

Attracting Flows by Attracting Big Clients

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Abstract

We explore a new channel for attracting inflows using a unique dataset of corporate 401(k) retirement plans and their mutual fund family trustees. Families secure substantial inflows by being named trustee. We find that family trustees significantly overweight, and are reluctant to sell, their 401(k) client firm's stock. Trustee overweighting is more pronounced when the relationship is more valuable to the trustee family, and it is concentrated in those funds receiving the greatest benefit from the inflows. We quantify this flow benefit and find that inclusion in the 401(k) plan has an economically and statistically large, positive effect on inflows.

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Retirement assets make up a large and growing percentage of the mutual fund universe. In 2004, nearly 40% of *all* mutual fund assets were held by Defined Contribution Plans and Individual Retirement Accounts. This percentage is steadily increasing largely because these retirement accounts represent the majority of new flows into non-money market mutual funds (60% in 2004).¹ With such a large and growing percentage of their assets coming from retirement accounts, mutual funds are likely to be interested in securing these big clients. Previous literature on the agency problems associated with increasing funds under management has concentrated on the flow-performance relationship (Brown, Harlow and Starks (1996), Goetzmann and Peles (1997), and Sirri and Tufano (1998)). In this paper we examine a new channel through which mutual fund families can attract assets: by becoming the trustee of a 401(k) plan.

The trustee position in 401(k) plans plays a fundamental role in our analysis. Under the United States Code, 401(k) plan sponsors must appoint a trustee who holds fiduciary responsibility over the plan assets. Included in the trustee's duties are the obligations to act in a "prudent" manner regarding employee contributions and to ensure that the plan offers a diversified and suitable set of investment options to plan participants.² Thus, it is the *trustee*, along with the other fiduciaries (usually company affiliates), who decides which investment options will be available to employees.

Many plans employ large mutual fund families (often with pension management divisions) as their trustees. Perhaps not surprisingly, in most plans the majority, and in some cases all, of the fund options are those of the trustee (Huberman and Jiang (2006), Elton, Gruber and Blake (2006)). For example, in 1997, T. Rowe Price was the trustee of CB Richard Ellis Services Inc.'s 401(k) plan. This plan offered 15 investment options: one was CB Richard Ellis company stock. The remaining 14 were T. Rowe Price mutual funds.

From the family's perspective, becoming the trustee of a large 401(k) plan is attractive for several reasons. First, by becoming the trustee, the family guarantees a large inflow of money

in the form of plan assets invested in family funds. In our sample, the average 401(k) plan has more than \$550 million in assets, or about 9% of the assets held by the average family. Second, the employees become captive investors in the plan options. A typical 401(k) plan in our sample has 13 options, one of which is company stock and another is a money market fund. Most, if not all, of the remaining options are mutual funds chosen (at least in part) by the trustee. Employees are able to invest and move their 401(k) retirement assets only between these plan options. Thus, in addition receiving an initial large inflow, the trustee fund family receives additional flows in retirement contributions as the employees save each year. Third, 401(k) plans rarely change trustees. In our sample, the unconditional probability that a company will change trustees in a given year is about 3.4%. Search costs, administrative costs, the cost to employees of rebalancing, and similar factors likely explain this low rate of transfer. Thus, the expected future benefits of the relationship are relatively long-lived.

Given the size and importance of sponsor firms' 401(k) assets to mutual funds, and the complex set of agency relationships within mutual fund conglomerates, it's important to understand: (i) how portfolio allocations are affected by the trustee relationship, and (ii) what the sources (if any) of these distortions are. In this paper we concentrate on the first point and provide strong evidence that the trustee relationship affects portfolio allocations. In addition, we provide evidence on the nature and timing of these distortions that may be useful in assessing how the relationship affects trustees' portfolio choices.

Let us first describe the main empirical results. We find that families acting as trustees systematically overweight their sponsor firms. One measure we use is the proportion of the firm's shares outstanding held by the family. Controlling for other firm, family, and plan characteristics, trustee families hold significantly more in sponsor firms (nearly 47% more on average). This translates

into holding on average about \$62 million more in each of the sponsor firms, which implies a total distortion over the industry of more than \$24 billion.

In order to gain a better sense of what could be driving this overweighting, we look into other portfolio choices taken by the trustee and find a number of additional effects. We find, first, that the trustee overweighting is largest when it appears to be most valuable for the mutual fund family. Specifically, overweighting is more severe for (i) relatively larger 401(k) plans, (ii) relatively smaller fund families, and (iii) those mutual funds included as options in the 401(k) plan. Larger 401(k) plans imply larger benefits for the family (in the form of inflows and fees), and these benefits are relatively more valuable to smaller families (as a percentage of total assets). Last, we expect the benefits to accrue especially to those mutual funds included in the plan. The magnitudes of each effect are empirically large. Controlling for firm and family characteristics, a one standard deviation increase in 401(k) plan size results in 15% more overweighting (\$19 million) in the sponsor firm's stock. In addition, smaller trustee mutual fund families overweight significantly more than larger families, all else being equal. A one standard deviation decrease in fund family size results in about a 10% (\$12 million) more severe overweighting. We also find that although funds outside the plan overweight the sponsor stocks by 15% on average, trustee funds inside the plan overweight by 98% on average, or more than six times as much.

We next examine the dynamics of the trustee overweighting. First, we find that the trustee behaves differently from other families when it comes to trading its sponsor firm's stock. Specifically, we find that when mutual funds are on aggregate selling off a sponsor firm's shares, trustees take the opposite position and significantly increase their holdings of the sponsor firm's stock. We look for events in which mutual funds collectively sell more than 1% of the total shares outstanding of the sponsor firm (the top decile of share-selling). In these cases, we find that whereas non-trustees significantly decrease their holdings by 2.6% on average, the trustee significantly *increases* its

position on the stock by 11.45%. Similar conclusions follow from looking at times around negative Cumulative Abnormal Returns (*CAR*) surrounding earnings news. Both results suggest that trustees behave differently, seemingly at times when it may be of value to the sponsor firm. Next, we look at the how changes in trustees affect their holdings of the sponsor firm's stock. We provide initial evidence that fund families increase the amount invested in the sponsor firm's stock during their first years as the trustee and decrease the amount invested in the sponsor firm's stock in the years after they end the trustee relationship.

We also quantify the flow benefit to the trustee mutual funds of being included in the sponsor firm's 401(k) plan, and find that these benefits are economically and statistically large. If we take a fund the same size as the average trustee fund in the plan, with the same past returns and same flow to its style, we find that trustee funds in 401(k) plans have on average more than 35% higher flows and are over 40% less likely to experience outflows. Consistent with the existing evidence that 401(k) participants rarely change allocations or deferral choices in plans (Mitchell et al. (2006)), we also find that the annual flow increase is performance-insensitive (it accrues to trustee funds equally across all levels of past performance).

The paper is organized as follows. Section I provides a brief background and literature review. Section II describes the data. Section III presents our main findings on overweighting. Section IV provides evidence on the portfolio changes around trustee changes, and quantifies the flow benefit to trustee mutual funds included in the 401(k) plan. Section V concludes.

I Background

Because the focus of this paper is on the trustee relationship, we provide a brief description of the trustee choice process.³ Each plan is required to appoint a trustee who holds fiduciary responsibility over the plan and is obliged not only to act in a "prudent" way with employee contributions but also to ensure that the plan offers a diversified, acceptable set of investment options.

We randomly selected and contacted 150 sponsor firms and 50 mutual fund families acting as trustees. The most common response by far from sponsor firms is that the trustee is chosen by the plan administrative (or investment) committee. This committee consists primarily of affiliated firm members, including directors and employees (usually management). Most firms stated that investment options are chosen jointly by the investment committee and trustee firm. On the trustee side, most funds also indicated that investment options in the plans were decided jointly with the plan committees. The majority of trustee fund families responded that they have specific brokers assigned to individual 401(k) plans, and that these brokers work with the plan committee and the trustee fund family in assessing each plan's needs.⁴

A large body of literature has established the link between a fund's returns and subsequent flows. This literature has found a generally positive relation: better-performing funds attract more flows, and, while investors pour money into strong-performing funds, they fail to pull money from poor-performing funds at the same intensity (Chevalier and Ellison (1997), Sirri and Tufano (1998), Goetzmann and Peles (1997)). A number of researches have explored the incentive effects of these findings and the resulting implications for portfolio choice. Chevalier and Ellison (1999) find that younger managers are penalized more severely for choices away from the fund-objective class mean, and thus are more likely to herd in general and to hold portfolios with less idiosyncratic risk. Brown, Harlow and Starks (1996) find that midyear losing managers tend to increase volatility of fund returns in the second half of the year more than midyear winners do. Gaspar, Massa and Matos (2006) examine the "allocation" of performance across funds within a mutual fund family and find evidence of strategic allocation of performance to funds that could potentially generate more revenue (e.g., higher fees) for the fund complex.⁵

Coupled with evidence on mutual funds, more evidence is pointing to new issues in the defined benefit plan structure. Cocco and Volpin (2005) find that when a defined benefit plan assigns

members of the board of directors to have fiduciary responsibility over the plan, the plan tilts more toward equities and has a higher dividend payout ratio. Bergstresser, Desai and Rauh (2005) find additional evidence that defined benefit plans make investment decisions in response to suspect incentives, while Goyal and Wahal (2005) find that defined benefit plans choose investments in a suboptimal way over time. The paper most relevant to ours is Davis and Kim (2006). They study the effect of business ties between mutual funds and 401(k) plans on the voting behavior of mutual fund families. The authors find that although particular pension ties to a firm do not make the family more likely to vote in that firm management's favor, the volume of pension business has strong predictive power for how management friendly a mutual fund is in general. They also examine overweighting for the one-year cross-section from mid-2003 to mid-2004 and do not find evidence of significant overweighting. In Section III we describe in more detail why our results differ on this dimension.

