

**SOFT DOLLAR BROKERAGE, PORTFOLIO MANAGEMENT, AND PRIVATE
INFORMATION: AGENCY THEORY AND EVIDENCE**

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SOFT DOLLAR BROKERAGE, PORTFOLIO MANAGEMENT, AND PRIVATE INFORMATION: THEORY AND EVIDENCE

Abstract

This paper examines the agency problems associated with the use of soft dollars in delegated portfolio management. We assume that active portfolio managers are hired to identify private information about mispriced securities, but in the absence of careful monitoring by investors or compensating organizational arrangements they will have too little incentive to do the necessary research. Moreover, when they succeed in identifying mispriced securities much of the value of the information can be lost to market interlopers due to low-quality broker executions. We develop two agency cost hypotheses for the role soft dollars play in active portfolio management. One hypothesis views soft dollars as a symptom of agency costs that allows money managers to unjustly enrich themselves at portfolio investors' expense. The other hypothesis views soft dollars as a method of reducing agency costs by encouraging optimal research and enforcing property rights to private information by bonding the quality of broker executions. Using a database of institutional money managers, we find that soft dollar use is positively related to risk-adjusted performance, suggesting that soft dollars reduce agency costs when other controls are uneconomic. Moreover, soft dollar use is unrelated to management fees, suggesting that managers do not use soft dollars to unjustly enrich themselves.

SOFT DOLLAR BROKERAGE, PORTFOLIO MANAGEMENT, AND PRIVATE INFORMATION: AGENCY THEORY AND EVIDENCE

1. Introduction

An impressive body of finance literature examines the returns to active portfolio management. At best, it appears that active managers just barely cover the added costs of identifying mispriced securities. These results point to two potential problems in active portfolio management. First, in a world of agency costs, money managers might have a sub-optimal incentive to identify mispriced securities. Second, where property rights to private information are costly to enforce, much of the value of private information might be lost to market interlopers when the informed manager enters the market to trade. The question then naturally arises, what organizational arrangements might ameliorate these problems in the context of professional portfolio management? This paper examines the theoretical and empirical effects of soft dollar brokerage in an effort to address this question.

Soft dollar brokerage — or simply soft dollars — is a popular financial industry arrangement in which investors subsidize the research inputs that professional portfolio managers use to identify profitable trading opportunities. In a typical soft dollar arrangement, a money manager agrees to place a designated dollar value of trading commission business with a broker over the coming month, quarter, or year. In consideration for this promise, the broker provides the manager with research credits equal to some percentage, often around 50%, of the promised commissions. The manager uses the credits to buy any of a large number of broker-approved research products sold in the market by third-party research vendors. The broker then pays the manager's research bill and cancels the appropriate number of credits from the manager's soft dollar account. Johnsen (1994) points out that, once having spent its soft dollar research credits, the manager has no legal obligation to place the promised commission business with the broker in question.¹

Commission rates for soft dollar brokerage are no doubt higher than they would otherwise be for pure discount brokerage, and managers are therefore said to pay up for soft dollar research. Since brokerage commissions are included in the price basis of a portfolio security, investors bear the associated research costs. The practice of formally bundling research

¹ In fact, the manager is prohibited by his fiduciary duty of best execution from contractually committing the portfolio to a particular broker.

and execution together into a single commission began toward the end of the era of fixed minimum commissions, as brokers found various nonprice methods of competing for lucrative institutional business (see, e.g., Jarrell, 1984). During this time, NYSE commissions were set far in excess of what would have, and ultimately did, prevail under freely negotiated commissions.²

Deregulation brought the entry of soft dollar brokers, who specialized in providing managers with third-party research pursuant to some form of soft dollar arrangement. Gradually, this competition forced the established brokerage firms to offer soft dollar credits to their institutional clients (see Johnsen, 1994). Although brokerage commissions fell dramatically following deregulation, they nevertheless reached an equilibrium that exceeds the execution-only rates charged by discount brokers. For example, discount brokerage commission rates run roughly two cents per share, whereas the average commission rate in our sample of managed portfolios ranges between six and eight cents per share. This equilibrium involves the routine receipt by money managers of soft dollar research credits.

The study of soft dollar brokerage is important for at least two reasons. First, the use of soft dollars has grown, by one account, to one-third of the \$2.4 billion in gross commissions money managers generated in 1994, and by other accounts to as much as \$1 billion annually (see Hopfner, 1995 and Conrad et al, 1998, respectively). In fact, the practice of soft dollar brokerage has spawned an entire industry of firms whose sole objective is to accept soft dollar brokerage commissions in exchange for providing third-party research. Second, a careful analysis of soft dollar practices provides profound insights into the economic organization of financial intermediaries, especially with respect to how financial market participants contract in a way to minimize agency costs.

² With the deregulation of fixed commissions in 1975, Congress added Section 28(e) to the Securities Exchange Act (1934). Labeled the “paying up amendment,” Section 28(e) provided money managers with a specific safe harbor from fiduciary suits when they pay up for brokerage if they receive research products or services that they believe adequately compensate for the higher commission rate. Section 28(e) was part of the Securities Acts Amendments (1975) and is codified at 15 U.S. Code § 78bb(e) (1988). It reads, in relevant part:

No person [who exercises] investment discretion with respect to an account shall be deemed to have . . . breached a fiduciary duty . . . solely by reason of having caused the account to pay a member of an exchange, broker, or dealer an amount of commission . . . in excess of the amount of commission another member of an exchange . . . would have charged . . . if such person determined in good faith that [it] was reasonable in relation to the value of the brokerage and research services provided

Section 28(e) applies to money managers regulated by both the SEC and the DOL. Although the DOL may have authority to issue its own regulations under 28(e), it has largely deferred to the SEC.

Since investors ultimately bear the burden of soft dollars, the question naturally arises whether they truly receive something of equal or greater value in return. Do money managers unjustly enrich themselves at the expense of portfolio investors, as some contend, when they pay up for soft dollars rather than using only discount brokerage and paying hard cash out of their own pockets for all research? We address this question, in part, by examining the effect soft dollars have on investor returns and other attributes of delegated portfolio management.

Our analysis and empirical results shed light on the welfare effects of soft dollar brokerage. The paper proceeds as follows. In Section 2, we develop a general theory of delegated portfolio management that accounts for the full range of agency costs as well as the transaction costs of enforcing property rights to private information arising from investment research. We assume that money managers are hired to identify private information about mispriced securities and to capture the associated profit opportunities for their managed portfolios through market trading. We also recognize that managers face a number of problems enforcing property rights to private information while attempting to trade in a marketplace filled with potential interlopers. In the absence of organizational arrangements that succeed in establishing property rights to private information, much of the value of the information would be captured by market interlopers.

Following Johnsen (1994), in Section 3 we develop two agency cost hypotheses to explain soft dollar use: the unjust enrichment hypothesis (UEH) and the incentive alignment hypothesis (IAH). Because the UEH and the IAH are both plausible versions of the agency problem in delegated portfolio management, the net effect of soft dollars on investor returns is an empirical question.

In Section 4, we derive cross-sectional implications for the UEH and the IAH based on agency theory. In Section 5, we describe our database, consisting of a sample of 1,273 institutional portfolios for the years 1979 – 1993 provided by the Mobius Group, Inc. We use premium commissions per dollar under management as a proxy for the extent to which portfolio managers pay up, in total, for bundled brokerage. Being unable to directly measure soft dollar use, we assume it is proportional to this proxy. Due to survivorship and other reporting biases, our database no doubt overstates manager performance, but this should leave our results unaffected as long as any misreporting is independent of premium commissions per dollar under management.

Our results, in Section 6, fail to reject the hypothesis that soft dollars align portfolio managers' interests with the interests of portfolio investors. Bundled brokerage is associated with higher risk-adjusted portfolio returns, and it is unrelated to the level of manager compensation. This evidence tends to reject the UEH and to lend support to the IAH. We provide a summary and some concluding remarks in Section 7.

2. A general theory of delegated portfolio management

2.1. Agency theory

This work should be viewed in the more general context of agency theory as pioneered by Jensen and Meckling (1976). In many cases portfolio management is subject to several layers of agency. Where the client consists of the pensioners of a firm's labor force, for example, the pension executive, an agent of the firm, negotiates with the portfolio manager and monitors its operation of the account. Similarly, the brokers hired by the manager to trade portfolio securities are agents of the fund subject to the manager's direction and monitoring. It is by no means evident that multiple layers of agency necessarily increase the sum total of agency costs. In any event, we simplify the analysis by focusing on one layer of agency at a time.

2.2. The client's objective

Given the gains from specialization, and scale and scope economies in investment research and portfolio administration, we assume that investors hire managers to obtain private information about mispriced securities and to take advantage of the opportunities to make profitable portfolio trades. Managers do this by combining three investment inputs: labor effort, investment research, and portfolio executions. We view the first two inputs as internal and external research inputs, respectively, while execution is an external input that can have a considerable effect on portfolio wealth. For example, disloyal brokers can erode portfolio returns by frontrunning the manager's informed trades, and even loyal brokers who act carelessly may reduce portfolio returns by failing to minimize price impact [see, e.g., Berkowitz et al., 1988). Although the manager may use these inputs in sub-optimal combination, efficient contracting will tend to minimize the associated losses by providing incentives for them to be used efficiently.

2.3. *The organizational constraints*

In mutual funds, investors are so numerous that explicit contracting on an investor-by-investor basis is almost impossible, while in money management investors or their agents contract directly with the manager and can arrange for their account to be managed separately from the manager's other accounts. Because money management involves direct contracting between relatively few parties, we assume that a manager's clients have the wherewithal to prohibit the use of soft dollars or other bundled brokerage and to require the manager to use only discount brokerage.³

Delegated portfolio management is also constrained by the difficulty of enforcing property rights to private information. It appears as though portfolio managers sometimes succeed in identifying profitable portfolio trades, and that from time to time they do so persistently (e.g., Ippolito, 1989; Hendrick et al., 1993). It therefore pays investors to favor managers whose recent performance has been relatively good, and there is substantial evidence that investors move capital toward managers who have demonstrated recent superior performance (e.g., Lakonishok et al., 1992; Chevalier and Ellison, 1997; DelGuercio and Tkac, 1998; and Sirri and Tuffano, 1998). This phenomenon suggests that investment dollars flow to managers who are expected to generate private information until the net benefits to investors from sharing in the associated returns are exhausted. In essence, according to Cheung (1970), the portfolio can be seen as a common pool in which entry will occur until all expected rents are dissipated.

