DOES SOFT DOLLAR BROKERAGE BENEFIT PORTFOLIO INVESTORS: AGENCY PROBLEM OR SOLUTION?

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Abstract

With soft dollar brokerage, institutional portfolio managers pay brokers "premium" commission rates in exchange for rebates they use to buy third-party research. One hypothesis views this practice as a reflection of the agency problem in delegated portfolio management; another views it as a contractual solution to the agency problem that aligns the incentives of investors, managers, and brokers where direct monitoring mechanisms are inadequate. Using a database of institutional money managers, we find that premium commission payments are positively related to risk-adjusted performance, suggesting that soft dollar brokerage is a solution to agency problems. Moreover, premium commissions are positively related to management fees, suggesting that labor market competition does not punish managers for using soft dollars.

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This paper examines the role "soft dollar brokerage" plays in institutional portfolio management. In a typical soft dollar arrangement, a portfolio manager agrees to place a designated dollar value of brokerage commission business with a broker over the coming period at premium commission rates. In consideration for this promise, the broker provides the manager with soft dollar research credits equal to some percentage of the promised commissions, often around 50%. The manager uses the credits to buy any of a large number of broker-approved research products — hardware, software, subscriptions, databases, etc. — supplied by third-party research vendors. As the broker pays the manager's research bill he cancels the manager's soft dollar credits. If all goes as planned, the manager places the promised commission business with the broker over the coming period to compensate him for his research and execution costs. Because brokerage commissions are included in the price basis of the underlying security, portfolio investors implicitly pay the underlying research costs. Soft dollars therefore subsidize the manager's use of research inputs, and in some cases the existence or amount of the subsidy is unknown to investors.

Soft dollars merit scholarly attention for at least two reasons. First, they are both widely used and widely misunderstood. Several studies suggest that in the U.S. alone soft dollar brokerage commissions may total $1 billion annually, or up to 40% of all equity trading commissions (Johnsen (1994), Lemke and Lins (1997), and Hopfner (1995)). Indeed, soft dollars have spawned an entire industry of brokerage firms whose sole function is to subsidize third-party research in connection with institutional portfolio management. What is more, financial market regulators, the financial media, and most academics have emphatically denounced soft dollars,[1] in spite of federal legislation that specifically exempts from fiduciary suits managers who "pay up" for research (Securities Exchange Act Section 28(e)). The second reason for studying soft dollars is that they provide profound insights into economic organization, generally, and specifically with respect to the principal-agent problem in institutional portfolio management.

Early theoretical work on the principal-agent problem in institutional portfolio management focused on efficient contracting for the sale of investment information and the protection of property rights to it (e.g., Admati and Pfleiderer (1986), Brennan and Chordia (1993), and Benabou and Laroque (1992)). Subsequent work examines how different forms of contracting might resolve principal-agent conflicts regarding agent inputs (e.g., Battacharya and

Pfleiderer (1985), Admati and Pfleiderer (1988), Dow and Gorton (1997), and Biais and Germain (2002)). Deli (2002) examines mutual fund advisory contracts and finds that the level of advisory fees is related to a fund's asset class, turnover, and size. He attributes differences in marginal compensation, in part, to differences in monitoring. Elton, Gruber, and Blake (2003) examine the effect on manager behavior of so-called "incentive fees" in the form of a relatively large share of one-time excess. They find that mutual fund managers who earn incentive fees exhibit superior stock selection ability and lower expense ratios and that their funds experience higher rates of cash inflow.

Early work on soft dollars by Berkowitz and Logue (1987) and Logue (1991) argued that soft dollars malign managers' incentives, encouraging them to make inefficient management decisions in an effort to unjustly enrich themselves at portfolio investors' expense. This view has been widely embraced by market regulators and financial industry critics. Blume (1993) performed the first empirical analysis of soft dollars based on aggregated data, tentatively suggesting that they are subject to lower price impact and execution costs than other forms of institutional brokerage. Johnsen (1994) was the first to rely on agency theory to argue that soft dollars may actually benefit portfolio investors by ameliorating the agency problem.

Most recently, Conrad, Johnson, and Wahal (2001) provide the first empirical analysis of soft dollars based on individual trades across various types of brokers. They find that the total cost of trades performed — including explicit brokerage fees, market impact costs, and the opportunity cost of delayed execution — by soft dollar brokers is generally higher than for "full-service" or "research" brokers after adjusting for trade difficulty and other factors. Absent evidence regarding the benefits of soft dollar research, however, they are unable to conclude that this necessarily harms investors on net balance. What is more, their database only crudely differentiates soft dollar brokerage from other forms of premium brokerage because research and full service brokers often do a substantial amount of their business pursuant to soft dollar arrangements. Livne and Trueman (2000) develop an adverse selection model to assess the effect of soft dollars on market equilibrium, finding that although soft dollars may increase portfolio investors' expected profits they may also reduce trading volume, market liquidity, and profits earned by individual investors. Finally, Brealey and Neuberger (2001) respond to a recommendation by Britian's Treasury to mandate that advisory contracts require managers to pay all research expenses out of their own accounts in exchange for a single "all-in-one"

management fee, apparently requiring that they use execution-only brokers to perform portfolio trades. This would effectively eliminate soft dollar brokerage. Although the elimination of soft dollars might sharpen managers' incentives in one area, Brealey and Neuberger conclude it would likely weaken their incentives in other areas so much that the proposed restriction on contract choice is unwarranted.

This paper investigates the effect of soft dollar brokerage on the welfare of portfolio investors. Specifically, we test whether soft dollar use is associated with abnormal risk-adjusted performance or with management fees. If soft dollars encourage managers to make inefficient management decisions in an effort to unjustly enrich themselves (see, for example, Berkowitz and Logue (1987) and Logue (1991)), they must reduce portfolio performance and investor welfare. Furthermore, labor market competition will require managers to compete for the opportunity to use soft dollars to enrich themselves by offering to work for lower management fees. If, on the other hand, soft dollars efficiently align the incentives of managers, investors, and brokers (see, for example, Johnsen (1994) and Horan and Johnsen (1998)), then their use should be positively related to risk-adjusted performance. Under this hypothesis, since soft dollars represent an efficient contracting mechanism, their use should be positively related or unrelated to management fees.