II Data

A 401(k) data

The majority of data we use comes from a hand-collected dataset of retirement plans sponsored by publicly traded firms matched to the stock holdings of mutual fund families. We gather information on 401(k) plans from Form 11-K documents filed by firms with the SEC and Form 5500 Filings filed with the Department of Labor (DOL).⁶ The 11-K data (SEC) is available for the fiscal years 1993 to 2003. Over this sample period, we hand collect all documents. Our initial sample thus represents the universe of firms filing 11-Ks with the SEC. In the 11-K document, we collect the total assets invested in the 401(k) plan, the proportion invested in company stock, the identity of the trustee and the amount invested in every mutual fund option in the 401(k) plan. So, for each plan-year filing, we can tell not only what funds are in the plan, but how much is invested in each fund. Our Form 5500 sample is from 1995 to 2004. The Form 5500 also has information on plan

assets and trustees, although it is not nearly as complete as 11-K data for our sample of firms. One data item we do collect from the Form 5500 is the fee paid to the trustee for trustee services.

The initial dataset contains more than 2,500 companies. For inclusion in our sample, however, the company must meet the following requirements. First, we need to be able to identify the company in the CRSP database. Companies in our 401(k) dataset are identified by their IRS Employer Identification Number (EIN). We use the CRSP/Compustat Merged Database to map the EINs into PERMNOs, CRSP's primary stock identifier. We then check each match by looking at the company's name. Once we have identified the companies, we exclude financial corporations (SIC codes between 6000 and 6999). We do this because they are usually the trustee of their own plan and there are likely other incentives and restrictions for holding their own stock. This gives us 1,537 companies. The final requirement is that we can identify the trustee of the company as a mutual fund family. Not all companies report their trustee and not all trustees are mutual fund families. Keeping only those plans that report one of the mutual fund families in our sample as their trustee leaves us with 899 companies. Of the 638 excluded trustees, 453 (nearly 70%) are missing, and the remaining are usually foreign banks or individuals within the company.

Companies often have more than one 401(k) plan. In the vast majority of cases, all plans from a given company belong to the same trustee. Whenever this happens, we sum the plan assets of the plans. In the few cases in which the company has two different trustees, we keep only the largest plan. This ensures that, at any given time, there is only one trustee for each company in our sample.

[Insert Table I Here]

Panel A of Table I lists summary statistics for the 401(k) plans. We measure the plan size throughout the paper as the *residual* of plan assets after subtracting out the amount of plan assets invested in company stock. We do this because restrictions are often placed on participants'

ability to transfer portions of their assets out of company stock (the company-matched portion), and the portion that is not restricted is empirically highly sticky within the company stock account (Huberman and Jiang (2006)). It is thus more reasonable to think of the amount of potentially transferrable assets into the funds of the trustee family as the residual plan assets after subtracting off this company stock piece. For brevity, we term this residual plan assets measure “plan assets”. The average size of a retirement plan in terms of this measure for our 1993 to 2003 sample is roughly \$553 million.⁷ In general, plan sizes increased over the sample, and the aggregate size of our sample peaked in 2003 at \$449 billion. In 2003, the largest plan in our sample had plan assets of nearly \$18 billion. The second and third largest plans that year had plan assets of roughly \$17 billion and \$14 billion, respectively. Our sample size averages 392 firms per year, and the sum of all plans’ assets averages about \$178 billion per year.

Panel B summarizes the sample at the fund level. For each 401(k) plan, we match every equity mutual fund to the CDA/Spectrum mutual fund holding database. This matching was done by hand because each plan uses different conventions for reporting fund names and fund level holdings. The average percentage of the funds that belong to the trustee fund family is 43%, while the average amount of plan assets in trustee mutual funds is roughly 45%. Further, for nearly 20% of our sample (about one in every five plans), the trustee fund family comprises 100% of the equity funds we are able to match from the plan.

B Matching Retirement and Mutual Fund Data

Our data on mutual fund holdings comes from the CDA/Spectrum Institutional holding database and the CDA/Spectrum Mutual Fund holding database. These contain the quarterly holdings of virtually all US investment companies.⁸

We first describe the data collection for the institutional data. We focus on the largest 100 mutual fund families because they better represent potential trustees for 401(k) plans.⁹ Our final

sample consists of 251 mutual fund families. Over 95% of the trustees identified as a mutual fund family are among the families in our final sample. In addition, these families represent over 80% of the total mutual fund industry, as measured by the market value of equity holdings.

We are mainly interested in comparing the holdings of the trustee family in the sponsor firm with those of a similar family. We therefore consider only families' holdings of companies in our 401(k) dataset. However, as we explain below, all equity holdings are included in the computation of aggregate measures, such as the total assets under management.¹⁰ We present summary statistics of the mutual fund families in our sample in Panel C of Table I. The average fund family in our sample has approximately \$12 billion in Total Net Assets (TNA).¹¹ Comparing the TNA of trustee and non-trustee fund families, we see that 401(k) plan trustees are on average larger families.

We then collect quarterly mutual fund level data for this same sample from CDA/Spectrum Mutual Fund holdings database. We include all equity mutual funds, presenting the fund level summary statistics in Panel D. The average TNA of a mutual fund in our sample is a little over \$1 billion. Comparing the size of mutual funds of trustees relative to non-trustees we see that the average trustee fund is about 50% larger than the average non-trustee fund.

The final step is to match our 401(k) dataset back to institution and fund level data on mutual funds. To do this, we first identify the trustees in the mutual fund dataset. We use the family name to match each company's trustee to its corresponding family in the CDA database. At the fund level, we take each mutual fund name provided in every 401(k) plan, and hand match this back to the corresponding fund name for that year in CDA. In sum, our final sample spans the years 1993 to 2003 and contains the number of shares that each of the 251 families (1,929 funds) in our sample owns of each of the 899 publicly traded companies whose 401(k) plan's trustee we matched as a mutual fund family.¹²

C Variable Construction

We focus on two measures of holdings, (i) how much of the family's assets are invested in a given stock (*% TNA*) and (ii) what fraction of the company's stock the family's holdings represent (*% Shares*). Our first measure, *% TNA*, for a given firm-family pair is measured as the market value of shares of the firm held by the specific family, divided by the family's total TNA. So if family f owns \$10 billion worth of firm s and has TNA of \$100 billion, *% TNA* for this observation will be 0.10. As such, it is a holdings measure from the family's viewpoint. From the company's point of view, the more relevant variable is our second measure, *% Shares*, which measures the percentage of shares outstanding of the company held by a given family. For the same family f and firm s pair as above, if the total market value of firm s is \$40 billion, then *% Shares* for the same observation will be 0.25. For some tests we also use a measure of time series changes in holdings, *Change*. *Change* is the number of shares held this period divided by the number of shares held last period, adjusted for splits.

We use a number of variables as controls for company and family characteristics. Size (*ME*) is the company's market value on the last day of the most recent quarter. Book-to-market (*BM*) is the ratio of the book-equity at the end of the firm's fiscal year during the calendar year preceding the formation date to the market value at the end of the preceding December (book-equity is calculated as in Fama and French (1992)). *Past Returns* are computed as the cumulative past returns of the firm over the previous 11 months (not including the last month of the quarter). *Future Returns* are computed as the cumulative future returns of the firm over the next 11 months. *Market Weight* is measured as the weight of the stock in the CRSP value-weighted market index. Finally, the *TNA* of a family is measured as the sum of the value of all equity holdings of that family in a given quarter.

