alpha	Forward Carhart Alpha	One Period Carhart Alpha	Russell Alpha
Minority Employee Owned	0.011 (0.44)	0.067 (1.95)*	0.077 (1.95)*	0.000 (0.02)	0.056 (1.57)	0.157 (2.11)**
Majority Employee Owned	0.001 (0.04)	-0.003 (0.08)	-0.025 (0.63)	-0.030 (2.06)**	-0.046 (1.33)	-0.108 (1.41)
Wholly Employee Owned	0.000 (0.01)	0.059 (2.33)**	0.025 (0.84)	-0.025 (1.47)	0.057 (2.26)**	-0.007 (0.24)
Ln(Firm Total Assets)	0.021 (5.39)***	0.015 (1.65)*	0.019 (2.02)**	0.021 (14.10)***	0.012 (1.47)	0.020 (2.06)**
Ln(Product Total Assets)	-0.021 (5.62)***	-0.011 (1.60)	-0.016 (1.57)	-0.028 (7.63)***	-0.023 (2.45)**	-0.021 (2.49)**
Constant	-0.044 (1.24)	-0.063 (0.80)	0.150 (1.03)	0.002 (0.07)	0.065 (0.75)	0.198 (1.46)
R^2	0.010	0.004	0.003	0.0001	0.05	0.05
# Observations	105,168	137,794	157,358	105,168	137,794	157,358

Panel B: Portfolio Sorted Results					
Ownership Portfolio	Zero	Minority	Majority	Wholly Owned	Long-Short
Carhart Alpha	0.09 (1.49)	0.08 (1.34)	0.07 (1.23)	0.07 (1.42)	-0.02 (0.33)
Small Firm Carhart Alpha	0.07 (1.37)	0.02 (0.28)	0.07 (1.23)	0.04 (0.84)	-0.04 (1.44)
Large Firm Carhart Alpha	0.10 (1.33)	0.29 (2.06)**	0.48 (2.55)**	0.20 (2.20)**	0.10 (0.96)
Small Product Carhart Alpha	0.08 (1.42)	0.05 (0.79)	0.05 (1.06)	0.06 (1.32)	-0.02 (0.51)
Large Product Carhart Alpha	0.11 (1.57)	0.14 (2.11)**	0.12 (1.60)	0.10 (1.33)	-0.01 (0.11)

Table 8
Portfolio Manager Ownership and Alpha

This table shows the results of regressing portfolio alphas on portfolio manager ownership. Panel A has the results where the dependent variable is individual product's alpha. PM Ownership % is portfolio managers' ownership in their IIM firm. We test significance using two methods: Fama-MacBeth regressions, and pooled regressions with standard errors clustered by time and product. Forward Carhart alphas are estimated using the Carhart (1997) model over the 24 month period following the measurement of ownership. One period Carhart alphas are estimated as the fund's actual return in the current month minus the product of lagged factor loadings times current period factor returns. Russell alphas are the difference between the product's geometric mean returns over the next 24 months and the geometric mean return on the benchmark index. Panel B has alphas from Carhart regressions using portfolios formed on the basis of portfolio manager employee ownership. In the double sorted portfolio results, 'large' and 'small' are relative to the median firm or product size respectively. The column "Long-Short" shows the alpha of a portfolio long wholly employee owned firms' products and short zero employee ownership firms' products. The symbols *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Product Level Regressions						
	Clustered			Fama-MacBeth		
	Forward Carhart Alpha	One Period Carhart Alpha	Russell Alpha	Forward Carhart Alpha	One Period Carhart Alpha	Russell Alpha
PM Ownership %	-0.003 (0.75)	0.000 (0.62)	0.000 (0.09)	0.000 (3.82)***	0.000 (0.28)	0.000 (0.04)
Ln(Firm Total Assets)	0.010 (2.59)***	0.003 (0.58)	0.003 (0.33)	0.010 (9.94)***	0.005 (0.81)	0.011 (0.99)
Ln(Product Total Assets)	-0.016 (4.58)***	-0.009 (1.40)	-0.018 (1.97)**	-0.024 (6.05)***	-0.022 (2.15)**	-0.023 (2.67)***
Constant	0.005 (0.13)	0.034 (0.47)	0.249 (1.54)	0.031 (2.10)**	0.120 (1.52)	0.209 (1.35)
R^2	0.006	0.0001	0.0002	0.02	0.01	0.01
# Observations	97,464	126,642	146,373	97,464	126,642	146,373

Panel B: Portfolio Sorted Results			
Ownership Portfolio	Zero	PM Ownership	Long-Short
Carhart Alpha	0.10 (1.83)*	0.02 (0.53)	-0.08 (2.17)**
Small Firm Carhart Alpha	0.06 (1.27)	0.04 (0.78)	-0.02 (0.82)
Large Firms Carhart Alpha	0.13 (2.06)**	0.44 (0.70)	0.31 (0.51)
Small Product Carhart Alpha	0.07 (1.53)	0.05 (0.99)	-0.03 (0.79)
Large Product Carhart Alpha	0.12 (1.96)**	0.05 (0.98)	-0.07 (1.55)

