Why Do Mutual Fund Advisory Contracts Change?
Performance, Growth, and Spillover Effects

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ABSTRACT

We examine changes in equity mutual funds' investment advisory contracts. There are substantial advisory compensation rate changes in both directions, with typical percentage rate shifts exceeding one-fourth. We find that rate increases are associated with superior past market-adjusted performance, whereas rate decreases reflect economies of scale associated with growth, and are not associated with extreme poor performance. There are within-family spillover effects. For example, superior (e.g., star) performance for individual funds is associated with rate increases for a family's other funds. We also document fee rate reductions post-2004 by family funds involved in market-timing scandals, but find no evidence of a spillover to the broader industry.

This paper examines changes in equity mutual funds' investment advisory contracts. Advisory contracts generally pay the advisor a fee which is a percentage of the fund's total net assets. Fees are substantial. The median annual fee is roughly 80 basis points in our sample, representing about half of total expenses. The paper is the first to document changes in the advisory rate specified in the contract, and to test hypotheses about changes in marginal compensation rates. Our analysis yields insights into price setting in the mutual fund industry, as well as the contract evaluation and renewal process used by fund boards. This evaluation process has come under scrutiny by the Securities and Exchange Commission, which in 2004 proposed new rules for the annual contract renewal process.

Our study fills an important gap. There is a large literature on the contracts between owners and managers of financial assets, but the advisory contracts of mutual funds have received only limited attention. Previous work on fund advisory contracts (e.g., Coles, Suay, and Woodbury (2000), Deli (2002)) examines how cross-sectional variation in advisory rates is determined by fund characteristics. While this allows hypothesis tests of how the optimal percentage advisory fee is determined, it leaves an important question unanswered: if the advisory rate reflects optimal compensation, why would it change?

The paper's contribution is in four areas. First, we use time-series data to investigate contract dynamics (see Heinkel and Stoughton (1994), and Kuhnen (2004) for related discussions), and to provide sharper tests of advisor compensation hypotheses. This approach is likely to be informative because fund characteristics important in setting the contractual advisory rate can change substantially. Specifically, both measured performance and size exhibit variation. Measured performance matters because mutual fund investors are "return chasers" (e.g., Sirri and Tufano (1998)), and return chasing reflects variation in perceptions of advisor marginal product. Return chasing generates flow, and affects fund size. Both advisor marginal product and size are key drivers of marginal compensation rates in prior cross-sectional analyses, and it is intuitive to study the effect of shocks to these variables.

Second, we focus on past performance as a measure of marginal product and a driver of rates and rate changes. In measuring advisor marginal product, previous cross-sectional work on fund advisory contracts uses asset characteristics, such as the type of security (e.g., foreign vs. domestic, equity vs. debt), but does not typically look at performance (see Coles, Suay, and Woodbury (2000), Table 3, Deli (2002), Table 4). Early work by Golec (1992, Table 2) for a limited sample of 343 funds finds no evidence of cross-sectional variation in advisory fees as a function of performance, and for a larger sample Tufano and Sevick (1997, Table 6) find no relation between total fees and performance.

Third, the paper investigates how rate changes result from the interaction of performance and size with a fund's board and family structure. The importance of board structure in fund decision making is emphasized in many papers (Tufano and Sevick (1997), Khorana, Tufano and Wedge (2007)). Other work recognizes that there are spillover effects between funds in a given family (e.g., Nanda, Wang and Zheng (2004)), and that fund decision making likely occurs at the family level (e.g., see Khorana and Servaes (1999) and (2005), Massa (2003), Gaspar, Massa, and Matos (2006), and Gallaher, Kaniel, and Starks (2006)). Funds in a family have the same management company and directors serve on multiple boards of a given family. Contract changes for funds in a given family are clustered in time, but we do not expect that this clustering simply reflects arbitrary decisions by common boards. Rather, we study the relative importance of family versus fund characteristics (e.g., performance, growth) and of spillover effects in these variables on rate changes.

Fourth, our study is connected to a broader academic literature on contracts. In the executive compensation literature, empirical analysis has focused on cross-sectional variation in contractual marginal compensation rates (e.g., Murphy (1999)), but little is known about time-series dynamics. Our analysis suggests that there can be advantages to simple and parsimonious contracts that are revised over time to reflect learning when manager marginal product follows a stochastic process. Further, a response of marginal compensation rates to past performance can be thought of as a form of "ex-post settling up" or performance fee. These various ideas concerning optimal contracting are discussed by Fama (1980) in the general context of the theory of the firm, but the relevance of ex-post settling up to fiduciary investments has also received attention (e.g., Starks (1987)).

Our hypotheses about changes in advisory fees are straightforward. Given economies of scale, asset growth at either the fund or family level should be reflected in rate reductions. The other side of the coin, however, is that asset growth can also reflect good advisor ability, and thus have the opposite effect on fees. Since these hypotheses are not mutually exclusive, our tests are designed to disentangle these two offsetting effects. Our main conclusion is that growth and performance are each empirically relevant in rate change determination, with family level variables at least as important as fund level variables. Collectively, the results are new evidence on how growth-related economies of scale benefit fund shareholders, and how good performance benefits fund sponsors.

Over the 1994 through 2006 sample period, the semi-annual contract change frequency is approximately 5%. Contract changes seem economically large. They often shift the percentage fee up or down by more than a fourth. Our tests show that rate increase likelihood is positively related to abnormal performance. The effect from market-adjusted performance is asymmetric, however. Extreme good performance leads to rate increases, while extreme poor performance does not affect the likelihood of rate decreases. Rather, rate decreases reflect economies of scale associated with growth. The general tenor of our results is not specific to any particular subperiod, and does not seem to be affected by the extensive mutual fund litigation during the later part of our sample period.

We also find that economies of scale from family-level asset growth are reflected in lower advisory rates for individual funds, and that superior (e.g., star) performance for individual funds has spillover effects and is associated with rate increases for a family's other funds. A high degree of board director independence is associated with smaller rate increases and higher rate decreases, consistent with Tufano and Sevick (1997). The paper's findings are not highly sensitive to alternative variable definitions or econometric procedures.

Section I provides background and outlines the paper's testable propositions. Section II discusses the data and Section III presents our methodology. Sections IV and V discuss the results. We conclude in Section VI.

I. Background and testable implications

A. The setting

Mutual funds are regulated by the Investment Company Act of 1940. A mutual fund relies on an "investment adviser" or "management company" to select and manage the fund's portfolio. The adviser is also responsible for fund and portfolio accounting, oversight of the fund's transfer agent and custodian, and regulatory compliance. In practice, the management company is almost always the sponsor who initially established the fund (see Tufano and Sevick, (1997)).

The responsibility for entering into or renewing the advisory contract rests with the fund's board of directors. Section 15 (c) of the Investment Company Act requires an annual meeting of the directors to evaluate the existing contract and to approve a new contract or renew the old contract. Under a 2004 SEC rule, at least 75% of the fund's directors must be independent, and a majority of the independent directors must approve the contract.[1] As part of the 15 (c) renewal process, directors evaluate the existing contract and the performance of the investment advisor. Third party providers, such as Lipper, often provide 15 (c) contract renewal services. These services include a variety of benchmarking analyses of the fund's expenses, advisory fees, and investment performance (see Lipper (2005) for a description).

In 2004, the 15 (c) process came under regulatory scrutiny. The SEC proposed to require that funds retain copies of the written materials that directors consider in approving the advisory contract (see SEC Release IC-26323). The 2004 Mutual Fund Directors Forum Best Practice Guidance was developed after a request from the SEC, and contains detailed procedural guidelines. Further, disclosure of the board's decision-making process has resulted for some funds (e.g., Putnam, PBHG).[2]

There remain, however, few legal restrictions on the general structure of the advisory fee contract (see Coles, Suay, and Woodbury (2000)). Fees can be a percentage of total net assets (the usual contract). The percentage can be fixed, or it can vary with the level of assets. The fee can also be a function of the difference between fund returns and some benchmark, so long as gains and losses are treated symmetrically. The board has wide latitude in setting the fee level,

[1] The 75% figure was increased from 50% in 2004 and from 40% in 2001. Under an SEC rule adopted in 2004, the board chairman must be independent. An Appeals court invalidated the 2004 rules in 2006. As of 2008, however, 88% of fund complexes follow the 75% rule and 63% of complexes report independent chairs (see the ICI publication "Fund Governance Practices 1994-2008").

[2] See "In New Disclosures, Boards Reveal Actions on Performance, Fees", *Wall Street Journal*, July 8, 2005.

with courts effectively applying a business judgment rule in excessive fee cases (see American Bar Association Fund Directors' Guidebook (2003)).

B. Percentage of net asset contracts

In over 90% of equity mutual fund advisory contracts, the fee is specified as a percentage of total net assets.[3] The percentage fee is either fixed (the majority of contracts), or fixed up to a given level ("breakpoint"), with net assets above that level receiving lower marginal rates (see Golec (1992) and Deli (2002)). Multiple breakpoints and marginal rates are sometimes included in the contract. For example, the advisory fee in the 1999 contract for Williamsburg Investment Trust Contrarian Equity Fund is 0.75% of the first $250 million of assets, 0.65% of the next $250 million, and 0.50% of assets over $500 million. Our study of contract changes includes those with breakpoints (i.e., piece-wise linear), but as discussed later we exclude cases where a contract with breakpoints remains the same but assets grow and the applicable marginal rate thus mechanically changes.[4] A small minority of advisory contracts add an explicit benchmark-based performance fee, but we do not examine these (see Elton, Gruber, and Blake (2003)).

The literature on investment management contracts has typically not examined percentage of net asset-based contracts. Instead, it has focused on explicit benchmark-based fee structures (e.g., Grinblatt and Titman (1989)). Nevertheless, the literature provides some guidance on why explicit benchmarks would typically not be observed in advisory contracts.

First, typical fund contracts already provide implicit performance adjustments (see Admati and Pfleiderer (1997)). Fees depend on total net assets, which, in turn, depend on both returns and flow. Further, flow depends positively on recent returns, with "return chasing"

[3] Typically, the fee is specified as an annual percent. It sometimes is payable monthly based on average daily total net assets.
[4] We also include switches between linear and piece-wise linear contracts. For discussion of a fund's choice between these contracts, see Deli (2002), Warner and Wu (2006), Massa and Patgiri (2009), and especially Cashman (2005).

representing a strong and well-documented empirical regularity (e.g. Ippolito (1992), Sirri and Tufano (1998)). Second, explicit benchmark-adjusted contracts can create adverse risk-sharing incentives (e.g., Grinblatt and Titman (1989), Admati and Pfleiderer (1997)). Third, funds do not generally switch advisors. Thus, the benefit of explicit performance incentives is lower with multiple rounds of contracting (Heinkel and Stoughton (1994)). As shown below, funds with superior market-adjusted performance are able to raise fees, highlighting the role of implicit incentives in a multi-period setting.

C. Hypotheses and testable propositions

We study how advisory contracts and advisory fee rates change over time. We investigate four factors: economies of scale, advisor ability, family and board structure, and industry competition. This extends prior work on cross-sectional differences in advisory fee rates (see Deli (2002) and a related analysis of closed-end funds by Coles, Suay, and Woodbury, (2000)) and expenses (e.g., Tufano and Sevick (1997)).

Economies of scale. Large funds and members of large fund families have lower advisory fees (e.g., Deli (2002)). While cross-sectional analyses of advisory fees thus suggest that economies of scale are passed on to investors, our time-series framework permits broader tests by focusing on shocks to size. For a given fund over time, marginal cost should change when net asset changes are large. Given competition, rates should decrease when funds grow, and vice versa.

Advisor ability. Fees should reflect differences in advisor ability to earn abnormal returns (e.g., Golec (1992), Tufano and Sevick (1997), Deli (2002)). There is uncertainty regarding the advisor's ability, and learning can take place. Thus, fees should change in response to recent performance, increasing with good performance and vice versa. We use a variety of performance measures. Even if these measures reflect luck rather than skill, our predictions hold so long as fund flows respond to the measures.

Family and board structure. The mutual fund literature examines within-family interrelations between funds. In particular, papers on fund family structure (e.g., Khorana and Servaes (2005) and Massa (2003)) emphasize that decision making on pricing and product differentiation occurs at the family level, so as to maximize total sponsor profits (see also, for example, Khorana and Servaes (1999), Gaspar, Massa, and Matos (2006), and Gallaher, Kaniel, and Starks (2006)). Our tests incorporate the intuition that contract changes are pricing decisions that reflect the characteristics both of the individual fund and the family. For example, economies of scale, either at the fund or family level should be reflected in advisor fees, so long as funds in a family share joint costs.[5] Similarly, if a fund has superior performance (e.g., "star funds"), this can have positive spillover effects on other fund in the same family (Nanda, Wang, Zheng (2004)). We examine the effect of both fund and family performance on advisory fee rates.

