PORTFOLIO MANAGER OWNERSHIP AND MUTUAL FUND PERFORMANCE

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ABSTRACT

ALLISON EVANS: Portfolio Manager Ownership and Mutual Fund Performance
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This paper examines the association between a mutual fund manager's personal fund investment and mutual fund performance. Newly-released managerial ownership disclosures reveal that fund ownership varies across mutual fund managers and, in many instances, is quite large. I find that mutual fund returns are increasing in the level of managerial fund investment, consistent with managerial ownership realigning decision-maker and shareholder interests. Also consistent with the reduction of agency costs, I find that managerial ownership is inversely related to fund turnover, which could affect both tax and trading costs. However, I do not find any association between portfolio manager ownership and a mutual fund's tax burden.

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CHAPTER I

INTRODUCTION AND MOTIVATION

The purpose of this paper is to determine whether a fund manager's personal ownership of mutual fund shares is associated with differences in mutual fund performance. Specifically, this paper examines whether mutual funds with higher levels of managerial ownership experience higher returns and/or lower fund costs. Such a finding would be consistent with fund ownership reducing agency costs between managers and fund shareholders in the mutual fund industry, beyond the current compensation structure. Over the years 2001-2004, I find that managerial ownership is positively related to fund returns, inversely related to turnover levels, and unrelated to the fund's tax burden.

The relation between a manager's investment in his business and the performance of that business has generated interest across the fields of accounting, finance, and economics. Many papers, including Jensen and Meckling's (1976) seminal work, have analyzed the effects of the separation of ownership and control, as well as compensation structures that attempt to realign incentives between the two. Studies have examined, for instance, the effect of firm managerial ownership on discretionary accounting adjustments (e.g., Warfield et al., 1995), disclosure decisions (e.g., Aboody and Kasznik, 2000; Nagar et al., 2003), dividend policy (e.g., Lambert et al., 1989; Chetty and Saez, 2005; Brown et al., 2005), inventory choices (e.g., Hunt, 1985; Niehaus, 1989), investment decisions (e.g., Clinch, 1991), market valuation (e.g., Morck et al., 1988) and future earnings (Hanlon et al., 2005).

Similar examinations of the relation between a manager's share ownership and performance have never been attempted in the mutual fund arena because managerial fund ownership data have been unavailable prior to this year.¹ Since mutual fund managers are not required to own fund shares, many researchers have assumed that their investment is small. Jin (2006), for instance, assumes that, since mutual funds managers generally are not required to own shares in their fund, they have no personal reason to care about fund tax consequences. This statement implies that the lack of an explicit requirement to own fund shares is equivalent to a manager not making a material investment in his fund. This assumption, though common, is contrary to the findings in this study. Of the 237 mutual fund portfolios in my sample, 22 percent have managers who have personally invested over \$1,000,000 in their fund.

In addition to being a vehicle to extend the agency literature, mutual funds are important in their own right. Mutual funds are playing an increasingly large role in domestic equity markets, as documented by the Investment Company Institute (ICI, 2005). The ICI reports that the mutual fund industry managed \$8.1 trillion and held approximately 22% of the outstanding stock of US companies in 2004. At the same time, regulators and fund investors are increasing their focus on the trading behavior of fund managers after the revelation of several recent trading abuses. This increased scrutiny culminated in the SEC's new regulation requiring mutual funds to disclose managerial ownership levels, compensation structure, and conflicts of interest.² Any empirical documentation of factors that may

¹ Tufano and Sevick (1997), Qian (2005), and Meschke (2005) study agency problems with respect to fund boards of directors.

² US Securities & Exchange Commission, 2004. Final Rule: Disclosure Regarding Portfolio Managers of Registered Management Investment Companies. 17 Code of Federal Regulation Parts 239, 249, 270, 274. US Government Printing Office, Washington, DC.

influence the trading decisions of mutual fund managers will benefit industry regulators, as well as current and potential fund investors.

The paper is organized as follows. Section 2 develops the hypotheses. Section 3 describes the data and sample selection process. Section 4 describes the empirical specifications. Sections 5 and 6 present the results from univariate and multivariate tests, respectively. Section 7 concludes and details plans for future research.

CHAPTER II

HYPOTHESIS DEVELOPMENT

Whether managerial fund ownership is associated with better fund performance is an empirical question. Such a result should obtain to the extent that fund ownership alleviates an incentive conflict between the manager and fund investors. Dow and Gorton (1997) model one such conflict, where a manager who actively searches for profitable trading opportunities and finds none will still execute trades, though they may actually decrease fund value. This action results from incentives embedded in the manager's compensation contract, formulated based on the inability for outsiders to distinguish informed non-trading from a manager's shirking his responsibilities or having no talent to pick good stocks. Thus, Dow and Gorton posit that a manager's compensation creates incentives for him to make trades, even value-reducing ones.

Though their compensation is based primarily on net assets under management, many fund managers also have at least a portion of their compensation (typically the annual bonus) tied to fund returns. In theory, this compensation structure should help align the desires of fund shareholders (higher returns) with the incentives of fund managers (personal wealth). Only 10 percent of the 237 fund portfolios in this sample disclosed that compensation is not tied to fund performance in some way. If this compensation structure is enough to alleviate any existing agency issues, then fund ownership may not be associated with better fund returns. If, however, the compensation structure does not fully alleviate the agency problem

between managers and shareholders, then I would expect fund returns to be positively associated with the degree of managerial ownership. The SEC's stated motivation for enacting this disclosure requirement, to "help investors assess the extent to which portfolio manager's interests are aligned with theirs," implies that current compensation arrangements have not alleviated regulator concerns about potential agency problems in the mutual fund industry.³ My first hypothesis, stated in alternative form, is that managerial fund ownership is positively related to fund returns.

In a related test, I also examine whether higher levels of managerial ownership are associated with lower levels of fund turnover, my second hypothesis. Finding an inverse relation between fund manager ownership and turnover would support the Dow and Gorton (1997) theory that one incentive conflict between managers and shareholders lies in fund turnover. Aligning incentives between the two should help offset the incentive of managers to make trades purely for the sake of making trades, regardless of their potentially negative effect on fund value. Lower turnover levels could also help reduce the fund's tax burden as well as administrative costs (brokerage commissions and trading expenses) associated with each sale. Managers who, as fund shareholders, would personally feel the effects of these costs (through lower fund returns) would have more of an incentive to minimize them.⁴ I will interpret a negative relation between ownership and fund turnover as a reduction of agency costs in the mutual fund setting.