Table 9
Employee Ownership and Tracking Error, Betas, and Standard Deviations

Panel A shows the results of regressing the next 24 months' tracking error on employee ownership. The first three columns show pooled regressions with standard errors clustered by product and time. The last column is a panel regression with firm fixed effects. Panel B shows the result of regressing the next 24 months' betas and portfolio standard deviations on employee ownership. For both variables, the first column contains results from pooled regressions with standard errors clustered by product and time, and the second column contains results from panel regressions with firm level fixed effects. The symbols *, ** and *** denote significance at the 10%, 5% and 1% levels, respectively.

Panel A: Tracking Error				
Employee Ownership %	0.0010 (3.16)***	0.0010 (2.38)**		
PM Ownership %		0.002 (1.96)**	0.002 (2.68)***	0.001 (4.03)***
Ln(Firm Total Assets)	-0.041 (4.19)**	-0.035 (3.35)***	-0.044 (4.27)***	0.012 (1.16)
Ln(Product Total Assets)	-0.074 (7.21)**	-0.074 (7.24)***	-0.073 (7.14)***	-0.082 (50.91)***
Style and Market Cap Effects	Yes	Yes	Yes	Yes
Firm Fixed Effects	No	Yes	No	Yes
Time Effects	No	Yes	No	Yes
Constant	2.274 (20.88)***	2.216 (19.17)***	2.323 (20.36)***	2.534 (26.88)***
R^2	0.10	0.10	0.10	0.19
# Observations	97,540	97,540	97,540	97,540

Panel B: Betas and Standard Deviations				
	Portfolio Betas		Portfolio Std. Deviations	
Employee Ownership %	0.0001 (0.70)		0.001 (1.99)**	
PM Ownership %		0.0002 (2.47)**		0.002 (7.71)***
Ln(Firm Total Assets)	0.003 (1.71)*	0.020 (7.52)***	0.013 (1.45)	0.087 (7.64)***
Ln(Product Total Assets)	0.007 (3.48)***	0.010 (23.95)***	-0.020 (1.91)*	0.001 (0.51)
Style and Market Cap Effects	Yes	Yes	Yes	Yes
Firm Fixed Effects	No	Yes	No	Yes
Time Effects	No	Yes	No	Yes
Constant	0.816 (39.61)***	0.654 (27.43)***	3.477 (25.51)***	4.149 (40.82)***
R^2	0.07	0.05	0.18	0.58
# Observations	97,540	97,540	97,540	97,540

References

- Almazan, Andres, Keith C. Brown, Murray Carlson, and David A. Chapman, 2004, Why Constrain Your Mutual Fund Manager?, *Journal of Financial Economics* 73, 289–321.
- Berk, Jonathan B., and Richard C. Green, 2004, Mutual Fund Flows and Performance in Rational Markets, *Journal of Political Economy* 112, 1269–1295.
- Berzins, Janis, and Charles A. Trzcinka, 2005, Performance and Survival of Institutional Money Managers, Working Paper, Indiana University.
- Busse, Jeffrey A., Amit Goyal, and Sunil Wahal, 2007, Performance Persistence in Institutional Investment Management, Working Paper, Emory University.
- Carhart, Mark M., 1997, On Persistence in Mutual Fund Performance, *Journal of Finance* 52, 57–82.
- Chen, Joseph, Harrison Hong, Ming Huang, and Jeffrey D. Kubik, 2004, Does Fund Size Erode Mutual Fund Performance? The Role of Liquidity and Organization, *American Economic Review* 94, 1276–1302.
- Chen, Qi, Itay Goldstein, and Wei Jiang, 2008, Directors’ Ownership in the U.S. Mutual Fund Industry, *Journal of Finance* 63, 2629–2677.
- Chevalier, Judith, and Glenn Ellison, 1999, Career Concerns of Mutual Fund Managers, *Quarterly Journal of Economics* 114, 389–432.
- Christopherson, Jon A., Wayne E. Ferson, and Debra A. Glassman, 1998, Conditioning Manager Alphas on Economic Information: Another Look at the Persistence of Performance, *Review of Financial Studies* 11, 111–142.
- Coggin, T. Daniel, Frank J. Fabozzi, and Shafiqur Rahman, 1993, The Investment Performance of U.S. Equity Pension Fund Managers: An Empirical Investigation, *Journal of Finance* 48, 1039–1055.
- Conference Board, 2007, Institutional Investment Report: Patterns of Institutional Investment and Control in the United States, New York, NY.
- Cremers, Martijn, Joost Driessen, Pascal Maenhout, and David Weinbaum, 2006, Does Skin in the Game Matter? Director Incentives and Governance in the Mutual Fund Industry, *Journal of Financial and Quantitative Analysis*, Forthcoming.
- Del Guercio, Diane, Larry Y. Dann, and M. Megan Partch, 2003, Governance and Boards of Directors in Closed-End Investment Companies, *Journal of Financial Economics* 69, 111–152.