Using a sample of 1,038 institutional portfolios in the Mobius database, we find that soft dollar use is positively related to risk-adjusted performance. Specifically, a two-cent per share increase in premium commission rates for a typical manager having 50% annual turnover is associated with an increase in performance of about 13 basis points annually. Furthermore, soft dollars appear to be slightly positively associated with management fees. A two-cent per share increase in premium commission rates for a typical manager is associated with a one basis point increase in management fees. Both these results suggest that soft dollars benefit investors by aligning incentives of investors and managers and refute the hypothesis that soft dollars malign managers' incentives.

The remainder of this paper is organized as follows. In Section I, we describe soft dollar brokerage in more detail, outline the agency problem in institutional portfolio management, and introduce two mutually exclusive hypotheses to explain the use of soft dollars — the unjust enrichment hypothesis and the incentive alignment hypothesis. We derive testable implications from these hypotheses in Section II. In Section III we describe our data, which reports money

manager returns from a sample of 1,038 institutional portfolios in the Mobius database. In Section IV we present and discuss our empirical results. In Section V we summarize our findings and provide insights into the general role of third-party payments such as soft dollars in resolving the principal-agent problem.

I. The Role of Soft Dollars in Institutional Portfolio Management

The practice of formally bundling research and execution together into a single brokerage commission began toward the end of the era of fixed minimum commissions, as brokers found various nonprice methods of competing for the increasing volume of lucrative institutional trading business (Jarrell (1984) and Blume (1993)). During this time, NYSE commissions were set far in excess of what ultimately prevailed under freely negotiated commissions. As part of the Securities Acts Amendments (1975) deregulating fixed commissions, Congress added Section 28(e) to the Securities Exchange Act (1934). This provision, known as the "paying up" amendment, gave portfolio managers a safe harbor from fiduciary suits when they pay premium commission rates if they believe the research they receive in exchange adequately compensates the portfolio (Johnsen (1994)). Deregulation brought dramatic reductions in institutional brokerage commission rates, but these rates nevertheless remained above the execution-only rate to reflect the provision of research to managers under the safe harbor. The opportunity to continue bundling research and execution into a single commission brought the entry of soft dollar brokers, who specialized in providing managers with third-party research from outside vendors. Soft dollar arrangements thereafter proliferated and are now widely used by virtually all brokers. The safe harbor together with managers' and brokers' standard fiduciary duty establishes the legal framework in which contracting over the provision of institutional portfolio management and brokerage now occurs.

A. The Agency Problem in Institutional Portfolio Management

Internally, active institutional portfolio management involves three categories of variable inputs that are no doubt complements in generating profitable trading opportunities through some range: research in the form of reports, databases, hardware, software, etc., manager labor effort to transform these inputs into profitable trading opportunities, and brokerage executions. Managers can either combine these inputs internally to generate profitable trading opportunities

or to some extent they can purchase "stock picks" from research or full service brokers by paying a premium commission rate. With soft dollar brokerage they pay a premium commission in exchange for raw research inputs that have no intrinsic value of their own until carefully combined with other inputs, including the manager's own labor effort. In this case, any manager who succeeds in identifying mispriced securities faces a leakage problem when trading if market interlopers are able to infer his possession of private information. With other forms of premium brokerage, the manager faces a favoritism problem, never knowing whether or not the stock pick he has been given by the broker was already given to one or more of the broker's preferred clients.

Depending on how managers are compensated and the extent to which they bear the marginal costs of management inputs, their behavior is likely to conflict in various ways with the interests of portfolio investors. Traditionally, the equilibrium advisory contract provides that managers are paid a recurring share of net asset value — often around 50 basis points — and that brokerage commissions are explicitly charged to the portfolio. To the extent managers pay premium commissions to obtain research, whether internally or externally generated, therefore, the portfolio implicitly bears the associated research costs. The manager explicitly pays any direct research costs and the cost of fixed inputs.

Externally, managers also use brokers to search for counter parties to execute trades. Because brokers have no immediate stake in the diligence with which they search (Garbade and Silbur (1982)), they may shirk in providing portfolio executions, resulting in information leakage and price impact. Trading costs therefore include not only brokerage commissions, but also market impact costs and the opportunity costs of delay. Keim and Madhavan (1997) demonstrate that commissions and market impact costs are economically significant (exceeding 2% of principal value for large trades in small capitalization stocks) and that traders behave strategically to reduce these costs. Dow and Gorton (1997) argue that the first-best strategy for informed managers who lack trading opportunities is to refrain from trading. But if investors cannot distinguish informed inactivity from inactivity motivated by shirking, managers are likely to engage in noise trading (i.e., trading whose immediate expected value is zero or negative) to create the appearance of having performed diligently. Others have argued that managers use uninformed noise trading to mask the information content of their informed trades, thereby preventing market interlopers from inferring their private information and diluting its value (see

Horan and Johnsen (2001))). Keim and Madhavan (1995) conclude that theoretical trading models fail to capture these and other important dimensions of trading behavior.

In this setting of institutional portfolio management, agency conflicts can manifest themselves in several ways. Because the quality of broker executions is impossible for the manager to discern ex ante, and costly to monitor ex post, and because brokers do not bear the full residual from their search efforts, they will tend to do too little search and to use too little care in searching. What is more, because managers bear only a small fraction of the portfolio residual, they might i) shirk by devoting too few resources to identifying profitable trading opportunities, ii) shirk by doing a careless job of allocating trades among brokers and monitoring the quality of the brokers' executions, and iii) misappropriate portfolio wealth by consuming perquisites. These conflicts provide the basis for identifying two mutually exclusive hypotheses about the effects of soft dollar brokerage on manager behavior.