The costs of enforcing property rights to investment research arise from the presence of market interlopers who attempt to free ride on private information produced by others (see Garvey, 1944). When a manager succeeds in developing systems for identifying mispriced securities, interlopers can often infer the nature of the system or simply mimic the manager's trades, siphoning off a portion of the associated returns. The manager captures only a first-mover advantage and the market as a whole captures the remaining benefits when the system

³The Virginia Retirement System, for example, has an explicit policy with respect to soft dollar research rebates that is incorporated by reference into all money manager contracts. Personal communication with Craig Scholl, Virginia Retirement System.

eventually becomes common knowledge.⁴ Simply identifying profitable trades is therefore only one of the problems active managers face. Getting the trades done discretely, without leakage to interlopers, is another.

2.4. The transaction costs of portfolio brokerage

Leakage can occur due to broker disloyalty, in the form of frontrunning, or it can occur due to broker indolence or lack of care or confidentiality in search. All of these sources of leakage can lead to price impact, which dilutes the private return to investment research. If a manager suspects that his broker is disloyal or incompetent, he can reduce leakage and price impact by keeping secret from the broker which trades are informed. Managers might enter into brokerage arrangements that attempt to reduce, as far as economically possible, the cost of executing marginal trades, and they can further benefit from some form of average pricing of commission payments to disguise the informed trades from the liquidity trades. For example, managers who are capable of generating private information might engage in a greater amount of noise trading to obscure their informed trades. Although such noise trading is costly, by obscuring informed trades it partially avoids the price impact that would otherwise occur and thereby increases portfolio returns net of costs through some range.⁵ Moreover, if informed managers were to pay higher commissions for higher quality brokerage on informed trades, they would signal to market interlopers that they held private information, leading to leakage and price impact. By entering into a soft dollar arrangement, in which brokerage commissions are average-priced and the marginal cost of an additional trade is close to zero until the manager reaches the limit of his trading obligation, the manager is better able to adopt trading strategies that minimize the leakage problem.

2.5. The agency costs of delegated portfolio management

In delegated portfolio management, agency conflicts between managers and investors can manifest themselves in at least three ways: i) managers might use too few inputs or use inputs in

⁴The erosion of first-mover advantages appears to have been the case for James Stowers, Sr., of Twentieth Century Fund. See *Investors Research Corporation v. SEC Investors Research Corp. v. SEC*, 628 F.2d 168 (1980).

⁵See Dow and Gorton (1997) for an alternative explanation for noise trading that relies on the manager's desire to convince investors that he is not shirking.

sub-optimal combination, ii) managers might attempt to misappropriate portfolio wealth, and iii) managers might do a careless job of monitoring brokerage executions. Investors or their agents might fear that managers will provide too few inputs such as labor effort or that they will substitute outside research at investors' expense for their own labor effort because they receive only a small share of the resulting portfolio wealth increments. By subsidizing managers' use of research products, soft dollars surely encourage managers to use more research products than they would use if they had to pay for such products out of their own pockets. Managers can either perform investment research internally by combining their labor effort with the research inputs they receive by paying up for soft dollars, or they can purchase it from full-service brokers by paying up for the broker's in-house research. In the latter case, it appears as though the manager's labor effort will be lower, thus allowing him to effectively substitute brokerage, at the expense of portfolio investors, for his own labor effort.

The important question is whether this research subsidy moves managers toward the optimal allocation of resources, or so far beyond the optimal allocation so as to dissipate all net benefits. Likewise, managers may choose sub-optimal levels of trading activity if required to pay for all brokerage out of their own pockets. Where investors subsidize trading by paying for brokerage, the manager might do too much trading. The notorious practice of *churning* refers to trading levels above what are socially optimal, and, as with research, the question is whether the brokerage subsidy moves managers toward, or excessively beyond, the optimal allocation of resources.

Another source of agency conflict is the potential for the manager to convert investor-provided resources into personal wealth. There are three at least three ways this can occur. Managers can simply appropriate profitable trades for their own account without ever making the opportunity available to the portfolio. They can engage in so-called front-running, which in this setting occurs when a manager trades on the basis of private information for his own account ahead of the portfolio and before the information is impounded into prices. Finally, they might convert portfolio executions into personal wealth through trading kick-backs by directing portfolio brokerage to those willing to rebate them cash or the in-kind equivalent.

Finally, agency conflicts affect the diligence with which the manager monitors the brokers he uses to trade on behalf of the portfolio. Since managers bear only a small portion of any wealth loss that results from inefficient contracting with brokers, they may purposely pay

excessive commission rates or at least be less than diligent in negotiating the best commission rate for the portfolio. Note that brokers have no immediate stake in the diligence with which they search. They may therefore have an incentive to shirk in providing portfolio executions or in avoiding leakage. Because money managers receive only a fraction of the gains from monitoring brokers, they may have too little incentive to carefully monitor these agents. However, since superior performance in one period attracts new investment dollars to the portfolio in subsequent time periods, managers have a larger stake in performance than a static framework — one focused strictly on their current period management fee — would suggest. In fact, the manager's stake in portfolio wealth may be larger than a typical corporate manager's stake in firm performance. Appendix A develops this idea more formally.

3. Two agency cost hypotheses

3.1. The unjust enrichment hypothesis

Berkowitz and Logue (1987) and Logue (1991) were perhaps the first scholars to articulate what can be called the unjust enrichment hypothesis (UEH) for soft dollar brokerage. In their view, soft dollars allow money managers to appropriate the wealth of portfolio investors, who face a free rider problem in monitoring managers' behavior. Any investor who bears the agency costs of monitoring its manager's use of soft dollars will receive only a pro rata share of the associated benefits. According to this hypothesis, shareholders will engage in too little monitoring than their collective interests would dictate, and managers will respond by overusing soft dollars. They will churn their accounts to generate soft dollar research credits, they will use research products that they would be unwilling to pay for with their own money, and they will allocate portfolio trades to brokers based on the brokers' willingness to provide soft dollar research credits rather than on expected execution quality.

To the extent managers in competitive labor markets, such as money management, are able to engage widely in this kind of unjust enrichment, equilibrium wages will adjust downward so that their full wage will equal their marginal product. The real losses are incurred by portfolio investors and money managers, jointly, and arise from the inefficiency of soft dollars as a form of equilibrium manager compensation. Following Jensen and Meckling (1976), if soft dollars reduce portfolio performance on net balance, then both groups will have an incentive to eliminate them because both groups can share in the gains from doing so. If we find that they are

unwilling to do so, we must conclude that the resulting monitoring and bonding costs are prohibitively high.

3.2. The incentive alignment hypothesis

According to the incentive alignment hypothesis (IAH), soft dollars reduce agency costs by aligning the interests of money managers with those of portfolio investors. For most active money managers, the annual management fee is a recurring 50 to 100 basis points of the net asset value of the portfolio. Although this arrangement essentially makes them co-owners of the portfolio, their share is nevertheless smaller than one hundred percent. If they were required to pay for all research and execution out of their own pockets, they would bear a disproportionate share of the costs of generating portfolio returns in relation to the private benefits based on their portfolio share. Seen in this light, the agency problem faced by portfolio investors is that managers will do too little research, identify too few profitable trading opportunities, and execute too few portfolio trades.

Soft dollar arrangements allow investors to subsidize investment research and thereby encourage managers to do more of it. In fact, if research, labor effort, and executions are complementary and normal inputs into the portfolio management process, the soft dollar research subsidy will encourage managers to use more of all the inputs, not just research.⁶ We provide a formal proof in Appendix B. It bears pointing out that the UEH and the research subsidy component of the IAH apply not only to soft dollar brokerage, in which third-party vendors supply the research inputs through a metering system, but also to full-service brokerage, in which the executing broker provides in-house research on an informal basis. Soft dollars are simply one form of bundling research and execution together into a single commission payment. Soft dollars are unique in allowing research and execution to be provided by entirely separate firms, thereby promoting vertical disintegration of the research and execution functions. Recognizing in-house and third-party research as otherwise identical is consistent with the recently disclosed standards published by the Association for Investment Management and Research (AIMR). (see AIMR Soft Dollar Standards, 1998, p.4.)

⁶We are indebted to Cliff Smith for drawing our attention to the need to address the income effects of soft dollar brokerage.

Soft dollars may also be unique in aligning the incentives of brokers and managers. When a broker provides soft dollar research credits to a money manager, it typically does so *in advance* of the commission payments it expects from the manager. The manager receives research credits that he can spend immediately, and his account with the broker is debited in anticipation of a specified dollar value of future commissions. This account debit may well constitute a performance bond in the face of the high costs managers face in immediately distinguishing high- from low-quality brokerage executions. Because the manager has no legal obligation to make the promised trades, any manager who detects low-quality brokerage is free to terminate the executing broker with the balance of the soft dollar account unpaid. The broker will then lose a stream of commissions that would have included a premium above the cost of providing low-quality brokerage. The threat of termination dramatically increases the expected losses to brokers who cheat by providing low-quality and may therefore perform an effective quality assuring function (see, e.g., Klein and Leffler, 1981).⁷ This appears to explain why soft dollar brokerage was instrumental to the effective entry of start-up brokerage houses following the deregulation of fixed commissions. Lacking established business reputations, these firms relied on the performance bond implicit in soft dollar brokerage to compete against established brokerage houses. By establishing an ongoing relationship of trust between brokers and managers, soft dollars may also provide brokers with an incentive to recommend appropriate research products.