Previous work suggests that a fund's board structure is important for pricing decisions. For example, Tufano and Sevick (1997) find that funds with a higher fraction of independent directors have lower fees and that funds whose independent directors are paid higher fees have higher shareholder expenses. Examples of other work on the relation between board independence and mutual fund behavior and governance include Khorana, Tufano, and Wedge (2007), and Ding and Wermers (2005). We examine how independent directors percentage and compensation affect decisions to change advisory rates. Finding that a high fraction of independent directors makes fee increases less likely or decreases more likely is consistent with

[5] Consistent with family-level economies of scale, Putnam Investments recently instituted fund family total net assets breakpoints in the advisory fee contract (Morningstar, July 28, 2009).

higher board effectiveness. Like Tufano and Sevick, however, we caution that our results do not imply a causal relation because it is difficult to control for the endogeneity of board structure.

Competition. Our general perspective is that the mutual fund industry is competitive. As noted by Massa (2003, p. 250), there are more mutual funds than stocks. Mutual funds are differentiated products, however, and funds target specific clienteles. In addition, investors face search and switching costs (e.g., Sirri and Tufano (1998)). Thus, while we do not expect funds to have significant market power, the exact advisory contract response to changes in costs and differences in advisor ability is largely an empirical question. For example, better known funds (e.g., high fund market share) and those of better known families should be better able to capture cost decreases.

D. Methodology

To determine the relative empirical relevance of the above hypotheses, we first examine the determinants of the likelihood of a rate change. Our sample selection procedure examines both funds with contract changes and those without. Second, we then focus on contract changes, and specifically the determinants of the magnitude of a rate change. We examine rate increases and rate decreases separately because they can be driven by different factors. For example, we show that rate increases are more likely following extreme good performance, but rate decreases do not tend to follow extreme poor performance. This is consistent with Sirri and Tufano (1998), who show a convex relationship between flow and past performance. Third, as in cross-sectional advisory fee studies, we try to control for other influences on rate changes which are not central to our analysis, such as a change in the number of services provided by the investment advisor and a change in portfolio turnover. Finally, the appropriate empirical proxies for some of our variables are not obvious. For example, the correct variable for fund performance and the appropriate lagged time interval over which to measure it are difficult to know in advance. To address this issue, we include an extensive set of robustness checks, but these checks only strengthen the paper's conclusions.

Our predictions are typically directional in nature. For example, we expect good performance to increase advisory rates. Theory is insufficiently developed to predict either contract change frequency or the exact advisory fee response. Similarly, we expect fund growth itself to generate scale economies, but the level of scale economy sufficient to generate a contract change is unclear. That our predictions are only directional raises an interesting issue of interpretation. Whether the observed semi-annual contract change frequency of 5% is "high" or "low" is unclear because there is no theoretical benchmark. Nevertheless, the finding is informative because it reinforces the view that observed contracts already provide implicit performance adjustments (see Admati and Pfleiderer (1997)) so as to make frequent adjustments unnecessary. Further, we document that when changes in contractual rates do occur, they seem large, so our tests for which factors drive the changes should be highly informative.

II. Data

A. Sample selection procedure

We collect mutual fund investment advisory contract information from the SEC EDGAR database from 1994 to 2001. Later (see Section V), we study the 2002-2006 period. The later period is of special interest because it is characterized by extensive litigation concerning both market-timing scandals and excessive fees, and it provides an important check.

Mutual funds provide details of advisory contracts in semi-annual reports filed on form N-SAR. There are 158,385 filings during the 1994-2001 period. Table I details our sample selection procedure. We keep only filings for open-end mutual funds with sufficient contract information. This includes the rate if the contract is linear and all marginal rates and break points if it is piece-wise linear.[6] For sample inclusion, the advisory fee must be based only on the fund's total net assets (TNA).[7] There are 112,614 filings meeting these criteria.

Performance-related variables, such as previous returns and flows, are key for our analysis. To obtain these, the EDGAR data must be matched with information from the CRSP Mutual Fund Database.[8] Since EDGAR does not provide a unique fund identifier, the combination with CRSP is conducted through a manual match of fund names. Many observations are lost in the matching process due to the necessity of obtaining precise name matches.[9] The combined dataset has 42,072 fund filings. Although a potential concern is sample selection bias, the sample summary statistics we report later are similar to those in Deli (2002) along several key dimensions, e.g. fund size, marginal rates, and the fraction of linear contracts. The fraction of family funds among our sample funds is also similar to that reported in Nanda, Wang, and Zheng (2004). The requirement that there be a valid contract within the previous one year period of the current contract further reduces our sample to 36,363 fund filings. Finally, we exclude bond funds, which represent about half of all contracts.

[Insert Table I here]

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[6] All piece-wise linear contracts in our sample are concave. Out of the 158,385 filings, there are 390 where the marginal rates in the EDGAR filing indicate convexity. These observations are excluded because an examination of them indicates that many reflect EDGAR data errors.

[7] We exclude contracts with an explicit performance-based component. They account for only a small fraction of the advisory contracts (see also Golec (1992) and Deli (2002)), and the relation between contract changes and fund characteristics is likely different for contracts with an explicit performance component (see Elton, Gruber, and Blake (2003)). Index funds are also excluded because they are passive and cross-sectional variation in benchmark-adjusted performance is likely to be small.

[8] CRSP reports data for each class (e.g., series A, series B, etc.) within a fund. We combine the information from different classes for the same fund. TNA is the sum of TNA from different classes. Fund monthly return is the weighted average return from different classes with weights based on beginning of the month TNA. Fund annual expense is the weighted average expense from different classes with weights based on beginning of the year TNA.

[9] Because of the often subtle differences in fund names, this name matching procedure was conducted manually. We insist on precise matches in fund names and refrain from making guesses that two different but 'very similar' names *might* belong to the same fund.

B. Summary statistics

Our final sample consists of 14,578 fund-filings for 2,063 funds. The number of fund families is 392. From Table I, 4.2% (611) of the contracts experience a change.[10] This figure represents a semi-annual contract change frequency, since most funds have two filings per year. The number of sample funds that experience at least one contract change is 442 (21%). Thirty-three percent (131) of our sample fund families experience at least one contract change. Panel A of Table II reports summary statistics on the time-series of contracts and contract changes. The number of sample funds increases from 349 in 1994 to 1,537 in 2001. While the number of contract changes also increases over time, the frequency of contract changes between successive filings does not show a clear time trend. Throughout the 1994-2001 period, slightly more than 70% of the contracts are linear. Marginal rates in the contracts remain at about 80 basis points, on average. Median fund size remains roughly constant, although average size increases.

[Insert Table II here]

Table II Panel B compares funds without contract changes to those with changes. Variable definitions are in the Appendix. To identify the timing of a contract change and align it with fund characteristics (such as prior performance and market share) potentially causing the change, we first compare each contract with the last contract filed within the previous one year period. Figure 1 provides a related timeline.[11]

[Insert Figure 1 here]

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[10] For a linear contract, a contract change is any change in the rate (N-SAR item 48). For piece-wise linear contracts, a contract change is any change in the set of rates or break points (N-SAR item 48, A through K).

[11] The N-SAR filings are generally 6 months apart. The decision to change the contract was likely made sometime between the two filings. However, due to uncertainty regarding the exact timing of the contract change decision, we lag our performance measurement interval. We measure performance-related variables, such as TNA growth, return, flow, and alpha over the one year period preceding the old contract period end. We measure fund size and market share at the beginning of the performance interval.

From Panel B, funds with contract changes have lower marginal rates before the contract change (for example, 76 versus 84 basis points at the mean). In addition, the contract change sample has lower advisory fees (fees divided by total net assets) and lower total expenses. Further, funds with contract changes are significantly larger than funds without contract changes, both at the mean (TNA of $ 1,292.88 million versus $ 544.37 million) and at the median ($152.65 million versus $85.89 million). Since larger funds tend to have lower marginal rates (Deli, 2002) and lower total expenses (e.g. Tufano and Sevick (1997)), the lower marginal rates and total expenses are consistent with the size difference between the two sub-samples.

Funds with contract changes have significantly larger dollar asset growth, higher one-factor alphas (at the mean) and four-factor alphas and larger market shares than funds without contract changes. The contract change sample tends to be from larger fund families and families that have experienced more dollar asset growth. In addition, funds with contract changes belong to families that have significantly more star funds, with higher one-factor and four-factor alphas and with larger market shares than funds without contact changes. These simple univariate statistics are consistent with the paper's main hypotheses, which link a contract change to past fund and family growth and performance.

Panel C partitions the sample by the sign of the marginal rate change. The marginal rate is the single rate for a linear contract and the applicable rate based on the average monthly total net assets for a concave contract. To determine the marginal rate change for a concave contract, we apply the *current* period total net assets to *both the previous and the current contracts*. Therefore, a marginal rate change is due to a contract change and not the mechanical effect of asset growth.

Contract changes are associated with large rate changes. For the 212 cases (35% out of the 611 contract changes) where rates increased, the mean and median increases were 28 and 25 basis points, respectively. The median marginal rate increase is 33%. For the 248 cases (40% out of the 611 contract changes) where the applicable marginal rate decreased, the absolute and percentage changes are somewhat smaller. The mean and median rate decreases are 21 and 20 basis points, respectively. The median marginal rate decrease is 20%.[12] Further, there is a large spread in rate changes within the rate increase and decrease groups. In 151 cases (23% of the 611 contract changes), the applicable marginal rate does not change. This can occur when, for example, there is a switch from a linear to a concave contract but the applicable marginal rate does not change. Excluding these 151 contract changes, the contract changes that involve a marginal rate change account for 3.2% of the semi-annual fund-filings, somewhat lower than the 4.2% shown in Table I.

Panel D presents summary statistics on boards of mutual funds with advisory contract changes.[13] We manually collect mutual fund board information from the 485APOS/485BPOS filings. The average board has 6.3 members (the median board size is 7) and about 70% of them are independent. The median number of boards served by independent directors is 4. The average director compensation from the fund trust is $11,822 ($16,249 for independents) and the average director compensation from all the funds in the family is $39,592 ($50,447 for independents). These statistics are generally comparable to those reported in Tufano and Sevick (1997).

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[12] Funds that decrease marginal rates still have increases in dollar advisory fees after the contract change. Annualized advisory fees after the contract change are on average $1.4 million higher than before the change. However, they are $845,000 lower than what the fees would have been without decreases in rates. Funds that increase marginal rates increase dollar advisory fees by $755,000. Without the contract changes, dollar advisory fees would have slightly decreased for these funds.

[13] Due to data collection costs, board information is collected only for these funds.

Table III provides additional descriptive statistics on the overall contract change likelihood (regardless of the direction and size of the marginal rate change) and its relation to fund dollar performance (i.e., dollar growth, return, and flow). We first classify sample funds into terciles based on fund size. Within each size tercile, we then sort funds into quintiles based on dollar performance. Table III shows that large funds are more likely to change contracts. The contract change frequency is 5.50% for funds in the top size tercile, compared to 3.14% for bottom size tercile funds. Large funds have higher unconditional contract change likelihood partially because they are more sensitive to good past dollar performance. There is only weak evidence that contract change likelihood varies with performance for medium-sized funds and small funds.

[Insert Table III here]

III. Hypothesis tests

To test the predictions in Section I, we estimate regression models for the probability of marginal rate changes (logit) and their magnitude (OLS).

A. Logit probability model

$$
\begin{aligned}
&Prob\,[Event_t\,] = Logit\,(a_0 + a_1\,Size_{t-2} + a_2\,High\_Growth_{t-1} + a_3\,Star_{t-1} + a_4\,Fund\_Mktshr_{t-2} \\
&+ a_5\,Family\_Size_{t-2} + a_6\,High\_Family\_Growth_{t-1} + a_7\,Other\_Stars_{t-1} + a_8\,Family\_Mktshr_{t-2} \\
&+ a_9\,High\_Fee_{t-1} + a_{10}\,Ch\_Services_t + a_{11}\,Ch\_Turnover_t + a_{12}\,Ch\_\#\,SubAdvsr_t + a_{13}\,Sector\_Perf_t \\
&+ a_{14}\,Acquirer\_Dummy + a_{15}\,Target\_Dummy) \qquad (1)
\end{aligned}
$$

The dependent variable $Event_t$ is defined as either $Rate\_Increase_t$ or $Rate\_Decrease_t$. This allows us to analyze the potentially different determinants of marginal rate increases and rate decreases. We also combine all rate changes and estimate an ordered logit regression, where the dependent variable is $Rate\_Change_t$.