B. The Unjust Enrichment Hypothesis

According to the unjust enrichment hypothesis (UEH), soft dollars allow managers to misappropriate portfolio wealth by churning their portfolios to subsidize research for which they should pay directly. This, in turn, generates various inefficiencies. Because research is subsidized, they will use infra-marginal research products for which they are unwilling to pay directly. They will commit to trading with brokers based on the brokers' willingness to provide research credits rather than on expected execution quality, and they will use brokers whose execution quality proves to be sub-optimal out of a sense of obligation arising from their prior acceptance of research credits.[2]

With a competitive labor market for portfolio management, of course, equilibrium management fees will adjust downward so that managers' total compensation, including the value of the research subsidy, will equal their marginal product. The real losses arising from soft dollars are incurred by portfolio investors and money managers, jointly, and result from the inefficiency of soft dollars as a form of equilibrium manager compensation. Following Jensen and Meckling (1976), any reduction in portfolio performance and total compensation gives the parties a mutual incentive to eliminate the inefficiency, either through investor monitoring or through broker bonding, because both groups can share in the gains from doing so. The question then arises whether soft dollars reflect a pareto optimal form of implicit contract.

C. The Incentive Alignment Hypothesis

According to the incentive alignment hypothesis (IAH), soft dollars ameliorate agency conflicts by aligning the interests of managers, investors, and brokers. Because managers' share of the portfolio residual is based on a small share of net asset value, they would bear disproportionately the costs of identifying profitable trading opportunities and hence have too little incentive to do so if they were required to pay directly for all research.[3] 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, execute too few portfolio trades, and engage in sub-optimal monitoring of execution quality. By bundling the cost of research inputs into brokerage executions, soft dollars allow portfolio investors to subsidize investment research at the margin, encouraging managers to do more of it. In fact, if research inputs, labor effort, and broker executions are complementary and normal inputs in the portfolio management process, the soft dollar research subsidy will encourage managers to use more of all the inputs, not just research (Paik and Sen (1995)).

In addition to ameliorating the investor-manager conflict by encouraging managers to do more research, soft dollars also ameliorate the investor-broker conflict. 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 portfolio. 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.[4] The unpaid soft dollar balance constitutes a nonsalvageable performance bond that facilitates monitoring when managers have difficulty assessing execution quality, either ex ante or ex post. The threat of termination dramatically increases the expected losses to brokers who are caught cheating by providing low-quality execution and thereby reduces the manager's optimal expenditure on monitoring.[5] Soft dollars therefore appear to be a textbook example of a quality-assuring price premium, as in Klein and Leffler (1981).[6]

The hypothesis that the advance soft dollar research credits bond the quality of brokerage executions is entirely plausible, but it fails to explain why the bond should take the form of research provided to the manager. A cash payment from the broker directly to the portfolio would provide an equally effective performance bond, and from the broker's standpoint would

be equally nonsalvageable. But the Klein-Leffler model requires that the bond take the form that maximizes the use value to the "customer" subject to the constraint that it is nonsalvageable. A dollar worth of research provided to the manager is worth more to the portfolio than a dollar in cash because, in the absence of a research subsidy, the manager has too little incentive to do research given his extremely small share of the portfolio residual. [7]

The broker's incentive to have the soft dollar balance paid quickly further explains why a research rebate is superior to cash.[8] By taking the rebate in research, the manager in essence signals his promise to work diligently to identify mispriced securities, leading to trades that allow the broker to recoup his investment sooner rather than later. If the research products the manager selects create profitable trading opportunities, the manager will order a higher volume of trades at higher commission rates that pay down his soft dollar account balance more quickly. If the manager is unable to identify profitable trading opportunities sufficient to generate commissions that exhaust his soft dollar account, the arrangement with the broker reduces the marginal cost of noise trading to zero, conditional on his desire to continue his relationship with the broker, because the manager has already committed to a specified amount of trading. Through some range, this encourages the manager to engage in a pattern of trading that obscures his private information from market interlopers and prevents informational leakage.

Note that bundling research and execution into a single commission applies to all forms of institutional brokerage and not just to soft dollars. Full-service and research brokerage, in which the executing broker historically provides in-house services and research on an informal or "relational" basis also involve bundling, and are no less subject to the criticisms of the UEH. Soft dollars are unique in that third-party vendors supply the research inputs at arm's-length through a formal accounting system. This allows research and execution to be provided by entirely separate firms, thereby promoting specialization of the research and execution functions. The UEH therefore ultimately rests on the maligned incentives resulting from bundling, generally, and not from the unique attributes of soft dollars, including formal accounting, specialization, and quality assurance. Conrad, Johnson, and Wahal (2001) distinguish between soft dollar brokers (those providing third party research) and full-service and research brokers (those providing in-house research). According to their study, the marginal implicit and explicit trading costs associated with these brokers as a group (i.e., those providing bundled brokerage) is lower than for soft dollar brokers alone after adjusting for trade difficulty. As already noted,

however, full-service and research brokers routinely do a substantial portion of their trades through soft dollar arrangements. Moreover, although Conrad, *et al.*, adjust for trade difficulty, they cannot determine the marginal execution costs full-service and research brokers would have incurred if they were called on to perform the large volume of trades actually performed by the soft dollar brokers in their sample.

Bundling in any form encourages managers to do more trades and to use more research than otherwise, and few seriously propose that managers be required to use only discount brokerage. Soft dollars as a particular form of bundling allow managers to bond the quality of brokerage executions. They also encourage the manager to provide increased labor effort because soft dollars require the manager to combine his labor effort with research *inputs* if he is to identify profitable trading opportunities. In contrast, a manager can effectively use full-service and research brokerage to substitute the broker's recommendations about profitable trading opportunities for his own labor effort. The important empirical question is whether the soft dollar research subsidy moves managers toward the optimal allocation of resources, as suggested by the IAH, or so far beyond the optimal allocation that investors are made worse off, as suggested by the UEH.