In some soft dollar settings the portfolio manager determines the brokerage commission rate on each trade after it is completed. The rate will depend on the manager's ex ante assessment of trade difficulty, his ex post assessment of the broker's performance, and the nature of his relationship with the broker. Alternatively, the rate is a fixed average commission rate for all trades negotiated between the manager and broker.⁸ The broker prefers a higher rate, of course, because it decreases the manager's account obligation more quickly than a lower rate. In either case, the system of ex post pricing or fixed average pricing implies that all trades are

⁷ Though rare, industry reports demonstrate that managers have from time to time reneged on their soft dollar "commitments." Julie Rohrer, *Soft Dollars: The Boom in Third-Party Research*, Institutional Investor, Apr. 1984, p. 78. In at least one case, this led to the broker's insolvency. Philip Maher, *Why Wall Street Can't Bank on Soft Dollars*, Investment Dealers' Digest, Oct. 23, 1989, p. 18.

⁸ In addition, brokers may not know until after the trade is completed whether the commission will be a soft dollar commission or a hard dollar commission. Our information comes from a casual survey of institutional brokers and

average priced, ex ante, from the broker's perspective. Moreover, as long as the manager intends to fulfill his trading obligation with the broker over the established term of the soft dollar arrangement, through a wide range this system reduces the manager's marginal cost of trading almost to zero and thereby reduces his cost of engaging in noise trading to obscure informed trades.

The UEH and the IAH are both theoretically plausible but have yet to be subjected to empirical testing. The remainder of this paper traces out the testable implications of these hypotheses and attempts to determine, empirically, whether soft dollars alleviate or aggravate agency conflicts between portfolio managers and investors.

4. Testable implications

4.1. Shared predictions

Both the UEH and IAH predict that managers will use more research and trade more often as a result of soft dollar brokerage than otherwise. According to the IAH, this increase in research and trading is efficient because the manager is moving toward optimality. According to the UEH, the increase in research and trading reflects a wealth transfer due to the manager's payment of excessively high commission rates, his overuse of research, and his excessive portfolio turnover.

Examining how commission rates relate to soft dollar use fails to distinguish the hypotheses because both hypotheses predict higher rates. The IAH views higher commissions as necessary to compensate for the optimal amount of research to assure high-quality executions. The UEH makes the same prediction, but contends that the soft dollar rate exceeds the value of research and high-quality brokerage combined. For example, both hypotheses predict that commission rates for index funds, which have little or no reason to pay up for research or quality assurance, should be lower than commission rates for actively managed funds.

Comparing soft dollar use in situations characterized by high and low agency costs generally fails to distinguish the two hypotheses. The UEH predicts soft dollar use will be greater in situations characterized by high agency costs because weak monitoring enables managers to use soft dollars to unjustly enrich themselves. The IAH also predicts soft dollar use

traders.

will be greater in situations characterized by high agency costs because soft dollars help to align managers' incentives where alternative monitoring mechanisms are uneconomic.

For example, one proxy for cross-sectional differences in agency costs is ownership concentration (see Easterbrook, 1984 and Pound, 1988), where more concentrated ownership reduces the collective action problem between co-owners. In the context of portfolio management, money managers may handle anywhere from a single account to tens of thousands of accounts (see Table I). Since clients can be seen as investors/owners, fewer accounts under management (i.e., higher ownership concentration) should be associated with better monitoring, all else equal. Both hypotheses therefore predict that managers with highly concentrated account bases will engage in less paying up for soft dollars, all else equal.

4.2. Risk-adjusted returns and management fees

Perhaps the most obvious way to determine whether soft dollars are beneficial or detrimental to portfolio investors is to examine how risk-adjusted returns vary with the extent to which managers pay up for brokerage. The IAH predicts that soft dollar use might lead to higher risk-adjusted returns, while the UEH predicts that they will lead to lower risk-adjusted returns.

Another way to distinguish between the IAH and the UEH is to examine the effect of soft dollar use on management fees. If managers use soft dollars to unjustly enrich themselves, then part of the residual loss will be reflected in their market wage. This is because managers will anticipate the opportunity to convert portfolio assets to their own use and will compete for the opportunity by offering to work for lower fees. Alternatively, if soft dollars are an effective incentive alignment mechanism used when other mechanisms fail, then management fees should be unrelated (or perhaps even positively related) to soft dollar use.

5. Data

The data from which the sample are drawn are supplied by Mobius Group, Inc., which has been in the business of selling returns data on money managers to the public since 1989.⁹

⁹ Other firms supplying money manager return data use their own database to support their main consulting business. Examples include Frank Russell Company and SEI Corp. The Mobius Group, on the other hand, provides no consulting services, so their data, alone, must pass the market test for reliability. Coggin and Trzcinka (1995) audit the accuracy of Mobius data by comparing the 68 worst performing managers having 10 years of data in the

The database fairly represents both pension assets and institutional money management more generally. For example, the pension assets in the sample represent 54% of all pension assets in the U.S. as reported in the Federal Reserve Board's Flow of Funds report for 1993. Further, the Mobius database includes 940 of the largest 1,000 tax-exempt money managers as reported by *Pension & Investments*.¹⁰ Tax-exempt assets comprise 84% of the equity assets in our sample compared to 83% for all institutional holdings of aggregate institutional equity holdings according to the Federal Reserve Board's Flow of Funds report. We use tax-exempt assets as a proxy for pension assets because pension funds are the most common tax-exempt vehicle, and it is common industry practice to use them synonymously. Lakonishok et al. (1992) report that 90% of tax-exempt assets are pension funds. Since the database covers institutional (rather than retail) managers, it contains large institutional index managers, such as Wells Fargo-Nikko, but does not include the popular retail Vanguard Index 500 Trust. Approximately 14% of the equity assets in the sample are indexed while *Pension & Investments* reports that 13% of total pension assets were indexed in 1993 according to Schramm (1994).¹¹

[Insert Table I about here]

Managers in the Mobius database may report returns for a series of portfolios, or management styles, that it offers clients. Consequently, it includes both firm-level and portfolio-level data. Since returns, commission rates, turnover, and management fees are reported at the portfolio-level, our unit of study is the portfolio rather than a advisory firm. Any number of accounts (i.e., clients) is managed under each portfolio, or management style. Table I shows descriptive statistics for all domestic equity portfolios in the Mobius database. Although the data are retrieved from the fourth quarter 1994 database, we report data from fourth quarter 1993 because many managers take several quarters to update their reports. Panels A and B show the

PIPER March 1993 database with those in the Mobius database. Of the fifty managers in both databases, all had identical returns (to within rounding error) in both databases. The worst performing managers may have an increased incentive to misreport if the payoff to cheating is asymmetric, such that the manager has limited downside risk, and if misreporting increases the variance of outcomes. The analogy in a corporate finance setting is when corporate management has an incentive to accept high-risk projects as the firm approaches bankruptcy. As the manager approaches the floor of possible payoffs, the incentive to gamble by misreporting performance increases.

¹⁰ Schramm, Sabine. (1994). *Indexing shows small increase: International posts the only big gains*, *Pension & Investments* 22(3) February, 2-4.

¹¹ The source of all indexed pension assets is Schramm, Sabine. (1994). *Indexing shows small increase: International posts the only big gains*, *Pension & Investments* 22(3) February, 2-4. The source for all pension assets is the Federal Reserve Flow of Funds Report.

distribution of portfolio assets and the number of accounts managed within each portfolio. The standard deviations are large, and the distributions are skewed. Not only is the median-sized portfolio below the mean, the portfolio in the 75th percentile is below the mean as well. In the statistical tests to follow, we transform portfolio assets and the number of accounts managed using a natural log operator so that the distributions are closer to normal as shown by the Shapiro-Wilk test statistic. Distributions with a Shapiro-Wilk test statistic insignificantly different from one are considered to be normal.

An issue worth addressing is how money manager returns data compare to those for mutual funds. The SEC plays an active role in monitoring mutual fund returns reporting, which may improve the quality of mutual fund reporting because the monitoring costs for an atomistic mutual fund investor are likely to far exceed the private benefits. The money management industry has alternative monitoring mechanisms, however, because the net benefit from monitoring money managers is probably fairly high for many pension plan sponsors. Perhaps this is why an entire industry of pension fund consultants has emerged to screen the data and weed out high-quality from low-quality money managers.

The Mobius Group does not charge managers to be in the database. Managers are included as long as they provide complete and accurate data through a questionnaire on a quarterly basis. There are at least three forms of selection bias in our data in addition to the usual survival bias. First, since managers choose whether or not to report it is possible that the superior performing managers report while the inferior performing managers do not. Second, managers who were once in the database may elect to be withdrawn. This might occur if a manager has had a particularly bad quarter and does not wish to publicize results until a better quarter. Third, calculated returns vary according to the methodology used to calculate them (e.g., dollar-weighted versus time-weighted). An upward bias in returns no doubt results because managers have an incentive to employ the most flattering calculations.

We measure risk-adjusted returns using a traditional Jensen's alpha as well as the estimated intercept from the three-factor model of Fama and French (1993), who explain the cross-section of security returns using the following regression.

$$R_{it} - r_{ft} = \alpha_i + b_i(R_{mt} - r_{ft}) + s_i SMB_t + h_i HML_t + \varepsilon_{it} \quad (1)$$

where R_{it} is the return on portfolio i in period t , R_{mt} is the return on the market portfolio in period t , r_{ft} is the risk-free rate in period t , SMB is the difference between returns on small- and big-

stock portfolios with about the same weighted-average book-to-market equity and *HML* is the difference between returns on high and low book-to-market equity portfolios with about the same average size. *SMB* and *HML* represent factors that capture the firm-size and book-to-market effects, respectively.

[Insert Table II about here]

Panel A of Table II shows the intercepts of OLS regressions for the 1,273 domestic equity portfolios in our sample with at least twelve quarters of reported returns. The time period under study runs from 1979 to 1993; the data is more abundant for recent years, however. The mean α is 93 basis points per quarter, or 3.7% annually (3.8% compounded quarterly). Exactly 85% of the intercepts are positive, 31% significantly so. These astronomical alphas can be attributed to data biases rather than to anomalies of the particular benchmarks for several reasons. First, Carhart (1996) uses the Fama-French factors on mutual fund data and finds intercepts near zero. Second, Panel A shows that alphas calculated with single-factor models produce similarly large alphas.