Our predictions tie marginal rate changes to economies of scale, advisor ability, and competition, all measured at both the fund level and the family level. We proxy for economies of scale with fund and family level dollar asset growth. If funds with higher asset growth change contracts to reflect lower costs due to economies of scale, we should observe decreases in the advisory fee rates. Since funds in the same family likely share joint costs, higher family dollar asset growth should also lead to decreases in advisory fee rates for funds in the family. We thus expect that, *ceteris paribus*, a fund is more likely to experience a rate decrease and less likely to experience a rate increase, when the fund or its family has higher dollar asset growth. Fund and family sizes, which are related to previous growth, should have the same effect. Therefore, the coefficients a_1 and a_2 on fund size and dollar growth and coefficients a_5 and a_6 on family size and family dollar growth are expected to be negative in the *Rate_Increase* and *Rate_Change* regressions and positive in the *Rate_Decrease* regression.

Fee rates in advisory contracts can increase as a reward for advisor ability if this ability makes it easier to attract or retain assets. We initially use star funds to proxy for advisor ability, where star funds are defined as top 5% performers with the highest returns among all equity funds in each year. Since the literature suggests that investors react to superior performance by other funds in the same family (Nanda, Wang, and Zheng (2004)), we expect both fund and family return performance to be important. We predict that, *ceteris paribus*, a fund is more likely to experience a rate increase and less likely to experience a rate decrease, when it or other funds in the same family have superior abnormal return performance. Thus, the coefficients a_3 on star funds and a_7 on the existence of stars among other funds in the family are expected to be positive in the *Rate_Increase* and *Rate_Change* regressions and negative in the *Rate_Decrease* regression.

Finally, the market share of a fund and its family can also affect rate changes. Since investors face search costs and switching costs (e.g. Sirri and Tufano (1998), Jain and Wu

(2000)), funds and fund families that are better known (e.g. with greater market share) likely are better able to capture cost decreases due to economies of scale and are better able to increase rates due to less competition. We therefore expect that, *ceteris paribus*, a fund is more likely to experience a rate increase and less likely to experience a rate decrease, when it or its family has larger market share. Therefore, the coefficients a_4 on fund market share and a_8 on family market share are expected to be positive in the *Rate_Increase* and *Rate_Change* regressions and negative in the *Rate_Decrease* regression.

Model (1) incorporates the effects of the lagged marginal rate with an indicator variable for above sample median marginal rates. If a fund charges low rates, it could be easier to raise them (see Khorana and Servaes (2005)). We also include the change in the number of services provided by the investment adviser, change in portfolio turnover, and change in the number of sub-advisors as well as sector performance rankings. Since these variables are likely related to higher compensation for the investment advisor, we expect their coefficients to be positive in the *Rate_Increase* and *Rate_Change* regressions and negative in the *Rate_Decrease* regression. Finally, because of the potential impact of mergers on advisory contracts, for example, through changes in the acquirer fund size or the possible replacement of existing investment advisor at the target, we include merger-related indicator variables for both the acquiring funds and the target funds.

B. OLS rate change model

In addition to the rate change *direction* tests, we also estimate an OLS regression (model (2)) on the *magnitude* of marginal rate changes. The regression is run for funds that have experienced a contract change and the dependent variable $\Delta Mrgrt_t$ is the change in marginal rates due to a contract change. The model (2) right-hand-side variables (see Table IV) include those in model (1) and have the same predicted signs as they do in the rate increase regression. We add board-related variables on the size of the board, the percentage of independent directors and the average TNA-deflated compensation for independent directors. Board-related variables are included only in model (2) because board information is collected only for funds with contract changes. Following Tufano and Sevick (1997), we predict that smaller boards and greater fractions of independent directors are associated with smaller changes in marginal rates.

IV. Results

The paper's central results are shown in Table IV. Columns (1)-(3) show the results on rate change direction. Column (1) and column (2) analyze the rate increases and rate decreases separately. Column (3) combines all rate changes in an ordered logit regression. Column (4) reports the OLS regression results on rate change magnitude. To account for any cross-correlation in the error structure, the standard errors from all regressions are clustered by family, year and fund objective (with similar results obtained if we include fixed effect dummies for these variables in the regression.)

[Insert Table IV here]

A. Rate change direction

A.1. Rate increase likelihood

Column (1) of Table IV analyzes rate increase likelihood. The sample is 9,220 fund filings from 1994 to 2001 that result in either no change in the marginal rate (including contracts that did not change and contract changes with no marginal rate change) or an increase in the marginal rate. The dependent variable is one if the marginal rate increases due to a contract change and zero if it stays the same.[14]

[14] Results are unchanged if we also include rate decreases and set the dependent variable to zero for these cases.

From column (1), better performance measured by star fund status (i.e., top 5% in return performance, $Star_{t-1}$) significantly increases the likelihood of a rate increase. The coefficient on this variable is positive as expected (1.1105) and significant at the 1% level. Being a star fund increases the likelihood of a rate increase by 1.25%, almost doubling the 1.30% unconditional semi-annual rate increase probability.[15] There is also evidence of a within-family spillover effect of star performance. The rate increase likelihood is positively associated with the existence of stars among other funds within the same family ($Other\_Stars_{t-1}$). The coefficient on this variable is 0.3739 and significant at the 10% level. Having star funds in the same family raises the rate increase likelihood for a particular fund by 0.27%, or about 21% of the 1.30% unconditional semi-annual rate increase probability.

$High\_Fee_{t-1}$ is significantly negative, indicating that funds with relatively high marginal rates are less likely to raise rates. $Ch\_Services_t$ and $Ch\_Turnover_t$ both have positive coefficients as expected, indicating that an increase in the number of services provided by the investment advisors and an increase in portfolio turnover are associated with rate increases.

A.2. Rate decrease likelihood

Column (2) of Table IV shows results for rate decrease likelihood. The sample is 9,257 fund filings from 1994 to 2001 that result in either no change in the marginal rate (including contracts that did not change and contract changes with no marginal rate change) or a decrease in the marginal rate. The dependent variable is one if the marginal rate decreases due to a contract change and zero if it stays the same.[16]

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[15] The marginal effects on the predicted probabilities in the logit regressions (changes in marginal rates in the OLS regressions) are measured for a one standard deviation increase from the mean for a continuous variable and from zero to one for an indicator variable, with the other variables measured at the mean.

[16] Results are unchanged if we also include rate increases and set the dependent variable to zero for these cases.

From column (2), rate decrease likelihood is associated with greater economies of scale, at both the fund and family levels. The coefficient on fund size ($Size_{t-2}$) is 0.0615 and significant at the 1% level. A one standard deviation increase of fund size raises the likelihood of a rate decrease by 0.22%, or about 13% of the 1.70% unconditional semi-annual rate decrease probability. The coefficient on high past dollar asset growth ($High\_\$Growth_{t-1}$) is also positive and significant at the 5% level. Being in the top asset growth quintile raises a fund's rate decrease likelihood by 0.71%, or 42% of the 1.70% unconditional semi-annual rate decrease probability. This is consistent with funds that have grown in the past being more likely to have experienced economies of scale and as a result to reduce fee rates.

Family asset growth is also important. The coefficient on $High\_Family\_\$Growth_{t-1}$ is positive and significant at the 10% level. Being in a family that is in the top asset growth quintile raises a fund's rate decrease likelihood by 1.24%, or 73% of the 1.70% unconditional semi-annual rate decrease probability. Thus the effect from family asset growth is at least as large as that from a fund's own asset growth in reducing advisory fee rates. This result suggests that economies of scale are shared among a family's funds.

$High\_Fee_{t-1}$ is significantly positive, indicating that funds with relatively high marginal rates are more likely to reduce rates. We also find a positive and significant coefficient on *Acquirer_Dummy*, indicating that funds that have recently acquired other funds are more likely to reduce rates, possibly reflecting greater economies of scale from the addition of new assets.

Overall, the results from the first two columns of Table IV support our predictions in Section I. Furthermore, they show that rate increase and rate decrease likelihoods are driven by different factors. Rate increase likelihood tends to reflect superior advisor ability; while rate decrease likelihood tends to reflect economies of scale. In addition, the effect from market-adjusted performance is asymmetric. The Table IV results on the effect of superior performance do not apply for inferior performance (the bottom 5% in returns or in four-factor alphas among all equity funds in a year), which does not affect the likelihood of rate decreases. While our findings also show the importance of family level spillover effects, we do not find fund or family market share to be important in determining marginal rate changes in advisory contracts.[17, 18]

A.3. Ordered logit regression

We estimate an ordered logit regression with the whole sample of 9,377 fund filings and report the results in column (3) of Table IV. The dependent variable is one if the marginal rate increases due to a contract change, zero if there is no change in the marginal rate (including contracts that did not change and contract changes with no marginal rate change), and minus one if the marginal rate decreases. The results are consistent with those reported in the first two columns and reflect the combined effects of rate increases and rate decreases. Specifically, the coefficients on $Size_{t-2}$ and $High\_\$Growth_{t-1}$ are negative and significant, consistent with the effect of economies of scale and the coefficient on $Star_{t-1}$ is positive and significant, reflecting the impact of advisor ability.

B. Rate change magnitude

Column (4) of Table IV reports OLS regression results on the *magnitude* of marginal rate changes. We use the change in marginal rate (ΔMrgrt) as the dependent variable.[19] The results generally reinforce the earlier findings on rate change direction. We expect rate changes to be negatively related to economies of scale, therefore we predict negative coefficients on both size

[17] These spillover effects help explain the time-clustering of contract changes. For all families that have at least two contract changes and are in our sample for at least 5 years (total of 77 families), on average 68% (median is 60%) of the contract changes occur in a single year and 89% (median is 100%) of the contract changes occur in two years.
[18] When we include interactive terms of asset growth with market share and star funds with market share in Table IV regressions, the interactive terms are insignificant and their inclusion does not affect the inferences.
[19] We also run separate OLS regressions for rate increases and rate decreases with similar inferences.

and asset growth at the fund and family levels. On the other hand, larger rate changes likely result from higher advisor ability and greater market share. Therefore, the abnormal return performance and the market share variables, at both fund and family levels, are expected to have positive coefficients.

From column (4) the coefficient on fund size ($Size_{t-2}$) is negative and significant at the 5% level, consistent with larger economies of scale leading to smaller rate changes (smaller increases or larger decreases). A one standard deviation increase in fund size leads to a smaller rate change by about 2.35 basis points. The coefficient on $High\_Growth_{t-1}$ is negative and significant at the 1% level. Being in the top quintile in asset growth is associated with a smaller rate change by about 11.14 basis points.

We also find that better abnormal return performance is associated with larger rate changes. The coefficient on $Star_{t-1}$ is positive and significant at the 10% level. Being a star fund leads to a larger rate change by 9.28 basis points. Furthermore, there is evidence of a within-family spillover effect. $Other\_Stars_{t-1}$ is positive and significant at the 5% level. Having stars among the other funds in the family is associated with a larger rate change by 9.02 basis points. These findings are consistent with family funds increasing advisory fee rates in order to capture the spillover effects of good performance by other member funds.

Among the board variables, funds with 100% independent directors ($Director\_Indep_{t-1}$) have smaller rate changes by 9.89 basis points (director independence at lower levels (e.g., 75%) does not have a significant impact on rate changes). We also find that funds with higher independent director compensation ($IndepDrct\_Comp_{t-1}$) have larger rate changes. These results are consistent with those in Tufano and Sevick (1997) on the effects of board structure on the total fees charged by mutual funds.

C. Robustness checks

Below we briefly summarize a number of robustness checks. Our inferences are not affected by them. Details of these tests are reported in the Internet Appendix.

C.1. Specification checks

We conduct an assessment of the goodness of fit of the regression models in Table IV and find that the predicted values and the realized values (both based on ranked deciles) line up reasonably well for all three models. We incorporate lagged two- and three-year performance into the regressions and find evidence of these variables affecting advisory fee rates in the predicted directions. In addition, our main inferences from Table IV are supported when four-factor alpha replaces star funds as the performance measure. Our inferences are not affected when we use a Tobit or a Heckman two-stage procedure to jointly estimate the direction and the magnitude of rate changes.

C.2. Subsample analysis

A separate analysis of the rate increases that are approved by shareholders reinforces our main conclusions about rate increases. We also investigate the relation between advisory fee rate changes and fee waivers. Our hypotheses apply and are valid even when the source of a marginal rate change is a waiver change, but data limitations make the importance of fee waivers difficult to determine.

V. Fund industry developments

Our analysis so far is based on the 1994-2001 period. We examine separately the 2002-2006 period. Although the main goal is to check the robustness of our earlier results, the later time period is also of interest because it saw a large wave of litigation related to mutual fund market-timing scandals and excessive fees allegations. It is possible that fee reductions by the scandal families create competitive pressure for other funds to follow. On the other hand, funds that are not tarnished by the scandals may feel less compelled to lower rates. Some argue that the legal settlements and the ensuing wave of "excessive fee" litigations have not had a significant overall impact in the mutual fund industry (e.g., ICI (2006), Benedict, Murphy, and Robertson (2005), and Carroll and Clancy (2008)).[20] The empirical evidence presented below is consistent with this view, and the general tenor of the earlier results is unchanged.