II. Testable implications

A. Shared Predictions

Both the UEH and IAH predict that soft dollar brokerage will lead managers to increase portfolio turnover and to pay higher commission rates. According to the IAH, managers will increase turnover as a natural response to the implicit research subsidy, which provides them with both the incentive and the ability to identify profitable trading opportunities. According to the UEH, managers will increase turnover to reduce their direct research costs and increase their net compensation at the portfolio's expense. The effect of soft dollars on portfolio turnover therefore fails to distinguish the two hypotheses. The effect of soft dollars on commission rates also fails to distinguish the hypotheses because according to both hypotheses managers will pay premium commissions. The IAH views higher commissions as necessary to subsidize research and assure execution quality. The UEH views higher commissions as indirect, and illicit, manager compensation.

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 will be greater in situations characterized by high agency costs because soft dollars help to align managers' and brokers' incentives where alternative monitoring mechanisms are uneconomic. One proxy for cross-sectional differences in agency costs is the concentration of portfolio ownership, for example, which reduces the collective action problem among investors (see Easterbrook (1984) and Pound (1988)). As Table I shows, private money managers may handle anywhere from a single account to tens of thousands of accounts. Fewer accounts under management for a given asset base or more assets for a given number of accounts (i.e., higher ownership concentration) should be associated with a smaller collective action problem and better monitoring. Both hypotheses therefore predict that managers with highly concentrated account bases will engage in less paying up for soft dollars, all else equal.

B. Risk-Adjusted Returns and Management Fees

One way to distinguish between the IAH and the UEH is to examine the effect of soft dollar use on management fees. Under the UEH, soft dollars constitute a second-best form of manager compensation, and if the managerial labor market is competitive at least a portion of the associated wealth transfer should be reflected in a lower management fee. 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 help to align managers' and brokers' incentives when other mechanisms fail, then management fees should be either unrelated to soft dollar use or positively related to the extent managers share in the gains from efficient contracting.

Perhaps the most obvious way to distinguish the two hypotheses is to examine how risk-adjusted returns vary with soft dollar use. The IAH predicts that soft dollars will lead to higher risk-adjusted returns as a result of improved execution quality and the manager's more optimal choice of research, labor effort, and trading. The UEH predicts that soft dollars will result in lower risk-adjusted returns because the costs of the premium commissions from misappropriating investors' resources exceed the value to the portfolio of the research and execution.

III. Data

The data for this study come from the Mobius database. Now owned by CheckFree Investment Services, the Mobius Group has been in the business of selling returns data on money managers to the public since 1989. The database fairly represents both pension assets and institutional money management more generally. For example, Horan (1998) shows that the database represents 54% of all pension assets in the U.S. and that the distribution of pension assets, and the proportion of indexed assets within the sample closely mirrors aggregate industry data. 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.

Managers in the Mobius database may report returns for a series of portfolios, or management styles, provided to clients. Consequently, the database 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 the 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. We used data from the 1997 first quarter database. Panels A and B show the distribution of portfolio assets and the number of accounts managed within each of the 1,038 portfolios that are the focus of this study. To be included in the sample, a portfolio must report at least twelve quarters of returns, strategy class profiles, commission rates, and turnover. The number of portfolios reporting data for assets under management and the number of accounts is 2,983. Excluding those portfolios that do not report strategy class profiles, commission rates, or turnover reduces the sample to 2,504 portfolios. Excluding those portfolios without at least twelve quarters of returns data produces the final sample of 1,038 portfolios.

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 approaching one. Panel C displays the distribution of commission rates and annual turnover, which is the lesser of purchases or sales divided by beginning

portfolio value, as of the first quarter of 1997. The median manager pays a six-cent commission rate and turns over about half of the portfolio each year. These descriptive statistics are stable over time as they are similar to earlier databases (see Horan (1998)).

Since a focus of this study is returns to investors, an issue worth addressing is how money manager returns data compare to those for mutual funds. The SEC plays an active role in monitoring and standardizing 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 and other large institutional clients. 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.

Mobius 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 present in mutual fund data. First, because managers choose whether or not to report it is likely that superior performing managers report while 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, returns data vary according to the methodology used to calculate them (e.g., dollar-weighted versus time-weighted); managers no doubt have an incentive to use the most flattering calculations, thereby biasing reported returns upward.

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.

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

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.

Panel A of Table II shows the intercepts of OLS regressions for the 1,038 domestic equity portfolios in our sample with at least twelve quarters of reported returns. The time period under study runs from 1979 to the first quarter of 1997, although data for recent quarters are more abundant. The mean α is almost 81 basis points per quarter, or 3.2% annually (3.3% compounded quarterly). Eighty-eight of the intercepts are positive, 23% 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, Table II shows that performance is cut almost in half with very few statistically significant alphas when only the most recent 21 quarters of returns are used to calculate performance. As a result, much of the positive performance is embedded in the early performance numbers of surviving firms, which suggest that survivorship bias is significant. The results of the tests that follow are unaffected by using only recent performance data, so this bias does not appear to affect our results. Third, Panel A shows that alphas calculated with single-factor models produce similarly large alphas. The following analysis shows that our conclusions are insensitive to the methodology used to calculate performance or the time period over which performance is evaluated. We assume that, on average, any upward bias is the same for all portfolios because we have no reason to believe it is systematically related to a portfolio's use of soft dollars.[9]

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 coefficients in equation (1). Strategy classes are measured on a discrete scale of zero to three. 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, and a portfolio can have multiple classifications. 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 0.52 and -0.52, 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 correlations are also stable over time. These findings suggest that the portfolios exhibit returns consistent with the strategy classifications.

Our data do not identify money managers' use of soft dollars directly. To the best of our knowledge, this data is unavailable, no doubt because managers typically consider it proprietary. Instead, we assume that soft dollar use is proportional to Premium Commissions per Managed Dollar (PCMD), calculated as the average premium commission rate times annual turnover expressed as a percentage of portfolio value. To calculate premium 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. It bears mentioning that any deduction conceptually removes execution-only brokerage for easy trades, however, and 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 to be correlated with trade difficulty. It seems reasonable that, on average, variations in PCMD across portfolios reflects variations in soft dollar use after controlling for other factors, such as portfolio strategies and portfolio size, that are likely to affect commission rates and turnover.