We then compute two variables to measure the investment focus of the family, percentage invested in style (*% in Style*) and percentage invested in industry (*% in Ind*). To construct *% in*

Style, following Daniel et al. (1997), we create 27 style portfolios based on a triple sort on size, book-to-market and momentum.¹³ Once these portfolios are constructed and each stock is assigned a style, *% in Style* is computed as the proportion of the family's TNA in a given style. We construct *% in Ind* in a similar manner, but across industries. So, for each industry, defined by two-digit SIC code, we calculate the proportion of the family invested in this industry. For example, if at a given time firms s and h are in the same style category and industry and they are both held by the same family f , then they will have identical values of *% in Style* and *% in Ind*.

In our time series tests, we make use of changes over time in these explanatory variables. In addition, we use two independent variables: *CAR* and percentage of company sold (*% Comp Sold*). *CAR* is measured as the cumulative return from two days before to two days after the earnings announcement date from CRSP, minus the CRSP value-weighted index return. *% Comp Sold* is measured as minus the change in the percentage of shares held by all families in the CDA database from time $t - 1$ to time t . So if fund families held an aggregate of 10% of the shares of firm s last quarter, and hold 11% this quarter, *% Comp Sold* for firm s would be -1.

III Trustee Overweighting

In this section we document the initial empirical evidence on the portfolio choices of trustees in their 401(k) sponsor firm's stock. Specifically, we show that controlling for other firm, fund, and plan characteristics, the trustee of a 401(k) plan significantly overweights that 401(k)'s sponsor stock in its portfolio. Davis and Kim (2006) also examine how pension fund business ties affect mutual fund companies, focusing mainly on effects on the funds' proxy voting, although they do look at overweighting for their six largest pension tie funds and find no significant effect. The differences between our results and theirs are twofold in nature. First, we focus solely on the trustee relationship, whereas they examine *any* relation of the pension fund to the mutual fund, including administrative services and custodial services (the day-to-day servicing of the plan).

Second, we use an 11-year panel of the universe of mutual fund trustees, whereas Davis and Kim (2006) examine a one-year cross section of their six largest pension tie families.¹⁴

On the issue of the difference in samples between Davis and Kim (2006) and ours, when we restrict our sample to the six families they consider, focusing *only* on the trustee relationship and using our 11-year panel, we find, consistent with our results on other trustees, a significant overweighting by these trustees of their sponsor firms' stocks.

We focus on the trustee relationship because the trustee is involved in choosing investment options. We expect this to be the strongest tie, because the potential gains from attracting funds far outweigh those from the direct trustee fees. In fact, a Department of Labor study conducted in 1998 (DOL (2000)) found that 90% of fees paid by a 401(k) plan are investment management fees. In our sample, we estimate this using trustee fees and an estimation of investment management expenses paid by 401(k) plan investors. We calculate trustee fees from the Form 5500 filings, and use the average mutual fund management expense ratio in ICI (2006a), which estimates these expenses for a large sample of 401(k) plans. We calculate the average annual expense revenue from attracting a 401(k) plan to be almost \$4.2 million: the average size of plan assets invested in mutual funds in our sample of \$552 million, multiplied by the average expense ratio 0.76%, from ICI (2006a). This is more than 27 times the average trustee fee revenue in our sample of \$150,000, indicating that investment management expenses far outweigh the relatively small trustee fees received by the families.¹⁵

A Trustee Overweighting Regression Results

The specific action we test for in this section is the overweighting of the 401(k) sponsor firm's stock in the trustees' fund portfolios. We show here and in Section IV that firms both overweight the sponsor firm's stock and increase this overweighting around times of negative shocks. In the regressions of Table II, we separate out the effect of other characteristics that determine mutual

fund portfolio choice. Each dependent variable observation can be thought of as a triple (f, s, t) , where f is the family, s represents the stock, and t is the quarter. So, for example, the holdings of family f in firm s in the first quarter of 1995 would be one observation. The dependent variable in all regressions is $\text{Log}(\% \text{ Shares})$, and it measures the percentage of a firm's shares outstanding that the family holds.¹⁶ Our main variable of interest is *Trustee*, which is a categorical variable that identifies when a fund family is the trustee for a given sponsor firm. Thus, $\text{Trustee}(f, s, t)$ is 1 if, at time t , family f is the trustee of company s , and it is zero otherwise. The control variables, and their construction, were described in Section II. We include firm characteristics of $\text{Log}(ME)$, $\text{Log}(BM)$, and past year returns (*Past Returns*), to control for firm-specific reasons that a fund may be weighting in a security. For fund family controls, we include $\text{Log}(TNA)$ to control for the size of the family,¹⁷ and two variables discussed above, *% in Style* and *% in Ind*, to proxy for the investment focus of the family. We include these because a fund family might overweight the sponsor while decreasing the weight in a similar stock (same style or industry) to keep the fund's style or industry exposure the same. *Market Weight* is also included, and is the weight the stock would receive if the fund simply invested in line with the CRSP value-weighted market portfolio. We run the regressions using pooled regressions with quarter fixed effects, clustering our standard errors at the firm level.¹⁸

[Insert Table II Here]

Column 1 of Table II shows the main regression specification. To quell concerns that autocorrelation is driving the significance levels, in Column 2 we run the same specification but only on a single cross-section (which is why we cannot include the quarter fixed effect in Column 2). We choose the middle of our sample, June 1998. Note that the coefficient estimates and significance levels are quite similar across both estimation types (Columns 1 and 2), especially on the variable of interest, *Trustee*. Specifically, from Column 1 (full sample), the coefficient on the variable of

interest, *Trustee*, indicates that, controlling for other firm and family characteristics, a trustee invests $e^{0.385} - 1 = 46.9\%$ ($t = 6.89$) more in the sponsor firm's stock than do other families. This translates into an overweighting of about \$61,574,000 more in each of the sponsor firms, or a total distortion over the industry of more than \$24 billion.¹⁹ Other coefficients that affect the holdings decision are size, (the larger the firm, the smaller the percentage of entire shares outstanding the average family holds) and TNA (larger fund families hold larger amounts of stock as a percentage of shares outstanding). Both coefficients are highly significant. In addition, families seem to prefer stocks with higher past returns. Last, to get an idea of whether this effect is concentrated in a specific group of the firms, we perform an additional test. In Column 3, we run a separate test only on the sub-sample of fund families that are trustees at some point during the sample period. This gets at the idea that perhaps the right comparison sample for trustee family holdings should be only other trustee families (and not all other large fund families). From Column 3, the coefficient on *Trustee* is large and significant, with the point estimate even slightly larger than for the identical full sample specification in Column 1. We have, in addition to these tests, included direct trustee fees paid, even though they are an order of magnitude smaller than fees from fund expense ratios, to ensure that there is no substitution effect between the two. The coefficient on fees is neither significant, nor affects the magnitude or significance of *Trustee*.

It could be that the investment patterns we see are driven by superior information. On securing a trusteeship, the fund family may have access to information about the company that other funds lack. If the trustee were getting superior information, we would expect it to get both positive and negative signals, and thus it is not clear that this would induce a positive overweighting in holdings.²⁰ To test this explanation, we simply check whether the trustee is better at predicting the future returns of the sponsor firm, both relative to other stocks and other mutual fund families holding the sponsor firm's stock.

This test is in Column 4 of Table II. From the loadings on *Future Returns*, mutual fund families in our sample don't seem to be able to predict consistently which firms will have higher future returns.²¹ We then also include the interaction term $Trustee \times Future\ Returns$. This should measure the extent to which the trustee has superior ability to predict future returns of the sponsor firm, relative to other firms and other fund families. If the trustee does trade on superior information on securing the trusteeship, this coefficient should be positive and significant. From Column 4, it is close to zero and insignificant, suggesting that superior information cannot explain the overweighting of the sponsor firm's stock that we document.

B Additional Evidence: Small Funds and Large 401(k) Plans

In this section we examine whether overweighting is related to how greatly fund families are expected to benefit from the trustee relationship. Specifically, we look at the effect of the size of the mutual fund family and the size of the 401(k) plan on the tendency of trustees to overweight the sponsor firm's stock. Larger 401(k) plans represent more potential asset inflows to the fund families, whereas a given size 401(k) plan represents a larger relative increase in assets for smaller fund families. We create two interaction terms to measure these two implications. The first is $Trustee \times Log(TNA)$. The prediction is that this interaction term should be significantly negative. The smaller the mutual fund trustee, all else being equal, the more attractive a given 401(k) plan, since the plan will represent a larger percentage increase in TNA. The second interaction term is $Trustee \times Log(401(k)\ Size)$. We expect this interaction term to have a significantly positive coefficient. The larger the plan, the larger the benefit a given mutual fund will receive for attracting it.