The sample collection procedure described in Section II is repeated for the period 2002-2006 with mutual fund contract data from EDGAR and fund performance data from CRSP. The two databases are manually matched based on fund names.[21, 22] The later sample contains 22,938 fund-filings from 3,481 equity mutual funds and 501 fund families. Among the 22,938 fund-filings, 5.9% (5%) experience a contract change (marginal rate change). This is reliably (t-stat = 7.65) higher than the 4.2% frequency for 1994-2001 period, but as shown below is mainly due to funds in families experiencing litigation.

Table V reports summary statistics on the time-series of contracts and contract changes. We define "scandal" funds as all funds in families which reached settlements with the SEC.[23]

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[20] According to Carroll and Clancy (2008), the most recent wave of excessive fee lawsuits against mutual funds amid the market timing controversy "*has been costly in attorney fees, but it has done no apparent structural damage.*"

[21] There are 166,864 fund-filings on EDGAR from 2002 to 2006. After excluding bond funds, index funds, and funds with no valid advisory contract information, 60,051 fund-filings remain. We are able to match 38% of these filings with CRSP fund records based on fund names.

[22] We do not conduct a joint analysis of the 1994-2006 period. This particular sample design is the result of how the paper evolved over time and a recent change in CRSP mutual fund database, where a new unique fund identifier (crsp_fundno) replaced the previous identifier (icdi) in 2007. Wharton Research Data Services does not provide a file linking the two identifiers. Since we manually matched EDGAR data with CRSP using the old CRSP identifier for the 1994-2001 sample and did the manual matching using the new CRSP identifier for the later sample, the two samples are not combined into a single dataset.

[23] It is already known that scandals at individual funds had large within-family spillover effects (Choi and Kahan (2007)), and we lack data on which funds within a family were the subject of the settlements. The ICI (Investment Company Institute) reports that ten mutual fund families reached legal settlements with the SEC during 2004 and 2005 related to market timing activities and agreed to reduce fees for investors (ICI (2006)). We search the SEC press releases in 2004 and 2005 and identify the following fund families as being involved in the market-timing scandals and also in our sample: AIM, Nations Funds (Bank of America), Columbia, Franklin, Fremont, Invesco, Janus, Putnam, and RS Investment. We have not identified all scandal families (for example, if some families

Funds in families involved in the market-timing scandals have higher contract change frequencies than non-scandal family funds (for the 2002-2006 period, the frequencies are 11.8% versus 5.4%, respectively). Although this can be partly due to the scandal family funds' larger average size, these funds also see a jump in contract change frequency in 2004 (to 13.71% from 6.21%) when many of the legal settlements regarding fees are reached with the SEC. The scandal family funds experience large marginal rate drops on average (from 73 basis points in 2002 to 62 in 2006) even though their average size shrinks significantly during this period.[24] Non-scandal family funds' marginal rates drop in the last two years of the sample (from 80 to 76 basis points), but this is not necessarily a spillover effect because they grow in size.[25] Mean marginal rates for all funds (both scandal and non-scandal) fall from 79 to 75 basis points but average size also increases.

[Insert Table V here]

Figure 2 compares the likelihood of a marginal rate decrease between scandal family funds and non-scandal family funds, given that there is a marginal rate change. The graph indicates a large difference between the two groups in 2004. Among the scandal family funds that change the marginal rates, 86% lower the rates, compared to 60% for non-scandal family funds.

[Insert Figure 2 here]

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reached settlements with state regulators but not with the SEC or if there was private litigation). To the extent there are scandal families misclassified as non-scandal families, the power of our tests to detect spillover to non-scandal families is reduced.

[24] Choi and Kahan (2007) conduct a much more detailed investigation of scandals. Their definition of scandals is broader than ours and includes investigations and sanctions by a state or federal regulatory agency of a mutual fund between 1994 and 2004. They document that mutual funds involved in scandals suffer significant fund outflows, but they do not examine advisory fees or contract changes.

[25] Non-scandal family funds have an increased frequency of non-linear contracts (26% in 2002 compared to 41% in 2006), but it is unclear if it is related to the scandals. There is no clear pattern of change among the scandal funds (roughly 50% have non-linear contracts throughout the period).

To study rate changes in more detail, we expand the multivariate analysis conducted earlier for the 1994-2001 period. Table VI, column (1) reports the results of an ordered logit regression. Column (2) models the likelihood of a rate decrease. Similar to model (1) reported earlier in Table IV column (3), the dependent variable in column (1) is one if marginal rate increases due to a contract change, zero if there is no marginal rate change, and minus one if marginal rate decreases due to a contract change. The dependent variable in column (2) is one if marginal rate decreases due to a contract change, and zero if it increases. Both models also include a dummy variable for the scandal period, *Post2004*, set to one for years 2004, 2005, and 2006 (and zero otherwise), a dummy variable, *Scandal*, for the fund families involved in the market-timing scandal and reached settlements with the SEC in 2004 and 2005 (and zero otherwise), and the interaction between the two dummy variables. Return performance is measured using four-factor alpha.

The findings from Table VI show that our earlier results hold in the more recent period. Specifically, the positive coefficient on $Alpha\_4Factor_{t-1}$ and negative coefficients on $Family\_size_{t-2}$ and $High\_Family\_Growth_{t-1}$ in column (1) are consistent with the hypothesized effects of advisor ability and economies of scale on advisor fee rates. Turning to the difference between scandal and non-scandal family funds, the insignificant coefficient on *Scandal* suggests they are not significantly different in rate change likelihoods before 2004. The insignificant coefficient on *Post2004* indicates non-scandal family funds experience no significant change in rate change likelihoods post 2004. Thus, there is no spillover. As expected, we find a significant and negative coefficient on *Post2004*Scandal*, showing that funds in scandal families are significantly less likely to raise rates and/or more likely to lower rates than non-scandal family funds post 2004. Overall, we document fee rate reductions by the scandal family funds post 2004, but find no evidence of a spillover to the broader industry.

Column (2) of Table VI models the likelihood of a rate decrease. The results are similar to those in column (1). In addition, we find a significant negative effect on rate decrease likelihood from family-level four-factor alpha. In order to control for potential self-selection bias, we run a first-stage regression of contract change likelihood on the same independent variables as those in column (1) and include the Inverse Mills Ratio in column (2). The Mills Ratio has an insignificant coefficient. The first-stage regression indicates a large and highly significant increase in contract change likelihood by scandal family funds post 2004. The non-scandal family funds experience a much smaller albeit still significant increase in contract change likelihood post 2004; however, as shown in both columns of Table VI, their likelihood of a rate decrease does not change significantly post 2004.

[Insert Table VI here]

VI. Conclusions

We investigate the determinants of mutual fund advisory contract changes using a dataset that combines information from CRSP and EDGAR from 1994 to 2006. We find that advisory contracts change to reflect good past performance. Marginal rate decreases are primarily driven by economies of scale from high asset growth; while marginal rate increases are caused by superior abnormal return performance. The general tenor of our results is not specific to any particular subperiod, and does not seem to be affected by the extensive mutual fund litigation during the later part of our sample period.

We find evidence that family has important influence on contract changes. For example, funds decrease rates to reflect family asset growth. Further, funds increase advisory fee rates to reflect family level superior abnormal return performance and to capture the spillover effect from good performance by other funds in the family. Finally, a high degree of board director independence is associated with smaller rate increases and higher rate decreases.

We do not investigate a fund's decision to choose a particular contract shape. However, our analysis on contract dynamics suggests that the distinction between a linear and concave contract is not as clear as assumed in previous literature (e.g. Deli (2002), Coles, Suay, and Woodbury (2000)). This is because a linear contract that changes the marginal rate over time is effectively nonlinear in a dynamic setting. On the other hand, a concave contract which requires substantial asset growth before moving onto the next step has the characteristics of a linear contract. Further, the observed semi-annual contract change of only 5% is consistent with the view that observed contracts already provide implicit performance adjustments (see Admati and Pfleiderer (1997)) so as to make more frequent adjustments unnecessary.

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Appendix. Variable Definitions

Mutual funds generally file their contract information with the SEC once every 6 months.

Current contract: the contract of interest.

Previous contract: the last contract filed within the previous one year period of the current contract. The previous contract period generally ends 6 months before the current contract period.

Contract change: measured relative to the previous contract. For a linear contract, a contract change is any change in the rate (N-SAR item 48). For piece-wise linear contracts, a contract change is any change in the set of rates or break points (N-SAR item 48, A through K).

Mrgrt: marginal rate of the previous contract. For linear contracts, this is the single rate. For concave contracts, this is the applicable rate based on monthly average total net assets.

ΔMrgrt: change in marginal rate from the previous contract. To determine the marginal rate change for a concave contract, we apply the *current* period total net assets to *both the previous and the current contracts*. Therefore, a marginal rate change is due to a contract change and not the mechanical effect of asset growth.

Advsrfee: advisory fees as reported in N-SAR filings as a percentage of monthly average total net assets in the previous contract. Advsrfee greater than 3.25% are set to missing. 3.25% is the 99^{th} percentile of total expense ratio for all CRSP funds.

ΔAdvsrfee: change in advisory fee percentages from the previous contract.

Exp: total expenses as reported in N-SAR filings as a percentage of monthly average total net assets in the previous contract. Exp greater than 3.25% is set to missing. 3.25% is the 99^{th} percentile of total expense ratio for all CRSP funds.

ΔExp: change in total expense percentages from the previous contract.

Size: TNA, in millions of dollars in Tables III, IV, and VII and billions of dollars in Tables V, VI, and VIII.

$Growth: annual fund $ growth in TNA: [$TNA_n - TNA_{n-1}$], n being the time subscript, in millions of dollars.

High_$Growth: an indicator variable that equals one if a fund's $\$Growth_{t-1}$ is within the top quintile of our sample funds, and equals zero otherwise.

%Growth: annual fund % growth in TNA: [($Growth/ TNA_{n-1}) *100]

%Return: annual percentage return.

$Return: annual $ return: [TNA_{n-1} * %Return], in millions of dollars.

$Flow: annual $ flow: [TNA_n – (TNA_{n-1} * (1+%Return/100))], in millions of dollars.

%Flow: annual % flow: [($Flow/$TNA_{n-1}$)*100]

Star: a dummy variable equal to one for a fund with %return within the top 5% of all equity funds in a year, and zero otherwise.

Alpha_4Factor: four-factor alpha based on Fama-French three factors plus the momentum factor estimated over 12 months.

Fund_Mktshr: a dummy variable equal to one if fund market share is within the top quintile among our sample funds in a particular year and zero otherwise, where fund market share is fund TNA as a percentage of the sum of TNA of all the equity funds in a particular year.

Note: family level variables are calculated based on all the funds in a family from the CRSP database, and not just the funds in our sample.

Family_Size: the sum of TNA of all equity funds in the family in billions of dollars.

Family_$Growth, Family_$Return, Family_$Flow: the sum of $Growth, $Return, and $Flow, respectively, from all equity funds in the family, in billions of dollars.

High_Family_$Growth: an indicator variable that equals one if Family_$Growth is within the top quintile of our sample fund families, and equals zero otherwise.

Family_%Growth Family_%Return, Family_%Flow: the simple average of %Growth, %Return, and %Flow, respectively, of all equity funds in the family.

Other_Stars: a dummy variable equal to one if there are star funds among other funds in the same fund family, and zero otherwise.

Family_Alpha_4Factor: the simple average of Alpha_4Factor of all equity funds in the family.