Our measure of paying up for soft dollar brokerage contrasts with that of Conrad, Johnson, and Wahal (2001), who examine the average commission premium paid to soft dollar brokers as opposed to those who also provide other forms of 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 reflects efficient 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 premium commission rates and increased turnover.

IV. Results

A. Commission Rates and Turnover

Many factors other than soft dollar brokerage affect commission rates and turnover, including portfolio size, the number of accounts, and management style. Table III shows how these factors affect average commissions, turnover, and PCMD. The dependent variable in the first regression is the average premium commission rate in cents per share. Holding other factors constant, we find a negative relation between portfolio assets and premium commission rates, no doubt because significant economies of scale exist in trading securities.[10] 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 administrative costs for the broker booking the trades.[11]

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 about one cent per share less in commissions than actively managed portfolios (i.e., the coefficient times the number of index classification steps, 0.30 x 3). The coefficient is not statistically significant for a single increment change (e.g., zero to one) in the index fund classification variable, but it is statistically significant for changes of two and three increments. The one-cent difference is also economically significant relative to the 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.[12] 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, to involve virtually no privately informed trades, and to require little or no quality-assuring brokerage premium.

An increase in the administrative costs of trading should also decrease the rate of portfolio turnover, as shown in the second regression in Table III. The relation between the number of accounts and turnover is negative, as predicted, and index funds exhibit significantly less turnover. In all, the independent variables explain 16% and 12% 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 harbor protection. Section 28(e) permits investment managers to pay for brokerage in exchange for investment research as long as the premium commission is commensurate with the value of the research and other services received. By Securities and Exchange Commission rule, 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 NASDAQ trades, receive no safe harbor protection. If this lack of protection is correlated with strategy classes, then the correlation between strategy classes and commission rates or turnover may be driven by variation in safe harbor protection. Alternatively, variation in safe harbor protection may be unrelated commission rates or turnover. For example, commission rates reported by managers are based on data from agency trades, which are always afforded the protection and are independent of the extent to which trading is done on either an agency or principal basis. In this case, the relation between strategy classes and commission rates is independent of variations in safe harbor protection.

The third regression of Table III shows how PCMD are related to portfolio characteristics. Investors can monitor managers in a number of ways, and when ownership concentration is high they have a greater incentive to do so. In addition, Horan (1998) presents evidence consistent with the notion that managers having pension funds as clients (i.e., those managing tax exempt assets) are more heavily monitored than those without. Table III shows that larger portfolios and those composed of pension assets seem to use less soft dollar brokerage, as do portfolios in certain strategy classes (e.g., index, mutual fund timing). These results suggest that soft dollar use is less common in situations subject to alternative monitoring mechanisms and are consistent with both the UEH and IAH. According to the UEH, managers without appropriate monitoring constraints will use soft dollars to unjustly enrich themselves. According to the IAH, soft dollars are a substitute monitoring mechanism that becomes a more valuable part of the contracting relationship between investors and managers when other monitoring mechanisms are unavailable. Although we do not report the results, the effect of portfolio size and the number of accounts on PCMD were qualitatively unaffected when we excluded various strategy class variables.

B. Soft Dollars and Performance

Table IV shows the effect of soft dollars on risk-adjusted returns. The first regression is a univariate test, which shows that paying up for bundled brokerage is positively associated with risk-adjusted returns at the 99% confidence level. Since risk-adjusted returns — reported in decimal units such that 0.10 represents a 10% return — are net of commissions, soft dollar brokerage seems to provide a net benefit to investors. The coefficient on PCMD can be interpreted as follows. For a typical manager having 50% annual turnover (see Table I), increasing the average commission rate by two cents per share (i.e., increasing PCMD by one cent) increases performance by 4.3 basis points per quarter, or about 13 basis points annually.

Bringing control variables into the analysis, we account for the correlation between PCMD and the other independent variables in a two-step process to avoid problems associated with colinearity. In the first step, we regress PCMD against the other control variables, just as in the third regression in Table II. In the second step, we use the residuals from this regression as the independent variable in the regressions in Table IV, so that by definition the variation in PCMD is uncorrelated with the other control variables. The significant positive relation between soft dollars and portfolio performance persists 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 likely results from selection and reporting biases. The results also suggest that portfolios with a high proportion of pension assets have relatively low returns compared to portfolios having non-pension assets, which is consistent with evidence presented by Ambachtsheer (1994). These results are qualitatively unaffected by whether or not one accounts for the colinearity between the dependent variables.

The positive relation between PCMD and performance withstands further tests of robustness. Table V examines the relation between PCMD and performance using different samples and different estimation procedures. The data on commission rates and turnover (and hence our soft dollar proxy) pertain to the first quarter of 1997. As a result, relating current commission rates and turnover to returns from the distant past may produce spurious correlations. In a practical sense, spurious correlations are unlikely to present a problem because the brokerage data are related to strategy classes (see Table III), which remain fairly stable over time. Nonetheless, to address this potential timing mismatch between returns data and brokerage data, we estimate the relation using only the most recent five years of returns from 1992 to the first quarter of 1997. The positive relation between quarterly risk-adjusted performance remains

significant at the 95% level of confidence.

Some estimates of risk-adjusted performance are better than others because some estimated alphas are less noisy than others in a statistical sense. 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. We also estimate the relation between soft dollars and performance using a traditional Jensen's alpha as our performance metric. In both cases, soft dollar use is positively associated with greater risk-adjusted performance. Although not reported here, we also weighted observations based on portfolio size with qualitatively identical results. The results were essentially the same when using various combinations of sample construction and estimation procedures. The positive relation between soft dollar brokerage and risk-adjusted returns is consistent with the IAH, but not the UEH.

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 results from the manager's ability to establish trust with his brokers. Paying up by itself is a necessary but not sufficient condition. To generate persistent excess returns, the know-how of using soft dollars effectively to build trust must be difficult for outsiders to discern or mimic, making it difficult for rival managers to generate superior portfolio performance simply by paying up.