The tests for both interaction terms are in Column 5 of Table II. Consistent with the trustees' overweighting being greater at times of most value to them, we find evidence for a more severe overweighting in both mechanisms. First, controlling for other firm, fund, and plan characteristics

(including the size of the 401(k) plan), a decrease in the size of the fund family significantly increases the extent of overweighting $Trustee \times \text{Log}(TNA)$. The coefficient in Column 6 implies that a one standard deviation decrease in fund size implies a 10% increased overweighting (\$12,121,000). The second interaction term, that on plan size, implies that, controlling for other characteristics (including fund size), a given fund family will overweight significantly more to retain larger 401(k) plans. The coefficient on this interaction term implies that a one standard deviation increase in the size of the 401(k) plan increases overweighting by the family by \$19,561,000, or 15%. We have also used size of the 401(k) plan as a percentage of TNA, and find similar magnitudes and significance.

C Fund Level Evidence

In this section, we examine mutual fund level holdings to gain further insight into the forces that drive the trustee family overweighting. We do this for two main reasons: first, it allows us to test varied implications of trustee overweighting *within* the trustee fund family, and second, it addresses one possible confounding accounting issue in the family level reporting of the sponsor firm's stock. Some families may report the company stock held by employees in their 401(k) plans as assets under management, which would be included in the 13-f filing. Although the subset of trustees we contacted indicated that they do not account for company stock in 401(k) plans as an asset they hold, it does not preclude other trustees in our sample from this practice. If so, then the results we document in the previous subsections may be mechanically caused by this accounting method. Using mutual fund level data, we can include equity mutual funds only in our analysis, and thus alleviate this mechanical accounting concern. We first replicate the regression as in Table II, but now using mutual fund level holdings data. Thus, we are measuring the weights managers place at the fund level. As such, we now define *Trustee* as equal to 1 if a mutual fund manager whose fund belongs to to the trustee family is holding the sponsor firm's stock. The results are in

Table III. From Column 1, we see that the fund level overweighting is nearly identical to that at the family level. Specifically, the coefficient on *Trustee*, indicates that, controlling for other firm and fund level characteristics, a trustee mutual fund invests 43.3% ($t = 8.37$) more in the sponsor firm's stock than do other funds.

[Insert Table III Here]

Using data at the fund level also allows us to test where, within the trustee fund family, the overweighting is being concentrated. Specifically, the mutual funds included in the sponsor firm's 401(k) plan are those that capture most of the benefits of the increased flows into their mutual funds. In line with the the results on smaller families and larger 401(k) plans, it may be reasonable, then, that they might be where we see the greatest overweighting. To test this, we match the CDA/Spectrum mutual fund holdings level data to the data on mutual funds contained in the sponsor firm's 401(k) plans, hand-collected directly from the 11-K filings. We then split trustee family mutual funds into two categories. The first is those mutual funds included in the sponsor firm's 401(k) plans. The variable *Plan Trustee Fund* measures this group's sponsor firm stock overweighting. It is equal to 1 for a trustee mutual fund that is holding a sponsor firm's stock in whose 401(k) plan its mutual fund is also included, and zero otherwise. The second group of funds are those trustee mutual funds not included in sponsor firm 401(k) plans. The variable *Non-Plan Trustee Fund* measures this group's sponsor firm stock overweighting and is defined congruent to *Plan Trustee Fund*. We can see that $Plan\ Trustee\ Fund + Non-Plan\ Trustee\ Fund = Trustee$, (the original trustee variable). The results of these tests are in Columns 2-4 of Table III. First, examining the overweighting of those trustee mutual funds outside the sponsor firm's 401(k) plans, the coefficient on *Non-Plan Trustee Fund* in Column 4 of 0.137 ($t = 3.04$) implies an overweighting of 15% by these funds. For those mutual funds included in the 401(k) plan, the coefficient on *Plan Trustee Fund* in Column 3 of 0.681 ($t = 7.32$) implies an overweighting of 98% in the sponsor

firm's stock. These results indicate that the trustee funds included in the plan overweight by more than six times as much as those not included in the plan, which is again consistent with our finding that the overweighting is more severe when the benefits are higher.

Coupled together, we have found that (i) trustees significantly overweight firm's relative to their holdings of all other stocks and to other families' holdings of the same stock, (ii) this overweighting is larger for smaller fund families and for larger 401(k) plans, and (iii) within the trustee fund family, the overweighting is concentrated in those funds that are included as investment options in the sponsor firm's 401(k) plan (so receive the benefits of the fund inflows).

IV Trustee Behavior Following Shocks

A Changes in Trustee

The changing of a 401(k) plan's trustee gives a more precise way of measuring the effect of trusteeship on portfolio choice. It also provides a more direct test of the result in Section III that trustee families tend to overweight the sponsor firm's stock. The idea is to test whether the family, on initiating (terminating) the trustee relationship, increases (decreases) its position in the sponsor firm's stock.

Just 3.4% of firms switch trustees each year. The number of trustee changes we can match with CDA holdings the year before and after the change is only 58. The rarity of the event thus reduces the power of the tests. It is important, however, to note that the rarity of the event – in other words, the propensity of sponsor firms to maintain long-standing ties with the trustee – may be part of what makes this trustee relationship so valuable to the fund family.

[Insert Figure 1 Here]

Figure 1 plots the change in the family's holdings of the sponsor firm before and after the trustee change. For each company that changed its trustee in our sample, we follow the change

in holdings of both the old and the new trustee from one year before the change to two years after the change.²² If we set the date of change as zero, this corresponds to looking at the interval $[-4, 7]$. Because we don't know in which quarter the change occurred (we know only the year of the change), we compute a moving average of four quarters. The pattern that emerges is that the old trustee strongly decreases its position in the stock after it stops being the trustee, whereas the new trustee progressively increases its position on the stock after becoming trustee.

B Trustee Behavior around Negative Shocks

We now turn to trustee behavior at times that appear more valuable to the sponsor firm, times of negative shocks to the company. Specifically, we look at times of downward price pressure caused by widespread selling of the sponsor firm's stock. Because this can be a time in which the trustee-sponsor firm relation is stressed, the trustee may behave in ways that differ from other fund families without this relationship with the sponsor firm. We test the trustee response in two ways. The first and most direct measure is when there is widespread selling of the sponsor stock by mutual funds. A benefit of this measure is that it is independent of a model of flows. We define periods of large selling as those when more than 1% of the shares outstanding of a firm are being sold in aggregate by all funds (including the trustee) in a quarter, an event that happens about 10% of the time. This allows us to examine differences in the behavior of trustees and other families at times when the sponsor is likely experiencing downward pressure on its price. The second measure we use is the *CAR* around earnings announcements. The construction of this measure is similar to Baker et al. (2005). We use the $[-2, 2]$ day abnormal return around an earnings announcement, controlling for the return on the CRSP value-weighted market index. A negative shock will be an event where the $CAR < 0$ at the closest earnings announcement of the firm before quarterly holdings are reported.

The results are shown in Table IV. The dependent variable in the regressions is $\text{Log}(\text{Change})$, defined in Section II as $\text{Log}(\text{shares}(t)/(\text{shares}(t-1)))$. Columns 1-3, contain the regressions for

periods of large selling by fund families. $\% \text{ Comp Sold}$ measures the percentage of the company sold in aggregate by all fund families, while $\% \text{ Comp Sold} > 1$ is a categorical variable equal to 1 when $\% \text{ Comp Sold}$ is greater than 1, and zero otherwise. The variable of interest is $\text{Trustee} \times \% \text{ Comp Sold} > 1$, the interaction between our trustee indicator and $\% \text{ Comp Sold} > 1$. It measures how trustees behave relative to other fund families in situations where the average family is selling off the sponsor firm's stock. If the trustee is behaving differently around times of aggregate fund selling, we expect this interaction term to be positive and significant.

[Insert Table IV Here]

From Column 1, the coefficient on the categorical variable $\% \text{ Comp Sold} > 1$ is negative and significant, indicating that when a large percentage of a given firm is sold in aggregate by *all* fund families, the average family that is not the trustee is selling that firm's shares. From the interaction term $\text{Trustee} \times \% \text{ Comp Sold} > 1$ we find that the trustee does the exact opposite of the other firms: the trustee significantly buys the sponsor firm's shares. The positive and significant coefficient on $\text{Trustee} \times \% \text{ Comp Sold} > 1$ in Column 1 of 0.141 ($t = 3.97$) implies that the trustee increases its already overweighted stake in the sponsor firm by 11.45% ($0.141 - 0.025$) at these times of negative shocks. We also run separate regressions for trustees and non-trustees (Columns 2-3). As in Column 1, whereas fund families on the whole are selling large quantities of the sponsor firm's stock, trustees are significantly increasing their holdings of the sponsor firm's stock (coefficient on $\% \text{ Comp Sold} > 1$ in Column 2 relative to Column 3).