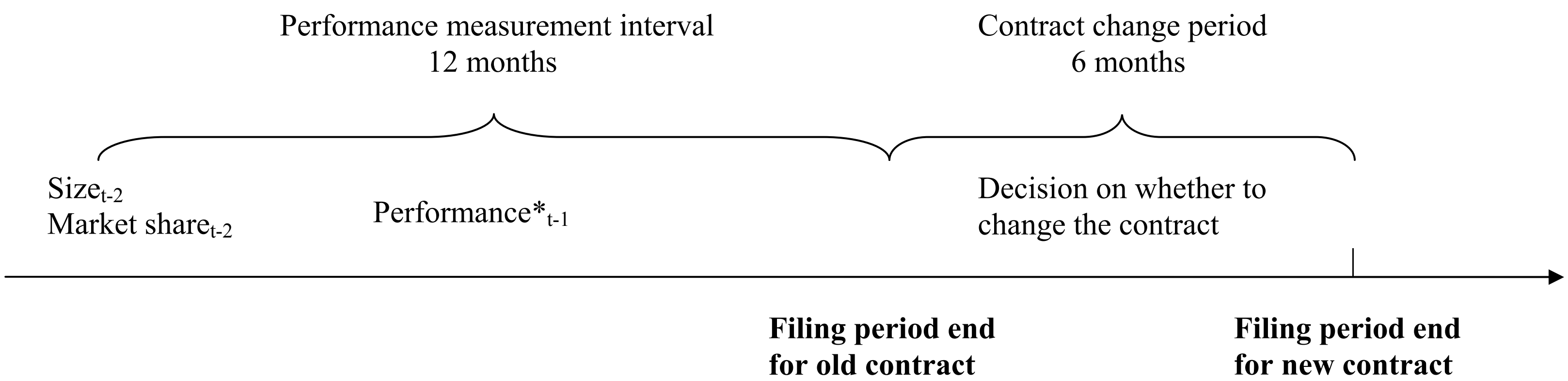
Family_Mktshr: a dummy variable equal to one if family market share is within the top quintile among our sample families in a particular year and zero otherwise, where family market share is family TNA as a percentage of the sum of TNA of all the equity funds in a particular year.
Family_Dummy: a dummy variable equal to one if a fund belongs to a fund family, and zero otherwise.

High_Fee: an indicator variable that is equal to one if the marginal rate in the advisory contract is higher than the sample median marginal rate in a given year, and zero otherwise.
Ch_Services: the number of services provided by the investment advisor reported in the N-SAR filing containing the *current* contract minus the number of services provided by the investment advisor reported in the N-SAR filing containing the *previous* contract. Mutual funds report in their N-SAR filings whether the following services are provided by their investment advisor(s): (1) occupancy and office rental, (2) clerical and bookkeeping services, (3) accounting services, (4) services of independent auditors, (5) services of outside counsel, (6) registration and filing fees, (7) stationery, supplies and printing, (8) salaries & compensation of registrant's interested directors, (9) salaries & compensation of registrant's disinterested directors, (10) salaries & compensation of registrant's officers who are not directors, (11) repots to shareholders, (12) determination of offering and redemption prices, (13) trading department, (14) prospectus preparation and printing for current shareholders, and (15) other. The number of services provided ranges from 0 to 15.
Ch_Turnover: annual portfolio turnover in the calendar year in which the *current* contract ends minus the annual portfolio turnover in the calendar year in which the *previous* contract ends.
Ch_#SubAdvsr: the number of investment sub-advisors reported in the N-SAR filing containing the *current* contract minus the number of investment sub-advisors reported in the N-SAR filing containing the *previous* contract.
Sector_Perf: performance rank of the sector to which the fund belongs during the calendar year in which the current contract ends. The average returns of the following CRSP objectives are ranked each year: (1) aggressive growth, (2) long-term growth, (3) growth and income, (4) income, (5) balanced, (6) total return, (7) global equity, (8) international equities, (9) precious metals, (10) utility funds, (11) sector funds, and (12) special funds. The rankings each year range from 1 to 12.
Acquirer_Dummy: an indicator variable equal to one if a fund has acquired other funds in the two years leading to the filing of the current contract, zero otherwise.
Target_Dummy: an indicator variable equal to one if a fund becomes a target (merged into another fund) within the next two years after filing the current contract, zero otherwise.

For each contract change, we obtain the fund's board of directors information from the 485APOS/485BPOS filing closest to the N-SAR filing reflecting the contract change. On average, the time lag between the 485APOS/485BPOS filing and the subsequent N-SAR filing is 10 months.
Large_Board: a dummy variable equal to one if the board size is 7 (the sample median board size) or above, and zero otherwise.
Director_Indep: an indicator variable equal to one if 100% of the board directors are independent, and zero otherwise.
IndepDrt_Comp: the average compensation of the independent directors on a fund's board, deflated by the lagged TNA of the fund.

Additional variables in the 2002-2006 analysis:
Post2004: a dummy variable equal to one for years 2004, 2005, and 2006; zero otherwise.
Scandal: a dummy variable equal to one for fund families involved in market-timing scandals and reached settlements with the SEC in 2004 and 2005; zero otherwise. The scandal families (identified through searches of SEC press releases in 2004 and 2005) in our sample include AIM, Nations Funds (Bank of America), Columbia, Franklin, Fremont, Invesco, Janus, Putnam, and RS Investment.

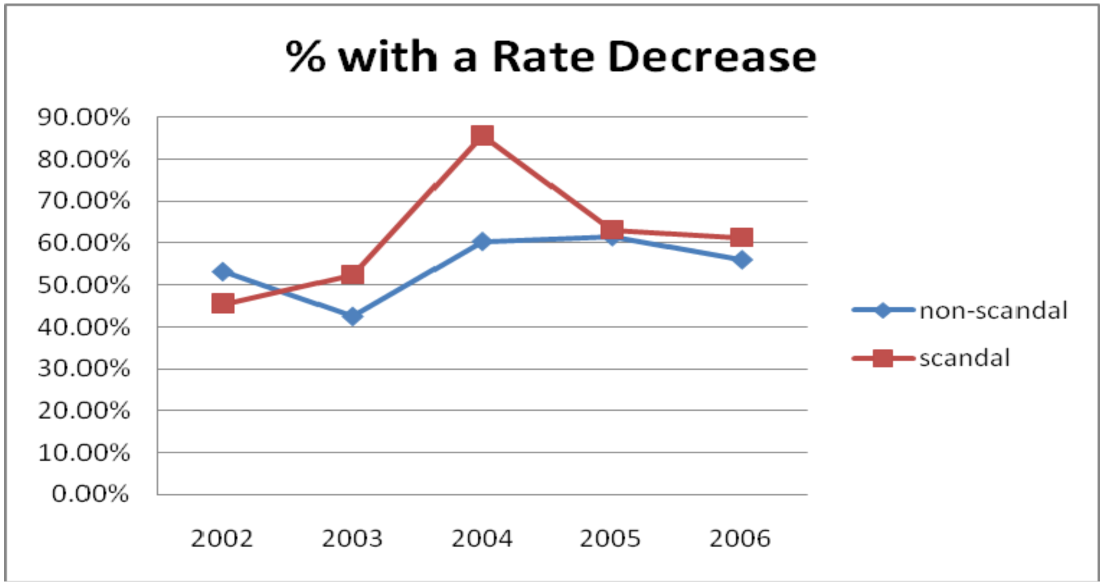
Figure 1. Timing of contract changes versus lagged fund performance and characteristics



*Performance measures include TNA growth, return, flow, and alpha.

The N-SAR filings are generally 6 months apart. The decision on whether to change the contract was likely made sometime between the two filings. However, due to uncertainty regarding the exact timing of the contract change decision, we lag our performance measurement interval. We measure performance related variables, such as TNA growth, return, flow, and alpha over the one year period preceding the old contract period end. To separate the effects of size from growth, we measure fund characteristics (size and market share) at the beginning of the performance measurement interval.

Figure 2. Percentage of fund-filings with a marginal rate decrease (among funds experiencing a marginal rate change): sample period 2002-2006



The scandal funds are defined as those in families involved in market-timing scandals. They are identified through searches of SEC press releases in 2004 and 2005. The families are AIM, Nations Funds (Bank of America), Columbia, Franklin, Fremont, Invesco, Janus, Putnam, and RS Investment.

Table I
Sample selection based on merged CRSP-EDGAR dataset of equity fund advisory contract changes from 1994 to 2001
The sample is based on 14,578 fund filings from 1994 through 2001, out of which 611 fund filings are with contract changes.

	Number of fund-filings	Number of funds	Number of fund families
Total EDGAR filings from 1994 through 2001	158,385		
Open-end funds with valid contract information	112,614		
Observations with unique matches on fund names with CRSP data	42,072		
Observations with valid information for current and lagged contracts	36,363		
Equity funds with valid information for current and lagged contracts	14,578	2,063	392
Equity funds with contract changes (% of equity funds with valid information for current and lagged contracts)	611 (4.2%)	442 (21%)	131 (33%)

Table II
Summary statistics on contract changes
Panel A and B sample: 14,578 fund filings from 1994 through 2001.
Panel C and Panel D sample: 611 fund filings with contract changes. Variables definitions are in the Appendix.

Panel A: Time-series of contracts and contract changes

Year	Market return	Aggr. Net New Cash Flow[a] (billion $)	Number of funds	Number of EDGAR filings	Frequency of semi-annual contract changes	Median fund size (million $)	Average fund size (million $)	Percentage of linear contracts	Marginal rate of contract[b] (basis points)
1994	-1%	114.5	349	466	3.43%	70.22	290.03	74%	80
1995	36%	124.4	614	1023	4.11%	72.37	355.84	71%	81
1996	21%	216.9	837	1497	3.67%	94.30	448.42	70%	83
1997	30%	227.1	986	1773	3.38%	102.30	575.68	71%	83
1998	23%	157.0	1203	2158	3.94%	90.41	608.21	70%	84
1999	25%	187.7	1370	2498	6.16%	83.95	742.22	70%	85
2000	-11%	309.4	1512	2763	4.63%	120.66	877.49	72%	85
2001	-11%	31.9	1537	2400	2.96%	105.11	761.40	71%	83

[a] Aggregate flow data obtained from the Investment Company Fact Book (ICI, 2009).
[b] Marginal rate of the contract: for linear contracts, this is the single rate; for concave contracts, this is the applicable rate based on monthly average total net assets.

Table II, continued

Panel B: Summary statistics: non-contract change sample and contract change sample

We measure performance-related variables, such as TNA growth, return, flow, and alpha over the one year period preceding the old contract period end. We measure fund size and market share at the beginning of the performance interval. Figure 1 provides the timeline.

*** , **, * represents significance levels at 1%, 5%, and 10%, respectively, for the differences between the non-contract change sample and the contract change sample based on t-tests for the mean and the Wilcoxon Rank tests for the median, two-tailed tests.

	Non-Contract Change Sample (13,967 fund filings)			Contract Change Sample (611 fund filings)		
Variable	Mean	StdDev	Median	Mean	StdDev	Median
Marginal rates (Mrgrt)	0.84%	0.26%	0.80%	0.76%***	0.40%	0.75%***
ΔMrgrt	0.00%	0.00%	0.00%	0.01%	0.27%	0.00%***
Advsrfee	0.83%	0.31%	0.80%	0.77%***	0.33%	0.75%***
ΔAdvsrfee	0.012%	0.21%	0.00%	0.002%	0.25%	-0.003%***
Exp	1.56%	0.60%	1.45%	1.50%**	0.61%	1.38%**
ΔExp	-0.004%	0.30%	0.00%	0.006%	0.40%	-0.01%
$Size_{t-2}$ (mil $)	544.37	2107.94	85.89	1292.88***	4027.03	152.65***
$$Growth_{t-1}$ (mil $)	122.36	817.11	9.54	383.07***	1798.66	12.29***
$$Return_{t-1}$ (mil $)	69.18	533.90	6.55	215.34***	1107.08	11.15***
$$Flow_{t-1}$ (mil $)	53.50	465.11	1.63	168.44***	842.23	4.85***
$\%Growth_{t-1}$	40.73%	85.37%	18.72%	45.48%	90.94%	23.87%
$\%Return_{t-1}$	15.85%	28.24%	14.83%	18.33%*	29.53%	15.51%
$\%Flow_{t-1}$	27.77%	80.98%	3.15%	30.82%	88.40%	6.71%
$Star_{t-1}$	0.05	0.22	0.00	0.06	0.23	0.00
Alpha-1 $factor_{t-1}$	-0.09%	1.71%	-0.11%	0.05%*	1.66%	-0.03%
Alpha-4 $factor_{t-1}$	-0.11%	1.75%	-0.07%	0.03%*	1.52%	0.04%**
$Fund\_Mktshr_{t-2}$	0.03%	0.09%	0.004%	0.06%***	0.19%	0.008%***
Fund_Age	8.12	12.38	4.00	8.87	13.67	4.00
$Family\_Size_{t-2}$ (bil $)	13.80	32.20	2.62	20.83***	36.86	6.98***
Family_$$Growth_{t-1}$(bil$)	2.62	9.58	0.28	5.50***	13.24	1.07***
Family_$$Return_{t-1}$ (bil $)	1.60	6.77	0.19	3.45***	8.37	0.61***
Family_$$Flow_{t-1}$ (bil $)	1.02	4.34	0.06	2.06***	6.22	0.13*
$Family\_\%Growth_{t-1}$	49.06%	52.78%	41.78%	51.98%	46.28%	41.85%
$Family\_\%Return_{t-1}$	14.96%	19.46%	15.46%	15.51%	17.28%	14.49%
$Family\_\%Flow_{t-1}$	36.83%	49.35%	29.46%	38.70%	40.24%	30.45%*
$Other\_Stars_{t-1}$	0.27	0.44	0.00	0.31**	0.46	0.00**
Family_Alpha-1 $factor_{t-1}$	-0.11%	1.07%	-0.15%	-0.07%	0.91%	-0.15%
Family_Alpha-4 $factor_{t-1}$	-0.17%	1.05%	-0.16%	-0.07%***	0.82%	-0.06%***
$Family\_Mktshr_{t-2}$	0.62%	1.28%	0.13%	0.98%***	1.76%	0.30%***
Family_Dummy	0.85	0.36	1.00	0.83	0.37	1.00
$High\_Fee_{t-1}$	0.50	0.50	0.00	0.37***	0.48	0.00***