³ Kunal Kapoor, Director of Fund Analysis at Morningstar, Inc., places mutual fund managers in two distinct categories: money managers and fund shareholders. This categorization reflects the opinion that fund managers who are personally invested in the fund likely possess more conviction, taking more care in executing appropriate trades, than money managers who simply perform investing services in exchange for compensation.

⁴ Trading expenses are charged directly against the fund's assets, thus reducing net asset value (NAV), the price at which fund shares are sold.

A manager's incentives can often diverge from the desires of investors with respect to the fund's potential tax burden. When a fund manager trades shares held within the fund's stock portfolio, he triggers capital gains or losses. The SEC requires mutual funds to distribute net gains to fund shareholders each year.⁵ While all investors would favor a higher pre-tax return, only taxable investors are interested in the potential tax burden associated with fund distributions. Several papers (Huddart and Narayanan, 2002; Weiss, 2002; Jin, 2006) cite conversations with fund managers who assert that taxes do not greatly affect trading behavior since shareholders vary in tax status and have different (often unobservable) marginal tax rates. Yet empirical studies (Dickson and Shoven, 1995; Bergstresser and Poterba, 2002) find evidence of significant heterogeneity in the tax liabilities associated with different mutual fund investments. This paper is the first to consider one possible explanation: the manager's personal stake in the fund.

For a fund manager to incorporate the potential tax burden of distributions into his selling decisions, he would need either an influential, tax-sensitive clientele or a personal incentive to do so. A fund manager's compensation is rarely tied to a fund's tax burden (only one of the sample funds does so), meaning that compensation does not provide a direct link between the fund's tax burden and the fund manager's incentives.⁶ However, a fund manager who personally owns fund shares in a taxable account could have a direct incentive to minimize the fund's tax burden, since he would personally be subject to that cost. Such personal ownership would align a manager's incentives with those of taxable individuals, regardless

⁵ To qualify as a flow-through entity, a fund must distribute at least 90% of its earnings to investors. After the Tax Reform Act of 1986, it must also distribute at least 98% of its realized capital gains net income, or be subject to an excise tax on the remaining undistributed portion.

⁶ Bergstresser and Poterba (2002) finds that funds with a lower-after tax return (a heavier tax burden) have lower subsequent inflows, which could lower fund net assets and, in turn, compensation.

of whether they are the fund's primary clientele. However, even a manager with a strong personal desire to minimize taxes on distributions by may not alter his selling behavior if such a strategy would be contrary to the desires of his key investors. It is quite plausible that a fund's clientele would be indifferent to taxes. The ICI (2005) estimates that 54 percent of 2004 mutual fund assets were held by tax-deferred or tax-exempt accounts and 37 percent were held in taxable household accounts.⁷ Hypothesis three, stated in alternative form, is that fund manager ownership is inversely related to a fund's potential tax burden. Such a relation would only be hypothesized to the extent that fund managers hold their shares in taxable accounts.

⁷ Household accounts can either be taxable (held directly by the individual(s)) or tax-deferred (held in a retirement account). Distributions received by a tax-deferred household account are not taxed until withdrawals are made from the account, at the ordinary tax rates in place at the time of withdrawal.

CHAPTER III

SAMPLE AND DATA

I hand-collect data from each fund's Statement of Additional Information (SAI) to construct a measure of managerial ownership. I only study funds with a single manager, which comprise nearly one-half (47%) of all Morningstar funds at the end of 2004. My sample consists of funds who issued ownership disclosures from the effective date of the SEC ruling (February 28, 2005) to September 16, 2005. Over these six and one-half months, I collected data for 273 fund portfolios of the types considered by this analysis (actively-managed growth, value, blend, or specialty funds).⁸ Of those, I eliminate 36 since the manager data in the fund's SAI differs from the manager information reported by Morningstar, leaving an initial sample of 237 actively-managed fund portfolios.⁹

Figure 1 illustrates the disclosed ownership levels for the initial sample of portfolios. Half of the sample portfolios (49%) have managers owning \$100,000 or less. Nearly 24 percent have managers owning between \$100,000 and \$500,000, while 28 percent have managers who have personally invested over \$500,000. These figures reveal that fund-manager ownership levels are quite diverse and can be substantial. Subsequent tests will

⁸ I exclude 13 tax-managed funds with ownership disclosures because they are so few in number and because the managers of those funds may face a different incentive structure than managers of traditional funds. Another 13 portfolios are excluded since their shares are restricted to institutional investors. Results are qualitatively unaltered when either of these groups is included in the analyses.

⁹ The data discrepancies could take two forms. Either the manager's name in the SAI is different from the name in Morningstar's database, or the SAI listed multiple managers, whereas Morningstar listed a sole manager.

examine whether these differences in ownership are associated with differences in fund performance.

With the exception of the ownership and capital gain distribution information, I obtain data for the fund characteristics from Morningstar's Principia database. Following Bergstresser and Poterba (2002) and Plancich (2003), I extract data from each January release of Principia and merge them into one dataset. Detailed long-term and short-term capital gain distribution data are provided by Lipper (a Reuters company that is a global provider of mutual fund information and analysis).

CHAPTER IV

EMPIRICAL SPECIFICATION

1. General

This paper examines the relation between fund-manager ownership and various measures of fund performance (returns and costs). Equation (1) captures the relation between each performance measure and managerial fund ownership:

$$\text{PERF}_{it} = \beta_1 \text{OWN0-100}_i + \beta_2 \text{OWN100-500}_i + \beta_3 \text{OWNOVER500}_i + \beta_4 X_{it} + \varepsilon_{it}. \quad (1)$$

PERF takes on each individual performance measure, in turn. I consolidate the disclosed ownership levels into three main OWN groups and create an indicator variable for each: \$0-\$100,000 (OWN0-100), \$100,001-\$500,000 (OWN100-500), and over \$500,000 (OWNOVER500). Each group is included in the regression with the intercept suppressed. X_{it} represents the set of covariates that could also affect a fund's performance. In each test, I only use data representing years that the current manager is at the fund. Consequently, I delete any fund-year observations that fall during the sample period but before the current manager's tenure. I cluster the error term in each estimation by fund portfolio since the same fund may be in the sample multiple years.¹⁰

2. Ownership Measure

¹⁰ See Petersen (2005) for a discussion of error-term clustering and entity fixed-effects.