Casual evidence suggests that relationships of trust are extremely important for all types of institutional brokerage. This is surely true of full-service and research brokerage, where managers often develop the relationship over a long course of dealing. We suspect one benefit provided by soft dollar brokerage is that it allows managers to strategically use brokers with whom they have little or no long-term relationship, precisely because the advance research rebates serves as a credible bond that substitutes for a longstanding relationship. Even if, as Conrad, Johnson, and Wahal (2001) suggest, soft dollar brokerage generates greater implicit costs than either full-service or research brokerage, the relevant question is what implicit costs

would result if the manager sent the same trades to his traditional brokers. To draw an analogy from the fast-food industry, McDonalds is not known for serving the best hamburgers to be found, but one can pull into a McDonalds on the interstate and be fairly certain of receiving the expected quality from a perfect stranger. In a world beset by market interlopers, a manager's ability to trade with a measure of confidence through nontraditional brokers is likely to generate substantial benefits for portfolio investors where special measures to keep the trades secret is warranted.

C. Soft Dollars and Management Fees

Another way to distinguish between the IAH and UIH is examine 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 who recently reported positive risk-adjusted returns gain the power to bargain for higher fees, although not significantly so. Note that the expected negative relation between indexing and management fees is clear.

The relation between soft dollars and management fees, however, is generally positive and statistically significant for large accounts. For example, according to the third regression in Table VI a typical manager having 50% annual turnover that pays an extra two cents per share in brokerage commissions (i.e., an extra one cent per managed dollar) is able to charge an extra 1.05 basis points in management fees. For the average manager with over a billion dollars in a given portfolio (see Table I), an extra basis point in management fees equates to an extra $100,000 in revenue. When one considers that a typical manager manages several different portfolios, the incremental revenue of several hundred thousand dollars can be economically significant. It appears that managers do not accept lower management fees in an attempt to compete for the opportunity to unjustly enrich themselves through soft dollar brokerage. Rather, investors appear to reward managers that use soft dollar brokerage with slightly higher

management fees. Or, at least, they do not appear to punish the practice. These results are consistent with the IAH but not the UEH.

These results also withstand the same tests of robustness as the relation between soft dollars and performance. Again, since the data concerning management fees pertain to the most recently reported quarter and since older returns data may be mismatched with current data on management fees, we restrict the analysis to returns reported over the most recent five years in the first regression of Table VII. The positive relation between soft dollars and management fees remains in tact, suggesting investors do not penalize managers using soft dollar brokerage. Weighting observations by the reciprocal of the alpha's standard error in regression (2) produces some interesting results. First, the explanatory power of the regression as measured by adjusted-r-squared increases dramatically to 62%. Although the positive relation between soft dollar brokerage and management fees weakens slightly, the positive relation between performance and management fees strengthens dramatically and is significant at the 95% level of confidence, 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 also yields a positive 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.

V. 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 by assuring execution quality. The IAH recognizes that in the absence of effective monitoring managers may have an incentive to shirk or use too few inputs in the investment process. By subsidizing research and allowing it to be bundled with brokerage, soft dollars encourage managers to use their own labor effort, market research, and brokerage executions more efficiently than if they were required to pay directly for these inputs. The incentive alignment hypothesis also 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 the consequences for leakage and price impact are

prohibitive. To the extent that managers receive soft dollar research rebates in advance of trading, soft dollars effectively bond the quality of the brokers' executions.

The inability to directly measure soft dollars, or even to clearly define them conceptually, is a stumbling block to assessing the effect of soft dollar's unique attributes on investor welfare. Nonetheless, by carefully controlling for various factors affecting commission payments, we believe our proxy for soft dollars, PCMD, picks up enough variation in actual soft dollar use to be informative. On this basis, we present evidence that is inconsistent with unjust enrichment and consistent with the incentive alignment. Soft dollars should be 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. Most importantly, soft dollars appear to benefit investors as they are positively related to risk-adjusted returns. Because they are positively related 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.

Regulators and professional associations continue to review the use and disclosure of soft dollars with the expectation of proposing new legislation. The results of this research may help guide this process. Future research could increase our understanding of the welfare effects of soft dollars by using data that directly measures their use. 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 might also provide additional insight. 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 their welfare effects.

Our analysis has more general implications for the study of the principal-agent problem. A tremendous amount of theoretical work focuses on how principals use the choice of economic organization to properly align agents' incentives. To the best of our knowledge, however, very few scholars have examined how implicit payments to agents from the third parties with whom they transact on their principals' behalf might ameliorate the principal-agent problem (but see Coase (1979)). Seen in this light, soft dollars are one member of a broad category of third-party payments to agents such as radio "payola," prescription drug rebates, physician referral fees,

mortgage broker rebates, preferential IPO allocations, underwriters' provision of personal investment opportunities to fund managers, and even frequent-flyer points that have been widely condemned by legislators, regulators, and media pundits with very little in the way of careful analysis. Our analysis of soft dollar brokerage suggests that further work on the principal-agent problem that explicitly accounts for the effects of third-party payments on agent's incentives would be invaluable both in furthering the body of agency theory and in fostering salutary regulation of financial and other markets.

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Table I

Descriptive Statistics for Domestic Equity Money Managers

Descriptive statistics for a sample of 1,038 domestic equity money manager portfolios as of first quarter 1997 compiled by Mobius Group, Inc. Portfolios must report at least 12 quarters of returns, strategy class profiles, commission rates, and turnover 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. Distributions are considered to be normal when the Shapiro-Wilk statistic using the method of Shapiro and Wilk (1965) 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.