$Ch\_Services_t$	0.00	0.82	0.00	0.04	1.49	0.00
$Ch\_Turnover_t$	-0.01	1.06	0.00	0.01	0.23	0.00
$Ch\_\#SubAdvsr_t$	0.00	0.18	0.00	0.01	0.25	0.00
$Sector\_Perf_t$	7.33	3.31	8.00	7.62*	3.23	8.00*
Acquirer_Dummy	0.05	0.22	0.00	0.09***	0.28	0.00***
Target_Dummy	0.10	0.30	0.00	0.11	0.31	0.00

Panel C: Marginal rates (Mrgrt) and changes in marginal rates (ΔMrgrt)

Variable	N	Mean (basis points)	StdDev (basis points)	Median (basis points)	Median change in marginal rates
Mrgrt	611	76	40	75	
Mrgrt for ΔMrgrt >0	212	60	41	56	
Mrgrt for ΔMrgrt <0	248	90	41	85	
ΔMrgrt	611	1	27	00	
ΔMrgrt - for ΔMrgrt >0	212	28	21	25	33%
ΔMrgrt - for ΔMrgrt <0	248	-21	18	-20	-20%

In 151 cases (23% of the 611 contract changes), the applicable marginal rate does not change. This can occur when, for example, there is a switch from a linear to a concave contract but the applicable marginal rate does not change.

Panel D: Board characteristics for funds with contract changes

Variable	N	Mean	StdDev	Median
Board size	611	6.3	4.5	7
Fraction of independent directors	455	0.70	0.13	0.71
Number of boards served	151	15.1	19.4	4.7
Number of boards served - Independent directors	151	17.5	24.7	4
Director compensation- fund trust	455	$11,822	$12,487	$7,635
Independent director compensation- fund trust	455	$16,249	$18,463	$9,750
Director compensation- All funds in family	455	$39,592	$40,302	$29,194
Independent director compensation- All funds in family	455	$50,447	$49,699	$37,536

Information on the number of boards served and director compensation are first averaged across the directors in each fund. The reported statistics (mean, median and standard deviation) are then calculated across the funds.

Table III
Fund contract change likelihood (semi-annual) and fund lagged performance
The sample is based on 14,578 fund filings from 1994 through 2001. Variable definitions are the Appendix. We first classify sample funds into terciles based on fund size at the beginning of the performance interval. Within each size tercile, we then sort funds into quintiles based on performance. P-values (in parentheses) are from Chi-Square tests for an association between the performance variable and contract change likelihood within each size tercile. P-values below 0.1 are bolded.

Performance measure	$\$Growth_{t-1}$			$\$Return_{t-1}$			$\$Flow_{t-1}$		
(Size tercile, perfm quintile)	$Size_{t-2}$ (million $)	$Growth_{t-1}$ (million $)	contract change likelihood	$Size_{t-2}$ (million $)	$Return_{t-1}$ (million $)	contract change likelihood	$Size_{t-2}$ (million $)	$Flow_{t-1}$ (million $)	contract change likelihood
Large size: all	1613.21		5.50%						
(3 large,5 good)	3889.15	1919.47	10.24%	4352.71	1112.66	8.75%	3200.73	1042.03	8.88%
(3,4)	921.04	264.97	4.86%	967.33	175.34	4.88%	846.18	100.49	6.25%
(3,3)	534.96	78.94	3.12%	520.63	74.47	4.37%	636.58	-1.79	3.00%
(3,2)	507.81	-25.65	3.74%	446.15	19.01	4.38%	722.84	-68.15	3.38%
(3 large,1 poor)	2225.92	-552.96	5.62%	1798.93	-345.35	5.25%	2679.28	-420.38	6.13%
P-value			**(0.000)**			**(0.000)**			**(0.000)**
Med size: all	96.38		3.44%						
(2 med,5 good)	112.85	193.09	4.37%	129.77	54.88	3.38%	105.85	158.78	4.51%
(2,4)	96.74	40.20	2.37%	99.73	21.69	3.25%	93.85	21.68	2.38%
(2,3)	83.07	13.38	2.50%	79.94	11.54	3.63%	79.23	1.44	3.13%
(2,2)	82.08	-3.67	4.24%	72.50	3.40	3.50%	85.24	-11.07	2.63%
(2 med,1 poor)	107.28	-36.24	3.50%	100.11	-16.25	3.13%	117.87	-38.86	4.26%
P-value			**(0.071)**			(0.984)			**(0.061)**
Small size: all	13.95		3.14%						
(1 small,5 good)	17.04	86.51	2.89%	24.13	9.57	4.03%	16.15	80.76	2.77%
(1,4)	16.09	11.78	3.14%	16.35	3.02	2.77%	14.51	8.87	3.15%
(1,3)	11.74	3.90	3.76%	9.75	1.13	2.64%	10.58	2.15	3.40%
(1,2)	7.37	0.66	2.89%	5.05	0.23	3.65%	8.36	-0.16	3.40%
(1 small,1 poor)	17.69	-4.70	3.14%	14.80	-2.26	2.77%	20.46	-5.30	3.15%
P-value			(0.855)			(0.399)			(0.953)

Table IV
Regression analysis of advisor fee rate changes

Model (1)

$Prob\ [Event_t\ ] = Logit\ (a_0 + a_1\ Size_{t\text{-}2} + a_2\ High\_Growth_{t\text{-}1} + a_3\ Star_{t\text{-}1} + a_4\ Fund\_Mktshr_{t\text{-}2}$
$+ a_5\ Family\_Size_{t\text{-}2} + a_6\ High\_Family\_Growth_{t\text{-}1} + a_7\ Other\_Stars_{t\text{-}1} + a_8\ Family\_Mktshr_{t\text{-}2}$
$+ a_9\ High\_Fee_{t\text{-}1} + a_{10}\ Ch\_Services_t + a_{11}\ Ch\_Turnover_t + a_{12}\ Ch\_\#SubAdvsr_t + a_{13}\ Sector\_Perf_t$
$+ a_{14}\ Acquirer\_Dummy + a_{15}\ Target\_Dummy)$

Columns (1)-(3) are estimated based on model (1). The dependent variable in model (1) $Event_t$ is defined as $Rate\_Increase_t$ (= 1 if $\Delta Mrgrt_t > 0$ and = 0 if $\Delta Mrgrt_t = 0$) in column (1) and $Rate\_Decrease_t$ (= 1 if $\Delta Mrgrt_t < 0$ and = 0 if $\Delta Mrgrt_t = 0$) in column (2). We also combine all rate changes and estimate an ordered logit regression, where the dependent variable is $Rate\_Change_t$ (= 1 if $\Delta Mrgrt_t > 0$; = 0 if $\Delta Mrgrt_t = 0$; and = -1 if $\Delta Mrgrt_t < 0$) in column (3). The sample for column (1) is based on 9,220 fund filings from 1994 to 2001 that result in either no contract change (ΔMrgrt = 0), or a contract change where the marginal rate stays the same (ΔMrgrt = 0), or a contract change where the marginal rate increases (ΔMrgrt > 0). The sample for column (2) is based on 9,257 fund filings from 1994 to 2001 that result in either no contract change (ΔMrgrt = 0), or a contract change where the marginal rate stays the same (ΔMrgrt = 0), or a contract change where the marginal rate decreases (ΔMrgrt < 0). The sample for column (3) is based on all 9,377 fund fillings with required data for the regression.

Model (2)

$\Delta Mrgrt_t = a_0 + a_1\ Size_{t\text{-}2} + a_2\ High\_Growth_{t\text{-}1} + a_3\ Star_{t\text{-}1} + a_4\ Fund\_Mktshr_{t\text{-}2}$
$+ a_5\ Family\_Size_{t\text{-}2} + a_6\ High\_Family\_Growth_{t\text{-}1} + a_7\ Other\_Stars_{t\text{-}1} + a_8\ Family\_Mktshr_{t\text{-}2}$
$+ a_9\ High\_Fee_{t\text{-}1} + a_{10}\ Ch\_Services_t + a_{11}\ Ch\_Turnover_t + a_{12}\ Ch\_\#SubAdvsr_t + a_{13}\ Sector\_Perf_t$
$+ a_{14}\ Acquirer\_Dummy + a_{15}\ Target\_Dummy$
$+ a_{16}\ Large\_Board_{t\text{-}1} + a_{17}\ Director\_Indep_{t\text{-}1} + a_{18}\ IndepDrct\_Comp_{t\text{-}1}$

Column (4) is based on model (2) using 204 fund filings from 1994 to 2001 that result in a contract change.

Variables definitions are in the Appendix. The standard errors from the regressions are clustered by family, year and fund objective and are reported in parentheses. ***, **, * represent significance levels at 1%, 5%, and 10%, respectively, for one-tailed t-tests for variables with predicted signs and two-tailed tests otherwise. Coefficients with P-values below 0.1 are bolded.

		Column (1)		Column (2)		Column (3)		Column (4)
Dependent variable N (Y=1)	Exp. Sign	**Model (1)** **Logit** **Rate_Increase$_t$** Y=1 if ΔMrgrt > 0 Y=0 if ΔMrgrt = 0 9,220 (120)	Exp. Sign	**Model (1)** **Logit** **Rate_Decrease$_t$** Y=1 if ΔMrgrt < 0 Y=0 if ΔMrgrt = 0 9,257 (157)	Exp. Sign	**Model (1)** **Ordered Logit** **Rate_Change$_t$** Y=1 if ΔMrgrt > 0 Y=0 if ΔMrgrt = 0 Y=-1 if ΔMrgrt < 0 9,377	Exp. Sign	**Model (2)** **OLS** Y= ΔMrgrt 204
Size$_{t-2}$	-	-0.0286 (0.0914)	+	**0.0615***** **(0.0163)**	-	**-0.0682***** **(0.0160)**	-	**-0.0064**** **(0.0035)**
High_ Growth$_{t-1}$	-	-0.1481 (0.2787)	+	**0.4094**** **(0.2084)**	-	**-0.3462**** **(0.1953)**	-	**-0.1114***** **(0.0459)**
Star$_{t-1}$	+	**1.1105***** **(0.3021)**	-	-0.2834 (0.3452)	+	**0.8761***** **(0.3448)**	+	**0.0928*** **(0.0678)**
Fund_ Mktshr$_{t-2}$	+	-0.0105 (0.3991)	-	-0.2305 (0.3034)	+	0.1503 (0.2030)	+	0.0252 (0.0510)
Family_Size$_{t-2}$	-	-0.0048 (0.0048)	+	0.0016 (0.0032)	-	-0.0034 (0.0031)	-	0.0006 (0.0007)
High_Family_ Growth$_{t-1}$	-	0.2977 (0.3474)	+	**0.6559*** **(0.4312)**	-	-0.2874 (0.3285)	-	-0.0720 (0.0594)
Other_Stars$_{t-1}$	+	**0.3739*** **(0.2790)**	-	-0.0895 (0.2938)	+	0.2068 (0.1699)	+	**0.0902**** **(0.0447)**
Family_ Mktshr$_{t-2}$	+	0.2688 (0.3726)	-	-0.3185 (0.5801)	+	0.3590 (0.3133)	+	0.0304 (0.0617)
High_Fee$_{t-1}$		**-2.1091***** **(0.3403)**		**0.4687***** **(0.1978)**		**-0.9916***** **(0.1482)**		**-0.3628***** **(0.0532)**
Ch_ Services$_t$	+	**0.3226***** **(0.0938)**	-	-0.1587 (0.1452)	+	**0.2455***** **(0.0675)**	+	0.0081 (0.0109)
Ch_ Turnover$_t$	+	**0.4068**** **(0.1928)**	-	0.0941 (0.3256)	+	0.0247 (0.0557)	+	-0.0530 (0.0463)
Ch_ # SubAdvsr$_t$	+	0.7618 (0.6715)	-	0.3447 (0.7775)	+	0.1852 (0.6468)	+	-0.0320 (0.0611)
Sector_Perf$_t$	+	0.0229 (0.0570)	-	0.0126 (0.0399)	+	0.0031 (0.0184)	+	**-0.0113*** $^{\eta}$ **(0.0064)**
Acquirer_ Dummy		0.3552 (0.5131)		**0.5779*** **(0.3086)**		-0.2565 (0.4056)		0.0399 (0.0797)
Target_ Dummy		-0.0767 (0.4266)		-0.0995 (0.3201)		0.0156 (0.2138)		0.0125 (0.0847)
Large_ Board$_{t-1}$							+	-0.0668 (0.0538)
Director_ Indep$_{t-1}$							-	**-0.0989*** **(0.0687)**
IndepDrct_ Comp$_{t-1}$								**0.0089***** **(0.0020)**
Unconditional probability		1.30% (120/9,220)		1.70% (157/9,257)				
Adjusted R^2		10.92%		2.52%		4.31%		23.85%

$^{\eta}$ Indicates that a coefficient is significant and has the 'wrong' sign.