Funds disclose their manager's personal investment at the portfolio level. However, if the fund has multiple share classes, the SEC does not require the fund to disclose in which share class(es) a manager has made his investment. The Eaton Vance Growth Fund, for instance, has class A shares (ticker symbol EVGFX), class B shares (EMGFX), and class C shares (ECGFX). Eaton Vance disclosed that Arieh Coll, the Growth Fund portfolio manager, owned between \$500,001 and \$1,000,000 in the portfolio as of the most recent fiscal-year end. However, the disclosure does not detail whether the investment is in class A, B, or C shares (or some in all three).

Share classes do not represent fundamentally different investments. They simply represent different means of entry into the same underlying set of stocks (e.g., whether a fee is charged upon an investor's entry or exit from the fund). Fifty-nine percent of the 237 sample portfolios have multiple share classes. Morningstar treats each share class of a fund as a separate fund, as do many mutual fund analyses. However, most fund characteristics are the same portfolio-wide (e.g., turnover, per-share distributions, and market capitalization) and thus are reported as the same for every share class.¹¹ Annual returns can also be the same between share classes, or only vary slightly as a result of differences in expenses between classes. To avoid counting the same observation multiple times, all analyses consider only the largest share class of a multi-class portfolio.

Funds disclose ownership levels using seven SEC-mandated dollar ranges.¹² Over two-thirds of the observations fall into three categories: none (22%), \$100,001-\$500,000 (24%) and over \$1,000,000 (22%). For ease of exposition, I group the remaining four categories

¹¹ Net assets vary between share classes, as do expenses, sales loads, and Morningstar's calculation of capital gains overhang.

¹² The seven ranges are: none, \$1-\$10,000, \$10,001-\$50,000, \$50,001-\$100,000, \$100,001-\$500,000, \$500,001-\$1,000,000, and over \$1,000,000.

with the three primary ownership levels to create, in essence, a low, medium, and high-ownership measure. Within the “low” group, there is no statistical difference between the “none” funds and the funds with ownership between \$1 and \$100,000 in any specification. I include the few funds that fall into the \$500,001-\$1,000,000 classification (6%) in the high-ownership group (OWNOVER500), though inferences are robust to reclassifying those funds into the mid-ownership group.

Ownership data have only been available since February 28, 2005 and are only disclosed for the fund’s most recent fiscal year end, so I assume each manager’s investment is the same across all years of this study (2001-2004).¹³ It is possible that managers increased their ownership levels immediately preceding the disclosure requirement. In that instance, my assumption would bias against finding significant differences in fund performance based on ownership. I should also emphasize that, for a fund to be in this paper’s sample, it must be in existence in 2005, the year the disclosure requirement took effect. Any fund that did not survive until 2005 would never have released ownership information and cannot be included in this study.

3. Pretax Returns

In this section, I study the relation between a fund’s pretax returns (adjusted for the mean return for the fund’s style category) and managerial ownership. The dependent variable, ANNRTN, is the difference between the fund’s simple annual return, as computed by

¹³ I re-estimate this paper’s tests over shorter time periods to reduce the number of years in which I assume the managers’ ownership is the same as for the most recent (and only) disclosure. Results are robust to shortening the time frame to 2003-2004. Using only 2004 as a sample period substantially reduces the sample size. Though the trends found in subsequent tests are still present using just 2004 data, the results lose significance in that specification.

Morningstar, and the mean return for all Morningstar funds within the same fund-style category (i.e., large-cap value, mid-cap growth) in a given year.¹⁴

Morningstar reports returns after adjusting for fund expenses, which are taken directly out of each fund's assets.¹⁵ A portion of those costs are captured by the fund's expense ratio and do not reflect any decision made by the fund manager. I consequently include the fund's expense ratio as an independent variable to control for the portion of net returns that are out of the manager's control. Other costs, which are not included in the expense ratio but which also decrease fund returns (brokerage commissions and transaction costs), are directly related to the amount of trades the fund manager executes.

I include additional covariates that could be associated with a fund's returns. To account for a fund's systematic risk, I include BETA as a control variable. I add LAGINFLOWS to proxy for a fund's need to sell additional shares to meet shareholder redemptions.¹⁶ Such liquidations likely took place over this time period, as mean inflows for sample funds were negative in 2001 and 2002.¹⁷ I also include an indicator variable to represent funds with a manager in his first year (NEWMGR), since new managers often make portfolio changes when they take over a fund. BOND, the percentage of fund assets that is invested in bonds, is a covariate since stocks and bonds exhibit different patterns of returns. I add year and

¹⁴ The fund-style categories are defined by Morningstar based on analysis of each fund's trading behavior, rather than the fund's self-reported investment style.

¹⁵ Those expenses include management, administrative, and 12-b1 (marketing) fees, as well as other costs taken out of fund assets.

¹⁶ The focus of this paper is on the manager's behavior when he buys and sells stocks held within the fund. However, it is also possible for fund shareholders to sell their fund shares, which funds are required to repurchase. If a fund does not have enough cash to meet redemptions, it may have to sell off some of its stock. Negative inflows mean redemptions exceed new stock purchases within a fund. Inflows are calculated following Bergstresser and Poterba (2002). $\text{Inflows} = [\text{Total Net Assets}_t / \text{Total Net Assets}_{t-1} - (\text{NAV}_t + \text{DIV}_t + \text{GAINS}_t) / \text{NAV}_{t-1}] / (1 + \text{AnnRtn}_t / 2)$

¹⁷ The ICI (2005) also estimates that net new cash flow for equity funds was negative in 2002.

fund-style indicators (e.g., large-cap value, mid-cap growth) to capture time differences and differences between mean fund returns based on investment objectives. I average the continuous control variables over the sample period in the four-year return specification.

