FIRM BOUNDARIES, INCENTIVES AND FUND PERFORMANCE: EVIDENCE FROM A PRIVATE PENSION FUND SYSTEM

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Abstract
The Turkish private pension fund system has a unique institutional structure where bank holding companies can set up both pension and asset management companies as subsidiaries. Often than not, these pension companies delegate their operational mandates to the asset management company under the same bank holding company. This structure exposes the retail investor to a double agency problem and raises questions about conflicts of interest and fiduciary duty. Using data on the full universe of Turkish pension funds we find that on average ‘captive’ funds – those funds founded and managed under the same bank holding company – perform worse on a risk-adjusted basis than their counterparts who have more of an arm’s length relationship between the founder and the manager. We provide further evidence that the relative underperformance is not driven by the overperformance of independent founders and managers, as the bank-affiliated founders and managers do just as well, if not better, when they are not ‘captive’. We provide a rationale for the prevalence of this institutional structure by showing that these funds attract more flows and charge lower fees.

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1. Introduction

Conflicts of interest and alignment of incentives are inherent problems with financial intermediation; naturally, a large body of literature has formed around these core issues. An implicit assumption in many studies in this area is that conflict of interest leads to an inefficient allocation of capital and reduces the welfare of clients, however Mehran and Stulz (2007) point out that it need not be the case. An investment bank’s care for its reputation, rivalry among analyst for credibility, or the career concerns of a fund manager, may well act as a disciplinary mechanism to mitigate such inefficiencies. Mehran and Stulz (2007) find the empirical evidence inconclusive on whether conflict of interest is a problem that requires a regulatory solution. We contribute to this ongoing literature by analyzing the institutional structure of the Turkish pension fund system, documenting the differences in performance between certain types of funds prone to conflicts of interest, and showing why market discipline does not eliminate the problem. Our findings are of potential use to pension plan sponsors responsible for picking asset managers and public policy officials trying to design or reform their countries’ pension system.

The Individual Pension System (IPS) in Turkey provides a unique opportunity to analyze the role of the organizational structure of financial institutions in mitigating or exacerbating agency problems. IPS allows chartered financial institutions (commercial banks, insurance companies, etc.) to setup pension companies and market various types of funds covering different asset classes, however these pension companies are prohibited from managing the funds themselves. They merely act as intermediaries between individual investors (pensioners) and asset management firms, similar to corporate pension plan sponsors and endowments in the US. An interesting twist is that both pension and asset management companies can be incorporated under a single bank holding company (BHC), thereby report to the same parent organization. We suspect that this arrangement leads to conflicts of interest and distorts incentives. For example, if the decisions to award fund mandates are influenced by the common parent, the fund managers may not fear losing their mandates and thus exert less effort to achieve superior performance. Similarly, pension companies may lack the ultimate authority to hire and fire managers working outside the umbrella of the parent company, or provide adequate incentives, thus giving rise to agency costs which ultimately fall on the pensioners.

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2 Regulation could limit the interference of a BHC (e.g., some kind of a ‘Volcker Rule’), however there was no such rule in Turkey in the time period we look at, which is makes it ideal for study.
We define pension funds that are setup and run by two subsidiaries of a single BHC as “captive”. The idea is that the pension company may not have the freedom to take away funds to other asset management firms when presented with poor performance, hence is taken “captive”. This concept allows us at the fund level to distinguish the cases where the allocation of mandates is more of a strategic decision at the BHC level or an unconditional wealth-maximizing choice at the pension company. One should not assume from the outset that captive funds are destined to underperform or that their clients be harmed; investors can always vote with their feet and withdraw their funds if they are unsatisfied with the performance (no penalty is incurred when they switch between funds). Even if withdrawals do not occur in equilibrium, the mere threat of them can incentivize fund managers to exert their best effort (Fama and Jensen (1983)). However, we suspect that the organizational structure of the IPS may limit the power of market discipline. Unlike the mutual fund investor in the US, the pension fund investor in Turkey faces a double-agency problem. While there is great transparency about fund asset values (they are publicly available on a daily basis), the question of who is responsible for generating the returns is not easy to answer. Funds are generally sold at commercial bank branches and the fact that there is a separate pension company and an asset manager is lost on many. In our sample, about 95 percent of the funds originating from BHC-affiliated pension companies are delegated to the asset management company of the same bank.\(^3\) It is hard to believe that such a skewed distribution is the competitive outcome of market forces – what is more likely is that the current situation is the outcome of strategic decisions at the BHC level.

We compare captive funds’ performance relative to non-captive funds using two different performance measures; alpha and selection return. Depending on the metric and the controls used, we find that captive funds underperform by 126 to 181 basis points (annualized). We include fund size, age, management fees, past fund flows and returns in our analyses as potential covariates, and show that underperformance is not driven by these observable characteristics. These are large economic magnitudes. Two related studies, Chen, Hong, Jiang and Kubik (2013) and Chuprinin, Massa and Schumacher (2015), report a difference of 72 basis points and 85 basis points respectively between outsourced and in-house mutual funds. Comparison with the mutual fund literature and the focus on performance is relevant since the pension funds we study are all defined-contribution plans and the regulators keep a close eye on performance.

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\(^3\) To be more precise, captive funds make up 95% of BHC-affiliated funds and 80% percent of all funds in the sample.
There is not a large literature on the problems associated with combining asset management and commercial banking under the same roof, though that is slowly changing. New studies such as Golez and Marin (2015), and Ferreira, Matos and Pires (2016) provide evidence of BHC-affiliated managers’ underperformance compared to independent managers. BHC-affiliated funds also underperform in our sample, up to 3 percent per year. This figure however, is in isolation and without taking into account the captive-ness of the relationship. Within the BHC-affiliated subsample, captive funds still underperform relative to non-captive funds, which leads us to conclude that there is more to the story than just working under a bank holding company. Moreover, when we compare non-captive funds managed by independent and BHC-affiliated firms we find no difference in their performance. Our view is thus more nuanced; asset management under a BHC is not categorically inefficient and different institutional structures can mitigate conflicts of interest.

In contrast to previous studies investigating the role of banks in asset management at the institution level, we work at the fund level. In one sense, our methodology is akin to Chen, Hong, Jiang and Kubik (2013) and Chuprinin, Massa and Schumacher (2015). These authors document the performance differences between outsourced and in-house mutual funds and draw attention to the fact that institutional structure of mutual funds has an impact on performance. While there is a difference in how ‘outsourced’ is defined in these two studies, the categorization rides on having two players in the market; one responsible for marketing and distribution, and the other responsible for portfolio choice. The Turkish pension fund system is similar to the mutual fund industry in that respect. We mainly depart from using the outsourced vs. in-house terminology because those terms would be inadequate to capture the complex web of relations between the BHCs, the pension companies, and the asset management companies in the Turkish pension fund system. The terms we designate – captive vs. non-captive – considers this trifecta and categorizes the funds accordingly.