We mitigate the effect of any selection or reporting bias by forming a restricted sample of portfolios having returns that conform to four quality standards. The restricted sample has four filters; returns must: i) be gross of fees, ii) be based on only discretionary portfolios, iii) include terminated accounts, and iv) not be from a predecessor firm. The performance measures for the restricted sample are similarly large. We will use both samples in tests that follow as a check on robustness. Although the selection or reporting bias remains, we assume the upward bias is the same for all portfolios, and in any event we have no reason to believe it is related to a portfolio's use of soft dollars.

Panel B provides external validity to the data. The Mobius database provides classifications for equity management styles, such as small capitalization, value, and growth, which ought to be correlated with the size and book-to-market effects in equation (1). Strategy classes are measured on a discrete scale of zero to three. A measure of three reflects the manager's assessment that the strategy class accurately describes the fund's strategy, while a measure of zero reflects an inaccurate description. Classifications one and two are hybrids. The Pearson correlation coefficient between s , the coefficient on *SMB*, and the small capitalization strategy class variable is a significant 0.66, indicating that the small capitalization variable is truly capturing the portfolios' sensitivity to movements in small stocks. The correlation of h , the

coefficient on *HML*, to the value and growth strategy class variables is 0.51 and -0.57, respectively, indicating that portfolios classified as value tend to have high estimated h coefficients, while portfolios classified as growth tend to have low estimated h coefficients. These findings suggest that the portfolios exhibit returns consistent with the strategy classifications.

Although our data does not directly identify money managers' use of soft dollars, we assume that soft dollar use is proportional to Premium Commissions per Managed Dollar, calculated as the average excess commission rate times annual turnover (expressed as a percentage of stock portfolio value). To calculate excess commissions, we deduct two cents per share from a portfolio's average commission rate to net out the execution-only rate, thereby capturing the effect of paying up for brokerage. The results that follow are insensitive to the exact amount of the execution-only deduction. However, it bears mentioning that any deduction conceptually removes execution-only brokerage for easy trades, not for trades requiring skill. Rather than paying up for soft dollar brokerage, managers may pay up to receive skilled brokerage on difficult trades. Although our measure of paying up for soft dollar brokerage also includes premiums paid for skilled trades, the following tests control for portfolio strategies (e.g., small capitalization, value, growth), which are likely correlated with trade difficulty.

Our measure of paying up for soft dollar brokerage contrasts with that of Conrad, Johnson, and Wahal (2000), who examine the average commission premium paid for soft dollar brokerage versus non-soft dollar (but often bundled) brokerage. While they focus exclusively on commission rates, we account for the possibility that managers can pay up for brokerage both by paying higher commission rates and by increasing portfolio turnover. If bundled brokerage adds no value, increasing either commission rates or turnover will have a negative effect on portfolio returns. Alternatively, if bundled brokerage facilitates contracting and profitable trading opportunities, the benefits from reducing residual losses and capturing the returns to private information will more than offset the costs imposed by excess commission rates and increased turnover.

6. Results

6.1. Commission rates and turnover

Many factors other than soft dollar brokerage affect commission rates and turnover,

including portfolio size, number of accounts, and portfolio management style. Table III illustrates how these factors affect soft dollar commission rates and turnover. The dependent variable in the first regression is the premium commission rate in cents per share. Holding other factors constant, we expect a strong negative relation between portfolio assets and excess commission rates because significant economies of scale exist in trading securities.¹²

[Insert Table III about here]

Table III also shows that index portfolios pay significantly lower average commission rates than actively managed portfolios. The index variable is a step variable that can take on four different values. An index classification of three very accurately describes a portfolio as indexed, while a classification of zero indicates that it would be wrong to apply the term indexed to the portfolio's strategy. On average, indexed portfolios pay two cents per share less in commissions than actively managed portfolios (i.e., the coefficient times the number of index classification steps, 0.67×3). The two-cent difference is economically significant in light of a median rate of six cents per share. Under the UEH, this difference should approximate the extent to which active portfolio managers attempt to unjustly enrich themselves. Under the IAH, average commissions for indexed portfolios should be lower than those for actively managed portfolios because indexed portfolios can be presumed to use considerably less research and because indexed portfolio trades can be presumed to be uninformed and to require no quality-assuring brokerage premium.

The regression in the first column also shows that an increase in the number of accounts managed in each portfolio increases commission rates, which is consistent with our prediction that a larger number of accounts increases the administrative work of the broker booking the trades.¹³ An increase in the administrative costs of trading should also decrease the level of portfolio turnover. The predicted negative relation between the number of accounts in a portfolio and turnover appears in the second regression. In all, the independent variables explain 17% and 26% of the cross-sectional variation in commissions and turnover, respectively.

Strategy classes, or management styles, may pick up variations in Section 28(e)'s safe

¹² Much of a broker's and manager's effort and costs in trading a block of securities are invariant to the size of the block, implying that commission rates should decrease with block size all else equal. If block size is directly related to assets under management, then average commission rates should decrease with portfolio assets.

¹³ If the manager is trading a specific security for only one large account, the broker need book only one trade. If he

harbor protection that allows managers to separate traditional soft dollar research rebates from the implicit research rebates provided by full-service brokers. Section 28(e) permits investment managers to pay up for brokerage in exchange for investment research as long as the extent of paying up is commensurate with the value of the research and other services received. By Securities and Exchange Commission Ruling, this protection is available only for trades conducted on an agency basis (i.e., those involving payment of a commission). Trades executed on a principal basis, for example on Nasdaq, receive no safe harbor protection. This restriction might cause managers who fear liability for accepting soft dollar research rebates on dealer trades to engage in less paying up for third party research and affect the relation between strategy class and bundled brokerage. To the extent managers can completely substitute soft dollar brokerage with full-service brokerage, however, the lack of safe harbor protection will not affect the relation since our measure of soft dollar brokerage captures full-service brokerage as well. Hence, it is difficult to know if the relation between strategy classes and bundled brokerage is driven by variations in Section 28(e) safe harbor protection.

The third regression of Table III shows how Premium Commissions per Managed Dollar is related to portfolio characteristics. The positive sign on the number of accounts suggests that soft dollar use decreases as client concentration increases and monitoring improves, a result that is consistent with both the UEH and IAH. We also see that some types of portfolios use fewer soft dollars (e.g., index, mutual fund timing) while others use more (e.g., growth, sector rotator, and hedged equity). Although not reported here, the effect of portfolio size and number of accounts are left qualitatively unaffected by excluding various strategy class variables.

6.2. Soft Dollars and performance

Table IV shows the effect of soft dollars on risk-adjusted returns. The first regression is a univariate test of this association, which shows that paying up for bundled brokerage is associated with higher risk-adjusted returns at the 99% confidence level. The risk-adjusted returns — reported in decimal units such that 0.10 represents a 10% return — are net of commissions, implying that soft dollars are a net benefit to the portfolio. Holding turnover and other factors constant, this suggests that a one-cent increase in Premium Commissions Per

is trading for a large number of accounts, the administrative work increases dramatically.

Managed Dollar increases risk-adjusted performance by 7.6 basis points per quarter. If managers pay up for soft dollar brokerage in an attempt to unjustly enrich themselves, investors do not appear to be harmed; soft dollars appear to at least pay for themselves.

[Insert Table IV about here]

To bring control variables into the analysis, we account for the correlation between Premium Commissions per Managed Dollar and the other independent variables. Premium Commissions per Managed Dollar is first regressed against the other control variables. The residuals from that regression are used as the independent variable in the second and third regression of Table IV. The significantly positive relation between soft dollars and performance remains after controlling for these effects. It also appears that index funds tend to underperform their actively managed counterparts even in the presence of other strategy class control variables, although this may result from selection and reporting data biases. The relatively low returns of portfolios with a high proportion of pension assets is consistent with results reported by Ambachtsheer (1994), while the relatively high returns of hedged equity portfolios is consistent with results reported by Schneeweis and Spurgin (1998). It is also important to note that, although not reported here, these results are qualitatively unaffected after accounting for the colinearity between the dependent variables.

[Insert Table V about here]

The positive relation between soft dollar brokerage and performance withstands further tests of robustness. Table V examines the relation between soft dollars and performance using two different samples and two different estimation procedures. Regression (1) estimates the relation using the restricted sample of portfolios having returns that conform to four quality criteria. The positive relation between bundled brokerage and performance is significant at the 99% level of confidence, as it is for all the tests of robustness. The data on commission rates and turnover (and hence our soft dollar proxy) report only the most recent set of returns and therefore may be less relevant to earlier return data. These data should certainly be related to the portfolio's strategy (as shown in Table III), however, which is stable over time. To address this potential mismatch between returns data and brokerage data, we estimate the relation using only the most recent five years of returns from 1989-1993. As in the first regression, quarterly risk-adjusted performance measured in the most recent years tends to increase with the use of soft dollars.

Some estimates of risk-adjusted performance are better than others are; that is, some estimated alphas are less noisy than others are. To place greater emphasis on those observations with more reliable estimates of performance, we perform a weighted-OLS analysis on the entire sample using the reciprocal of the alpha's standard error as weights in regression (3). Finally, we estimate the relation between soft dollars and performance using the traditional Jensen's alpha in regression (4). In both cases, greater soft dollar use is associated with greater risk-adjusted performance at the 99% level of confidence. Although not reported here, we also weight observations based on portfolio size with qualitatively identical results. The results are essentially the same when using various combinations of sample construction and estimation procedures. These results are consistent with the IAH, but not the UEH.

6.3. Soft dollars and management fees

If managers use soft dollars to unjustly enrich themselves in a competitive labor market, the expectation of being able to capture this value should be reflected in lower management fees. On the other hand, if soft dollars align managers' interests in the absence of other monitoring mechanisms, management fees should be either unrelated to the extent of paying up for bundled brokerage or positively related. Table VI shows the effect of soft dollars on management fees. Management fees expressed in basis points for various account sizes appear to be unrelated to soft dollar use regardless of account size. Interestingly, fees on larger accounts tend to increase with past performance, suggesting that managers gain pricing power if they recently reported positive risk-adjusted returns. The expected negative relation between indexing and management fees is clear. And it seems that portfolios having relatively more pension assets tend to have lower management fees. The relation between soft dollars and management fees, however, is generally positive but statistically insignificant. It appears managers do not accept lower management fees in an attempt to compete for the opportunity to unjustly enrich themselves through soft dollar brokerage. These results fail to reject the IAH but are inconsistent with the UEH.