Column 4 of Table IV contains the regressions for the *CAR* measure of a negative shock to the firm. The categorical variable $\text{CAR} < 0$ is equal to 1 when *CAR* is negative and zero otherwise. The interaction term $\text{Trustee} \times \text{CAR} < 0$ then tests how trustees behave differently toward sponsor firms following a sponsor firm's negative *CAR*. From Column 4, the coefficient on *CAR* is positive although not significant, indicating that fund families do increase (decrease) their holdings in firms

following positive (negative) abnormal returns around earnings announcements, but not reliably so. As in other regressions, this is controlling for past year returns of the firm. The coefficient on $CAR < 0$ is negative but also not significant. Funds do slightly decrease their holdings following negative earnings surprises as measured by CAR , but not significantly. The positive and marginally significant coefficient on the interaction term $Trustee \times CAR < 0$ suggests that the trustee invests more in the sponsor firm following negative earnings surprises, with CAR itself seeming to be a weaker identification for a shock to a firm.

Another way to examine the effect that being a 401(k) trustee has on portfolio choice at times of negative shocks is to look at the probability of selling a firm's stock. In Columns 5 and 6 of Table IV we compare the probability of other fund families selling the sponsor stock to that of the trustee. We use probit regressions in which the dependent variable $Sell$ is equal to 1 if the mutual fund sold the firm's stock, and zero otherwise. We estimate the coefficients using an approach similar to Fama and MacBeth (1973): after running probit regressions for each quarter in our sample, we use the time series of estimates to calculate the coefficients in Table IV, correcting the standard errors for autocorrelation. The coefficient estimates reported in the table are the implied marginal effects on the probability of selling. Again the main variables of interest are the interaction terms $Trustee \times \% Comp Sold > 1$ and $Trustee \times CAR < 0$. The negative and significant coefficient estimate of -0.198 ($t = -3.42$) on $Trustee \times \% Comp Sold > 1$ implies the trustee actually has a 19.8% smaller probability of selling the sponsor's firm stock when fund families are on average doing so. The interaction $Trustee \times CAR < 0$, as before, does not have a significant effect. The evidence in Table IV further supports the idea that the trustee-sponsor relationship affects the trustee's portfolio choice. During times of aggregate selling of the sponsor firm, causing negative price pressure, the trustee acts in an opposite manner to other fund families and significantly increases its position.

C *Quantifying the Flow Benefit*

One large benefit of the trusteeship to the family, and more directly to the trustee funds included in the 401(k) plans, is the flow of 401(k) funds. In this section, we quantify this benefit. By being included as an investment option in the plan, managers gain access to both new capital and a constant *inflow* of new contributions by employees. These new inflows are based on participant flow deferrals, which again are rarely altered. Mitchell et al. (2006), for instance, find that 80% of plan participants in their sample make no changes in fund choices over their two-year sample. Accordingly, these 401(k) flows should translate into: (i) significantly higher flows than otherwise identical funds not included in a 401(k) plan, and (ii) less performance-sensitive flows, since participants rarely rebalance accounts or deferrals.

We test this empirically in Table V. The variable to be explained is annual fund flows, defined as the increase in total assets net of fund returns (Sirri and Tufano (1998)). The main independent variable is *Plan Trustee Fund*, a categorical variable equal to 1 for trustee mutual funds that are included in one of the trustee's 401(k) plans. *Any Trustee Fund* is a categorical variable equal to 1 for any trustee mutual fund (both inside and outside the 401(k) plan). *Past-Ret Quintile 1-5* are categorical variables that measure a mutual fund's performance rank in the universe of funds for the prior year, ranging from worst performing (Quintile 1) to best performing (Quintile 5). *Trustee × Past-Ret Quintile* is the interaction of *Plan Trustee Fund* and *Past-Ret Quintile*. *Lag TNA* is the logarithm of the TNA of the mutual fund in the prior year, *Flow To Style* is the aggregate flow to all mutual funds that share the style of the given mutual fund (defined by holdings characteristics, using Daniel et al. (1997)), and *Lag Return* is the return of the mutual fund in the prior year. We include year fixed effects, and all of our standard errors are clustered at the mutual fund level.

[Insert Table V Here]

Columns 1 and 2 of Table V have annual flows as a dependent variable. From Column 1, mutual funds included in the 401(k) plan of the sponsors have significantly higher flows. The *Plan Trustee Fund* coefficient of 22.50 ($t=7.53$) implies that trustee funds in the 401(k) plan have over 35% higher flows ($22.50/64.12$) than comparable funds. *Any Trustee Plan*, measuring the benefit to any trustee mutual fund (both inside and outside the plan), is also included, but is small and insignificant in each of the regressions, indicating that the trustee funds *not* included in the 401(k) plan gain no increase in flows.²³ The fact that the increased flow benefit accrues entirely to those trustee funds included in the 401(k) plan is in line with our finding from Table III, that the overweighting is concentrated on the funds that get the greatest flow benefits.²⁴

Column 2 explores the effect on flows more deeply by splitting funds by past performance, and by examining the effect of trustee plan funds' increased flows across these past return quintiles. From Column 2, we first see the well-established convex performance-flow relationship, in that being in the top return quintile corresponds to a disproportionate jump in flows (the omitted category is the lowest performers, *Past-Ret Quintile 1*). The interaction terms give the additional increase in flows in each past return quintile for being a trustee mutual fund in a 401(k) plan. What we see is a remarkably stable effect across past return categories: the trustee flow increase is large, significant, and similar in magnitude across all categories (all five coefficients are statistically the same). This is exactly what we would expect to see given the 401(k) literature's finding that participant's exhibit extreme inertia in their fund contributions – a stream of new flows into the funds unaffected by past returns.

Columns 3 and 4 then test more specifically whether being in the plan prevents those states of the world that may be most disruptive to fund managers: net outflows from the fund. The dependent variable in Column 3 is a categorical variable equal to 1 when the fund has outflows (i.e., negative net flows), and zero otherwise. The dependent variable in Column 4 is a categorical

variable equal to 1 if the fund is experiencing outflows in the lowest quintile of the distribution (in our sample, this is $\text{flows} < -15.26$).

From both specifications, being a trustee fund included in the plan has a large and significant effect on preventing these bad (outflow) states. The coefficient in Column 3 implies that it reduces the likelihood of outflow states by over 36% ($.161/.453$), while the coefficient in Column 4 implies that the likelihood of have extreme outflows (lowest quintile) is significantly decreased, by over 42% ($.108/.257$), for these funds.

Across all these tests, we see that being included in the plan not only has an economically and statistically large positive effect on inflows but significantly reduces the probability of experiencing outflows.²⁵

V Conclusion

Mutual fund families attract assets under management in several ways. We document a new, economically large, and growing channel, through the 401(k) market, and find evidence that mutual fund families exhibit systematically different behavior on these 401(k) clients' stocks. Specifically, we find that mutual fund families who become trustees significantly overweight their 401(k) sponsor firm's stock. This overweighting is significantly more pronounced for larger 401(k) plans and for smaller fund families, and it is concentrated in those mutual funds actually included in the 401(k) plans (those accruing the largest benefit of increased flows). Moreover, we find that the trustee family behaves in contrast to other fund families by buying its sponsor firm's stocks around times of substantial selling of the sponsor firm's stocks by all other funds. This overweighting cannot be explained by information, as trustees do no better on their sponsor firm holdings than other fund families. We quantify a substantial flow benefit to trustee mutual funds included in the 401(k) plan. The increased flows accrue to these funds regardless of past performance.

Agency problems might be one possible explanation for our findings. Specifically, it could be that conflicts of interest within mutual funds are driving the patterns we document. Although their fiduciary duty is to maximize risk-adjusted returns, fund complexes also have incentives to maximize their own value as a going concern. From the point of view of individual fund managers, increasing the underlying value of the fund also has many benefits because their compensation often increases with the size of the fund. Attracting a 401(k) plan results in a large, stagnant, and captive flow of capital. This inflow increases not only the current, but also the future, size of the fund as employees continue to save. Since sponsor companies understand how valuable a 401(k) plan can be to fund families, they could attempt to use their bargaining power to influence fund actions that may go against the fund's fiduciary duty (e.g., buying shares at times of negative shocks to the company). Future research should explore both other agency implications that accompany the increasing role and importance of 401(k) plans for mutual fund families, and potential policy implications that could address resultant agency costs.