In the spirit of the studies cited above, we also provide an explanation of how underperformance of active funds comes to persist amid fierce competition and why market discipline does not do away with it. The commonly offered explanation, the irrationality of unsophisticated investors (dumb-money effect), does not exactly apply here because the pension companies who pick the managers are experienced institutional investors. Lack of incentives is a better candidate for explanation based on the result that non-captive funds with a credible threat of moving away do better than captive funds at the same asset management company (11 basis points per
month). Now, it could still be the case that pension companies would take away the mandates from underperforming managers as their dissatisfied clients walk away or defer opting into the pension system. We show that this correction mechanism does not work in practice because let alone suffering from outflows, captive funds actually attract more inflows than non-captive funds. This harks back to the dumb-money question. Are retail investors really making irrational choices by choosing captive funds? Our analysis of fund fees and flows offers one rational explanation. We find that captive funds and BHC-affiliated funds charge lower fees and their flows are not sensitive to alpha. On the other hand, flows into non-captive funds are positively related to alpha, henceforth it is possible that fee sensitive customers self-sort into cheaper captive funds while performance sensitive customers self-sort into non-captive funds. There are clearly long-term welfare implications of such choices, but those are beyond the scope of this study.

2. Literature Review

From a general perspective, our study relates to the literature analyzing conflicts of interest problems in asset management, more specifically, to the studies of conflict of interest faced by asset management companies run by bank holding companies. Studies such as Golez and Marin (2015), Gil-Bazo, Hoffmann and Mayordomo (2015), Ferreira, Matos and Pires (2016) put forward a common cause for underperformance: the negligence of the fiduciary responsibility to investors. In some cases, BHC-affiliated funds are shown to support the prices of the affiliated bank’s stock (Golez and Marin (2015)) in others, the affiliated bank’s bond issues (Gil-Bazo, Hoffmann and Mayordomo (2015)). There is also evidence of biasing the portfolios towards the stocks of lending clients of the affiliated bank with no informational advantage (Ferreira, Matos and Pires (2016)). Our results are consistent with these studies in that we find underperformance of funds founded by BHC-affiliated pension companies and managed by BHC-affiliated asset managers. However, we also find that the impact of bank ownership is better explained by the relationship between these institutions. Furthermore, neither our findings nor our hypotheses are specific to an asset class. When we exclude all funds which invest in domestic equity and corporate bonds we still find underperformance of captive funds. That is not to say that the underlying mechanisms put forward by the above-mentioned studies cannot be at play in our sample. What

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4 Our personal conversations with fund managers have also revealed that they have little bargaining power in negotiating fees with the pension companies. Not having enough “carrots” may also contribute to their underperformance but because we do not have the compensation data, we do not push this story.

5 These results are available upon request.
we can say is that the underperformance of captive funds is general enough to include all these mechanisms and possibly more. Unfortunately, we do not have access to portfolio holdings data, and therefore cannot explore the mechanisms by which portfolio allocation decisions are made.

Our emphasis on weak incentives in understanding the underperformance of certain funds is similar to the argument in Guercio and Reuter (2014). Comparing mutual funds sold through intermediaries to those directly sold to investors, the authors find that the first group underperforms. Their hypothesis is that the retail mutual funds market is segmented (direct-sold versus intermediary-sold), with different clientele and with different type of competition. Mutual funds sold through intermediaries underperform because their managers essentially have weaker incentives. We also relate the underperformance of (pension) funds to the incentives of managers, yet in our case incentives are altered by the organizational structure of financial conglomerates rather than by market segmentation.

Our study complements the findings in the mutual fund literature that show underperformance of outsourced funds. Technically, all the funds in our sample are outsourced since the pension companies in Turkey are not allowed to run funds internally. Nevertheless, there are parallels. Chen, Hong, Jiang and Kubik (2013) investigate outsourcing relationships from the perspective of mutual fund families, while Chuprinin, Massa and Schumacher (2015) consider the conflict of interest faced by the manager on the receiving end. Both studies find that outsourced funds underperform relative to funds run internally due to the conflict of interest shaped by firm boundaries. In our study, independence between the mandate ‘giver’ and ‘taker’ is found to be beneficial, somewhat contrary to the existing studies. However, the conflict of interest that exists between the mutual fund family and the outside manager does not exist in our institutional setting. It is the conflict of interest between the bank holding company and its subsidiaries that give rise to the negative externalities we document. Overall, our results stress the importance of organizational structure in extracting performance from fund managers. By studying a pension fund system quite different from the one in the US, we are able to provide additional insights into aligning the incentives of financial service providers.

3. Turkish Private Pension System

Individuals in most countries are forced or ‘nudged’ to save in private pension plans as government sponsored (unfunded) public pensions fast approach insolvency due to economic crises and population ageing. On the heels of these demographic trends, pension funds continue to grow
among institutional investors – there were USD 25.2 trillion of assets under management worldwide in OECD countries at the end of 2014 and the weighted average asset-to-GDP ratio for pension funds reached 84.4%. Due to its young age and low contribution levels, the pension assets in Turkey make up only 5.5% of its GDP. Even though the country does not satisfy the OECD’s definition of a mature pension fund market yet, there is tremendous interest in IPS among the public.

The Individual Pension System (IPS) in Turkey commenced on October 27, 2003. The system complements the public social security and is based on defined contribution plans. The contributions collected from participants are pooled in individual accounts overseen by pension companies and invested in funds managed by asset management companies. Individual investors decide on their own whether to enter the system, which pension company to work with, which asset classes they want to invest in, and how much and how often to contribute. Corporations can also provide benefits by contributing to their employees’ pension savings, however they also have to go through the pension companies. Investors (individuals or corporations) can replace their pension companies but do not have direct control over the managers that run the portfolios.

In 2003, there were 12 pension companies offering 72 funds, at the end of 2014 there were 19 pension companies offering 241 funds. Assets under management have grown exponentially since 2003. As of year-end 2014, there are about 5 million participants vested in retirement plans with a total market value of approximately 38 billion Turkish Lira (16 billion USD). The “Pension Monitoring Center” (a consortium of pension companies), and the Turkish Treasury expect continued interest in the system due to ongoing reforms to provide additional incentives for individuals to join the system. In 2013, a government contribution matching 25% of individuals’ contributions was introduced, which was met with success. According to the official estimates, total assets under management is expected to surpass 115 billion Turkish Liras by the year 2020.