- Del Guercio, Diane, and Paula A. Tkac, 2002, The Determinants of the Flow of Funds of Managed Portfolios: Mutual Funds vs. Pension Funds, *Journal of Financial and Quantitative Analysis* 37, 523–557.
- Deli, Daniel N., 2002, Mutual Fund Advisory Contracts: An Empirical Investigation, *Journal of Finance* 57, 109–133.
- Demsetz, Harold, 1983, The Structure of Ownership and the Theory of the Firm, *Journal of Law and Economics* 26, 375–390.
- Demsetz, Harold, and Kenneth Lehn, 1985, The Structure of Corporate Ownership: Causes and Consequences, *Journal of Political Economy* 93, 1155–1177.
- Fama, Eugene F., 1980, Agency Problems and the Theory of the Firm, *Journal of Political Economy* 88, 288–307.
- Fama, Eugene F., and Michael C. Jensen, 1983a, Separation of Ownership and Control, *Journal of Law and Economics* 26, 301–325.
- Fama, Eugene F., and Michael C. Jensen, 1983b, Agency Problems and Residual Control, *Journal of Law and Economics* 26, 327–349.
- Farnsworth, Heber, and Jonathan Taylor, 2006, Evidence on the Compensation of Portfolio Managers, *Journal of Financial Research* 29, 305–324.
- Gervais, Simon, Anthony W. Lynch, and David K. Musto, 2005, Fund Families as Delegated Monitors of Money Managers, *Review of Financial Studies* 18, 1139–1169.
- Himmelberg, Charles P., R. Glenn Hubbard, and Darius Palia, 1999, Understanding the Determinants of Managerial Ownership and the Link between Ownership and Performance, *Journal of Financial Economics* 53, 353–384.
- Holmstrom, Bengt, 1982, Managerial Incentive Problems - A Dynamic Perspective, in *Essays in Economics and Management in Honor of Lars Wahlbeck* pp. 210–235. Swedish School of Economics, Helsinki.
- James, Christopher, and Jason Karceski, 2006, Investor Monitoring and Differences in Mutual Fund Performance, *Journal of Banking and Finance* 30, 2787–2808.
- Kempf, Alexander, and Stefan Ruenzi, 2008, Tournaments in Mutual-Fund Families, *Review of Financial Studies* 21, 1013–1036.
- Khorana, Ajay, 1996, Top Management Turnover: An Empirical Investigation of Mutual Fund Managers, *Journal of Financial Economics* 40, 403–427.
- Khorana, Ajay, 2001, Performance Changes following Top Management Turnover: Evidence from Open-End Mutual Funds, *Journal of Financial and Quantitative Analysis* 36, 371–393.

- Khorana, Ajay, Henri Servaes, and Lei Wedge, 2007, Portfolio Manager Ownership and Fund Performance, *Journal of Financial Economics* 85, 179–204.
- Khorana, Ajay, Peter Tufano, and Lei Wedge, 2007, Board Structure, Mergers and Shareholder Wealth: A Study of the Mutual Fund Industry, *Journal of Financial Economics* 85, 571–598.
- Lakonishok, Josef, Andrei Shleifer, and Robert W. Vishny, 1992, The Structure and Performance of the Money Management Industry, *Brookings Paper: Microeconomics* pp. 339–391.
- McConnell, John J., and Henri Servaes, 1990, Additional Evidence on Equity Ownership and Corporate Value, *Journal of Financial Economics* 27, 595–612.
- Meschke, J. Felix, 2006, An Empirical Examination of Mutual Fund Boards, Working Paper, University of Minnesota.
- Morck, Randall, Andrei Shleifer, and Robert W. Vishny, 1988, Management Ownership and Market Valuation: An Empirical Analysis, *Journal of Financial Economics* 20, 293–315.
- Morrison, Alan, and William J. Wilhelm, 2004, Partnership Firms, Reputation, and Human Capital, *American Economic Review* 94, 1682–1692.
- Petersen, Mitchell, 2009, Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches, *Review of Financial Studies* 22, 432–480.
- Pollet, Joshua M., and Mungo Wilson, 2008, How Does Size Affect Mutual Fund Behavior?, *Journal of Finance*, Forthcoming.
- Pomorski, Lukasz, 2008, Acting on the Most Valuable Information: “Best Idea” Trades of Mutual Fund Managers, Working Paper, University of Toronto.
- Tufano, Peter, and Matthew Sevick, 1997, Board Structure and Fee-Setting in the U.S. Mutual Fund Industry, *Journal of Financial Economics* 46, 321–355.