			Percentiles					*Std.*	*Shapiro-Wilk stat.*
	N	*Mean*	*Min*	*25%*	*Median*	*75%*	*Max*	*Dev.*	*(Pr < W)*
Panel A: Portfolio Assets (in millions)									
Tax-exempt	1038	997.4	0	36	202	714	41,676	3,071	0.31 (.00)
Taxable	1038	296.2	0	0	25	173	32,056	1,279	0.20 (.00)
Total	1038	1,293.2	0.2	77	300	1,094	43,501	3,555	0.34 (.00)
Ln (Total)	1038	5.60	-1.5	4.3	5.7	7.0	10.7	2.0	0.99 (.00)
Panel B: Number of Accounts Managed									
Tax-exempt	1038	37.5	0	2	10	28	4,764	175	0.14 (.00)
Taxable	1038	41.1	0	0	3	17	7,786	274	0.10 (.00)
Total	1038	78.6	1	4	15	51	12,550	446	0.11 (.00)
Ln (Total)	1038	2.72	0	1.4	2.7	4.0	9.44	1.71	0.97 (.00)
Panel C: Trading Characteristics									
Commissions	1038	7.2	0	5	6	7	75	5.8	0.52 (.00)
Turnover (%)	1038	65.7	0	33	51	85	1074	56.6	0.66 (.00)

Table II

Performance and Risk Measures

Coefficients from OLS regressions of equity and cash quarterly portfolio excess returns on benchmarks calculated using the Fama and French (1993) methodology for 1,038 portfolios.

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

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 and returns must be gross of fees. 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.

Panel A. Intercepts (α)

Model	*N*	*Qtrly. Mean α*	*Std.Dev.*	*No. Pos. (%)*	*No. Neg.*	*Significant and Pos.(%)*	*Significant and Neg.(%)*
FF Three-Factor							
1979 – 1997Q1	1038	0.806	1.01	913 (88.0)	125	235 (22.6)	3 (0.00)
1992 – 1997Q1	1038	0.429	0.93	740 (71.3)	198	62 (6.0)	4 (0.00)
Jensen Single-Factor							
1979 – 1997Q1	1038	0.534	0.82	853 (82.2)	185	167 (16.1)	3 (0.00)

Panel B: Pearson Correlation Coefficients

	Strategy Class				
	s	*h*	*Small Capitalization*	*Value*	*Growth*
s	1.00				
(*p*-value)	-				
h	-0.17	1.00			
(*p*-value)	(0.000)	-			
Small Capitalization	0.66	-0.17	1.00		
(*p*-value)	(0.000)	(0.000)	-		
Value	-0.17	0.52	-0.07	1.00	
(*p*-value)	(0.000)	(0.000)	(0.028)	-	
Growth	0.20	-0.52	0.18	-0.41	1.00
(*p*-value)	(0.000)	(0.000)	(0.000)	(0.000)	-

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 the 1997 first quarter Mobius database. Average Premium Commission Rate 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 Premium Commission Rate 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.

	Dependent Variable					
	(1) *Average Premium Commission Rate*		*(2)* *Annual Turnover*		*(3)* *Premium Commissions per Managed Dollar*	
	Parameter Estimate	*p-value*	*Parameter Estimate*	*p-value*	*Parameter Estimate*	*p-value*
Intercept	9.11	0.000***	104.16	0.000***	637.18	0.000***
Ln (Assets)	-0.90	0.000***	-0.81	0.432	-35.35	0.000***
Ln (Accounts)	0.84	0.000***	-4.65	0.001***	7.00	0.429
% Tax-exempt assets	-1.87	0.000***	-5.02	0.341	-178.73	0.000***
Annual Turnover	-0.01	0.003***				
Average Soft Dollar Commission			-0.92	0.003***		
Strategy Classes						
Value	0.09	0.618	-7.07	0.000***	-29.27	0.014**
Growth	0.16	0.359	2.53	0.144	20.51	0.127
Small Capitalization	-0.05	0.728	1.38	0.383	-4.19	0.733
Broad Market	0.25	0.124	1.78	0.283	8.60	0.504
Market Timer	-0.17	0.615	2.85	0.390	29.07	0.260
Sector Rotator	0.01	0.956	2.81	0.236	3.69	0.841
Index	-0.30	0.242	-14.71	0.000***	-49.44	0.013**
Contrarian	-0.05	0.803	-3.15	0.140	-3.02	0.855
Theme Selection	0.41	0.035**	-1.41	0.472	29.03	0.056
Defensive	-0.00	0.999	-2.02	0.376	-12.95	0.467
Core	-0.09	0.567	-3.14	0.048**	-21.21	0.085*
Mutual Fund Timing	-2.59	0.000***	31.94	0.000***	-176.28	0.002***
N	1038		1038		1038	
F-value	13.28	0.000***	10.01	0.000***	7.65	0.000***
Adj. R squared	0.16		0.12		0.09	

*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.

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

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 1997 first quarter 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. Percent tax-exempt assets is the proportion of the portfolio composed of pension assets. To avoid colinearity, the Premium Commissions per Managed Dollar Residual term is the OLS residual from having Premium Commissions per Managed Dollar as the dependent 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.

	Estimated alpha from Fama and French (1993) OLS regressions		
Intercept	0.675***	0.928	.905***
Premium Commissions per Managed Dollar	0.043***		
Premium Commissions per Managed Dollar Residual		0.036***	0.023***
Ln (Assets)		0.010	0.002
Ln (Accounts)		0.019	0.037**
% Tax-exempt assets		-0.256***	-0.200**
Value			-0.104***
Growth			0.119***
Small Capitalization			0.186***
Broad Market			-0.035
Market Timer			-0.011
Sector Rotator			-0.056
Index		-0.247***	-0.198***
Contrarian			-0.075**
Theme Selection			0.048
Defensive			-0.054
Core			-0.095***
Mutual Fund Timing			-0.382***
N	1038	1038	1038
F-value	35.62***	15.33***	21.93***
Adj. R-squared	.03	.06	.24

*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.

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

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. Percent 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 Premium Commissions per Managed Dollar as the dependent variable and all other factors as independent variables. Regression (1) uses alphas estimated from returns in 1992 through the first quarter of 1997. Regression (2) is a weighted OLS regression weighted by the reciprocal of the standard error of the estimated Fama-French alpha. The dependent variable in regression (3) is a Jensen's single-factor alpha using the Fama-French market proxy.