A typical fund mandate itemizes how an investment manager oversees allocated funds and manages the fund for a specific style. Typically, the manager gets a fixed portion of fund management fees collected by the pension company – augmented usually with a relatively low, symmetric performance fee. Funds are categorized by their investment strategies stated in their prospectus and provide their own benchmarks. If a fund declares itself to be a “Flexible” fund, it is no longer obligated to report a benchmark and can invest in any asset class as it deems fit (many funds

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7 Automatic enrollment with an opt-out option was implemented in 2017. The system was completely voluntary for the period under study.
naturally follow this strategy). Some funds classify themselves as “Balanced” or “Mixed” instead of “Flexible” but from a regulatory perspective, they are identical. Government External Debt and Government Internal Debt categories refer to funds that invest in the Turkish Treasury debt market, either as in Eurobonds or in Turkish Lira denominated bonds, respectively. The law requires all funds to report their asset values in Turkish Liras hence the funds that hold mainly Eurobonds have returns that behave similar to holding foreign exchange. Other styles are self-explanatory. Figure 1 Panel A shows the breakdown as a percentage of net asset value at the end of our sample period.

Figure 1 HERE

Pension companies act as the intermediaries between individual investors and asset managers. They setup, market, and distribute the fund to retail channels, similar to the activities of fund families in the US market such as Vanguard or Fidelity. But they are dissimilar in that they cannot own asset management companies or employ asset managers directly. Their fiduciary duty is to award fund mandates to asset managers and monitor them to make sure assets are invested responsibly. They can however be related in an ownership sense to asset management companies, if both are incorporated under the same Bank Holding Company (BHC). The law allows for a lot of flexibility. One pension company can employ more than one asset management firm, and one asset management firm can work for more than one pension company. Figure 2 illustrates the structure of the pension fund industry and identifies hypothetical interactions among different types of institutions.

Figure 2 HERE

For instance, pension company 1, under the roof of a BHC, could potentially dish out mandates to its own sister asset management company (portfolio manager 1), to a rival bank's asset manager (portfolio manager 2), or to an “independent” portfolio manager – not under any BHC structure. Similarly, a non-BHC pension company could give mandates to a combination of any group of portfolio management companies. This system provides a rich interaction among different types of institutions, paving the ground for an analysis of agency problems and optimal incentives.

4. Data and Variable Descriptions
All pension funds in Turkey are required by the regulator to mark-to-market and report their net asset value on a daily basis. We obtain fund-level data at daily frequency along with self-declared fund styles and benchmarks from RASYONET®, a private data provider that is widely used in the financial services industry in Turkey. Because data is sourced from regulatory filings, it is completely free of reporting bias and survivorship bias. Each fund has a unique identifier code, an asset management firm associated with it, and a pension company that has founded it. Funds are categorized into six styles: Money Market, Equity, Balanced/Flexible, Government Internal Debt, Government External Debt, and International. The distribution of the funds across styles is far from uniform; we have 50 balanced/flexible funds compared to 5 international funds at the end date of our data sample for instance. Thus the sample is not big enough to run our tests for each style separately; nevertheless, the style information is still useful for checking the robustness of certain results and controlling for heterogeneity in fund fees. We drop the first month of data for all funds because some of the initial reporting may be prone to errors. Our sample starts in October 2003, the launch date of the new private pension fund system in Turkey, and ends in December 2014. Because daily returns are extremely noisy, we define monthly return as the cumulative return from the first day of the month to the last and use them instead for this study. For benchmark returns we use Borsa Istanbul for the local indexes and Bloomberg for the international indexes. Index descriptions are given in Appendix A. What makes this study possible however is the hand-collected data on the ownership structure of pension companies and asset management firms. Through web searches and public financial documents, we determine the parent company of all firms in our sample. We also ‘time-correct’ matching errors arising from mergers and acquisitions which have occurred throughout our sample period.

Our main variables of interest in the regression analysis are indicator variables we define based on whether the asset management firm or the pension company is owned by a BHC. We refer to these institutions as “Managers” and “Founders” even though the terms do not refer to specific persons. Remember that the institutional structure in Turkey allows many-to-many matches between Managers and Founders, thus these firms’ links to BHCs can be considered on two levels: individually, or in pairs as each fund provides the link between one Manager and one Founder. If both the Manager and the Founder is owned by the same bank, we classify this relationship as “captive”. By construction, Managers or Founders not affiliated with banks cannot be

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captive. The cases where both the Manager and the Founder is owned by two different banks are also treated as not captive.

Other control variables include size, flow, age, fees, and past return of a fund. These variables are commonly used to explain the cross-section of fund returns in the literature hence their inclusion. They also capture the heterogeneity among different fund styles such as equity and government debt. We also include month dummies in every regression to control for time fixed effects. This allows us to focus our attention to cross-sectional differences in fund returns and make sure our results are not biased in one way or another as a result of macroeconomic factors such as inflation, exchange rates, regulatory changes, etc.

The main dependent variables are two measures of risk-adjusted return. It has become commonplace in the mutual fund literature to adjust for risk via the Carhart (1997) four-factor model, however, such factors are not available for the Turkish market and even if they were, they would not capture the risk of the fixed income funds which dominate the pension fund industry. Instead, we use an asset-class factor model similar to Gökçen and Yalçın (2015) to compute our risk-adjusted return measures. The factors are popular indexes, which cover wide classes of assets both in the Turkish capital market and in international markets. Another reason for our choice is that these indexes are universally found among the list of benchmarks declared by the funds themselves.\footnote{For consistency, we use the same set of factors for all funds regardless of whether a particular index appears in one fund’s prospectus.} For each fund we run the following regression:

$$R_{i,t} = \alpha_i + \sum_{k=1}^{10} \beta_{k,i} R_{k,t} + \varepsilon_{i,t}$$

(1)

where $R_{i,t}$ is the return of fund $i$ in month $t$, $R_{k,t}$ is the return on the benchmark index $k$ in month $t$, $\beta_{k,i}$ is the beta of fund $i$ with respect to benchmark index $k$, and $\alpha_i$ is alpha.

