Mutual Fund Dual Holdings and Shareholder-Creditor Conflicts *

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Abstract

Mutual fund families increasingly hold bonds and stocks from the same firm. We study the implications of such dual holdings for corporate governance and firm decision-making by exploiting variations in dual ownership resulting from the rise in the popularity of bond mutual funds and from cross-family fund mergers. We present evidence of a reduction in shareholder-creditor conflicts, which allows firms to increase valuable investments and to refinance by issuing bonds with lower yields and fewer restrictive covenants. Overall, our results suggest that fund families internalize the shareholder-creditor agency conflicts of their portfolio companies, highlighting the benefits of such institutional ownership.

Keywords: Mutual funds, dual holding, investment, debt overhang

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1 Introduction

In the past decade, an increasingly popular way to invest in corporate bonds is through bond mutual funds. By 2019, bond mutual funds accounted for more than 25% of the U.S. corporate bond market and held approximately 1.5 trillion dollars, which more than tripled from 423 billion dollars in 2009.[1] Together with their long-standing and substantial ownership in the equity market, mutual funds have become primary investors in both stocks and bonds. Consequently, fund families managing both equity and bond funds are more likely to simultaneously hold stocks and bonds from the same portfolio companies. This trend naturally raises the question of whether the families' fund managers coordinate their decisions on these firms. More specifically, would such dual holdings mitigate conflicts of interest between shareholders and bondholders (Jensen and Meckling, 1976; Myers, 1977)? And how would such dual holdings affect corporate actions?

The answer is far from clear given the mixed incentives of mutual fund managers. On the one hand, because investors chase performance and management fees are proportional to fund size, fund managers face short-term performance pressure and have strong incentives to compete, even within the same family (e.g., Brown, Harlow, and Starks, 1996; Chevalier and Ellison, 1997; Kempf and Ruenzi, 2007; Schwarz, 2011). Individual funds also have a fiduciary duty to their own investors, and equity and bond investors have significantly different risk appetites and investment objectives (Goldstein, Jiang, and Ng, 2017). Greppmair et al. (2020) find that mutual funds that lend securities do not share their knowledge about shorting demand with other fund managers in the same fund family. As such, if managers of equity and bond funds only seek to maximize the value of their own funds, dual holding families might not affect or even exacerbate the shareholder-creditor conflicts of their portfolio companies.

[1]The U.S. corporate bond market itself has also grown substantially since the 2008 financial crisis, with the amount of outstanding non-financial corporate bonds increasing from 3 trillion dollars in 2009 to more than 5.7 trillion dollars in 2019. According to data from the Fed, the corporate bond market is now more than 60% larger than the corporate loan market (see Figure 1).

[Figure 1 about here.]

On the other hand, there is a growing literature documenting cross-subsidization and coordination within fund families, where families strategically allocate performance across their member funds to maximize the value of the whole group (e.g., Gaspar, Massa, and Matos, 2006; Bhattacharya, Lee, and Pool, 2013). Bodnaruk and Rossi (2016) find evidence of within-family coordination between equity and bond funds when the portfolio companies become takeover targets. Auh and Bai (2020) provide evidence of information sharing between equity and bond funds by studying co-movement in holdings within the families. Keswani, Tran, and Volpin (2021) find that equity funds from dual holding families vote more in line with creditors' interests. Thus, if equity and bond funds coordinate to maximize the value of the family, intra-family dual ownership could mitigate shareholder-creditor conflicts of their portfolio companies.

We empirically study how mutual fund dual holdings affect shareholder-creditor conflicts and corporate actions by focusing on investment decisions. Firm investment is at the heart of conflicts between shareholders and creditors (e.g., Jensen and Meckling, 1976). Due to their subordinated cash flow claims, shareholders could lack incentives to finance investment projects when the firm is in financial distress, even if these projects have a positive net present value (e.g., Myers, 1977). The resulting underinvestment is known as the debt overhang problem. We show that mutual fund dual ownership helps prevent debt overhang problems, allowing firms to increase valuable investments and refinance at lower costs.

Using detailed holding data from the CRSP mutual fund database for the period from 2008 to 2018, we first document a rising trend in mutual fund dual holdings of U.S. publicly traded firms. Among firms with mutual fund equity ownership and outstanding bonds, the percentage of firms with dual holdings increases from 38% in 2008 to 58% in 2018, and firm-level mutual fund dual holding intensity increases by threefold (see Figure 2).[2]

[Figure 2 about here.]