	Dependent Variable: Estimated Alpha from Performance Regressions		
	(1)	*(2)*	*(3)*
	1992-1997 Returns	*Weighted OLS by the SE reciprocal*	*Jensen's Alpha*
Intercept	0.736***	0.558***	0.589***
Premium Commissions per Managed Dollar Residual	0.015**	0.020***	0.010*
Ln (Assets)	0.007	0.011	-0.013***
Ln (Accounts)	-0.004	0.024*	0.052***
% Tax-exempt assets	-0.366***	-0.093	-0.166**
Value	-0.007	-0.079***	0.082***
Growth	0.024	0.105***	-0.040
Small Capitalization	0.068**	0.131***	-0.019
Broad Market	-0.042	-0.021*	-0.013
Market Timer	-0.034	-0.007	-0.032
Sector Rotator	-0.036	-0.054	0.016
Index	-0.102**	-0.136***	-0.067*
Contrarian	-0.007	-0.026	0.005
Theme Selection	0.027	0.059*	-0.000
Defensive	-0.101***	-0.069***	0.031
Core	-0.025	-0.055***	-0.036
Mutual Fund Timing	-0.301**	-0.231**	-0.210*
N	1038	1038	1038
F-value	5.11***	25.65***	4.84***
Adj. R-squared	.06	.28	.06

*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 from the 1997 first quarter 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. Percenttax-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) *Fee1MM*	*(2)* *Fee10MM*	*(3)* *Fee50MM*	*(4)* *Fee100MM*
Intercept	137.01***	72.39***	69.86***	66.57***
Alpha	8.66	1.78	2.89	2.85
Premium Commissions per Managed Dollar Residual	-1.52	0.85	0.87**	1.05***
Ln (Assets)	21.33***	1.02	-0.00	0.19
Ln (Accounts)	-19.13***	0.02	-2.71	-3.09**
% Tax-exempt assets	-84.08***	0.71	-8.88	-10.86*
Index	-42.70***	-18.97***	-14.40***	-13.63**
N	161	161	161	161
F-value	5.51***	2.87***	13.52***	13.44***
Adj. R-squared	.14	.07	.32	.32

*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. Percent 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.

	Dependent Variable: Fee100MM		
	(1)	*(2)*	*(3)*
	1992-1997 Returns	*Weighted OLS by the SE reciprocal*	*Jensen's Alpha*
Intercept	69.02	56.95***	69.89***
Alpha	-0.78	5.89***	-2.67
Premium Commissions per Managed Dollar Residual	1.18***	0.83**	1.22***
Ln (Assets)	0.09	-0.54	-0.07
Ln (Accounts)	-2.88**	-1.25	-2.59**
% Tax-exempt assets	-11.24*	-5.92	-10.81*
Index	-14.07***	-12.62***	-14.20***
N	161	161	161
F-value	12.89***	44.12***	13.18***
Adj. R-squared	.31	.62	.31

*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.

ENDNOTES

[1] Dennis Logue (1991) may have been the first academic to criticize soft dollars. The list of regulators and industry critics who condemn soft dollars is long; see, for example, Peter Rawlins (1992) and Paula Dwyer, "Wall Street's Soft Dollars: Only a Ban Will Do," *Business Week*, October 12, 1998, p. 58.

[2] Even worse, managers might allocate commission business to brokers based on their willingness to rebate the manager cash or an in-kind equivalent such as airline tickets to conferences in resort destinations that provide the manager with personal consumption. Section 28(e)'s safe harbor applies exclusively to research products that provide "lawful and appropriate" assistance to the manager in making investment decisions on behalf of the portfolio. The SEC has ruled that airfare to conferences is not a lawful and appropriate research expense, although the conference registration fee may be. This is not to say that a manager who uses soft dollar credits to pay for airfare has necessarily violated his fiduciary duty, only that he will not have the benefit of the safe harbor's presumption.

[3] It is important to note that managers' share of the portfolio residual is substantially larger than their periodic management fee for at least two reasons. First, they receive a recurring fee so that any permanent increase in portfolio wealth provides them with an increase in compensation equal to the present value of future fees. Second, several studies indicate that flows into funds (which increase total fees) are positively related to past performance (see, for example, Ippolito (1992) and Chevalier and Ellison (1997)). As a result, managers tend to receive future benefits from performing well. Horan and Johnsen (2000) estimate that all things considered a fund managers' share of incremental portfolio wealth is close to 17%. In any case, they are likely to underinvest in research if they are required to pay for all research costs even after considering the effects of fund flows.

[4] In fact, the manager is prohibited by his fiduciary duty of best execution from contractually committing the portfolio to use any particular broker.

[5] This result follows from Becker (1968). There are several reasons why a manager who bears less than the full portfolio residual will have an incentive to monitor brokers. First, a share of the residual provides some incentive to monitor. Second, by raising the penalty from being caught cheating, the bonding function of soft dollars reduces the manager's monitoring costs while also improving portfolio performance through reduced price impact. Third, in many cases managers use soft dollars to pay for consultants or software to monitor execution quality and costs (Johnsen (1994)). The data used by Conrad, Johnson, and Wahal (2001) come from just such an organization. Finally, execution quality affects performance, and managers have a significant interest in performance through future funds flows that are related to performance in the current period (see Chevalier and Ellison (1997) and Horan and Johnsen (2000).

[6] 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.

[7] Our analysis assumes throughout that securities research is, at least from time to time, privately valuable on average. In any event, any suggestion that this assumption is invalid serves as a blanket condemnation of all forms of bundled brokerage, including that provided by research and full-service brokers.

[8] 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 such as public pension funds currently have both the wherewithal and the incentive to insist on cash pass-through of commission rebates if the net effect of soft dollar research rebates on portfolio wealth is negative. It is equally clear that many such clients decline to do so.

[9] One possible source of systematic bias would arise if managers who had performed well over the recent past decided to "cash in" on their superior performance by using soft dollars to pay for research they otherwise would have paid for directly. Our results cast doubt on this possibility because it would suggest that managers engaging in such activity would bid down their management fees, whereas Section IV, C clearly shows that this does not happen.

[10] 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.

[11] If the manager is trading a specific security for only one large account, the broker need book only one trade. If he is trading for a large number of accounts, the administrative work increases dramatically.

[12] We are assuming that the opportunities index fund managers have for unjust enrichment are virtually nil due to the ability of investors to assess performance.