[Insert Table VI about here]

These results withstand the same tests of robustness as the relation between soft dollars and performance. Using the restricted sample of portfolios having returns that meet four quality criteria, regression (1) in Table VII shows an insignificant positive relation between soft dollar

use and management fees. Again, the data concerning management fees covers the most recently reported time period, since older returns data may be mismatched with the more recent data on management fees. In any event, no detectable relation exists between soft dollars and management fees for the most recent set of return data in regression (2). Weighting observations by the reciprocal of the alpha's standard error in regression (3) significantly strengthens the relation and the explanatory power of the regression as measured by adjusted-r squared, suggesting that investors are willing to pay higher management fees when historical risk-adjusted returns are less noisy. Finally, measuring performance with a traditional Jensen's alpha fails to identify a significant relation between soft dollars and management fees. The results are qualitatively unaffected by weighting observations by portfolio size or by using various combinations of sample construction and estimation procedures.

[Insert Table VI about here]

7. Summary

The unjust enrichment hypothesis holds that soft dollars allow managers to misappropriate investors' wealth. The incentive alignment hypothesis holds that soft dollars discourage shirking and provide a mechanism by which managers can better capture the returns to identifying mispriced securities. We present evidence that is inconsistent with unjust enrichment and fails to reject incentive alignment. Soft dollars are most common in situations where the cost of alternative monitoring mechanisms is high. That is, managers with a dispersed client base composed of few pension assets engage in more paying up for bundled brokerage and, presumably, use more soft dollars. Soft dollars appear to benefit investors, however, as they are positively related to risk-adjusted returns. Furthermore, since their use is unrelated to management fees, it appears that soft dollars do not serve as a second-best form of manager compensation dictated by market competition in the context of prohibitive contracting costs.

The inability to directly measure soft dollars, or even to clearly define them conceptually, is a stumbling block to resolving the soft dollar debate. The incentive alignment hypothesis recognizes that exclusive property rights to private information are costly to enforce. As a result, privately informed portfolio managers cannot use low quality (discount) brokerage because of the consequences for leakage and price impact. Nor can they confine their trading strictly to those situations in which they are privately informed by paying up only for high quality

brokerage. As long as market interlopers stand ready to capture the value of managers' privately informed trades, managers must engage in some amount of noise trading to obscure their privately informed trades. Institutional brokerage commissions must converge to a fairly uniform equilibrium rate that reflects, on average, the marginal cost of executing the optimal combination of noise trades and privately informed trades. This rate will necessarily exceed the marginal cost of executing purely uninformed, or liquidity, trades. The difference reflects a quality-assuring rent that brokers must compete to capture by providing managers with valuable nonprice concessions. These concessions can take the form of in-house research or services, or they can take the form of soft dollar credits that subsidize the manager's purchase of research inputs from vertically disintegrated third-party providers. Being able to buy research inputs in the marketplace, managers who use soft dollars can generate their own investment conclusions. To the extent that managers receive these research rebates at brokers' expense in advance of trading, the rebates can effectively bond the quality of the brokers' executions.

Why soft dollar brokerage should generate persistent risk-adjusted excess returns is a critical question. If market participants are quick to mimic those whose methods prove superior, then all excess portfolio returns should be competed away in the long run. One explanation for persistent excess returns is that managers truly perceive a nonzero risk of civil suit or negative publicity when using soft dollars and that this risk must be compensated with superior portfolio returns. A more plausible explanation is that the know-how to generate superior portfolio performance lies to a large extent in the manager's ability to establish trusting relationships with his brokers; paying up — whether for reputable full-service brokerage or for bonded soft dollar brokerage — is an absolutely necessary part of the process. To generate persistent excess returns, this know-how must be difficult for outsiders to discern or mimic. Trust is an effective mechanism for enforcing exclusive property rights to proprietary information about mispriced securities that results from the manager's investment research. This explains why rival managers are unable to generate superior portfolio performance simply by paying up; paying up, by itself, does not create a trusting relationship.

Managers routinely claim to base their brokerage allocation decisions on three factors: the broker's ability to perform high-quality executions, the value of the research the broker provides, and "the relationship." We view "the relationship" as short-hand for the reciprocal trust the parties place in one another.¹⁴ It surely extends to the manager's trust in the broker's care and loyalty in executing trades. The evidence suggests that it also extends to the broker's stewardship over any information about portfolio composition or long-term investment strategy the manager may reveal to allow the broker to recommend worthwhile research or to trade effectively on behalf of the portfolio. For his part, the broker obviously places substantial trust in the manager given his inability to compel the manager to fulfil either the letter or the spirit of the soft dollar obligation. This explains why a research rebate is superior to a cash rebate paid by the broker directly to the portfolio.¹⁵ Any form of advance rebate paid to the portfolio by the broker will bond the quality of his executions, but a research rebate gives the manager the wherewithal to generate the difficult trades on which the broker hopes to earn a premium commission stream. By taking the rebate in research rather than in cash paid to the portfolio, the manager bonds his promise to work diligently to identify mispriced securities, leading to trades that allow the broker to recoup his investment. The more appropriate the research products a broker recommends, the more difficult the manager's trades will be. This leads to a higher commission rate on all of the managers trades and allows him to pay down his soft dollar account balance more quickly.

¹⁴ A huge body of scientific literature emphasizes the importance of reciprocity -- often in the form of gift giving or strategic rebates -- in promoting group welfare (see, e.g., Ridley (1996) and Hoffman, McCabe, and Smith (1998)). This literature suggests that the presumption of impropriety invariably directed toward many forms of market generated rebates may be widely mistaken.

¹⁵ Franco (1999) has suggested a modification to existing regulations that would allow managers to provide collective cash pass-through to their advisory clients. In our view, this would provide benefits to clients in the form of additional contracting options. As an empirical matter, however, it is clear that large advisory clients currently have both the wherewithal and the incentive to insist on cash pass-through of commission rebates if their net effect on portfolio wealth is negative. It is equally clear that many such clients decline to do so.

High-quality brokerage (the execution of difficult trades) is not a mere commodity. It is a uniquely tailored service whose attributes are impossible to measure at the moment the transaction takes place and difficult to measure on a one-time basis even with the passage of time. The difficult trades that create the need for high-quality brokerage arise from close cooperation between the parties in a process best characterized as joint production. Because the parties' expectations are legally unenforceable, they must rely on extra-legal methods of assuring performance, such as trust. Institutional securities brokerage therefore relies on what economists refer to as "relational investing."

Our assessment of the welfare effects of soft dollar brokerage is not meant to suggest that traditional full-service brokerage is in any way deficient or inferior. In our view, full-service brokers probably provide the highest quality execution services in the industry. Our point is simply that by providing an up-front performance bond soft dollars assure the manager of receiving higher quality execution *than he would otherwise expect to receive* when patronizing a broker whose reputation has not been widely established over a long course of dealing. No doubt both types of brokerage provide unique advantages and disadvantages to investment managers and their clients under various circumstances. Bundled full-service brokerage, being the status quo, requires no justification in the public policy realm.

In the current market setting, soft dollars increase competition by reducing the cost to managers of establishing trust and allowing them to use a larger pool of brokers than otherwise. Absent the ability to rely on an immediate performance bond, managers would be forced to use a smaller pool of brokers with whom they have taken the time to establish long-term relations or whose reputations are already well-established. This could easily compromise the informed manager's anonymity, leading to leakage, price impact, poor execution quality, and reduced portfolio performance.

Regulators and professional associations are currently reviewing the use and disclosure of soft dollars with the expectation of proposing new legislation.¹⁶ The results of this research may help guide the formation of impending regulation. Future research could increase our understanding of the welfare effects of soft dollars by using data that directly measures their use.

¹⁶ U.S. Securities & Exchange Commission, Office of Compliance, Inspections and Examinations, *Inspection Report on the Soft Dollar Practices of Broker-Dealers, Investment Advisers and Mutual Portfolios*, September 22, 1998.

Knowing whether these relations hold in the mutual fund industry, which arguably has more accurate returns data, would increase our understanding further. Until such data become available, however, evidence that can partition portfolios across defined-benefit and defined-contribution pension plans would also provide additional insight, as this distinction provides an excellent proxy for the net benefits of careful monitoring. As residual claimants to portfolio assets, the sponsors of defined-benefit plans can be expected to monitor their managers better than defined-contribution plans. Examining soft dollar use across these plans will increase our understanding of soft dollars and their welfare effects.

APPENDIX A

Since assets under management are positively related to prior period performance, paying managers a share of assets under management gives them a stake in portfolio performance beyond the immediate compensation they receive from their advisory fee and may help alleviate the agency conflicts in delegated portfolio management. Superior returns in one period attracts future asset inflows on which successive management fees are earned in future periods. Over the long run, managers with superior ability should capture all excess returns as new investors contribute funds to the portfolio in anticipation of capturing subsequent excess returns. Portfolio assets will continue to grow (as will the manager's total compensation) until all excess returns are exhausted (Johnsen, 1994).

In a static framework that ignores future increases (decreases) in the asset base from outperforming (underperforming) the benchmark index, the manager's marginal wealth at the end of period 1, MW_{m1} , is expressed by

$$MW_{m1} = \phi MW_{p1} \quad (\text{A1})$$

where MW_{p1} is the marginal wealth increase of the portfolio in period 1 and $\phi = \sum_{t=1}^T f(1+r)^{-t}$ where f is the manager's fee expressed as a percent of assets under management, r is the risk-adjusted discount rate, and T is the number of periods that the wealth increase persists. Equation (1) ignores the effect of superior performance on future inflows, however. Chevalier and Ellison (1997) report that a 1% increase in annual portfolio return in excess of a benchmark return increases a manager's asset base by about 2% the following year net of investment performance. In fact, the same 1% excess performance increases assets two and three years hence by about 1% and 0.5%, respectively. We call this measure period t 's "performance elasticity of assets." Since management fees are earned on these newly attracted assets, managers' stake in portfolio performance extends beyond the effect on current assets.