4. After-tax Returns

A fund's abnormal after-tax return, again calculated using the after-tax return for the average fund in the same style category as a benchmark, incorporates both its return and its tax burden. The SEC, since 2001, requires funds to present two after-tax returns numbers: annual returns after taxes on distributions, and after taxes on distributions and the sale of fund shares. That ruling sets forth a common formula for funds to use to compute each measure. The calculations assume distributions are received by individual shareholders in the top statutory tax bracket and thus represent an upper bound on the tax on distributions. The formula for the tax on sale assumes a fund shareholder exits the fund at the end of the year and thus incorporates any unrealized gain or loss on fund shares. Funds calculate that tax burden based on a hypothetical shareholder with a \$1,000 initial investment. Only taxable investors would be subject to these tax costs.

Controls for this specification are largely the same as for the pre-tax returns specifications. I also include a control variable representing the one-year lag of the fund's capital gains overhang (percent of net assets that represent appreciation). Prior research (Barclay et al., 1998; Bergstresser and Poterba, 2002) finds evidence consistent with the level of appreciation within a fund influencing a manager's selling decisions.

5. Fund Turnover

In this section, I analyze whether higher levels of fund ownership are associated with differences in the frequency of a fund's trades. An inverse relation would be consistent with Dow and Gorton (1997), who theorize that managerial compensation encourages noise trading even when no value-enhancing trades are found. If managerial ownership reduces this agency problem, then higher share ownership by mutual fund managers should result in lower levels of share turnover. Low turnover would help minimize selling expenses (brokerage and transaction costs) and potentially a fund's tax burden, since fewer sales may decrease the capital gains or losses a fund would trigger. In fact, after avoiding net taxable gains altogether, AllianceBernstein (2004) lists low turnover as the next-best way for managers to minimize the potential tax burden on mutual fund distributions. Both transaction and tax costs reduce a shareholder's return on his mutual fund investment.

TURN, a fund's turnover ratio, can be interpreted as the percentage of the portfolio's holdings that have changed over the past year. A low turnover (e.g., 20%-30%) would indicate a buy-and-hold strategy, whereas a high turnover (e.g., over 100%) indicates an investment strategy involving considerable buying and selling of securities. To address the possibility that turnover is a proxy for fund style, I again use the mean ratio for the fund's style category as a benchmark. The resulting TURN variable represents the abnormal turnover volume relative to the mean for the fund's peer group. As in all previous tests, the fund's investment style is classified by Morningstar based on its analysis of the fund's trading behavior.

I include INFLOWS as a covariate since funds with low or negative net inflows may have to sell additional stock to meet shareholder redemptions. I add a fund's current and lagged returns to control for the fact that managers may sell shares to lock-in gains or rebalance their

portfolios following market upswings. I also add a one-year lag of the fund's capital gains overhang (LAGCGOH) since the level of unrealized gains may influence a manager's selling decisions. I include NEWMGR because a new manager may make more sales to rebalance his fund's portfolio. Year and fund-style indicators also serve as covariates, consistent with prior specifications.

6. Tax Burden Measures

Finally, I examine the association between a manager's ownership in his fund and the tax burden of that fund. I use several different measures designed to capture different aspects of a fund's tax sensitivity. Consistent with prior tests, each measure represents the difference between the fund's tax measure and the average for the same fund style category. The first construct of a manager's sensitivity to taxes on fund distributions is LTTOT, the percent of total gains paid out as long-term. Planch (2003) uses LTTOT to test whether mutual funds shifted more towards long-term gains after the Tax Reform Act of 1997 reduced the capital gains tax rate from a maximum of 28% to 20%. She finds evidence consistent with such a shift. LTTOT represents a fund's sensitivity to individual tax incentives because in all years of this study, short-term capital gains are taxed at a higher rate than long-term gains.¹⁸ Since most dividends are now also taxed at a 15% tax rate, short-term capital gains are currently the most tax-disadvantageous form of mutual fund distribution.

Though favoring long-term gains would decrease a taxable individual's tax burden, a better measure of tax-sensitivity may be whether funds distribute gains at all.

¹⁸ Another disadvantage of short-term gains is that they become classified as ordinary income on an individual's tax return, meaning that the investor cannot utilize that distribution to offset any capital losses. An individual's capital losses can be offset by capital gains, then up to \$3,000 of ordinary income. Any remaining capital losses must be carried forward for use in future years.

AllianceBernstein (2004) lists avoiding short-term capital gains and offsetting realized capital gains with capital losses as the primary tax-management techniques for mutual fund managers. Dickson, Shoven, and Sialm (2000) finds that active realization of capital losses has a significant effect on after-tax returns for actively-managed funds. Specifically, instead of distributing capital gains realized within the fund, the manager could offset those gains with fund losses.¹⁹ To see whether higher ownership is associated with this tax-sensitivity measure, PCTGAIN, the per-share dollars of gains paid out as a percent of each share's net asset value, is used as a dependent variable.

The final tax-cost measure, PCTTAX, captures the effects of dividend, short-term gain, and long-term gain distributions. PCTTAX represents the maximum per-share tax burden a taxable individual would face on all fund distributions as a percent of the fund's net asset value, relative to the average for funds in the same category.²⁰ If managers with larger personal fund investments want to minimize their current tax bill, PCTGAIN and PCTTAX should decrease with fund ownership. However, it is possible that desires of a tax-insensitive clientele would outweigh the manager's personal tax situation, or that the managers themselves hold their fund investments primarily in tax-deferred accounts.

I include INFLOW since negative cash inflows could prompt the fund manager to increase stock sales to meet redemptions. NETA, a fund's total net assets, is included to control for scale effects. I add LAGCGOH since the fund's level of unrealized gains may affect a manager's decisions, consistent with prior specifications. I include NEWMGR since a

¹⁹ A fund cannot distribute the losses it generates. However, it may use those losses to offset gains within a portfolio for up to eight future years.