As the percentage of mutual fund assets held by defined contribution retirement plans steadily increases, we expect these 401(k) plans to become more important sources of growth for fund families. This is coupled with the passage of the Pension Protection Act of 2006, following which, projections estimate that 401(k) participation rates will increase by nearly 50% in coming years (Investment Company Institute (2006b)), vastly increasing the size of 401(k) plans. We therefore predict the importance of the trustee relationship on mutual fund portfolio choice that we document here to increase in coming years.

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Notes

¹These numbers reflect 2004 and are taken from the Investment Company Institute (2005), Federal Reserve Flow of Funds (2005), and the Department of Labor. These non-money market funds are termed “long-term” mutual funds by the Investment Company Institute. Individual Retirement Accounts (IRA) and Defined Contribution Plans (DC) together held \$3.1 trillion in mutual funds (DC held \$1.6 trillion, IRA held \$1.5 trillion) out of a total \$8.1 trillion in the entire universe.

²These requirements are outlined in the Employee Retirement Income Security Act of 1974 (ERISA) and Title 29 Ch.18 of the United States Code (Title 29, Ch. 18, SUBCHAPTER I, Subtitle B, part 4, Section 1104). Throughout the paper we use the term “sponsor firm” to refer to the firm that sponsors the 401(k) plan to which the trustee has been hired.

³We thank the Investment Company Institute for helpful conversations on this subject. In addition, as discussed below, we contacted 150 of our firms and 50 trustees, and their responses also helped shape this description.

⁴Some specific responses from the trustees were: “The trustee decides which funds go into the platform, and the plan sponsor and the FA [fund administrator] then picks from that list which funds will go into the plans,” and from another trustee, “The plan sponsor and the fund administrator pick funds from the trustee’s menus.” From the firms, we received such responses as: “[The trustee] was chosen a long time ago and is evaluated based on performance” and from another firm, “Options are determined by the benefits committee, which meets once a quarter with representatives from [the trustee] to see how options are doing.”

⁵Other recent literature has explored agency relationships owing to mutual funds' affiliations with other institutions. Massa and Rehman (2005) explore these with respect to financial conglomerates, while Kuhnen (2006) examines connections between fund directors and advisory firms. Reuter (2006) studies IPO allocations to mutual funds and finds a strong positive relation between underwriting and the IPO shares held by funds, while Zitzewitz (2006) documents the widespread nature of late trading in the mutual fund industry from the late 1990s until 2003. Huberman (2007) examines mutual fund fees, profit margins, and the long-term valuation estimates of money management firms.

⁶Plans that need to file 11-K documents are those 401(k) plans that have company stock as an option, and issue new shares for the plan. This encompasses almost all of the largest 401(k) plans and makes up 60% of the universe of 401(k) assets. Regarding Form 5500, any firm that sponsors an employee benefit plan that qualifies under ERISA must file a Form 5500 with the Department of Labor.

⁷The plans in our sample hold roughly \$90 million in company stock on average. All tests in the paper were also run using aggregate plan assets; the results were very similar in magnitude and significance.

⁸The primary source of holdings data at the institution level is the 13f form that investment companies with more than \$100 million under management are required to file with the SEC each quarter (Securities Exchange Act Section 3(a)(9) and Section 13(f)(5)(A)). Smaller companies are also permitted to file, and many actually do. Thus, data on smaller families may be inconsistent and have a selection bias. However, as we explain below, we focus only on large mutual fund families. At the mutual fund level, the primary source of data are N-30D forms filed at the individual fund level to the SEC.

⁹Specifically, in each quarter, families are sorted by the market value of their holdings of CRSP stocks and the largest 100 families identified. Our sample includes all families that, at some point in time, are among those top 100 (i.e., if a family happens to be among the largest 100 families in the second quarter of 1999, it is included in our sample in *every* quarter from 1993 to 2003).

¹⁰Another reason why only holdings of companies in our 401(k) dataset are included is for homogeneity of sample across tests. Some of our tests (e.g. changes in trustees) necessarily include only such companies.

¹¹We refer to TNA throughout as being the sum of the market value of the *equity* holdings of a family. The averages in Table I are taken over all families and all quarters

¹²We have also run all tests in the paper on the subsample of fund families that are trustees at some point in time. We do this to rule out results that might be driven by something specific to this sample of families. The results in the subsample are actually a bit stronger, but we decide to use the top 100 fund families, because we think it provides a better comparison group for holdings.

¹³The construction of these portfolios and the criteria used for the inclusion of the stocks are very similar to those in Daniel et al. (1997). Each July, stocks are first sorted into three groups based on each firm's market equity on the last day of June. Then the firms within each size group are further sorted into three groups based on their book-to-market ratio. Last, the firms in each of the nine size-BM portfolios are sorted into three groups based on their preceding 12-month return. The main difference is then that Daniel et al. (1997) constructed 125 style portfolios, as opposed to our 27. We briefly describe the construction of these portfolios here and refer the reader to their paper for details.

¹⁴The Internet Appendix (<http://www.afajof.org/supplements.asp>) contains many robustness checks and further results related to the patterns we document in this section.

¹⁵As explained above, not all investment options necessarily belong to the trustee. However, even if only a fraction of the plan assets is invested in the trustee family, the benefits from management fees far exceed those from the trustee fees.

¹⁶We focus on $\text{Log}(\% \text{ Shares})$ throughout the paper instead of $\text{Log}(\% \text{ TNA})$, because this is the more relevant measure from the sponsor firm's perspective. Our conclusions hold regardless of the measure used. In fact, our point estimate for the effect of *Trustee* overweighting is almost identical, which is not surprising since one can simply rewrite both measures as the difference of logs and see that the regression models will be nearly identical.

¹⁷To control for other possible nonlinear effects of *TNA* on holdings, we also ran the regressions including a categorical variable for different cutoffs of *TNA* (e.g. top 10%). This does not affect the magnitude or significance of the results.

¹⁸We have used a number of alternative specifications including family fixed effects, firm fixed effects, and clustering the standard errors at the fund family and the quarter level. Magnitudes and significance are very similar, and all our conclusions remain the same. We also use a Fama and MacBeth (1973) type approach, which we report in the appendix, and get nearly identical results.

¹⁹These numbers are calculated using the estimated increases in holdings attributed to the trustee relationship. For each observation, we first compute the fitted value implied by our regression, $\text{Log}(\widehat{\% \text{ Shares}})$. From these estimates, we calculate the fitted dollar value of each holding as $\widehat{\text{Holding}} = \exp(\text{Log}(\widehat{\% \text{ Shares}})) \times ME$, where *ME* stands for the market value of the given company. We then average the estimated holdings for trustees and non-trustees separately to get

\$77.4 billion and \$15.8 billion, respectively. The estimated increase due to the trustee relationship (i.e. implied by the *Trustee* coefficient) is the difference of these averages. The total distortion is then found by multiplying this difference by the average number of sponsor firms per year in our sample (392 from Table I).

²⁰Even if the company reveals only good information to the trustee, it is not clear why the trustee wouldn't anticipate this behavior.

²¹This is consistent with the view that managers don't have stock picking ability. See Carhart (1997), Pastor and Stambaugh (2002), Jones and Shanken (2005), and references therein for a discussion.

²²Our measure of holdings here is the percentage of the family's TNA the stock accounts for. The same pattern emerges if we use changes in the percentage of the company instead. We chose the percentage of the TNA because we abstract from size of fund family issues when sponsors change trustees.

²³Including this trustee effect (even though insignificant) increases the flow benefit estimate to over 36%. As below, we simply include the effect of being a trustee mutual fund in the plan in our estimates of magnitudes (not the combined effect), to strip out any effect that may be coming simply by being part of the trustee family.

²⁴This same flow benefit should accrue to all of the mutual funds in the 401(k) plan. However, because we focus on trustee benefits throughout the paper and because trustee mutual funds make up nearly half of all mutual funds in 401(k) plans, we focus on these funds in our tests.

²⁵There may be other benefits of the trustee overweighting to funds and to sponsor firms, in addition to potential costs to the investors in trustee mutual funds. Recent evidence in Elton, Gruber and Blake (2007) and Brown and Harlow (2008) suggest, though, that funds within 401(k) plans outperform their peers. Any investor cost must thus be weighed against this seeming benefit of outperformance. We choose to focus here on a benefit that is easily observable and measurable: that of significant increases in fund flows.