We use 60-month rolling window regressions with a minimum of 36 observations to capture the time variation in betas and alphas (equation (1) drops the time subscripts on the coefficients to avoid confusion). By its nature alpha is backwards looking – it is the in-sample intercept term hence we also utilize the step-ahead ‘selection return’ concept proposed by Sharpe (1992). More specifically, we compute:

$$s_{i,t} = R_{i,t} - \sum_{k=1}^{10} \beta_{k,i,t-1} R_{k,t}$$

(2)
where $\beta_{k,i,t-1}$ is the beta of fund $i$ with respect to benchmark index $k$ previously estimated in equation (1) between $t-61$ and $t-1$.

Intuitively, the idea behind selection return is to take out the portion of the return attributable to asset allocation in each month and evaluate the manager on the remaining portion. Beta estimates from the most recent 60 months are multiplied by the index returns in the current month and summed up to arrive at the hypothetical style return. Selection return in month $t$ is defined as the realized return minus the style return in month $t$.

5. Results

5.1. Summary Statistics

We start by giving an overview of the properties of our dataset. Reported statistics in Table 1 are time-series means of cross-sectional medians.

| TABLE 1 HERE |

Banks clearly dominate the pension fund industry. They own (on average) three quarters of all pension companies. Moreover, they offer more funds per company than the independent players do. In fact, the reported medians hide the fact that the distribution is even more lopsided in the earlier parts of the sample, because only in recent years foreign insurance companies have been able to increase their market share in this industry through mergers and acquisitions. In the asset management space, the differences in market share is even starker. Independent managers run only 8 funds out of a total of 153 funds. Given these numbers, it would be safe to say that commercial banks enjoy higher degrees of economies of scale in their operations and lower enrolment costs per retail investor. As we will see in Section 5.5, some of these advantages are passed onto retail investors.

When we examine managers and founders in pairs we notice the prevalence of captive relationships; that is, pension companies give most of their mandates to the asset management companies who work under the same BHC (132 captive pairs vs. 33 non-captive pairs). It is the economic consequences of this institutional structure that we hope to tease out in this study.
Based on gross return (before fees) BHC-affiliation appears beneficial, however, it is the risk-adjusted return that is important for the evaluation of managers as it more accurately captures the value added, if any. We can also think about the risk-adjusted return as a measure of how well the founders perform their fiduciary duty to award fund mandates to the best possible manager. Retail investors, unfortunately, are likely to focus on gross return as a measure of performance and reach the wrong conclusion that funds offered by commercial banks are superior. We show some evidence of this type of behavior in Section 5.4.

The alpha and selection return columns encapsulate the main findings of our study. Both BHC-affiliated managers and founders do worse than their independent counterparts in the industry on a risk-adjusted basis. Differences in risk-adjusted return are routinely interpreted as differences in skill, and while that is certainly a possibility, there is evidence favoring the view that it is the nature of the relationship between the founder and the manager that is responsible for this difference. Captive relationships, that is, when the same bank owns both the pension company and the asset management company, result in an alpha of 0.09% per month on average, as opposed to 0.18% per month when the two institutions are unrelated (in an ownership sense). To put these magnitudes into perspective, consider the study of the costs of active investing by Ken French. French (2008) estimates that US equity investors spend on average 67 basis points per year trying to beat the market. If the underperformance of 67 basis points is enough to convince you to switch over to index funds, then the 108 basis points (9 basis points per month annualized) should be enough to switch over to non-captive funds.

These statistics being univariate do not account for other factors that might affect performance. In the following sections, we use a panel regression framework to provide more reliable evidence on captive relationships’ negative effects on performance.

5.2. Regression Analysis: Managers’ Perspective

Do managers who run funds for pension companies that belong to the same parent organization really perform worse than others? That is the question we try to answer in this section using a panel regression framework. Our explanatory variable is the dummy CAPTIVE that takes on the value of 1 if the asset management and the pension company pair are owned by the same BHC and 0 otherwise. We also include a dummy variable for whether only the manager is owned by a bank holding company based on other studies which have found BHC-affiliated asset management to have a negative impact on performance (Golez and Marin (2015), Ferreira, Matos and
Pires (2016)). Other control variables we include are the size of the fund (log of net-asset-value), the age of the fund, the fee it charges, and its return over the past year. We also include time dummies in the regression, thus isolating the variation in the cross-sectional part of the panel dataset. Table 2 reports the regression results for the full sample and for subsamples of particular interest.

**TABLE 2 HERE**

For the full sample (Panel A), the coefficient on CAPTIVE is highly significant and negative both for alpha and selection return as the dependent variable in the regression. In economic terms, captive funds underperform by 15 basis points per month (column 1), or 1.8 percent per annum, which is roughly equal to the average annual fee for a fund. In the second column we use the bank holding company dummy (managerBHC) instead of CAPTIVE and that too turns out to be negative and statistically significant. The magnitude of the effect is larger in this case, 26 basis points. In the third column we include both dummy variables together to see whether the impact of one variable is captured by the other. We find that when using alpha as the dependent variable both CAPTIVE and the managerBHC are significant, and when using selection return only CAPTIVE is significant. While we cannot conclusively say whether BHC ownership hurts performance, what we can say is that the captive-ness is always detrimental to performance. There may be other reasons so as to why BHC-affiliated asset management performs poorly relative to the competition, but the nature of the relationship between the pension and the asset management company certainly matters.

In Panel B, we run the same regressions in various subsamples in order to better distinguish between the effects of BHC-affiliation individually for the manager, and for the founder-manager as a pair. The first subsample is the BHC-affiliated asset management companies. If the performance differential in the full sample is driven solely by whether the asset management firm is owned by a bank or not, then within this subsample we should not expect to see a difference. This is not the case. CAPTIVE is still significant both in terms of alpha (11 basis points) and selection return (10 basis points). This result indicates that the same asset management companies perform better when they run funds for an outside client as opposed to a “sister” client. The second column turns the question around and asks whether there is any effect of being incorporated under a BHC among the non-captive pairs. The funds in this subsample are run either by independent managers or by BHC-affiliated managers working for pension companies outside their own parent company. We find a slight difference in alpha between these groups (7 basis points, 10% statistical significance), and no significant difference in the selection return. In the third and
the sixth columns, we exclude independent pension companies, which are mostly international life insurance conglomerates classified as non-captive by construction. If these companies possess better ability in picking the best managers, - a plausible scenario since they enter the Turkish market with more global experience - they might be driving the results we saw in the full sample (Panel A, columns 2 and 4). The results do not support this hypothesis; on the contrary, we observe that the coefficient on CAPTIVE jumps to 32 basis points (of alpha) within the BHC-affiliated sample, rather than diminishing or disappearing completely. The conclusion is that among BHC-affiliated pension companies, there is no underperformance when the mandate is given to a BHC-affiliated asset management company generally, but there is underperformance when that management company is owned by the same BHC.