²⁰ $PCTTAX = ((lrcg * t_{lt}) + (stcg * t_{st}) + (div * t_d)) / NAV$. The tax rate on long-term capital gains (t_{lt}) is 20% in the years before the enactment of the 2003 JGTRRA and 15% after it. The tax rate on short-term gains (t_{st}) is set equal to the maximum ordinary tax rate, and thus represents an upper bound on the potential tax burden from short-term gain distributions. The dividend tax rate (t_d) is equal to the maximum ordinary tax rate in all years before the Jobs and Growth Tax Relief Reconciliation Act, and 15% in 2003 and 2004.

manager in his first year may make more stock sales to rebalance the portfolio, increasing the potential tax burden of the fund. I also include year and fund-style indicators to control for time and investment objective differences. PCTGAIN is a regressor in the LTTOT specification to control for the amount of gains distributed, following Plancich (2003).

CHAPTER V

UNIVARIATE RESULTS

Panels A and B of Table 1 present the mean, median, and standard deviation of each performance measure that I use as a dependent variable (returns and costs, respectively), by ownership level. Before missing value deletions, the initial sample consists of 812 fund-year observations. F-statistics report whether the means are fundamentally different between the three ownership groups. I have adjusted those statistics to account for the fact that the same funds appear in the sample multiple years.

Panel A presents univariate results for the measures of a fund's abnormal returns. Each return measure is presented and analyzed before sales loads.²¹ Fund returns, however defined, are monotonically increasing in ownership. This increase is significant in three of the four return measures at the one-percent level. Overall, these results lend initial support to the hypothesis that both pretax and after-tax returns are highest for funds with the highest level of managerial investment.

²¹ The return figures disclosed in fund prospectuses are reported after incorporating the maximum sales load of the fund. However, these sales charges are not set by the fund manager and are consequently removed from this analysis. When sales loads are incorporated, the differences between mean returns based on ownership are magnified, implying that sales loads are lower for funds with higher levels of ownership. Untabulated univariate statistics support this implication. The mean total sales load for the low-ownership funds is 2.4 percent, while it is only 0.64 percent for the highest-ownership group, a difference that is significant at the one-percent level.

Panel B presents univariate results for the measures of a fund's relative costs. The turnover univariate statistics clearly indicate an inverse relation between the frequency of trading and the level of managerial ownership within a fund. Turnover levels relative to fund-style averages are significantly, monotonically decreasing with managerial ownership at the one-percent level. This relation is consistent with the reduction of an agency cost that often results in an inflated level of executed trades, as well as the minimization of selling expenses and/or tax costs which also have a negative effect on shareholder returns.

The tax cost statistics in Panel B provide initial evidence of whether funds with highly-invested managers have a lower tax burden, which would be consistent with the finding that those funds appear to have lower levels of fund turnover. However, the univariate results indicate that there is no significant difference between any of the abnormal tax cost variables. LTTOT and PCTGAIN show no monotonic trend between groups. A tax-sensitivity hypothesis would have predicted increasing LTTOT means (as ownership increases), since tax-sensitive funds would favor long-term capital gains. The mean PCTGAIN is actually lowest for the low-ownership group (OWN0-100), which is also inconsistent with minimizing the current-year tax burden. There is no significant difference in the percent of NAV that represents the total tax on distributions, though there is a monotonic decrease with ownership. In sum, univariate tax cost results do not support a negative relation between ownership and the fund's current tax burden.

Panels C and D of Table 1 present univariate statistics on the control variables. Panel C illustrates that there are significant differences between funds with different managerial investment levels. Both net assets and capital gains overhang (the percent of net assets representing capital appreciation) are monotonically increasing with ownership, with

differences between groups significant at the one-percent level. The percent of assets invested in bonds is statistically different between groups, though there is no monotonic trend. The fund's expense ratio, capturing costs outside the fund manager's control, is significantly decreasing in managerial ownership, consistent with managers choosing to invest in funds with lower expenses.

Panel D shows the breakdown of the fund ownership levels by the type of fund. The funds with highly-invested managers are more evenly spread amongst the fund types (ranging from 7 percent in large value funds to 13 percent in large blend funds). In comparison, category holdings in the low- (mid-) ownership group ranges from a low of 2 (0) percent to a high of 19 (20) percent. The high-ownership group has significantly higher ownership concentrations in the mid- and small-cap value funds relative to the other fund categories. As expected, fewer of the OWN OVER 500 funds have managers in their first year with the fund.

CHAPTER VI

MULTIVARIATE RESULTS

1. Pretax Returns

In both of the pretax returns specifications in Table 2, the OWN coefficients in Panel A are monotonically increasing with ownership. Panel B shows the comparisons between the OWN coefficients and presents the significance of the F-value using a one-tailed test. In the current and annualized four-year return regressions, the coefficient on OWNOVER500 is significantly higher, at the one-percent level, than the coefficient for the lowest ownership group. This result is consistent with highly-invested fund managers making trades and investments that lead to higher returns and minimizing selling costs that decrease those fund returns. This finding supports the argument that managerial share ownership helps align incentives between fund managers and fund shareholders, consistent with the SEC's motivation for enacting the disclosure requirement.²²

Besides the fund investment style and year, which explain a large amount of mutual fund's annual returns, prior period inflows are negatively related to abnormal returns at the five-percent level. This result is consistent with the difficulty in managing an increasing asset base.

²² In a separate analysis, I examined whether cumulative returns are higher for high-ownership funds. I studied cumulative, four-year returns for the subset of funds that were in existence and had complete data over the entire sample period. While the resulting sample was quite small (57 observations), the results are consistent with the tabulated returns analyses. HIGH funds had significantly higher cumulative returns than the LOW funds at the one-percent significance level.

2. After-Tax Returns

Similar to the pretax returns specifications, the coefficients in both after-tax specifications in Table 2 are monotonically increasing in ownership. Panel B illustrates that, consistent with the pretax comparisons, the difference between the lowest and highest OWN groups in both specifications is significant at either the one- or five-percent level. Results on the control variables are also similar to the results in the pretax specifications, with inflows being negatively related to returns. Overall, the results from this section reinforce the univariate finding that returns are significantly, positively associated with ownership.