Let δ_t represent the percentage increase in portfolio inflows in period t as a result of exceeding the return on the benchmark index by one percent in period 1 (i.e., period t 's performance elasticity of assets). If the manager outperforms the benchmark index by n percent, then his marginal wealth as a function of portfolio wealth increments can be written as

$$MW_{m1} = \phi MW_{p1} + \frac{\phi n \delta_1 P_1}{(1+r)} + \frac{\phi n \delta_2 P_2}{(1+r)^2} + \frac{\phi n \delta_3 P_3}{(1+r)^3} + \dots \quad (\text{A2})$$

where P_t is the value of the portfolio in period t . The first term represents the present value of the manager's benefit associated with portfolio wealth increases in the first period under the static view. The numerator of the second term represents the value (at the end of period 1) of the manager's claim on $n\delta_1 P_1$, the increase in portfolio assets that result from exceeding the benchmark return by n percent in period 1. The subsequent terms are interpreted analogously for subsequent period asset inflows that result from superior performance in period 1.

Making the simplifying assumption that the appropriate risk-adjusted discount rate, r , is equal to the expected internal investment return,

$$MW_{m1} = \phi MW_{p1} + \frac{\phi n \delta_1 P_0 (1+r)}{(1+r)} + \frac{\phi n \delta_2 P_0 (1+r)^2}{(1+r)^2} + \frac{\phi n \delta_3 P_0 (1+r)^3}{(1+r)^3} + \dots \quad (\text{A3})$$

Dividing to unity and recognizing that $P_0 = MW_{p1}/r$, equation (3) can be re-written as

$$MW_{m1} = \phi MW_{p1} + \frac{\phi n \delta_1 MW_{p1}}{r} + \frac{\phi n \delta_2 MW_{p1}}{r} + \frac{\phi n \delta_3 MW_{p1}}{r} + \dots$$

or

$$MW_{m1} = \phi MW_{p1} \left[1 + \frac{n\delta_1}{r} + \frac{n\delta_2}{r} + \frac{n\delta_3}{r} + \dots \right] \quad (\text{A4})$$

For example, ignoring δ_t when $t > 3$, the manager's wealth increment can be estimated using asset elasticity estimates from Chevalier and Ellison (1997) where $\delta_1 = .02$, $\delta_2 = .01$, $\delta_3 = .005$. Assuming wealth increases are permanent, $f = 0.01$, and $r = 10\%$, and the portfolio return exceeds the benchmark index by 1%, the manager's marginal benefit of each marginal dollar of portfolio wealth is

$$MW_{m1} = .10(\$1) [1 + .02/.10 + .01/.10 + .005/.10] = .135$$

That is, for each incremental dollar of portfolio wealth, the manager gains 13.5 cents.

When the manager outperforms the index by 2%,

$$MW_{m1} = .10(\$1) [1 + 2(.02)/.10 + 2(.01)/.10 + 2(.005)/.10] = .17$$

An examination of this example and the positive first derivative with respect to n of equation (4) reveals that managers receive increasing marginal wealth as portfolio performance increases. Unlike Lakonishok et al. (1992), we find it difficult to believe that institutional money management is an industry that subtracts value when managers are given such a large stake in

their marginal performance, essentially sharing ownership in the portfolio. This is especially true given that much of the manager's payment comes in the form of future performance-induced fund flows based on investors' (presumably rational) expectations.¹⁷ When compared to average corporate inside ownership, this stake is large. For example, Morck et al. (1998) report mean and median board ownership of 10.6% and 3.4%, respectively.¹⁸

This analysis actually underestimates the manager's interest in superior performance by ignoring any pricing power accruing to managers that beat the benchmark index. Evidence presented in Table VII suggests that managers reporting positive historical risk-adjusted returns are able to charge higher management fees than those with inferior performance.

¹⁷ A test for our rationality formulation could be performed by examining the effect of stepped-down management fees on the portfolio inflows that follow superior performance. All else equal, our formulation predicts that stepped-down management fees will lead to larger portfolio inflows following superior performance because greater inflows will be required to bring investors expected abnormal returns to zero. Portfolios and funds with stepped-down fees should be larger, on average, as a function of cumulative superior performance.

¹⁸ See also McConnell and Servaes (1990) for similar reports regarding levels managerial inside ownership.

APPENDIX B

The notion that a research subsidy will increase the amount of research used in the production of excess returns derives from the notion that as factor inputs research, labor effort, and execution complementary goods and that the subsidized inputs, research and execution, are normal factors. If the subsidized inputs are inferior factors, the manager will simply reduce his own spending by exactly the amount of the subsidy. Input factors are complementary if and only if the angle curve (i.e., expansion path of the indifference curve) of research with respect to the other inputs is monotonically increasing. A more formal analysis requires a profit function for the portfolio manager to be defined and the signs of the first-order cross-partial derivatives to be identified. If the first-order partial derivative of research with respect to the cost of research is negative, then the research demand function is downward sloping, implying that research subsidies encourage the use of more research. For example, assume that risk-adjusted excess returns, y , are generated by combining outside investment research, r , portfolio manager labor, l , and portfolio execution, e , in the following Cobb-Douglas technology

$$y = r^a l^b e^c \quad (\text{B 1})$$

such that $a, b, c > 0$ and $a + b + c < 1$. In other words, generating risk-adjusted excess returns requires positive amounts of all three inputs and is subject to decreasing returns to scale with respect to all three complementary inputs.

Knowing that manager compensation is generally a function of total assets under management and thus a function of y , we can define the manager's profit function as

$$\pi = B + \phi y - (k_r r + k_l l + k_e e) \quad (\text{B 2})$$

where B is the base management fee, ϕ is the present value of future increases in management fees from producing positive risk-adjusted excess returns, and k_i is the marginal cost of input i . Substituting the (B1) into (B2),

$$\pi = B + \phi r^a l^b e^c - (k_r r + k_l l + k_e e). \quad (\text{B 3})$$

To maximize their profit, managers will satisfy the first-order conditions,

$$\begin{aligned}
ar^{a-1}l^b e^c &= \frac{k_r}{\phi} \\
br^a l^{b-1} e^c &= \frac{k_l}{\phi} \\
cr^a l^b e^{c-1} &= \frac{k_e}{\phi}
\end{aligned} \tag{B 4}$$

To determine the effect of a subsidy that reduces the marginal cost of outside research, k_r , we examine the resulting factor demand functions. In other words, what is the slope of the demand function for research? But the demand for each input factor is a function of all the factor prices. To examine how the factor demands behave with respect to the factor prices, differentiate each of the first-order conditions with respect to each factor price using the chain rule. The result, in matrix form, is:

$$\begin{array}{ccc}
a(a-1)r^{a-2}l^b e^c & abr^{a-1}l^{b-1} e^c & acr^{a-1}l^b e^{c-1} \\
abr^{a-1}l^{b-1} e^c & b(b-1)r^a l^{b-2} e^c & bcr^a l^{b-1} e^{c-1} \\
acr^{a-1}l^b e^{c-1} & bcr^a l^{b-1} e^{c-1} & c(c-1)r^a l^b e^{c-2}
\end{array}
\begin{array}{ccc}
\frac{fr}{fk_r} & \frac{fr}{fk_l} & \frac{fr}{fk_e} \\
\frac{fl}{fk_r} & \frac{fl}{fk_l} & \frac{fl}{fk_e} \\
\frac{fe}{fk_r} & \frac{fe}{fk_l} & \frac{fe}{fk_e}
\end{array}
= \frac{1}{\phi}
\begin{array}{ccc}
1 & 0 & 0 \\
0 & 1 & 0 \\
0 & 0 & 1
\end{array},$$

or

$$HxS = \frac{1}{\phi} I \tag{B 5}$$

where H is the Hessian matrix, S is the substitution matrix, and I is the identity matrix. The second-order condition for a (strict) profit maximum is that the Hessian matrix is a symmetric, negative-definite matrix. H is symmetric. For H to be negative definite, $D_1 < 0$, $D_2 > 0$, and $D_3 < 0$ where D_i is the i^{th} principle minor.

$$|D_1| = a(a-1)r^{a-2}l^b e^c < 0 \quad \text{since } a < 1. \tag{B 6}$$

$$|D_2| = abr^{2(a-1)}l^{2(b-1)} e^c \{1-a-b\} > 0 \quad \text{since } a+b < 1. \tag{B 7}$$

$$|D_3| = abc r^{3a-2} l^{3b-2} e^{3c-2} \{a+b+c-1\} < 0 \quad \text{since } a+b+c < 1. \tag{B 8}$$

Since H is a symmetric negative definite matrix, H^{-1} is also a symmetric negative definite matrix.

From (B5) we know

$$S = H^{-1} \frac{1}{\phi} I \quad (\text{B 9})$$

Thus, the substitution matrix, S , is also a symmetric negative definite matrix. Since the diagonals of a negative definite matrix are negative, r/ k_r must also be negative. In other words, as the marginal cost of investment research is reduced through soft dollar arrangements, the manager will use more research inputs.

To examine the signs of the cross partials more formally, we need to find the inverse of the Hessian matrix, which can be expressed as

$$H^{-1} = \frac{adjH}{|H|} \quad (\text{B 10})$$

where $adjH$ is the transpose of the cofactor matrix, or

$$H^{-1} = \begin{array}{ccc} \frac{bcr^{2a}l^{2(b-1)}e^{2(c-1)}\{1-b-c\}}{|H|} & \frac{abcr^{2a-1}l^{2b-1}e^{2(c-1)}}{|H|} & \frac{abcr^{2a-1}l^{2(b-1)}e^{2c-1}}{|H|} \\ \frac{abcr^{2a-1}l^{2b-1}e^{2(c-1)}}{|H|} & \frac{acr^{2(a-1)}l^{2b}e^{2(c-1)}\{1-a-c\}}{|H|} & \frac{abcr^{2(a-1)}l^{2b-1}e^{2c-1}}{|H|} \\ \frac{abcr^{2a-1}l^{2(b-1)}e^{2c-1}}{|H|} & \frac{abcr^{2(a-1)}l^{2b-1}e^{2c-1}}{|H|} & \frac{abr^{2(a-1)}l^{2(b-1)}e^{2c}\{1-a-b\}}{|H|} \end{array} \quad (\text{B 11})$$

where C_{ij} is terms in the i^{th} row and j^{th} column of the cofactor matrix. The first column of H^{-1} corresponds to r/ k_r , l/ k_r , and e/ k_r , respectively. In all terms, the numerator is positive and the denominator is negative by equation (B8), making all the demand cross partials negative. In other words, the factor demands of labor and execution with respect to the cost of research have negative slopes and more labor and execution will be used as the cost of research is decreased (i.e., as research is subsidized). This result obtains because the factor inputs are complementary goods.