Overall, our results strongly suggest that the relationship between managers and founders is a determinant of the fund’s performance. There are a couple of stories to be told about why the captive relationship has a negative impact. It could be that when a BHC sets up both a pension company and an asset management division, the managers do not fear losing their mandates hence lack the incentive to outperform. Or they could simply be saving their best ideas for outside pension companies to attract additional mandates. In addition, if executive decisions are made at the parent level, pension companies may not have the autonomy to impose market discipline on the managers when performance is found to be lacking. Lastly, it is also possible that the performance benchmarks used in the industry are different from ours\textsuperscript{10}, and hence the underperformance we report may not be apparent to the pension companies or their parents.

5.3. Regression Analysis: Founders’ Perspective

We now move onto the founders’ perspective, which is to say, we investigate the effects of captive relationships from the viewpoint of the pension company. While pension companies do not generate the returns themselves – they are not allowed to manage the portfolios as pointed out earlier - they have a fiduciary duty to award the fund mandates to the most able managers. Therefore, underperformance or overperformance of a fund can be interpreted as a measure of

\textsuperscript{10} In fact, we have confirmed that managers are evaluated based on the benchmarks set by the pension companies, and not by alpha or selection return based on a factor model. Because we do not have access to those private contracts, we cannot know for sure whether the pension companies are aware of the underperformance we find.
how well they achieve this task. Table 3 keeps the same format as Table 2, with the same dependent variables and control variables. The only difference is that the dummy variable managerBHC is replaced by founderBHC.

TABLE 3 HERE

The results we find are similar to the managers’ perspective (note that columns 1 and 4 in Panel A are identical to those in Table 2 and shown here for ease of exposition). There is a statistically significant negative effect on performance when the founder is BHC-affiliated; albeit at roughly 7 basis points it is much smaller in economic magnitude compared to the manager working under a BHC. Interestingly, when we include the CAPTIVE dummy in the regression the marginal effect of the founderBHC turns positive (statistically significant at the 5% level when alpha is the dependent variable). What this suggests is that, it is the relationship between the founder and the manager that is responsible for the relative underperformance and not the ownership status of the pension company. Actually, the positive coefficient on founderBHC in column 3 implies that BHC-affiliated founders may be even better at picking managers than non-BHC-affiliated founders when given the opportunity to do so.

In panel B, we run the same regressions within the subsamples to strengthen this argument. First, among BHC-affiliated founders being captive is highly significant and negative (32 basis points, t = -5.67). Focusing on this subsample help ease our concern that maybe there is something special about non-BHC-affiliated founders that is the cause of their relative overperformance. Second, strictly among non-captive pairs, BHC-affiliated founders do significantly better than non-BHC-affiliated founders (53 basis points in alpha and 41 basis points in selection return). Once again, this goes on to show that when BHC-affiliated founders have the freedom to choose any manager they do so successfully. Finally, in the third and sixth columns we exclude non-BHC-affiliated managers and the results are qualitatively unchanged. The reason for excluding this group – even though they are extremely small – is that it could be argued that these small boutique shops are more agile in terms of implementing new trading strategies and perhaps have the advantage of investing in small illiquid securities, thus skewing the results in favor of non-captive relationships. With them out of the picture, our confidence in the claim that captive relationships are negatively related to performance goes up.
5.4. **Fund Flows: Captive is Popular**

The evidence so far points to the verdict that the captive relationship between the pension and the asset management companies hurts performance. A follow up question is how this relative underperformance can come to persist in competitive financial markets. Wouldn’t the investors pull their money out of underperforming funds and direct it to better performing funds? In the current private pension system retail investors are not penalized for switching between funds as long as they don’t leave the pension system, hence we expect funds to flow out of underperforming funds as it is the case all around the world. Based on our conversations with practitioners from the industry this behavior is actually quite rare. Most retail investors do not change the funds they initially pick, or when they choose to pull their money out it is typically for other types of investments (e.g. real estate). The rationale for such behavior (or whether it is optimal) is beyond the scope of our study; nonetheless, we offer a potential explanation in Section 5.5. In this section, our goal is to document the fact that captive funds do not discourage investors from investing in them. To understand this phenomenon better we investigate the determinants of fund flows in Table 4.

**TABLE 4 HERE**

It would be interesting enough to observe that flows are independent of the institutional structure of the fund – that retail investors naively assume all funds are created equal – but the data reveals an even more interesting pattern. CAPTIVE is positively related to flows (column 1). The next two columns give us some idea on why this might be happening. In column 2 we observe a significantly positive coefficient on the founderBHC dummy. This simply indicates that investors prefer funds offered by the local banks. That is to be expected because these financial institutions have a long history in the Turkish banking sector and a strong brand recognition. Non-BHC-affiliated pension companies on the other hand, while may be a part of a much larger global financial organization, are relatively unknown for the majority of the public. In column 3, we include CAPTIVE along with founderBHC and the effect of BHC-affiliation disappears. That tells us that funds offered and managed by the same institution at the top attract more investors, even taking into account the positive effect of the familiarity of banks. This may be why the underperformance of these funds is able to persist. As long as flows do not suffer, there would be little incentive to try harder.
The other variables of interest in Table 4 are PAST RETURN and ALPHA. Together they provide additional insight into how captive funds can sustain themselves. In the first three columns we see that past return is always positively related to flows and alpha is not. Flows chasing performance is a well-established pattern in the mutual fund literature so that in itself is not surprising; however, the fact that the risk-adjusted return (alpha) having no effect on future flows is telling. Insensitivity of flows to alpha suggests that risk-adjustment does not factor into the pension investors’ decision. We also found out that the regressions in the previous sections do not yield statistically significant results when gross returns are used as the dependent variable (available upon request). So, it is unlikely that the underperformance we find is picked up by the pension investor. There is also existing evidence in the literature that pension fund investors exhibit ‘inertia’ (Dahlquist and Martinez (2015)). They are found to be less reactive to performance compared to mutual fund investors. Putting all these ideas together, we gather that the noise in fund returns and the unfamiliarity of pension investors with performance attribution allows underperforming managers to keep attracting new money.

In columns 4 and 5 we investigate fund flows to captive and non-captive funds separately. For both types of funds PAST RETURN is significantly related to flows, whereas ALPHA is significant only for non-captive funds. Sensitivity of fund flows to alpha can potentially explain why the non-captive group exhibit relatively better performance. These managers get rewarded by more money coming in when they are able to beat the market, hence have the necessary incentives. Captive fund managers on the other hand do not attract new funds when they are able to beat the market; hence, their incentive would be to stay close to their benchmarks. These results are consistent with the findings in Guercio and Reuter (2014), namely that lack of incentives resulting in lower alphas, though that study compares direct-sold mutual funds to funds sold through brokerages.