[2]Measurement details are explained in Section 2.2.

Next, we show that mutual fund dual holdings are positively related to corporate investment, especially for firms that face financial distress. Our baseline results imply that an increase in dual holdings from zero to the median level is associated with an increase in capital expenditures by approximately 1 percentage point. Given that firms reduce investments by about 3.7 percentage points when facing financial distress, a median level of mutual fund dual holdings substantially offsets this investment decline by relatively 27%. Our tests use industry $\times$ year fixed effects to compare firms facing the same shocks to investment opportunities, and control for a rich set of characteristics as well as firm fixed effects. As such, our findings are not due to macroeconomic or industry-wide investment cycles, or firm-specific time-invariant unobserved factors that might influence the match between firms and mutual funds.

Of course, mutual fund dual holdings are not randomly assigned to firms. Picking the right stocks and bonds at the right time is exactly the fund managers' job, which suggests that funds could select to become dual holders when firms are about to increase investments. There may also be other time-varying unobserved firm characteristics that are simultaneously correlated with both funds' holding decisions and firms' future investments. We use cross-family mutual fund mergers as a source of exogenous variation in dual holdings to address these endogeneity concerns. Cross-family funds merge to achieve economies of scale and to offer a broader set of investment choices to customers, which are reasons unrelated to individual portfolio companies (Jayaraman, Khorana, and Nelling, 2002). Moreover, since individual firms constitute only a minor fraction of the merging funds' portfolios, it is unlikely that firm-specific characteristics lead to fund mergers.

We use a difference-in-differences (DID) framework and classify firms as treated when they receive more dual holdings due to fund mergers. We find that cross-family fund mergers increase firm-level dual holding intensity by 0.021, representing a 30% increase relative to the sample mean. We match each treated firm with a control firm within the same industry-year cohort based on one-year pre-treatment log assets, market-to-book ratio, institutional own-

ership, mutual fund bond holding, and dual holding level. The DID estimates imply that treated firms increase investments more than control firms in the post-treatment period. This effect is predominantly driven by financially distressed firms. In the subsample that only contains distressed firms, the DID estimates suggest that treated firms facing financial distress increase investments by 4.3 percentage points after the mergers—21% more relative to the control firms. A further examination of the dynamics of the treatment effect and placebo tests confirm that the observed effect can be subscribed to the fund mergers. Moreover, we test an effect of potentially confounding factors by assigning a placebo treatment to firms that are involved in fund mergers but that do not experience any changes in their dual ownership. We find no effects in these placebo tests, which highlights the relevance of dual ownership.

Next, we provide evidence that dual holding families are willing to supply the capital to firms that need to finance their investments. Our DID analysis shows that treated firms are, on average, 12% more likely to issue new bonds than control firms (20% more likely in the case of financially distressed firms), with a significant share bought by mutual fund dual holders. Pricing and contracting terms also depend on mutual fund dual holders. More specifically, dual holdings reduce the offering yield by 17 bps for issuers with high yield credit ratings, effectively lowering firms' cost of debt financing. Covenants are less restrictive in the case of dual holdings, allowing financially distressed firms to be more flexible in selecting investment projects and providing refinancing opportunities through debt or asset sales.

To further study the mechanisms through which mutual funds reduce potential conflicts between shareholders and bondholders, we examine mutual fund voting records. We show that equity funds are less likely to miss votes at shareholder meetings of firms from which their families simultaneously hold bonds. This result suggests that equity funds from dual holding families pay more attention and exert more effort to influence corporate decision-making. This increased involvement in corporate governance also helps explain why dual holders are willing to supply additional capital against lower yields and with fewer restrictions.

Finally, we link dual holdings to the value created by investments. We focus on firms' takeover decisions as acquisition announcement returns are relatively easy to observe and could signal to the market that debt overhang problems are mitigated. We find that acquirers' bondholder and shareholder returns are higher when financially distressed bidders have more mutual fund dual holdings. Moreover, firm risk does not increase with mutual fund dual ownership, which is evidence against the possibility of risk-shifting behavior.