3. Two-Stage Least Squares Estimation

Of concern in the foregoing analysis is the potential endogeneity of the ownership choice; specifically, that high fund returns could be causing high managerial ownership. To address this concern, I have estimated a two-stage least squares (2SLS) regression. For the purposes of this estimation, I redefine my ownership variable to equal one if the level of managerial ownership falls into the “high” group (over \$500,000) and zero otherwise.²³ The first stage is a logistic estimation in which I regress the binary OWN variable on fund style, lagged abnormal fund returns, and a measure of manager compensation since managers with higher income will have more to invest. Because fund managers are largely compensated based on net assets under management, I use total net assets as the compensation proxy. The Pearson correlation coefficient between the dichotomous OWN variable and total net assets is 0.30, which is significant at the one-percent level. Total net assets are uncorrelated with abnormal returns (a Pearson correlation coefficient of 0.004) and thus can be considered an appropriate instrument for the first stage. Estimating 2SLS with this structure does not result in a change

²³ Inferences from the earlier OLS regressions hold using this binary measure.

in inferences from the original OLS estimation.²⁴ The coefficient on the predicted OWN value from the first stage is significant at the five-percent level.

4. Turnover

Results from the turnover regression are found in Table 3. Consistent with the univariate results, turnover levels (mean-adjusted for the fund's investment style) are decreasing with fund ownership. Panel B reports that both the mid- and high-ownership funds have significantly lower turnover ratios than OWN0-100 funds at the one-percent level. These results are consistent with personal fund ownership reducing managerial incentives to inflate fund turnover to appear competent as a manager and increase compensation. Decreasing the amount of noise trading should also result in an increase of fund returns following Dow and Gorton (1997), which is consistent with the results presented in Table 2. Thus, managerial ownership's relation to both returns (a positive relation) and turnover (a negative relation) in this paper is consistent with ownership reducing agency costs in the mutual fund setting.

Minimizing turnover-related costs, through executing fewer trades, also helps maximize the return of all shareholders (including the return of the manager). Executing fewer trades reduces transaction costs and possibly decreases the fund's tax burden. In addition, results from the control variables reveal that turnover is negatively related to a fund's net assets under management. Turnover is also negatively related to a fund's prior year return and capital gains overhang, consistent with selling to lock-in gains.

5. Tax Costs

²⁴ Though the primary endogeneity concern is between ownership and pretax returns, I have also estimated 2SLS using each of the two after-tax return figures. Inferences remain unchanged.

The fact that the significance between OWN coefficients is no greater in the after-tax return specifications than in the pretax specification suggests that the fund's tax burden may not be reduced as a result of a highly-invested manager executing trades. However, those funds with highly-invested managers also have lower fund turnover, a common strategy for tax-minimization in mutual funds. As a direct test of whether the tax burden is reduced in funds with highly-invested managers, I analyze three tax-sensitivity measures.

The results from these regressions are presented in Table 4. There is no clear trend between ownership coefficients in any of the three specifications and there is no significant difference between ownership groups. Such results suggest that a fund manager's ownership and the fund's tax burden have no relation to one another. These findings are consistent with fund managers trading on behalf of a tax-insensitive clientele, or a clientele of unknown tax status. They are also consistent with the anecdotal claims that managers trade irrespective of the tax implications of their behavior. The fact that funds with highly-invested managers do not appear to tax-manage to minimize their own tax burden could also indicate that managers hold mutual fund shares in tax-deferred accounts, though ownership disclosures are not required to denote in what kind of account(s) the manager holds his investment. Thus, while certain research has shown that managers, as a whole, engage in some degree of tax planning (Bhabra et al., 1999; Gibson, et al., 2000; Huddart and Narayan, 2002; Plancich, 2003), the results of this analysis do not support the hypothesis that managers with higher ownership engage in more tax-planning than managers without a substantial personal fund investment.

Results from control variables indicate that a fund's tax burden is positively related to the capital gains overhang at the beginning of the year. This relation is consistent with overhang affecting trading decisions, consistent with prior research (Barclay et al., 1998; Bergstresser

and Poterba, 2002). LTTOT is positively related to the percentage of net asset value paid out as gains. It is also significantly higher for funds with new managers who make initial portfolio changes when they take over the fund.

CHAPTER VII

CONCLUSION

As the share of the market owned by mutual funds continues to rise, determining the factors that affect fund manager trading behavior has become increasingly important. This paper uses newly-disclosed managerial ownership data and details of other fund characteristics from the years 2001-2004 to study the relation between a manager's personal wealth and the performance of his fund. I find that managerial fund ownership varies widely, with approximately one out of every two managers owning over \$100,000 in his fund, and one out of every five managers owning over \$1,000,000.

Higher ownership is positively associated with mutual fund returns and negatively related to fund turnover. Both findings are consistent with the reduction of the agency costs set forth in the Dow and Gorton (1997) model, where managers make value-reducing trades in lieu of making no trades when they cannot identify any suitable investments. This paper's tax analyses do not find evidence of increased tax-sensitivity in funds with highly-invested managers. This result is consistent with trading for a tax-insensitive clientele, a clientele of unknown tax status, or with a manager holding shares in a tax-deferred retirement account.

Investors should consider many variables when they choose to invest in mutual fund shares. The optimal fund choice for each individual depends on his goals, investment horizon, and risk profile. However, the results of this study suggest that investors of any tax

status may need to add managerial ownership to the list of variables to consider when choosing a mutual fund investment.

Future research will continue to develop the database of managerial ownership disclosures. In addition to expanding tests of the relation between ownership and returns, additional analyses will examine the relation between ownership and future returns. Very preliminary tests based on the first three quarters in 2005 do not support a positive relation between managerial ownership and future fund returns. However, multiple years of ownership and returns data will be required to test this relation.

Another related analysis will examine multi-manager funds, and test whether ownership incentives or fund management, in general, varies between sole-managed and team-managed funds. In addition, I will undertake further analysis into the relation between fund manager ownership and a fund's tax burden. I plan to use a methodology similar to that employed by Huddart and Narayanan (2002), using quarterly stock holdings to further investigate the influence of capital gain taxation on fund manager's stock-sale decisions.