When investors subsidize research, the marginal cost of research, k_r , declines and if research is a normal input more of it will be used. It is important to note that the soft dollar research subsidy can be used only for research and not for the purchase of other factor inputs. This feature of soft dollar brokerage makes bundled brokerage superior to a cash subsidy in which the cash could otherwise be diverted to subsidize other inputs.

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Table I**Descriptive Statistics for Domestic Equity Money Managers**

Descriptive statistics for a sample of 1,273 domestic equity money manager portfolios as of 1993 compiled by Mobius Group, Inc. Portfolios must report at least 12 quarters of data to be included. Portfolio assets are measured in millions. Minimum account size is the smallest sized account accepted by a given manager expressed in thousands. Commissions are measured in cents per share. Annual turnover is defined as the minimum of purchases or sales divided by average market value. Minimum fee is expressed in dollars. Distributions are considered to be normal when the Shapiro-Wilk statistic is close to 1. A low number indicates a non-normal distribution. The number in parentheses, $Pr < W$, represents the probability of incorrectly rejecting the null hypothesis of normalcy. Low p-values, such as those reported in the table, indicate distributions that are not normal. The Shapiro-Wilk test statistic for normalcy is calculated using the method of Shapiro and Wilk (1965).

	<i>N</i>	<i>Mean</i>	<i>Percentiles</i>					<i>Std. Dev.</i>	<i>Shapiro-Wilk stat. (Pr < W)</i>
			<i>Min</i>	<i>25%</i>	<i>Median</i>	<i>75%</i>	<i>Max</i>		
<i>Panel A: Portfolio Assets (in millions)</i>									
Tax-exempt	1098	747.4	0	23	123	526	30,495	2,201	0.35 (.00)
Taxable	1090	143.2	0	0	17	93	5,222	448.2	0.34 (.00)
Total	1135	924.9	0.1	53	185	733	30,495	2,427.9	0.39 (.00)
Ln (Total)	1135	5.19	-2.0	4.0	5.2	6.6	10.3	2.0	0.98 (.00)
<i>Panel B: Number of Accounts Managed</i>									
Tax-exempt	1091	71.4	0	3	11	30	16,436	701.6	0.08 (.00)
Taxable	1086	120.0	0	0	3	26	44,530	1,698.7	0.06 (.00)
Total	1120	190.9	1	5	16	62	60,966	2,363.6	0.07 (.00)
Ln (Total)	1120	2.88	0	1.6	2.8	4.1	11.0	1.8	0.96 (.00)
<i>Panel C: Minimum Account Size (in thousands)</i>									
Tax-exempt	1203	5,198.7	0	300	1,000	5,000	500,000	17,465	0.23 (.00)
Taxable	1133	4,315.0	0	250	1,000	5,000	500,000	16,041	0.21 (.00)
<i>Panel D: Median Account Size (in thousands)</i>									
Tax-exempt	1065	45,429	0	710	6,000	23,400	12,000,000	393,455	0.10 (.00)
Taxable	1007	28,902	0	11	602	3,000	4,158,000	219,965	0.12 (.00)
Total	1074	61,962	0	750	5,000	24,500	15,000,000	566,675	0.10 (.00)
<i>Panel E: Trading and Fee Characteristics</i>									
Commissions	1108	7.9	0	6	6	8	75	6.3	0.55 (.00)
Turnover (%)	1205	63.3	2	30	50	80	500	49.3	0.77 (.00)
Minimum Fee	1091	29,043	0	2,500	10,000	42,500	800,000	48,676	0.60 (.00)

Table II

Performance and Risk Measures

Coefficients from OLS regressions of equity and cash quarterly portfolio excess returns on the Fama and French (1993) benchmarks.

$$R_{it} - r_{ft} = \alpha_i + b_i(R_{mt} - r_{ft}) + s_iSMB_t + h_iHML_t + \varepsilon_{it}$$

Specifically, *MKT*, *SMB*, and *HML* capture the market effect, firm size effect, and book-to-market effect in security returns, respectively. *b*, *s*, and *h* are the respective OLS coefficients. Portfolio returns are taken from data provided by Mobius Group, Inc. To be included in the analysis, a portfolio must have at least 12 quarterly returns in the database. The restricted sample has four filters: returns must be i.) gross of fees, ii.) based on discretionary portfolios, iii.) include terminated accounts, and iv.) not be from a prior firm. Small Capitalization, Value, and Growth are variables used by sample managers to describe their investment strategy. Strategy classes are measured on a discrete scale of 0 to 3. Three is descriptive of the fund's strategy, while zero is not descriptive. Figures are in percent.

<i>Panel A: Intercepts (α)</i>							
<i>Model</i>	<i>N</i>	<i>Qtrly.</i>		<i>No. Pos. (%)</i>	<i>No. Neg.</i>	<i>Significant and Pos.(%)</i>	<i>Significant and Neg.(%)</i>
		<i>Mean α</i>	<i>Std.Dev.</i>				
FF Three-Factor							
Entire Sample	1273	0.931	1.20	1083 (85.1)	190	397 (31.2)	5 (0.00)
Restricted Sample	843	0.788	1.15	683 (81.0)	160	207 (24.6)	5 (0.01)
Jensen Single-Factor							
FF Market Proxy	1273	0.715	1.03	1067 (83.8)	206	265 (20.8)	5 (0.00)
S&P 500	1273	0.681	1.07	1029 (80.8)	244	201 (15.8)	6 (0.00)

<i>Panel B: Pearson Correlation Coefficients</i>			
	<i>Strategy Class</i>		
	<i>Small Capitalization</i>	<i>Value</i>	<i>Growth</i>
<i>s</i>	0.66	-0.11	0.11
(<i>p</i> -value)	(0.000)	(0.000)	(0.000)
[N]	[1210]	[1244]	[1237]
<i>h</i>	-0.21	0.51	-0.57
(<i>p</i> -value)	(0.000)	(0.000)	(0.000)
[N]	[1210]	[1244]	[1237]
Value	-0.08	1.00	-0.39
(<i>p</i> -value)	(0.05)	-	(0.000)
[N]	[1203]	[1244]	[1218]
Growth	0.21	-0.39	1.00
(<i>p</i> -value)	(0.000)	(0.000)	-
[N]	[1206]	[1218]	[1237]

Table III

Cross-Sectional OLS Regressions of Commissions, Turnover, and Total Commissions on Portfolio Variables

Ordinary least squares regressions of average commission rates and turnover on fund characteristics from 1993 data compiled by Mobius Group, Inc. Average soft dollar commission is the average commission rate on equity trades expressed in cents per share less an execution-only commission rate of two cents per share. Annual turnover is the minimum of purchases or sales divided by average market value. Premium Commissions per Managed Dollar is the product of Average Soft Dollar Commission and Annual Turnover. Ln (Assets) is the natural log of portfolio assets. Ln (Accounts) is the natural log of the number of accounts managed. Strategy classes are measured on a discrete scale of 0 to 3. Three is descriptive of the fund's strategy, while zero is not descriptive. They are included to control for the effect of investment philosophies on commissions and turnover. Funds have at least 12 quarters of reported returns.

	<i>Dependent Variable</i>					
	<i>(1)</i>		<i>(2)</i>		<i>(3)</i>	
	<i>Average Soft Dollar Commission Rate</i>		<i>Annual Turnover</i>		<i>Premium Commissions per Managed Dollar</i>	
<i>Parameter</i>			<i>Parameter</i>		<i>Parameter</i>	
	<i>Estimate</i>	<i>p-value</i>	<i>Estimate</i>	<i>p-value</i>	<i>Estimate</i>	<i>p-value</i>
Intercept	8.01	0.000***	86.38	0.000***	385.37	0.000***
Ln (Assets)	-0.91	0.000***	1.00	0.275	-30.06	0.000***
Ln (Accounts)	1.05	0.000***	-3.21	0.001***	35.00	0.000***
% Tax-exempt assets	-0.90	0.16	-5.00	0.299	-76.48	0.077*
Annual Turnover	-0.01	0.001***				
Average Soft Dollar Commission			-0.79	0.001***		
<u>Strategy Classes</u>						
Value	0.22	0.271	-4.22	0.006***	2.33	0.864
Growth	0.59	0.005***	-0.35	0.823	35.00	0.012**
Small Capitalization	-0.31	0.088*	1.21	0.382	1.45	0.907
Broad Market	0.01	0.955	-1.38	0.357	-8.27	0.540
Market Timer	-0.26	0.440	0.13	0.959	-19.32	0.393
Convertible	-0.19	0.573	-7.41	0.003***	-53.20	0.018**
Sector Rotator	0.04	0.895	5.53	0.006***	47.21	0.009***
Index	-0.67	0.034**	-13.20	0.000***	-53.06	0.012**
Contrarian	-0.12	0.626	-5.65	0.002***	-25.76	0.115
Theme Selection	-0.05	0.822	-0.50	0.779	-12.28	0.447
High Yield	0.21	0.401	-1.699	0.376	1.73	0.920
Core	-0.017	0.930	-3.37	0.018**	-17.30	0.176
Hedged Equity	-0.01	0.988	25.81	0.000***	129.01	0.000***
Socially Responsible	-0.21	0.406	-2.45	0.205	-27.24	0.116
Technical	0.96	0.001***	12.39	0.000***	133.08	0.000***
Mutual Fund Timing	-2.37	0.001***	29.86	0.000***	-204.71	0.000***
N	961		961		961	
F-value	11.04***		17.43***		11.37***	
Adj. R squared	0.17		0.26		0.17	

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

Table IV

The Effect of Soft Dollars on Performance

Intercepts from OLS regressions of equity and cash quarterly portfolio excess returns on the Fama and French (1993) benchmarks.

$$R_{it} - r_{ft} = \alpha_i + b_i(R_{mt} - r_{ft}) + s_iSMB_t + h_iHML_t + \varepsilon_{it}$$

Specifically, *MKT*, *SMB*, and *HML* capture the market effect, firm size effect, and book-to-market effect in security returns, respectively. Portfolio returns are taken from data provided by Mobius Group, Inc and cover the 1979 through 1993 period. To be included in the analysis, a portfolio must have at least 12 quarterly returns in the database. The product of Soft Dollar Commission and Annual Turnover is Premium Commissions per Managed Dollar. Ln (Assets) is the natural log of portfolio assets. Ln (Accounts) is the natural log of the number of accounts managed. The Index variable and other strategy class variables are measured on a discrete scale of 0 to 3. Three is descriptive of the fund's strategy, while zero is not descriptive. % Tax-exempt assets is the proportion of the portfolio composed of pension assets. To avoid collinearity, the Premium Commissions per Managed Dollar Residual term is the OLS residual from having the product of Premium Commissions per Managed Dollar as the independent variable and all other factors as independent variables. The residual term represents the portion of soft dollar brokerage left unexplained by the remaining independent variables.