Table I: Summary Statistics

Panel A: This panel is a summary of the 401(k) plan data used, collected from SEC Form 11-K filings. All numbers are in millions of dollars. When a firm has more than one 401(k) plan, if all the plans have the same trustee (the vast majority of cases), we aggregate them by company. Otherwise we choose the largest plan. Number of Plans is the total number of plans in our sample. All numbers in both panels are measuring 401(k) size as the residual assets in the plan after subtracting the amount of plan assets invested in company stock. Panel B: This panel contains data on the number of equity funds available as options in 401(k) plans. Included in the sample are all equity funds available as an option in one of the 401(k) plans in our sample that could be identified in the merged CDA-CRSP Mutual Fund database. *Funds in Plan* contains the number of distinct funds and the average TNA (in millions). *Trustee Funds in Plan* represents those funds in the plan that are identified as being part of the plan trustee family. Panel C: This panel is a summary of the mutual fund family data we use in the paper (top 100 families), and is taken from the CDA/Spectrum Institutional database. All numbers are in millions of dollars. We then separate by trustee families and non-trustee families. Panel D: This panel replicates Panel C for mutual funds. The sample consists of all equity mutual funds in the merged CDA-CRSP Mutual Fund database that could be identified as belonging to one of the mutual fund families in our sample.

Panel A: Average 401(k) Plan Size

Period	Number of unique plans	Mean (Millions)	STD	Max	Min
<i>Full Sample</i>	899	552.90	1,847.19	22,530.27	0.0003
<i>1993-1998</i>	560	460.07	1,595.58	21,845.84	0.0003
<i>1999-2003</i>	741	629.22	2,027.75	22,530.27	0.0005

Panel B: Funds in 401(k) Plans

Period	Funds in Plan		Trustee Funds in Plan		
	Number of Funds	Avg TNA (Millions)	Number of Funds	Avg TNA (Millions)	% Plan Assets in Trustee Funds
<i>Full Sample</i>	846	3,406	362	3,503	44.5
<i>1993-1998</i>	427	2,938	188	2,791	43.0
<i>1999-2003</i>	746	3,658	309	3,930	45.2

Panel C: Mutual Fund Family Summary Statistics

Period	Number of Families			Avg TNA (millions)			Std of TNA (millions)		
	Full Sample	Non- Trustee	Trustee	Full Sample	Non- Trustee	Trustee	Full Sample	Non- Trustee	Trustee
<i>Full Sample</i>	251	197	54	12,199	8,856	29,940	22,820	15,585	40,280
<i>1993-1998</i>	228	184	44	8,184	6,025	20,737	14,638	8,338	29,535
<i>1999-2003</i>	208	165	43	17,375	12,625	39,963	29,470	21,188	47,430

Panel D: Mutual Fund Summary Statistics

Period	Number of Funds			Avg TNA (millions)			Std of TNA (millions)		
	Full Sample	Non- Trustee	Trustee	Full Sample	Non- Trustee	Trustee	Full Sample	Non- Trustee	Trustee
<i>Full Sample</i>	1,929	1,495	942	1,040	886	1,338	3,343	2,671	4,345
<i>1993-1998</i>	1,609	1,204	624	760	632	1,070	2,389	1,806	3,394
<i>1999-2003</i>	1,691	1,204	848	1,270	1,124	1,507	3,943	3,264	4,841

Table II: Trustee Effect on Portfolio Choice

The dependent variable in each regression is the logarithm of the percentage of the shares outstanding of a firm owned by a given mutual fund family, $\log(\% \text{ Shares})$. All regressions are pooled, with standard errors clustered at the firm level (in parentheses). Quarter fixed effects are included where indicated. In Column 2, we estimate the parameters for one cross-section, corresponding to the middle of our sample (June 1998), and thus cannot include a quarter fixed effect. In Column 3, we include only trustee families. The independent variable of interest in the regressions is *Trustee*, a categorical variable equal to 1 if the given mutual fund is the trustee for the given firm, and zero otherwise. Also included in the regressions are the logarithms of the firm characteristics of market equity and book-to-market, *ME* and *BM*, and the firm's weight in the CRSP value-weighted market portfolio, *Market Weight*. *Past Returns* are included, which are the previous 11 months of returns for the firm (excluding last month). The mutual fund family characteristic of the logarithm of total net assets, *TNA*, is included. Additional fund family characteristics of percentage invested in the industry of the stock being considered, *% in Ind*, and percentage invested in the style of the stock being considered (computed following Daniel et al. (1997)), *% in Style*, are included. *401(k) Size* is the logarithm of the size of the 401(k) plan of the firm being considered. *Trustee* \times *401(k) Size* is the interaction of the Trustee categorical variable and *401(k) Size*. *Trustee* \times *TNA* is the interaction of the Trustee categorical variable and *TNA*. *Future Returns* are measured as the next 11 months of returns for the firm being considered, with *Trustee* \times *Future Returns* being the interaction of the Trustee categorical variable and *Future Returns*. The sample period is 1993 to 2003. All regressions include an intercept (not reported).

	(1)	(2)	(3)	(4)	(5)
<i>Trustee</i>	0.385*** (0.056)	0.451*** (0.111)	0.450*** (0.058)	0.384*** (0.058)	1.026** (0.492)
<i>ME</i>	-0.202*** (0.011)	-0.256*** (0.017)	-0.036*** (0.012)	-0.205*** (0.011)	-0.179*** (0.014)
<i>BM</i>	0.021 (0.026)	0.062* (0.034)	-0.068** (0.029)	0.021 (0.026)	0.047** (0.018)
<i>TNA</i>	0.817*** (0.009)	0.815*** (0.012)	0.969*** (0.006)	0.818*** (0.009)	0.832*** (0.010)
<i>Past Returns</i> ($\times 100$)	0.071*** (0.012)	0.107* (0.056)	0.032** (0.013)	0.069*** (0.012)	0.068*** (0.018)
<i>% in Style</i>	0.022*** (0.001)	0.026*** (0.003)	0.009*** (0.001)	0.022*** (0.001)	0.022*** (0.001)
<i>% in Ind</i>	0.028*** (0.003)	0.034*** (0.005)	0.009*** (0.003)	0.029*** (0.003)	0.031*** (0.003)
<i>Market Weight</i>	0.237*** (0.067)	0.496*** (0.129)	0.537*** (0.085)	0.246*** (0.068)	0.209*** (0.064)
<i>Future Returns</i> ($\times 100$)				-0.035*** (0.013)	
<i>Trustee</i> \times <i>Future Returns</i> ($\times 100$)				0.011 (0.060)	
<i>401(k) Size</i> ($\times 100$)					0.470 (0.850)
<i>Trustee</i> \times <i>TNA</i>					-0.103** (0.043)
<i>Trustee</i> \times <i>401(k) Size</i>					0.108*** (0.029)
<i>Quarter Fixed Effects</i>	Yes	-	Yes	Yes	Yes
<i>R-squared</i>	0.26	0.27	0.33	0.26	0.26
<i>Observations</i>	1,715,610	40,908	727,513	1,695,480	820,766

*, **, *** denote significance at the 90%, 95% and 99% level, respectively.

Table III: Trustee Effect at the Fund Level

The dependent variable in each regression is the logarithm of the percentage of the shares outstanding of a firm owned by a given mutual fund, $\log(\% \text{ Shares})$. All regressions are pooled, with standard errors clustered at the firm level (in parentheses). In Column 1, the independent variable of interest in the regressions is *Trustee Fund*, a categorical variable equal to 1 if the given mutual fund is the trustee for the given firm, and zero otherwise. In Column 2, this dummy variable is decomposed into *Plan Trustee Fund* and *Non-Plan Trustee Fund*. The former is 1 if the trustee fund also belongs to the sponsor firm's 401(k) plan and zero otherwise. The latter, *Non-Plan Trustee Fund*, is 1 if *Trustee Fund* equals 1 but the fund is not in the sponsor firm's plan at that point in time. Columns 3 and 4 include only plan funds and non-plan funds, respectively. Plan funds are funds that, at some point in time, are included in some plan in our sample. Non-plan funds are those that are not included in any plan. Also included in the regressions are the logarithms of firm characteristics of market equity and book-to-market, *ME* and *BM*, and the firm's weight in the CRSP value-weighted market portfolio, *Market Weight*. Also included are *Past Returns*, the previous 11 months of returns for the firm (excluding last month). The mutual fund assets are measured as the logarithm of the percentilized total net assets. Additional fund characteristics of percentage invested in the industry of the stock being considered, *% in Ind*, and percentage invested in the style of the stock being considered (computed following Daniel et al. (1997)), *% in Style*, are included. The sample period is 1993 to 2003. All regressions include an intercept (not reported).