In sum, our findings suggest that mutual fund dual holders substantially reduce debt overhang problems by allowing firms facing financial distress to refinance at lower costs and with fewer restrictive covenants. As such, we contribute to the debt overhang literature.[3] Our work also contributes to the literature on the relation between corporate governance and mutual funds. While this literature so far mostly focuses on whether mutual funds effectively monitor management (e.g., Duan and Jiao, 2016; Appel et al., 2016; Bebchuk et al., 2017), our findings suggest that mutual funds internalize the shareholder-creditor agency conflicts through their dual holdings. Chen, Zhang, and Zhu (2019) find that mutual fund dual holdings affect CEO compensation design, which leads us to control for CEO compensation design in the relevant empirical analyses. Chu et al. (2018) consider dual holdings that include bonds and show that distressed firms with dual holders are more likely to go through out-of-court restructuring than through bankruptcy filings. Through our focus on investment and financing, we show that dual holdings enable mutual funds to influence corporate investment through the capital supply channel.

Our work also contributes to the growing literature on the implications of dual ownership. Previous studies in this literature mostly focus on the simultaneous holdings of equities and syndicated loans and find that dual holdings through syndicated loans can reduce agency problems (Jiang et al., 2010; Chu, 2017; Chava et al., 2019a; Antón and Lin, 2020; Chu et al., 2021). It is *ex-ante* unclear whether the extant findings apply to mutual fund dual holdings

[3]Studies in this literature show that alternative ways in which debt overhang problems can be mitigated are by ex-post debt renegotiation (Roberts and Sufi, 2009; Roberts, 2015; Chu, forthcoming), by aligning managers' incentives with creditors (Becker and Stromberg, 2012), and by equity ownership concentration (Alanis, Chava, and Kumar, 2018).

of stocks and bonds, as mutual fund managers face short-term performance pressure and have strong incentives to compete, even within the same family (e.g., Brown et al., 1996; Chevalier and Ellison, 1997; Kempf and Ruenzi, 2007; Schwarz, 2011). Different types of investors could lead to substantially different outcomes. For example, while non-commercial bank dual holders involved in syndicated loans charge lower loan yield spreads (Jiang et al., 2010), having a hedge or private equity fund as one of the syndicate loan members increases loan spreads (Lim et al., 2014). We find evidence that mutual fund dual holdings lead to lower borrowing costs and fewer restrictive covenants. To our knowledge, our paper is the first to document the emerging trend of mutual fund dual holdings and to identify the effects of such ownership on firm investment and financing decisions.

The rest of the paper is organized as follows. Section 2 describes the data and the construction of the dual holding variable. Section 3 develops hypotheses and discusses our empirical methodology. Section 4 presents our empirical findings, Section 5 studies potential mechanisms, and Section 6 concludes.

2 Data and summary statistics

2.1 Data sources and sample

We combine data from various sources. We obtain mutual fund equity and bond holding data from the CRSP Survivor-Bias-Free Mutual Fund Database for the period from 2008 to 2018. We start in 2008 because Schwarz and Potter (2016) point out inaccurate position information prior to 2008. We obtain stock price data from CRSP, financial reporting data from Compustat, and corporate bond information from the Mergent Fixed Income Securities Database. We require firms to have mutual fund equity ownership and outstanding bonds and exclude financial firms (SIC 6000-6999) and utilities (SIC 4900–4999). Our sample consists of 10,452 firm-year observations and 1,409 unique firms. These firms have issued 3,454 new bonds during the sample period. To assess investment quality, we also collect

acquisition announcement data, which we obtain from SDC, for 4,513 acquisitions made by our sample firms.

2.2 Measuring dual holdings

Our main independent variable is a firm-level measure of mutual fund dual holding intensity, denoted as *Dualholding*. A higher value of *Dualholding* implies that a firm has more mutual fund dual ownership and is more likely to be influenced by these dual holders.

We first measure dual holdings per mutual fund family level per firm-quarter. For each fund family j and quarter q, we follow Bodnaruk and Rossi (2016) to identify j as a dual holder of firm i if j's bond positions represent at least 5% but not more than 95% of family j's overall exposure (both debt and equity) to firm i. In other words, family j is a dual holder of firm i in quarter q, i.e., $DH_{ijq} = 1$, if

$$5\% \leq \frac{BondMV_{ijq}}{BondMV_{ijq} + EquityMV_{ijq}} \leq 95\%,$$

where $BondMV$ and $EquityMV$ denote family j's total bond and equity positions in firm i, respectively.