To sum up, the fact that CAPTIVE is positively related to flows makes it appear almost as if investors are gravitating towards underperforming funds. There have been many reports in the financial media about retail investors being confused by the private pension system and wary of opting in (which appears to be common problem in countries trying to privatize their pensions). Funds that are offered and managed by an established bank are perhaps seen as more trustworthy, hence attract more customers. At the same time, banks have been aggressively marketing their own funds to their customer base. Either way, we believe that the outcome is not in the financial interest of the pension fund investor. She picks a pension company first and the manager is picked
for her; thus she is exposed to a double agency problem. Most of these savings are then funneled to managers affiliated with the same bank whose performance turn out to be below that of their peers. We want to emphasize that the issue is not necessarily about the skill level of managers (though skill may play a role); the evidence we presented in previous sections is clear in that when managers and founders are not linked through their parent company, they are able to achieve results as good as any.

5.5. Fees: No Free Lunch

In this last section, we tackle the question of why pension companies choose to give out their mandates to managers working under the same roof when they can get better performance elsewhere. The section on flows provided some justification for this puzzle, and here we study fund fees to gain further insight. We see fees as a potential factor in attracting customers into a fund. If there are differences in fees between captive and non-captive funds that might be further evidence of captive funds’ popularity.

TABLE 5 HERE

In Table 5 the dependent variable is fund fees as a percentage of net asset value. We have an additional control variable, GROUP DUMMY, which represents funds offered exclusively under employer sponsored plans at reduced cost. These funds charge about half of what is charged to individuals and both captive and non-captive funds offer them. We also add fund style dummies in this regression (return regressions controlled for style with the factor model), because equity funds are inherently more costly to run than money market funds for example. In column 1, the coefficient on CAPTIVE is statistically significant and negative. Simply put, captive funds charge less than non-captive funds, though at 9 basis points the economic magnitude is not large. It is important to realize in the current pension system it is not the asset managers who set the fees at their will. Pension companies determine the style of the fund and the appropriate fee to charge investors; they then negotiate with the asset managers for the percentage cut of that fee that they (the managers) will receive. Lower fees of captive funds represent the equilibrium outcome between the founder and the manager. Without knowing the details of the negotiations and the contracts between these two actors it is not possible to provide a definitive answer to why captive funds on average have lower fees. Nevertheless, the empirical results point to an internally consistent story. According to Table 5 column 1, asset management firms charge more for their services when they manage funds for outside pension companies. But because their incentive is to
maximize the assets-under-management they may be better off managing a greater number of funds at a lower per fund fee. Founders could then award them more mandates if they are willing to accept lower fees. From the founders’ point of view, lower fees can help with the marketing costs of acquiring new customers by making the funds more attractive. We have already seen that captive funds attract more flows, and lower fees are a plausible explanation why this occurs. In contrast, the non-captive relationship between the founder and the manager necessitates reflecting the true cost of running the fund in the fees they charge, which is consistent with the lower level of flows they experience. This mutually reinforcing circle of incentives between the retail investor, the pension company, and the asset management firm is a rational explanation for the underperformance of captive funds.

In column 2, we observe a similar effect for BHC-affiliated founders, and in column 3, we observe significant and negative coefficients for both of the dummy variables. The thing to note here is that while BHC-affiliated funds charge lower fees in general (perhaps due to economies of scale), the captive funds’ lower fees are not subsumed by this effect. A BHC-affiliated pension company still charges more for funds it chooses to use outside asset management for. In columns 4 and 5 we run similar regressions for the captive and non-captive subsamples. The variable we are interested in is ALPHA. Not surprisingly, alpha is statistically significant and positively related to fees in both samples, confirming the stylized fact that managers that are more skilled charge more for their services.

These results more clearly reveal the dilemma of the pension fund investor. It makes economic sense for retail investors to gravitate towards funds with lower fees especially if they are not knowledgeable about fund performance evaluation. The growth of index funds around the world speak to this fact. When pension investors simply go for the funds offered by their bank that they already have a relationship with they end up with captive funds. The consequence of this choice is lower risk-adjusted return but also higher net-of-fees return; therefore, it may not turn out to be detrimental in the end. The long term welfare implications of this choice are an extremely pertinent question that requires much more data to investigate than what is available publicly at the moment. Our results suggest however, that the benefits of lower fees (at their current state) would not be enough to offset the potential losses due to lower risk-adjusted returns. Note that every regression in Table 2 and Table 3 included fund fees as a control variable. Hence, the differences in alpha or selection return between captive and non-captive funds were for the same level of fees. If it were merely the case that high alpha funds charged high fees, then fees
would capture all the variation in alpha and our main variable of interest in Tables 2 and 3, CAP-TIVE, would turn out to be insignificant. The difference in alpha between captive and non-captive funds was between 12 and 21 basis points per month depending on whether we were controlling for the BHC-affiliation of the pension company or the asset management company. That translates into 1.4 - 2.4% per year which is hard to square with the low level of variation we observe in fees due to the competitive nature of the business.

Taking into consideration the patterns in fund flows, we interpret the findings regarding fees as follows. Although captive funds offer lower risk-adjusted performance, they also offer lower fees. While the flows to non-captive funds respond to alpha, they do not for captive funds. Putting those two ideas together, it seems to us that fee-sensitive pensioners self-sort into cheaper and captive funds while alpha-sensitive customers turn to non-captive funds. Such behavior, together with the unnecessary effort to fight for mandates, creates weak incentives for the managers of captive funds. Facing these weak incentives, managers of captive funds provide adequate performance to keep their jobs but not as good as their peers.

6. Conclusion

Our motivation for this study was to investigate the effects of the institutional structure of delegated portfolio management on fund performance. The newly instituted pension system in Turkey with its complex structure and accurate data provided the perfect setting. The broad take-away of our empirical results is that conflicts of interest in delegated portfolio management can lead to underperformance and the lack of market discipline can allow the effect to sustain itself. A rule-of-thumb policy recommendation for countries which are privatizing or reforming their pension systems would be to encourage more competition among asset managers for fund mandates and grant more freedom in setting their fees. We hold out on recommendations that are more specific than that because often times the regulatory pendulum swings too far and leads to unintended consequences. Although our results were generally not in favor of banks' involvement in asset management, not allowing banks to setup pension and asset management arms in emerging economies would make it impossible for private pension systems to get off the ground. We also took note of the over-concentration of BHC-affiliated pension and asset management companies in the industry; however, there is also a danger in forcing diversification across managers by allocating too much capital into the hands of less able managers. Our discussion on why underperformance is persistent should also not be taken as a recommendation for short-term evaluation of managers and more turnover. The underperformance we talk about is relative to other
managers, not to absolute benchmarks. The arithmetic of active management dictates that some managers must underperform if others are to outperform. Thus, in the ideal case there would be no significant differences between groups of asset managers working in different types of financial institutions.