FIGURE 1
Level of Mutual Fund Portfolio Manager Ownership

TABLE 1
Descriptive Statistics by Level of Managerial Ownership
PANEL A – Abnormal Fund Returns

	\$0- \$100,000	\$100,001- \$500,000	over \$500,000	F-value	Pr > F
ANNRTN					
Mean	-0.41	1.6	2.7	7.1	0.001
Median	-0.54	0.75	1.3		
Std Deviation	8.8	11.2	9.6		
AFTTAX RTN - Distrib					
Mean	0.047	2.1	3.2	6.3	0.002
Median	-0.24	1.0	1.4		
Std Deviation	9.4	11.3	10.4		
AFTTAX RTN – Distrib/Sale					
Mean	0.41	1.3	1.7	2.3	0.10
Median	0.14	0.42	0.69		
Std Deviation	6.2	7.3	7.2		

The number of observations is 812 before missing data deletions (136 for the four-year return variable).

All variables are in excess of the fund-style mean.

VARIABLE DEFINITIONS: ANNRTN = fund's percentage annual return; AFTTAX RTN-Distrib (Distrib & Sale) = fund's percentage annual return including tax burden from fund distributions (and assuming shareholder exits the fund at year-end), calculated per SEC regulations.

TABLE 1
Descriptive Statistics by Level of Managerial Ownership
PANEL B – Abnormal Fund Costs

	\$0- \$100,000	\$100,001- \$500,000	over \$500,000	F-value	Pr > F
<u>Turnover</u>					
TURN					
Mean	10.9	-44.7	-58.7	6.1	0.003
Median	-33.0	-52.5	-63.0		
Std Deviation	192.8	86.2	57.5		
<u>Tax Costs</u>					
LTTOT					
Mean	0.087	-0.012	0.10	1.7	0.18
Median	0.17	0.14	0.17		
Std Deviation	0.30	0.37	0.26		
PCTGAIN					
Mean	0.00059	0.0025	0.00046	0.18	0.83
Median	-0.0039	-0.0039	-0.0039		
Std Deviation	0.026	0.038	0.025		
PCTTAX					
Mean	0.0013	0.00042	-0.00061	2.0	0.14
Median	-0.00093	-0.00093	-0.0013		
Std Deviation	0.010	0.0067	0.0056		

The number of observations is 812 before missing data deletions. All variables are in excess of the fund-style mean.

VARIABLE DEFINITIONS: TURN = fund's turnover ratio; LTTOT = ratio of a fund's long-term to total capital gain; PCTGAIN = percent of a fund's net asset value paid out as capital gains; PCTTAX = per-share maximum tax burden on distribution as a percent of a fund's net asset value.

TABLE 1
Descriptive Statistics by Level of Managerial Ownership
PANEL C – Continuous Control Variables

	\$0-\$100,000	\$100,001-\$500,000	over \$500,000	f-value	Pr > f
CGOH					
Mean	-20.8	-13.6	9.7	7.0	0.0012
Median	-1.0	5.0	15.5		
Std Deviation	101.8	82.8	28.7		
EXPRATIO					
Mean	1.6	1.3	1.3	7.5	0.0007
Median	1.5	1.3	1.3		
Std Deviation	0.71	0.43	0.46		
NETA					
Mean	306	564	1,806	8.8	0.0002
Median	100	193	430		
Std Deviation	612	900	3,136		
INFLOW					
Mean	0.56	-8.4	6.7	2.7	0.072
Median	0.16	0.14	0.30		
Std Deviation	1.7	109.6	40.9		
BETA					
Mean	1.4	2.5	1.3	0.79	0.45
Median	0.89	0.94	0.84		
Std Deviation	6.4	11.7	5.7		
BOND					
Mean	0.83	0.22	0.78	3.2	0.043
Median	0.0	0.0	0.0		
Std Deviation	3.6	0.93	3.2		

The number of observations is 812 before missing data deletions.

VARIABLE DEFINITIONS: CGOH = percentage of the fund's assets that represent capital appreciation; EXPRATIO = fund's expense ratio; NETA = the fund's total net assets, in millions; INFLOW = net inflows weighted by beginning net asset value; BETA = the fund's systematic risk as reported by Morningstar; BOND = percentage of fund assets invested in bonds.

TABLE 1
Descriptive Statistics by Level of Managerial Ownership
PANEL D – Discrete Control Variables

	\$0- \$100,000	\$100,001- \$500,000	over \$500,000	F-value	Pr > F
LGROW	15%	11%	9%	0.62	0.54
MGROW	13%	17%	12%	1.1	0.33
SGROW	14%	7%	11%	0.93	0.39
LVALUE	5%	15%	7%	2.5	0.08
MVALUE	4%	2%	9%	4.4	0.013
SVALUE	5%	0%	11%	5.9	0.032
LBLEND	16%	20%	13%	0.23	0.80
MBLEND	6%	9%	9%	0.53	0.59
SBLEND	2%	2%	11%	1.8	0.16
SPECIALTY	19%	17%	8%	1.5	0.24
	<hr/> 100%	<hr/> 100%	<hr/> 100%		
NEWMGR	15%	12%	6%	7.0	0.001
number of observations	364	190	258		
percent of all observations	45%	23%	32%		

The number of observations is 812 before missing data deletions.

VARIABLE DEFINITIONS: L/M/S GROW/VALUE/BLEND = 1 if the fund is a large/medium/small growth/value/blend fund, and 0 otherwise; SPECIALTY = 1 if the fund is a specialty fund, and 0 otherwise; NEWMGR = 1 if the manager is in his first year, and 0 otherwise.

TABLE 2 – Abnormal Fund Returns

Panel A – Regression Results

	ANNUAL RTN		AFTTAX RTN (Distrib)		AFTTAX RTN (Distrib & Sale)	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
OWN0-100	-0.37	-0.16	1.7	0.70	0.49	0.29
OWN100-500	2.0	0.83	3.9	1.55	1.4	0.84
OWNOVER500	3.2	1.66	4.9	2.32*	2.1	1.42
LAGINFLOWS	-0.018	-2.60*	-0.018	-2.74**	-0.012	-2.45*
EXPRATIO	-0.61	-0.76	-0.63	-0.70	-0.11	-0.17
BETA	-0.011	-0.36	-0.013	-0.40	-0.0019	-0.08
BOND	0.13	1.30	0.12	0.82	0.014	0.17
NEWMGR	-0.0013	0.01	-0.28	-0.20	0.18	0.20
LAGCGOH	-	-	1.7	0.70	0.49	0.29
number of observations	519		519		519	
Year fixed effects?	yes		yes		yes	
Fund style indicators?	yes		yes		yes	

*,** t-statistic is significant at the 0.05 or 0.01 level, respectively.