	(1)	(2)	(3)	(4)
<i>Trustee Fund</i>	0.360*** (0.043)			
<i>Plan Trustee Fund</i>		1.082*** (0.110)	0.681*** (0.093)	
<i>Non-Plan Trustee Fund</i>		0.309*** (0.043)		0.137*** (0.045)
<i>ME</i>	-0.593*** (0.018)	-0.593*** (0.018)	-0.511*** (0.019)	-0.638*** (0.018)
<i>BM</i>	-0.176*** (0.034)	-0.177*** (0.034)	-0.192*** (0.032)	-0.171*** (0.036)
<i>TNA</i>	2.168*** (0.009)	2.168*** (0.009)	3.221*** (0.014)	1.904*** (0.007)
<i>Past Returns</i> ($\times 100$)	0.199*** (0.020)	0.199*** (0.020)	0.215*** (0.022)	0.196*** (0.020)
<i>% in Style</i>	3.731*** (0.133)	3.732*** (0.130)	4.400*** (0.180)	3.511*** (0.111)
<i>% in Ind</i>	1.307*** (0.089)	1.307*** (0.089)	1.376*** (0.112)	1.245*** (0.082)
<i>Market Weight</i>	-0.095 (0.101)	-0.095 (0.103)	-0.131 (0.100)	-0.0429 (0.108)
<i>Quarter Fixed Effects</i>	Yes	Yes	Yes	Yes
<i>Observations</i>	1,084,491	1,084,491	346,263	738,228
<i>R-squared</i>	0.66	0.66	0.62	0.69

*, **, *** denote significance at the 90%, 95% and 99% level, respectively.

Table IV: Trustee Behavior around Negative Shocks

The dependent variable in the pooled regressions in Column 1 - Column 4 is the logarithm of the ratio ($shares(t)/shares(t-1)$) held by the given firm. These regressions include quarter fixed effects and have standard errors clustered at the firm level (in parentheses). Column 1 and Column 4 use the full panel. Column 2 includes trustees only, while Column 3 is run for non-trustees only. For the full panel regressions, the independent variables of interest are $Trustee \times \% Comp Sold > 1$ and $Trustee \times CAR < 0$. These measure the differential behavior of the trustee around negative events for the firm. Trustee is a categorical variable equal to 1 if the given family is the trustee for the given firm, and zero otherwise. $\% Comp Sold$ is the percentage of the given firm that is sold by the aggregate mutual fund industry including the trustee in a given quarter. $\% Comp Sold > 1$ is a categorical variable equal to 1 if the percentage sold of the company is greater than 1% of shares outstanding, and 0 otherwise. $Trustee \times \% Comp Sold > 1$ is the interaction of $Trustee$ and $\% Comp Sold > 1$. CAR measures the abnormal return in the [-2,2] day window around earnings announcement, controlling for the return on the CRSP value-weighted market index. $CAR < 0$ is a categorical variable equal to 1 if the CAR is negative, and zero otherwise. $Trustee \times CAR < 0$ is then an interaction of $Trustee$ and $CAR < 0$. Column 5 and Column 6 run Probit regressions with the specification listed every quarter, and calculate time series averages and standard errors of the regressions using a Fama-MacBeth approach. The dependent variable in these regressions, $Sell$, is equal to 1 if the given family sold the given firm over the last quarter, and zero otherwise. The coefficient estimates shown are the implied marginal effects on the probability of selling. For these regressions, standard errors (in parentheses) are estimated using the Newey-West procedure with a 4 period lag. The sample period is 1993 to 2003. All regressions include an intercept and the controls ME , BM , $Past Returns$, TNA , $\% in Ind$, $\% in Style$ and $Change Market Weight$, all described in Table III (not reported).

	Pooled Regressions						Probit	
	(1) (Full)	(2) (Trustees)	(3) (Non-Trustees)	(4) (Full)	(5) (Full)	(6) (Full)		
<i>Trustee</i>	-0.025*** (0.008)			-0.035* (0.018)	0.014 (0.034)	-0.020 (0.053)		
$\% Comp Sold > 1$	-0.026*** (0.005)	0.079** (0.038)	-0.026*** (0.005)		0.079*** (0.011)			
$\% Comp Sold (\times 100)$	-0.770*** (0.072)	-0.023 (0.487)	-0.784*** (0.059)		0.783*** (0.077)			
$Trustee \times \% Comp Sold > 1$	0.141*** (0.035)				-0.198*** (0.058)			
$CAR < 0$				-0.002 (0.005)			0.015*** (0.006)	
CAR				0.001 (0.001)			0.001 (0.001)	
$Trustee \times CAR < 0$				0.052* (0.027)			0.017 (0.056)	
<i>Quarter Fixed Effects</i>	Yes	Yes	Yes	Yes	Yes	Yes		
<i>R-Squared</i>	0.01	0.01	0.01	0.01	0.01	0.01		
<i>Observations</i>	591,510	8179	583,331	266,520				

***, **, * denote significance at the 90%, 95% and 99% level, respectively.

Table V: Flows to Trustee Mutual Funds Included in the 401(k) Plans

The dependent variable in each regression is: *Flow* (the percentage increase in TNA, after taking out returns) (Columns 1 and 2), and two categorical variables (0,1) that measure *Outflow* (equal to 1 if negative flows) and *Bot 20%* (equal to 1 for bottom quintile flows). *Trustee Plan Fund* is a categorical variable equal to 1 for mutual funds that are the trustee's, and are included in one of the trustee's 401(k) plans. *Past-Ret Quintile 1-5* are categorical variables that measure a mutual fund's performance rank in the universe of funds for the prior year, from worst performing (Quintile 1) to best performing (Quintile 5). *Trustee × Past-Ret Quintile* is the interaction of *Trustee Plan Fund* and *Past-Ret Quintile*. *Lag TNA* is the natural logarithm of the TNA of the mutual fund in the prior year, *Flow To Style* is the aggregate flow to all mutual funds that share the style of the given mutual fund (defined by characteristics of holdings, using Daniel et. al (1997)), and *Lag Return* is the return of the mutual fund in the prior year. Last, *Any Trustee Fund* is a categorical variable equal to 1 for any trustee mutual fund (both inside and outside the 401(k) plan). The sample period is 1993 to 2003. All regressions include an intercept (not reported). Year fixed effects are included where indicated, and standard errors adjusted for clustering at the mutual fund level are included in parentheses below the coefficient estimates.

<i>Dependent Variable</i>	(1) Flow	(2) Flow	(3) Outflow	(4) Bot 20%
<i>Trustee Plan Fund</i>	22.50*** (2.99)		-0.161*** (0.023)	-0.108*** (0.015)
<i>Past-Ret Quintile 2</i>		8.07*** (2.08)		
<i>Past-Ret Quintile 3</i>		16.84*** (2.37)		
<i>Past-Ret Quintile 4</i>		28.10*** (2.43)		
<i>Past-Ret Quintile 5</i>		55.09*** (3.22)		
<i>Trustee × Past-Ret Quintile 1</i>		23.25*** (4.06)		
<i>Trustee × Past-Ret Quintile 2</i>		23.95*** (3.55)		
<i>Trustee × Past-Ret Quintile 3</i>		23.59*** (3.46)		
<i>Trustee × Past-Ret Quintile 4</i>		15.09*** (3.44)		
<i>Trustee × Past-Ret Quintile 5</i>		25.56*** (7.38)		
<i>Lag TNA</i>	-10.93*** (0.71)	-10.91*** (0.71)	0.026*** (0.003)	-0.003 (0.002)
<i>Flow To Style (×100)</i>	3.34*** (1.19)	2.09* (1.21)	-0.018*** (0.006)	-0.003 (0.005)
<i>Lag Return</i>	83.11*** (5.78)		-0.642*** (0.026)	-0.410*** (0.021)
<i>Any Trustee Fund</i>	0.75 (2.04)	-0.02 (2.04)	0.034** (0.014)	0.038*** (0.011)
<i>Constant</i>	64.12*** (3.99)	48.83*** (3.94)	0.453*** (0.014)	0.257*** (0.010)
<i>Year Fixed Effects</i>	Yes	Yes	Yes	Yes
<i>R-squared</i>	0.04	0.07	0.08	0.04
<i>Observations</i>	19,715	19,715	19,715	19,715

*, **, *** denote significance at the 90%, 95% and 99% level, respectively.

Figure 1: Changes in Trustee

This figure plots the holdings of mutual fund family trustees around the event of a change in trustee. It compares the holdings of firms that began being trustee (solid line) with those that ended being trustee (dotted line). The holdings in the sponsor firm are calculated as the percentage of the trustee family's TNA (% TNA). The y-axis in the figure is in percentages (from 0.09% to 0.16%). The x-axis measures time, with Time 0 being the time of the trustee change. Holdings are measured as the average past four quarters of holdings. So, [-4,-1] refers to the average holdings in the sponsor firm in the one-year period from the quarter directly before the trustee change to four quarters before the trustee change. The figure represents the average over the 58 cases of trustee changes we observe and can match to CDA holdings data.