In detail, we find that funds that are administered and managed by the subsidiaries of a single bank holding company – “captive” funds as we label them – underperform by 15 basis points per month on a risk-adjusted basis compared to other funds where the founder and the manager are either not affiliated with a bank holding company or are subsidiaries of two different bank holding companies. We attribute this performance difference to the complacency of the asset management companies and not to their skill level as further evidence reveals that BHC-affiliated asset management companies perform better when they are managing funds for an outside client. In the subset of BHC-affiliated managers, the non-captive funds generate 11 basis points more alpha captive funds.

It is also possible to view the results from the perspective of a pension company that hires an asset management firm. Subpar performance may be indicative of the inability to evaluate and pick managers. We find little evidence for this hypothesis. While BHC-affiliated pension companies underperform on average compared to their non-BHC-affiliated counterparts (7 basis points), the effect actually turns positive (8 basis points) when we control for captive relationships. It appears that the relationship type between the founder and the manager of a fund hinders performance, not the ownership structure of these firms taken in isolation.

Despite their poor track record, captive funds outnumber non-captive funds by a factor of four. One can’t help but wonder how underperformance can be so prevalent in a competitive financial market. Wouldn’t the pension investors vote with their feet and force underperforming funds to close? We provide two explanations why this does not occur. The first explanation is that pension fund investors are naïve and evaluate funds based on gross returns, not risk-adjusted returns. The univariate statistics of captive and non-captive funds show that there is no economically significant difference between the average returns of these groups, and multivariate regression tests fail to detect any underperformance with gross returns. Moreover, captive funds flows are not sensitive to alpha but they are sensitive to past gross return. The second explanation is that there must be some other benefit to investors in choosing captive funds that offsets the deficiencies in their performance. When we analyze fund fees, we find that captive funds have lower fees in general (controlling for funds’ style, alpha, and other factors). While the magnitude is small (9 basis points per year), combined with the unaccounted search costs of finding better funds elsewhere,
it may be all that is needed for retail customers to go along with whatever their bank is offering them.

The findings in this study point to new avenues of research for the future. The empirical evidence of the conflicts of interest is robust however it is indirect. If data on the contracts between pension companies and asset managers were available, one could better understand the incentives of both parties. Similarly, the behavior of pension investors is a kind of black box when one does not have access to investor level demographic data. Observing their choices and analyzing the factors that affect those choices would help in designing a more efficient pension fund system.
A. Appendix

A.1. Index Definitions

**BIST100 (getiri_xu100)**: A value-weighted index of the 100 largest stocks that trade on Borsa Istanbul.

**GOVBILL (kyd91)**: Index of short-term Turkish Government bonds. Securities need to have less than 180 days until maturity to be included in the index. They are weighted according to the coefficients published by Borsa Istanbul which are inversely proportional to how far out the days until maturity is from 91 days.

**GOVBOND (kydtum)**: A value-weighted index that contains all Turkish Government bonds regardless of maturity.

**GOVDEBT USD (kydebondusd)**: A value-weighted index of Eurobonds issued by the Turkish Treasury. The bonds are denominated in US dollars but the index value is reported in Turkish Lira based on the official exchange rate published at the end of each day by Central Bank of the Republic of Turkey.

**USD/YTL (usd_ds)**: An index that tracks the return of the US dollar/Turkish Lira exchange rate.

**MSCI WORLD (mxwo)**: MSCI World Index. Includes a collection of stocks from 24 developed markets.

**MSCI EMERG (mxef)**: MSCI Emerging Markets Index. Includes a collection of stocks from 21 emerging markets.

**USGOV SHORT (usg1tr)**: Bloomberg/EFFAS Government Bond Index that tracks US Treasuries with 1 to 3 year maturities.

**GEGOV SHORT (grg1tr)**: Bloomberg/EFFAS Government Bond Index that tracks German Government Treasuries with 1 to 3 year maturities.

**EMBI BOND USD (jpeigbl)**: JP Morgan EMBI Global Total Return Index. The index covers liquid US dollar denominated debt instruments from 27 emerging market countries.
References:


Gil-Bazo, Javier, Peter Hoffmann, and Sergio Mayordomo, 2015, Mutual funding.


Figure 1. Fund style percentage breakdown by net asset value.

Panel A: All Funds

Panel B: Captive Funds

Panel C: Non-captive Funds
Figure 2. Institutional Structure in the Turkish Individual Pension System
Table 1: Summary Statistics

This table reports the time-series means of cross-sectional medians between October 2003 and December 2014. All return statistics are per month. Gross return is the before-fee cumulative daily return in a month. Alpha is the intercept term from a rolling regression of gross returns on a ten asset factor model. Selection Return is realized return of a fund minus its style return, which is given by the product of the asset factor betas estimated between time t-61 and t-1 and the corresponding asset class index returns for time t.

<table>
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<tr>
<th></th>
<th>Number of Obs.</th>
<th>Number of Funds</th>
<th>Number of Firms</th>
<th>Gross Return</th>
<th>Alpha</th>
<th>Selection Return</th>
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<td>0.10%</td>
<td>0.10%</td>
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<td>0.10%</td>
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<td>0.09%</td>
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<td>Non-Captive Pairs</td>
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<td>12</td>
<td>0.94%</td>
<td>0.18%</td>
<td>0.15%</td>
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Table 2: Panel Regressions of Risk-Adjusted Returns on Fund Characteristics: Managers’ Perspective

Dependent variables are either alpha or selection return estimated previously from rolling regressions of fund returns on a ten asset class factor model. CAPTIVE is a dummy variable that takes on the value of 1 if the manager and the founder of a fund belong to the same bank holding company, 0 otherwise. managerBHC is a dummy variable that takes on the value of 1 if the asset manager firm is a subsidiary of a bank holding company, 0 otherwise. FUNDSIZE is the log of net asset value. FUNDFLOW is the cumulative cash flow in a month scaled by the net asset value. FUNDAGE is the time elapsed since the IPO date of the fund measured in years. FUNDFEE is the annualized percentage fee charged by the fund. PAST RETURN is the geometric average of the fund’s return in the previous twelve months. All regressions include month dummies. Sample period is between November 2008 and December 2014. White’s heteroskedasticity consistent standard errors are used to determine statistical significance. “***”, “**”, “*” represent statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Full Sample