Panel B - Comparisons between Ownership Coefficients

	ANNUAL RTN		AFTTAX RTN (Distrib)		AFTTAX RTN (Distrib&Sale)	
	OWN0-100	OWN100-500	OWN0-100	OWN100-500	OWN0-100	OWN100-500
OWN0-100	-	0.11	-	0.14	-	0.24
OWN100-500	0.11	-	0.14	-	0.24	-
OWNOVER500	0.0002	0.25	0.001	0.28	0.01	0.29

Panel B reports the significance of the F-value using a one-tailed test. All dependent variables are in excess of the fund-style mean.

VARIABLE DEFINITIONS: ANNUAL RETURN = fund's annual return percentage; OWN0-100 = 1 if the manager owns \$0-\$100,000 in the fund, 0 otherwise; OWN100-500 = 1 if the manager owns \$100,001-\$500,000 in the fund, 0 otherwise; OWNOVER500 = 1 if the manager owns over \$500,000 in the fund, 0 otherwise; LAGINFLOWS = one-year lag of net inflows weighted by beginning net asset value; EXPRATIO = fund's expense ratio; BETA = fund's systematic risk, reported by Morningstar; BOND = percent of fund assets invested in bonds; NEWMGR = 1 if tenure is less than one year, 0 otherwise; LAGCGOH = one-year lag of the percentage of the fund's assets that represents capital appreciation.

TABLE 3 – Abnormal Turnover

Panel A – Regression Results

	<u>Coefficient</u>	<u>t-value</u>
OWN0-100	47.3	1.70
OWN100-500	-15.0	-0.66
OWNOVER500	-20.2	-1.06
INFLOWS	-0.018	-0.97
NETA	-0.0035	-2.05*
LAGANNRTN	-1.1	-2.53*
NEWMGR	16.6	1.34
LAGCGOH	-0.30	-2.72**
number of observations	571	
Year fixed effects?	yes	
Fund style indicators?	yes	

*,** t-statistic is significant at the 0.05 or 0.01 level, respectively.

Panel B - Comparisons between Ownership Coefficients

	<u>OWN0- 100</u>	<u>OWN100- 500</u>
OWN0-100	-	0.003
OWN100-500	0.003	-
OWNOVER500	0.001	0.39

Panel B reports the significance of the F-value using a one-tailed test.

Variable Definitions: TURN = fund's turnover ratio in excess of the mean for the fund-style category; OWN0-100 = 1 if the manager owns \$0-\$100,000 in the fund, 0 otherwise; OWN100-500 = 1 if the manager owns \$100,001-\$500,000 in the fund, 0 otherwise; OWNOVER500 = 1 if the manager owns over \$500,000 in the fund, 0 otherwise; INFLOWS = net inflows weighted by beginning net asset value; NETA = the fund's total net assets, in millions; LAGANNRTN = fund's one-year lagged annual return percentage; NEWMGR = 1 if the manager is in his first year, and 0 otherwise; LAGCGOH = one-year lag of the percentage of the fund's assets that represents capital appreciation.

TABLE 4 – Abnormal Fund Tax Costs

Panel A –Regression Results

	LTTOT		PCTGAIN		PCTTAX	
	Coefficient	t-value	Coefficient	t-value	Coefficient	t-value
OWN0-100	-0.13	-1.75	-0.14	-0.18	-0.093	-0.71
OWN100-500	-0.16	-1.84	-0.19	-0.26	-0.18	-1.39
OWNOVER500	-0.13	-1.83	-0.23	-0.29	-0.20	-1.43
INFLOWS	0.00012	-1.08	-0.0015	-1.42	-0.00012	-0.54
NETA	0.00001	1.71	0.000002	-0.29	0.000001	-0.12
LAGCGOH	0.0047	2.92**	0.0042	2.13*	0.00047	1.40
NEWMGR	0.15	3.25**	0.42	1.09	0.029	0.40
ANNRTN	-0.00077	-0.25	-0.0027	-0.15	0.00084	0.26
LAGANNRTN	0.0030	-1.70	0.043	1.31	-0.0085	1.76
PCTGAIN	0.86	2.45*	-	-	-	-
number of observations		199		572		572
Year fixed effects?		yes		yes		yes
Fund style indicators?		yes		yes		yes

*,** t-statistic is significant at the 0.05 or 0.01 level, respectively.

Panel B - Comparisons between Ownership Coefficients

	OWN0-100	OWN100-500	OWN0-100	OWN100-500	OWN0-100	OWN100-500
OWN0-100	-	0.33	-	0.44	-	0.12
OWN100-500	0.33	-	0.44	-	0.12	-
OWNOVER500	0.50	0.33	0.38	0.45	0.07	0.39

Panel B reports the significance of the F-value using a one-tailed test. All dependent variables are in excess of the fund-style mean.

Variable Definitions: LTTOT = ratio of a fund's long-term to total capital gain distributions; PCTGAIN = fund's per-share capital gain payout as a percent of NAV; PCTTAX = fund's per-share tax due by taxable investor as a percent of NAV; OWN0-100 = 1 if the manager owns \$0-\$100,000 in the fund, and 0 otherwise; OWN100-500 = 1 if the manager owns \$100,001-\$500,000 in the fund, and 0 otherwise; OWNOVER500 = 1 if the manager owns over \$500,000 in the fund, and 0 otherwise; INFLOWS = net inflows weighted by beginning net asset value; NETA = the fund's total net assets, in millions; LAGCGOH = one-year lag of the percentage of the fund's assets that represent capital appreciation; NEWMGR = 1 if the manager is in his first year, and 0 otherwise; (LAG)ANNRTN = fund's (one-year lagged) annual return percentage.

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