Table V
Summary statistics on contract changes: sample period 2002-2006

Time-series of contracts and contract changes

Year	Market return	Aggr. Net New Cash Flow[a] (billion $)	Frequency of semi-annual contract changes	Frequency of semi-annual contract changes: Non-scandal family funds	*Frequency of semi-annual contract changes: Scandal family funds*	Median fund size (million $): Non-scandal family funds	*Median fund size (million $): Scandal family funds*	Average fund size (million $): Non-scandal family funds	*Average fund size (million $): Scandal family funds*	Mean Marginal rate of contract[b] (basis points) All funds	Mean Marginal rate of contract[b] (basis points): Non-scandal family funds	*Mean Marginal rate of contract[b] (basis points): Scandal family funds*
2002	-23%	-27.6	5.69%	5.41%	*9.21%*	99.70	*492.90*	501.06	*2963.44*	79	80	*73*
2003	26%	152.3	4.20%	4.02%	*6.21%*	87.30	*421.00*	393.57	*1867.19*	79	80	*73*
2004	9%	177.8	6.06%	5.31%	*13.71%*	80.85	*400.25*	333.55	*1223.16*	79	80	*71*
2005	3%	135.6	6.04%	4.98%	*16.86%*	118.65	*544.55*	477.99	*1352.43*	77	78	*65*
2006	14%	159.4	7.37%	6.96%	*11.64%*	136.60	*607.30*	625.01	*1283.93*	75	76	*62*

[a] Aggregate flow data are obtained from the Investment Company Fact Book (ICI, 2009).
[b] Marginal rate of the contract: for linear contracts, this is the single rate; for concave contracts, this is the applicable rate based on monthly average total net assets.
The scandal funds are defined as those in families involved in market-timing scandals. They are identified through searches of SEC press releases in 2004 and 2005. The families are AIM, Nations Funds (Bank of America), Columbia, Franklin, Fremont, Invesco, Janus, Putnam, and RS Investment.

Table VI
Regression analysis: sample period 2002 - 2006

Model (3)

$Prob\ [Rate\_Change_t\ ] = Logit\ (a_0 + a_1\ Size_{t-2} + a_2\ High\_Growth_{t-1} + a_3\ Alpha\_4Factor_{t-1} + a_4\ Fund\_Mktshr_{t-2}$
$+ a_5\ Family\_Size_{t-2} + a_6\ High\_Family\_Growth_{t-1} + a_7\ Family\_Alpha\_4Factor_{t-1} + a_8\ Family\_Mktshr_{t-2}$
$+ a_9\ High\_Fee_{t-1} + a_{10}\ Ch\_Services_t + a_{11}\ Ch\_Turnover_t + a_{12}\ Ch\_\#\ SubAdvsr_t + a_{13}\ Sector\_Perf_t$
$+ a_{14}\ Acquirer\_Dummy + a_{15}\ Target\_Dummy + a_{16}\ Post2004_t + a_{17}\ Scandal + a_{18}\ Post2004_t * Scandal)$

The dependent variable in model (3) is $Rate\_Change_t$ (= 1 if $\Delta Mrgrt_t > 0$; = 0 if $\Delta Mrgrt_t = 0$; and = -1 if $\Delta Mrgrt_t < 0$). The sample for column (1) is based on 9,192 fund filings from 2002 to 2006 that satisfy the data requirement.

Model (4)

$Prob\ [Rate\_Decrease_t\ ] = Logit\ (a_0 + a_1\ Size_{t-2} + a_2\ High\_Growth_{t-1} + a_3\ Alpha\_4Factor_{t-1} + a_4\ Fund\_Mktshr_{t-2}$
$+ a_5\ Family\_Size_{t-2} + a_6\ High\_Family\_Growth_{t-1} + a_7\ Family\_Alpha\_4Factor_{t-1} + a_8\ Family\_Mktshr_{t-2}$
$+ a_9\ High\_Fee_{t-1} + a_{10}\ Ch\_Services_t + a_{11}\ Ch\_Turnover_t + a_{12}\ Ch\_\#\ SubAdvsr_t + a_{13}\ Sector\_Perf_t$
$+ a_{14}\ Acquirer\_Dummy + a_{15}\ Target\_Dummy + a_{16}\ Post2004_t + a_{17}\ Scandal + a_{18}\ Post2004_t * Scandal +$
$a_{19}\ InverseMillsRatio)$

The dependent variable in model (4) is $Rate\_Decrease_t$ (= 1 if $\Delta Mrgrt_t < 0$; and = 0 if $\Delta Mrgrt_t > 0$). The sample for column (2) is based on 523 contract changes from 2002 to 2006 that result in either a marginal rate increase or a marginal rate decrease. To control for potential selection bias, we run a first stage regression with a contract change indicator as the dependent variable and the same right-hand-side variables as in model (3). The Inverse Mills Ratio generated from the first stage is then included in model (4) as one of the independent variables (*InverseMillsRatio*).

Variables definitions are in the Appendix. The standard errors from the regressions are clustered by family, year and fund objective and are reported in parentheses. ***, **, * represent significance levels at 1%, 5%, and 10%, respectively, for one-tailed t-tests for variables with predicted signs and two-tailed tests otherwise. Coefficients with P-values below 0.1 are bolded.

		Column (1)		Column (2)
Dependent variable N (Y=1)	Exp. Sign	**Model (3)** **Ordered Logit** **$Rate\_Change_t$** Y=1 if ΔMrgrt > 0 Y=0 if ΔMrgrt = 0 Y=-1 if ΔMrgrt < 0 9,192	Exp. Sign	**Model (4)** **Logit** **$Rate\_Decrease_t$** Y=1 if ΔMrgrt < 0 Y=0 if ΔMrgrt > 0 523 (312)
$Size_{t-2}$	-	-0.0110 (0.0799)	+	0.0106 (0.1129)
$High\_Growth_{t-1}$	-	0.2198 (0.2304)	+	-0.1570 (0.2587)
$Alpha\_4Factor_{t-1}$	+	**0.0730*** **(0.0527)**	-	**-0.2559*** **(0.1726)**
$Fund\_Mktshr_{t-2}$	+	-0.2679 (0.2758)	-	0.1784 (0.3372)
$Family\_Size_{t-2}$	-	**-0.0062**** **(0.0032)**	+	**0.0193**** **(0.0111)**
$High\_Family\_Growth_{t-1}$	-	**-0.4289***** **(0.1721)**	+	**1.0256***** **(0.2709)**
$Family\_Alpha\_4Factor_{t-1}$	+	-0.0485 (0.1088)	-	**-0.6962**** **(0.3855)**
$Family\_Mktshr_{t-2}$	+	-0.2142 (0.1713)	-	-0.0520 (0.4376)
$High\_Fee_{t-1}$		**-0.5566***** **(0.1253)**		**1.1418***** **(0.2295)**
$Ch\_Services_t$	+	-0.0398 (0.0609)	-	0.0711 (0.0653)
$Ch\_Turnover_t$	+	-0.0026 (0.0303)	-	0.0246 (0.2477)
$Ch\_\#SubAdvsr_t$	+	0.0975 (0.2661)	-	0.1846 (0.1861)
$Sector\_Perf_t$	+	0.0293 (0.0411)	-	-0.2012 (0.1299)
Acquirer_Dummy		**-0.5504***** **(0.1518)**		**0.8939***** **(0.3070)**
Target_Dummy		0.0839 (0.1609)		-0.3105 (0.3280)
$Post2004_t$		-0.0261 (0.1485)		0.2735 (0.3042)
Scandal		0.5594 (0.3900)		**-1.0865*** **(0.6452)**
$Post2004_t$ * *Scandal*	-	**-1.2083**** **(0.5288)**	+	**2.1275***** **(0.7465)**
InverseMillsRatio				0.3287 (0.2010)

Unconditional probability				60% (312/523)
Adjusted R^2		3.75%		25.55%

Internet Appendix for
"Why Do Mutual Fund Advisory Contracts Change?
Performance, Growth, and Spillover Effects"*

This document provides details of the robustness tests summarized in Section IV, part C of the main text.

A. Goodness of fit of the regression models

Table IA.I provides an assessment of the goodness of fit of the regression models in Table IV in the main text. We rank funds based on their predicted values of the dependent variable (likelihood of a rate increase in column (1), likelihood of a rate decrease in column (2), rate changes in column (4)) and assign the funds into deciles. For each decile, Table IA.I shows the mean predicted and the mean realized value of the dependent variable. The results suggest that the predicted values and realized values line up reasonably well for all three regression models, with correlation coefficients varying between 0.68 and 0.90. Further, predicted and realized values for extreme deciles are similar.

[Insert Table IA.I here]

B. Lagged two- and three-year performance

Table IV in the main text includes only lagged one-year fund and family performances on dollar asset growth and star funds. We extend the performance window and add the lagged two-year and three-year performances. The logistic regression results of the extended model are reported in Table IA.II columns (1) and (2), for rate increases and rate decreases, respectively. The data requirement for the lagged two-year and three-year performance reduces the sample size by about a third. We find that star performance in year t-2 is significantly positively related

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to the likelihood of a rate increase, and high dollar asset growth in year t-3 significantly reduces the rate increase probability. Both higher fund dollar asset growth and higher family asset growth in year t-2 are significantly related to higher likelihoods of rate decreases. The results on the other variables are generally consistent with those reported in Table IV in the main text. Because of the loss of observations, we do not include the lagged two-year and three-year performances in our subsequent regressions. However, our inferences are not affected when these variables are included.

[Insert Table IA.II here]

C. Alpha as return performance measure

Star funds proxy for abnormal return performance in the main text. This helps capture the empirical regularity that flows respond more to good performance than bad performance (e.g. Ippolito (1992) and Sirri and Tufano (1998)). As a robustness check, we estimate a regression model with the alternative continuous performance measure of four-factor alpha based on the Fama-French three factors (1993) and the momentum factor. The logistic regression results are reported in Table IA.II columns (4) and (5), for rate increases and rate decreases, respectively. We find that higher four-factor alpha is significantly positively related to the likelihood of rate increases; while larger fund size and higher dollar asset growth are significantly positively related to the likelihood of rate decreases. Therefore, our main inferences from Table IV in the main text are supported when four-factor alpha is the performance measure, although the evidence on within family performance-related spillover is weaker.

D. Rate increases and shareholder voting

Mutual funds generally need approval by a majority of shareholders before increasing contractual fees. We search the relevant EDGAR filings for information on shareholder vote. We are able to verify that for 75 out of the 212 rate increases there is a shareholder vote approving the rate increase.[1] The mean (median) marginal rate change for these 75 cases is 32 (25) basis points, with a median marginal rate increase of 50%. To see if this subsample of rate increases behaves differently, we repeat our logistic analysis. The results are reported in Table IA.II column (3). We find a lower likelihood of rate increases for funds with higher asset growth, and a higher likelihood of rate increases for star funds and funds in families with other star funds. A vote to increase rates is less likely if rates are already high. These findings reinforce our main inferences about rate increases from Table IV in the main text.

E. Fee waivers

Fund advisors sometimes waive a portion of the advisory fee (see Christoffersen (1998)). The marginal rates we use in our sample (those reported to the SEC in form N-SAR) include fee waivers. Our hypothesis tests apply and are valid even when the source of a marginal rate change is a waiver change. However, it is difficult to determine whether changes in fee waivers are a significant source of variation in marginal rates. To investigate fund fee waivers, we match our contract change sample with the Lipper fee waiver data from 1993 to 2005. Out of the 611 funds with contract changes, we are able to find only 190 (31%) with names in the Lipper fee waiver database. Among these, 34 have complete information on advisory fees, fee waivers and lagged total net assets in the year before and the year of the contract change.[2]

F. Other robustness checks

Additional tests show that the paper's overall conclusions are not highly sensitive to alternative variable definitions or econometric procedures. Specifically, using investment objective-adjusted growth measures in the regressions yields similar results to those reported in

[1] In the remaining 137 cases, there is insufficient information from N-SARs or N-30Ds to make this determination. It is possible that some of these cases had rate increases because of a reduction in fee waivers (see Section E).