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<th>Dependent Variable:</th>
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<td>(7.51)**</td>
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Panel B: Subsamples

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<th>Non-Captive Pairs</th>
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<td></td>
<td>(1.33)</td>
<td>(2.26)**</td>
<td>(2.57)**</td>
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<td>0.166</td>
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Note: Table 2 presents the results of panel regressions of risk-adjusted returns on fund characteristics, focusing on managers’ perspective. The dependent variables are either alpha or selection return estimated from rolling regressions of fund returns on a ten asset class factor model. The independent variables include CAPTIVE, a dummy variable that takes on the value of 1 if the manager and the founder of a fund belong to the same bank holding company, and 0 otherwise. managerBHC is a dummy variable that takes on the value of 1 if the asset manager firm is a subsidiary of a bank holding company, and 0 otherwise. FUNDSIZE is the log of net asset value. FUNDFLOW is the cumulative cash flow in a month scaled by the net asset value. FUNDAGE is the time elapsed since the IPO date of the fund measured in years. FUNDFEE is the annualized percentage fee charged by the fund. PAST RETURN is the geometric average of the fund’s return in the previous twelve months. All regressions include month dummies. The sample period is between November 2008 and December 2014. White’s heteroskedasticity consistent standard errors are used to determine statistical significance. “***”, “**”, “*” represent statistical significance at the 1%, 5%, and 10% level, respectively.
Table 3: Panel Regressions of Risk-Adjusted Returns on Fund Characteristics: Founders’ Perspective

Dependent variables are either alpha or selection return estimated previously from rolling regressions of fund returns on a ten asset class factor model. CAPTIVE is a dummy variable that takes on the value of 1 if the manager and the founder of a fund belong to the same bank holding company, 0 otherwise. founderBHC is a dummy variable that takes on the value of 1 if the pension company is a subsidiary of a bank holding company, 0 otherwise. FUNDSIZE is the log of net asset value. FUNDFLOW is the cumulative cash flow in a month scaled by lagged net asset value. FUNDAGE is the time elapsed since the IPO date of the fund measured in years. FUNDFEE is the annualized percentage fee published by the fund. PAST RETURN is the geometric average of the fund’s return in the previous twelve months. All regressions include month dummies. Sample period is between November 2008 and December 2014. White’s heteroskedasticity consistent standard errors are used to determine statistical significance. ***, **, *” represent statistical significance at the 1%, 5%, and 10% level, respectively.

### Panel A: Full Sample

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<thead>
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<th>Dependent Variable</th>
<th>Alpha</th>
<th>Selection Return</th>
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<tr>
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<td>(1)</td>
<td>(2)</td>
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<tr>
<td>CAPTIVE</td>
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<td></td>
<td>(-8.48)***</td>
<td>(-6.29)***</td>
</tr>
<tr>
<td>founderBHC</td>
<td>-0.067</td>
<td>0.077</td>
</tr>
<tr>
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<td>(2.52)**</td>
</tr>
<tr>
<td>FUNDSIZE</td>
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<td>(8.55)***</td>
<td>(6.97)***</td>
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<td>(1.04)</td>
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<td>-0.030</td>
</tr>
<tr>
<td></td>
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<td>(-7.30)***</td>
</tr>
<tr>
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<td>0.089</td>
</tr>
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<td>(6.25)***</td>
<td>(6.81)***</td>
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<td>(1.31)</td>
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<td>(3.43)***</td>
<td>(1.40)</td>
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<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>8,327</td>
<td>8,327</td>
</tr>
<tr>
<td>R-squared</td>
<td>8,327</td>
<td>8,327</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.085</td>
<td>0.078</td>
</tr>
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<td>8,327</td>
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<td>R-squared</td>
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<td>0.078</td>
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### Panel B: Subsamples

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<th>Dependent Variable</th>
<th>Alpha</th>
<th>Selection Return</th>
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<td>BHC-affiliated Founders</td>
<td>Non-Captive Pairs</td>
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<td>CAPTIVE</td>
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<td>-0.180</td>
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<tr>
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<td>(-5.21)***</td>
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<td>(3.25)***</td>
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<td>(1.03)</td>
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<td>(11.61)***</td>
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<td>(-7.60)***</td>
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<td>0.051</td>
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<td>(1.64)</td>
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<td>(-4.45)***</td>
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<td>1,692</td>
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<tr>
<td>R-squared</td>
<td>1,692</td>
<td>7,963</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.103</td>
<td>0.219</td>
</tr>
<tr>
<td>R-squared</td>
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<td>6,514</td>
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<tr>
<td>R-squared</td>
<td>0.103</td>
<td>0.219</td>
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Table 4: Determinants of Fund Flows

Dependent variable is Flow, defined as the cumulative cash flow in month t scaled by net asset value in month t-1. ALPHA is the intercept from a regression of fund returns against the ten asset class factor model estimated between t-61 and t-1. Other regressors are defined in Table 3.

<table>
<thead>
<tr>
<th>Dependent Variable:</th>
<th>Flow (% of NAV)</th>
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</thead>
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<td>Full Sample</td>
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<tr>
<td>CAPTIVE</td>
<td>0.027</td>
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<td></td>
<td>(5.96)**</td>
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<td>founderBHC</td>
<td>0.016</td>
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<td>(3.03)**</td>
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<td>(-5.13)**</td>
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<td></td>
<td>(1.99)**</td>
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<td>PAST RETURN</td>
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<td>(3.62)**</td>
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<td>ALPHA</td>
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<tr>
<td>R-squared</td>
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</table>
Table 5: Determinants of Fund Fees

Dependent variable is Fee, defined as the annualized percentage fee published by the fund. GROUP DUMMY takes on the value of 1 if a particular fund is exclusively intended for employer pension plans, 0 otherwise. Other regressors are defined in Table 3 and Table 4. All regressions include fund style dummies,

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<tr>
<th>Dependent Variable:</th>
<th>Fee (%)</th>
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<td>(7.26)***</td>
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<tr>
<td>FUNDAGE</td>
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<tr>
<td>(9.99)***</td>
<td>(11.49)***</td>
</tr>
<tr>
<td>PAST RETURN</td>
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<td>(2.45)**</td>
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<td>(8.67)***</td>
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<td>(56.89)***</td>
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<td>Style Dummies</td>
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<tr>
<td>R-squared</td>
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