	<i>Estimated alpha from Fama and French (1993) OLS regressions</i>		
Intercept	0.69***	1.66***	1.21***
Premium Commissions per Managed Dollar	0.076***		
Premium Commissions per Managed Dollar Residual		0.060***	0.037***
Ln (Assets)		-0.070***	-0.041*
Ln (Accounts)		0.024	0.031
% Tax-exempt assets		-0.509***	-0.330***
Value			-0.075**
Growth			0.155***
Small Capitalization			0.204***
Broad Market			-0.085**
Market Timer			-0.111*
Convertible			-0.160***
Sector Rotator			-0.016
Index		-0.276***	-0.204***
Contrarian			-0.027
Theme Selection			0.026
High Yield			-0.060
Core			-0.103***
Hedged Equity			0.379***
Socially Responsible			-0.026
Technical			0.083
Mutual Fund Timing			-0.277**
N	1102	967	961
F-value	80.65***	23.05***	17.41***
Adj. R-squared	.07	.10	.25

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

Table V

Robustness Tests of the Effect of Soft Dollar Brokerage on Performance

Intercepts from OLS regressions of equity and cash quarterly portfolio excess returns on the Fama and French (1993) benchmarks.

$$R_{it} - r_{ft} = \alpha_i + b_i(R_{mt} - r_{ft}) + s_iSMB_t + h_iHML_t + \varepsilon_{it}$$

Specifically, *MKT*, *SMB*, and *HML* capture the market effect, firm size effect, and book-to-market effect in security returns, respectively. Portfolio returns are taken from data provided by Mobius Group, Inc and cover the 1979 through 1993 period. To be included in the analysis, a portfolio must have at least 12 quarterly returns in the database. The product of Soft Dollar Commission and Annual Turnover is Premium Commissions per Managed Dollar. Ln (Assets) is the natural log of portfolio assets. Ln (Accounts) is the natural log of the number of accounts managed. The strategy class variables are measured on a discrete scale of 0 to 3. Three is descriptive of the fund's strategy, while zero is not descriptive. % Tax-exempt assets is the proportion of the portfolio composed of pension assets. To avoid multicollinearity, the Premium Commissions per Managed Dollar Residual term is the OLS residual from having the product of Premium Commissions per Managed Dollar as the dependent variable and all other factors as independent variables. Regression (1) has four filters: returns must be i.) gross of fees, ii.) based on discretionary portfolios, iii.) include terminated accounts, and iv.) not be from a prior firm. Regression (2) uses alphas estimated from returns in 1989 through 1993. Regression (3) is a weighted OLS regression weighted by the reciprocal of the standard error of the estimated Fama-French alpha. The dependent variable in regression (4) is a Jensen's single-factor alpha using the Fama-French market proxy.

	<i>Dependent Variable: Estimated Alpha from Performance Regressions</i>			
	<i>(1)</i> <i>Restricted</i> <i>Sample</i>	<i>(2)</i> <i>1989-1993</i> <i>Returns</i>	<i>(3)</i> <i>Weighted OLS by</i> <i>the SE reciprocal</i>	<i>(4)</i> <i>Jensen's</i> <i>Alpha</i>
Intercept	0.95***	1.09***	0.84***	0.95***
Premium Commissions per Managed Dollar Residual	0.042***	0.037***	0.028***	0.029***
Ln (Assets)	-0.001	-0.024	-0.030**	-0.062***
Ln (Accounts)	-0.018	-0.018	0.021	0.057***
% Tax-exempt assets	-0.329**	-0.394***	-0.156*	-0.261***
Value	-0.030	-0.806**	-0.055**	0.064*
Growth	0.173***	0.149***	0.120***	0.032
Small Capitalization	0.212***	0.260***	0.138***	0.052*
Broad Market	-0.059	-0.074**	-0.043*	-0.057*
Market Timer	0.040	0.039	0.075	0.058
Convertible	-0.058	-0.122*	-0.110***	-0.092
Sector Rotator	0.038	0.013	-0.017	0.019
Index	-0.157**	-0.171***	-0.152***	-0.076
Contrarian	-0.012	-0.023	-0.027	-0.010
Theme Selection	0.029	0.028	0.059*	0.009
High Yield	-0.049	-0.50	-0.053*	0.048
Core	-0.146***	-0.073**	-0.059***	-0.066**
Hedged Equity	0.271***	0.385***	0.132**	0.334***
Socially Responsible	-0.094	-0.086*	-0.009	-0.023
Technical	0.036	0.117**	0.093**	0.052
Mutual Fund Timing	-0.233	-0.311**	-0.165*	-0.211*
N	686	961	961	961
F-value	11.49***	17.42***	18.20***	6.52***
Adj. R-squared	.23	.25	.26	.10

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

Table VI**The Effect of Soft Dollars on Management Fees**

Cross-sectional OLS regressions of management fees on portfolio variables for 1993 taken from the 1994 Mobius, Inc. data base. Parameter estimates are expressed in basis points. Ln (Assets) is the natural log of portfolio assets. Ln(Accounts) is the natural log of number of accounts managed. The Index Fund variable takes on values of 0 to 3 with 3 being a bona fide index fund and 0 being an actively managed portfolio as described by the money manager. Average Commission is the average commission rate on equity trades expressed in cents per share. Annual Turnover is the minimum of purchases or sales divided by average market value. The product of Average Soft Dollar Commission and Annual Turnover is a measure of Premium Commission per Managed Dollar. Alpha is the intercept of the OLS regression of portfolio returns on the Fama and French (1993) risk factor proxies. % Tax-exempt assets is the percent of pension assets in the portfolio. Fee1MM, Fee10MM, Fee50MM, and Fee100MM are management fees in basis points on one-million, ten-million, fifty-million, and one-hundred-million dollar accounts, respectively.

	(1) <i>Fee1MM</i>	(2) <i>Fee10MM</i>	(3) <i>Fee50MM</i>	(4) <i>Fee100MM</i>
Intercept	117.86***	80.62***	67.28***	66.43***
Alpha	5.86	5.33**	6.41***	5.70***
Premium Commissions per Managed Dollar Residual	-1.87	0.65	0.90	0.61
Ln (Assets)	13.54***	-0.05	0.10	-0.63
Ln (Accounts)	-15.24***	1.08	-0.51	-0.33
% Tax-exempt assets	-13.73	-13.04	-16.64***	-17.53***
Index	-19.09**	-10.02***	-6.56***	-5.58**
N	360	360	360	360
F-value	3.30***	4.65***	9.26***	8.10***
Adj. R-squared	.04	.06	.12	.11

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

Table VII

Robustness Tests of The Effect of Soft Dollars on Management Fees

Cross-sectional OLS regressions of management fees on portfolio variables for 1993 taken from the 1994 Mobius, Inc. data base. Parameter estimates are expressed in basis points. Ln (Assets) is the natural log of portfolio assets. Ln(Accounts) is the natural log of number of accounts managed. The Index Fund variable takes on values of 0 to 3 with 3 being a bona fide index fund and 0 being an actively managed portfolio as described by the money manager. The product of Average Soft Dollar Commission and Annual Turnover is Premium Commission per Managed Dollar. Alpha is the intercept of the OLS regression of portfolio returns on the Fama and French (1993) risk factor proxies or a single-factor performance model as indicated. % Tax-exempt assets is the percent of pension assets in the portfolio. Fee100MM is the management fees in basis points on a one hundred million-dollar account. . Regression (1) has four filters: returns must be i.) gross of fees, ii.) based on discretionary portfolios, iii.) include terminated accounts, and iv.) not be from a prior firm. Regression (2) uses alphas estimated from returns in 1989 through 1993. Regression (3) is a weighted OLS regression weighted by the reciprocal of the standard error of the estimated Fama-French alpha. The dependent variable in regression (4) is a Jensen's single-factor alpha using the Fama-French market proxy.

	<i>Dependent Variable: Fee100MM</i>			
	<i>(1) Restricted Sample</i>	<i>(2) 1989-1993 Returns</i>	<i>(3) Weighted OLS by the SE reciprocal</i>	<i>(4) Jensen's Alpha</i>
Intercept	65.65***	68.14***	58.23***	68.29***
Alpha	5.85**	4.51***	8.18***	5.68***
Premium Commissions per Managed Dollar Residual	1.46	0.75	1.01	0.79
Ln (Assets)	0.098	-0.87	-0.65	-0.60
Ln (Accounts)	-1.42	0.01	0.09	-0.53
% Tax-exempt assets	-22.82***	-17.59***	-14.52***	-18.49***
Index	-6.04**	-6.03**	-9.58***	-6.40**
N	248	360	360	360
F-value	5.61***	7.55***	28.39***	7.49***
Adj. R-squared	.10	.10	.31	.10

*Significant at the 10% level.

**Significant at the 5% level.

***Significant at the 1% level.