[2] The low match rate with Lipper can be due to survivorship bias in the Lipper fee waiver data, confirmed in our discussion with Lipper and documented by Christoffersen (1998). In addition, we insist on precise matches in fund names. Among the 137 cases where there is a rate increase but we cannot verify a shareholder vote only five report any fee-waiver information in the two-year period surrounding the contract change in the Lipper fee waiver database.

Table IV in the main text. When we use a Tobit procedure to jointly estimate both the direction and magnitude of rate changes, the conclusions are unchanged. Furthermore, since Tobit restricts the coefficients on the explanatory variables to be the same in both the rate change direction and the rate change magnitude regressions, we use a Heckman (1979) two-stage estimation procedure to allow for different coefficients in the two regressions. Again our conclusions are unaffected.[3] Finally, since electronic N-SAR filings are not required until the later half of 1996, we conduct our analysis using data from 1997 to 2001, and find our inferences unchanged.[4]

[3] The Tobit and Heckman procedures are for rate increases and rate decreases separately so that the dependent variable in the rate change direction analysis is a dichotomous (instead of ordinal) variable.

[4] *Sector_Perf* has an insignificant coefficient in all regression models, except for model (2) in Table IV column (4), where this variable is marginally significant but with the "wrong" sign. The coefficient on *Ch_Services* in Table IA.II column (3) also has the "wrong" sign and is marginally significant.

Table IA.I
Good of fit of regression models in Table IV in the main text

For columns (1), (2) and (4) in Table IV, we rank funds based on their predicted values of the dependent variable (likelihood of a rate increase in column (1), likelihood of a rate decrease in column (2), rate changes in column (4)) and assign the funds into deciles. For each decile, Panel B shows the mean predicted and the mean realized values of the dependent variable. Pearson correlation coefficients are calculated between the mean predicted values and realized values across the 10 deciles. ***, **, * represent significance levels at 1%, 5%, and 10%, respectively.

Regression Model in Panel A	Logit Rate Increase (1)		Logit Rate Decrease (2)		OLS Rate Changes (3)	
Decile	Mean predicted probability	Mean realized probability	Mean predicted probability	Mean realized probability	Mean predicted rate change (basis points)	Mean realized rate change (basis points)
1	0.15%	0.11%	0.82%	1.73%	-28	-30
2	0.19%	0.00%	1.03%	0.86%	-20	-23
3	0.22%	0.54%	1.10%	0.65%	-12	-11
4	0.29%	0.43%	1.29%	0.86%	-1	3
5	0.67%	1.30%	1.50%	0.86%	4	3
6	1.38%	1.74%	1.61%	1.73%	8	14
7	1.59%	0.76%	1.71%	2.27%	12	15
8	1.81%	1.74%	1.88%	1.40%	14	15
9	2.24%	1.30%	2.33%	2.27%	19	12
10	4.47%	5.10%	3.68%	4.32%	29	29
Correlation coefficient	0.86***		0.66**		0.90**	

Table IA.II
Analysis of advisor fee rate changes: Alternative model specifications

Model (5)

$Prob\ [Event_t\ ] = Logit\ (a_0 + a_1\ Size_{t\text{-}2} + a_2\ High\_Growth_{t\text{-}1} + a_3\ Star_{t\text{-}1} + a_4\ Fund\_Mktshr_{t\text{-}2}$
$+ a_5\ Family\_Size_{t\text{-}2} + a_6\ High\_Family\_Growth_{t\text{-}1} + a_7\ Other\_Stars_{t\text{-}1} + a_8\ Family\_Mktshr_{t\text{-}2}$
$+ a_9\ High\_Fee_{t\text{-}1} + a_{10}\ Ch\_Services_t + a_{11}\ Ch\_Turnover_t + a_{12}\ Ch\_\#\ SubAdvsr_t + a_{13}\ Sector\_Perf_t$
$+ a_{14}\ Acquirer\_Dummy + a_{15}\ Target\_Dummy$
$+ a_{16}\ High\_Growth_{t\text{-}2} + a_{17}\ Star_{t\text{-}2} + a_{18}\ High\_Family\_Growth_{t\text{-}2} + a_{19} Other\_Stars_{t\text{-}2}$
$+ a_{20}\ High\_Growth_{t\text{-}3} + a_{21}\ Star_{t\text{-}3} + a_{22}\ High\_Family\_Growth_{t\text{-}3} + a_{23}\ Other\_Stars_{t\text{-}3})$

Columns (1) and (2) report logistic regression results of rate increases and rate decreases where we include lagged 2-year and 3-year performances at the fund and family levels. Column (3) reports logistic regression results of rate increases where the rate increases are associated with a shareholder vote. The dependent variable $Event_t$ is defined as $Rate\_Increase_t$ (= 1 if $\Delta Mrgrt_t > 0$ and = 0 if $\Delta Mrgrt_t = 0$) in column (1) and column (3) and $Rate\_Decrease_t$ (= 1 if $\Delta Mrgrt_t < 0$ and = 0 if $\Delta Mrgrt_t = 0$) in column (2).

Model (6)

$Prob\ [Event_t\ ] = Logit\ (a_0 + a_1\ Size_{t\text{-}2} + a_2\ High\_Growth_{t\text{-}1} + a_3\ Alpha\_4Factor_{\ t\text{-}1} + a_4\ Fund\_Mktshr_{t\text{-}2}$
$+ a_5\ Family\_Size_{t\text{-}2} + a_6\ High\_Family\_Growth_{t\text{-}1} + a_7\ Family\_Alpha\_4Factor_{t\text{-}1} + a_8\ Family\_Mktshr_{t\text{-}2}$
$+ a_9\ High\_Fee_{t\text{-}1} + a_{10}\ Ch\_Services_t + a_{11}\ Ch\_Turnover_t + a_{12}\ Ch\_\#\ SubAdvsr_t + a_{13}\ Sector\_Perf_t$
$+ a_{14}\ Acquirer\_Dummy + a_{15}\ Target\_Dummy)$

Columns (4) and (5) are estimated based on model (6) and report regression results of rate increases and rate decreases where return performance is the continuous measure of four-factor alpha.

Variables definitions are in the Appendix. The standard errors from the regressions are clustered by family, year and fund objective and are reported in parentheses. ***, **, * represent significance levels at 1%, 5%, and 10%, respectively, for one-tailed t-tests for variables with predicted signs and two-tailed tests otherwise. Coefficients with P-values below 0.1 are bolded.

		Column(1) Lagged 2 & 3 year performance		**Column (2) Lagged 2&3 year Performance**		**Column (3) Shareholder vote**			**Column (4) Four-Factor Alpha**		**Column(5) Four-Factor Alpha**
Dependent variable N (Y=1)	Exp Sign	**Model (5)** Rate_Increase$_t$ Y=1 if ΔMrgrt > 0; Y=0 if ΔMrgrt = 0 6,041 (86)	Exp Sign	**Model (5)** Rate_Decrease$_t$ Y=1 if ΔMrgrt < 0; Y=0 if ΔMrgrt = 0 6,051 (96)	Exp Sign	**Model (1)** Rate_Increase$_t$ Y=1 if ΔMrgrt > 0; Y=0 if ΔMrgrt = 0 9,151 (51)	**Dependent Variable**	Exp Sign	**Model (6)** Rate_Increase$_t$ Y=1 if ΔMrgrt > 0; Y=0 if ΔMrgrt = 0 9,220 (120)	Exp Sign	**Model (6)** Rate_Decrease$_t$ Y=1 if ΔMrgrt < 0; Y=0 if ΔMrgrt = 0 9,257 (157)
$Size_{t-2}$	-	-0.0097 (0.0914)	+	**0.0563***** **(0.0156)**	-	0.0152 (0.0815)	$Size_{t-2}$	-	-0.0480 (0.1065)	+	**0.0623***** **(0.0168)**
$High\_Growth_{t-1}$	-	-0.0683 (0.2713)	+	0.2302 (0.2458)	-	**-0.5170*** **(0.3244)**	$High\_Growth_{t-1}$	-	-0.0945 (0.2576)	+	**0.3022*** **(0.2101)**
$Stars_{t-1}$	+	**0.8303**** **(0.3616)**	-	-0.7052 (0.7144)	+	**1.2719***** **(0.3977)**	$Alpha\_4Factor_{t-1}$	+	**0.1747***** **(0.0643)**	-	0.0623 (0.0566)
$Fund\_Mktshr_{t-2}$	+	0.2785 (0.5040)	-	-0.3530 (0.3880)	+	-0.5378 (0.5450)	$Fund\_Mktshr_{t-2}$	+	-0.0012 (0.4106)	-	-0.1605 (0.3194)
$Family\_Size_{t-2}$	-	**-0.0085*** **(0.0059)**	+	0.0034 (0.0035)	-	0.0009 (0.0020)	$Family\_Size_{t-2}$	-	-0.0048 (0.0045)	+	0.0015 (0.0033)
$High\_Family\_Growth_{t-1}$	-	-0.0818 (0.3986)	+	0.3460 (0.4626)	-	0.6989 (0.4262)	$High\_Family\_Growth_{t-1}$	-	0.3559 (0.3691)	+	**0.6237*** **(0.4575)**
$Other\_Stars_{t-1}$	+	**0.5620**** **(0.2759)**	-	0.2228 (0.2995)	+	**0.5601*** **(0.4151)**	$Family\_Alpha\_4\ Factor_{t-1}$	+	0.1039 (0.2187)	-	0.0472 (0.1028)
$Family\_Mktshr_{t-2}$	+	0.0921 (0.3318)	-	0.1257 (0.5378)	+	0.2857 (0.5331)	$Family\_Mktshr_{t-2}$	+	0.3485 (0.4064)	-	-0.3032 (0.5827)
$High\_Fee_{t-1}$		**-2.1913***** **(0.4333)**		**0.3971**** **(0.2246)**		**-3.1812***** **(0.7671)**	$High\_Fee_{t-1}$		**-2.0550***** **(0.3340)**		**0.4358**** **(0.1999)**
$Ch\_Services_t$	+	**0.2920***** **(0.1078)**	-	-0.1739 (0.1682)	+	**-0.2751*** $^{\eta}$ **(0.1521)**	$Ch\_Services_t$	+	**0.3410***** **(0.0964)**	-	-0.1624 (0.1463)

$Ch\_Turnover_t$	+	0.0977 (0.2784)	-	0.1870 (0.4148)	+	0.1186 (0.3883)	*$Ch\_Turnover_t$*	+	**0.4246***** **(0.1800)**	-	0.0970 (0.2841)
$Ch\_$ $\#SubAdvsr_t$	+	0.3375 (1.1222)	-	-0.1450 (1.0080)	+	-0.7770 (0.7182)	*$Ch\_$ $\#SubAdvsr_t$*	+	0.7204 (0.6505)	-	0.3702 (0.7793)
$Sector\_Perf_t$	+	0.0295 (0.0710)	-	0.0312 (0.0487)	+	0.0535 (0.0967)	*$Sector\_Perf_t$*	+	0.0334 (0.0639)	-	0.0119 (0.0393)
Acquirer_ Dummy		0.2262 (0.6211)		**0.7500**** **(0.3336)**		0.6196 (0.6561)	*Acquirer_ Dummy*		0.3242 (0.4996)		**0.5482*** **(0.3067)**
Target_ Dummy		-0.1665 (0.5743)		-0.2773 (0.4634)		-0.1781 (0.6438)	*Target_ Dummy*		-0.0284 (0.4192)		-0.0554 (0.3136)
$High\_Growth_{t-2}$	-	-0.0887 (0.3041)	+	**0.4692*** **(0.3557)**							
$Stars_{t-2}$	+	**1.0467***** **(0.3997)**	-	-0.6408 (0.6382)							
$High\_Family\_$ $Growth_{t-2}$	-	0.6038 (0.3785)	+	**0.8375*** **(0.5833)**							
$Other\_Stars_{t-2}$	+	-0.1278 (0.3248)	-	-0.0893 (0.2640)							
$High\_Growth_{t-3}$	-	**-0.6509**** **(0.3777)**	+	0.0588 (0.3380)							
$Stars_{t-3}$	+	0.0262 (0.5514)	-	-0.0433 (0.4342)							
$High\_Family\_$ $Growth_{t-3}$	-	0.2791 (0.3849)	+	-1.3317 (0.9057)							
$Other\_Stars_{t-3}$	+	0.2951 (0.2592)	-	0.0803 (0.2509)							
Unconditional probability		1.42% (86/6,041)		1.59% (96/6,051)		0.56% (51/9,151)			1.30% (120/9,220)		1.70% (157/9,257)
Adjusted R^2		11.62%		5.12%		13.47%			10.28%		2.61%

[η] Indicates that a coefficient is significant and has the 'wrong' sign.