Next, we aggregate across all mutual fund families to obtain a firm-level mutual fund dual holding measure. Given the large differences between mutual fund families, their holdings, and their incentives to monitor, equally weighting all families is inappropriate (Gilje, Gormley, and Levit, 2020). Therefore, we take a weighted average, giving more weight to family j if (1) firm i has more weight in j's portfolio, and (2) if j owns a larger fraction of firm i's shares. The former captures the importance of the firm to the fund family and thus how much attention it will likely pay to the firm, whereas the latter captures how much firm management likely cares about the fund family. We follow Kempf et al. (2016) and construct

the weights as follows:

$$w_{ijq} = \frac{QPweight_{ijq} + QOwn_{ijq}}{\sum_{j \in J_{iq}} (QPweight_{ijq} + QOwn_{ijq})},$$

where Own_{ijq} is the fraction of firm i's shares held by family j, and $Pweight_{ijq}$ is the market value weight of firm i in family j's portfolio. To minimize the impact of outliers and measurement error, we sort all stocks held by family j in quarter q by $Pweight$ into quintiles, denoted $QPweight$. Similarly, we sort firm i's shareholders by ownership into quintiles $QOwn$. Finally, we scale by the term in the denominator so that the weights add up to one. The resulting weights capture the relative importance of each firm to each mutual fund family, and vice versa. Hence, our approach assigns large weights to dual holders that have the incentive and ability to influence management.[4]

Using this weighting scheme, we define mutual fund dual holding at the firm-quarter-level as follows:

$$Dualholding_{iq} = \sum_{j \in J_{iq}} w_{ijq} \times DH_{ijq},$$

where J_{iq} denotes the set of all mutual fund families that own shares of firm i in quarter q. To aggregate this measure at the firm-year-level, we take the average over the four quarters for each year t.

2.3 Summary statistics

Table I reports the summary statistics of all variables used in the empirical analyses. The key independent variable is the firm-level mutual fund dual holding, which is right-skewed and equals 0 for about 50% of the sample. We therefore also report the distribution of *Dualholding* with only positive values, which has a mean of 0.13 and a median of 0.10. Henceforth, we refer to the value 0.10 as the median dual holding level and refer to values

[4]In robustness tests, we employ simpler dual holding measures that focus on only one dimension. For example, we sum the number of dual holders whose equity stake exceeds 1%. We find that our results are robust to alternative measurements of dual holdings.

above 0.10 as the high dual ownership group, which involves 25% of our sample. Detailed definitions of the variables are reported in Table A1. All continuous variables are winsorized at the 1% at both tails. Our summary statistics of firm-level variables are similar to those of the Compustat universe, except that our sample has higher total institutional ownership, lower ownership concentration, and more (non-dual) mutual fund bond holdings.

[Table I about here.]

Figure 2 shows the time-series and cross-sectional variation of mutual fund dual holdings. The percentage of firms with non-zero dual holdings increases from 38% in 2008 to 58% in 2018. The average level of dual holdings increases from 0.03 to 0.10 over the same period. Figure 2 also compares the distribution of mutual fund dual holdings in 2008 and 2018, conditional on having non-zero dual holdings. Relative to the 2008 distribution, the 2018 distribution has a much larger value in the higher percentiles. The dual holding values in 2018 are also more evenly distributed than the dual holding values in 2008.

3 Hypotheses and empirical methodology

3.1 Hypothesis development

The conflict of interest between shareholders and creditors can lead to severe agency problems (e.g., Jensen and Meckling, 1976). Myers (1977) shows that due to their subordinated cash flow claims in financial distress, shareholders could have incentives to not finance investment projects when the firm is financially distressed, even if these projects have a positive net present value, because debt holders capture most of this value. This underinvestment reduces firm value and is commonly known as the underinvestment or debt overhang problem. Dual holdings, i.e. the simultaneous holding of equity and debt claims, could reduce this problem as dual holders have incentives to maximize total firm value rather than only the value for shareholders. A growing literature indeed shows that families strategically

allocate performance across their member funds to maximize the value of the whole group (e.g., Gaspar, Massa, and Matos, 2006; Bhattacharya, Lee, and Pool, 2013; Ma, Tang, and Gómez, 2019) and there is evidence of within-family coordination between equity and bond funds (Bodnaruk and Rossi, 2016; Auh and Bai, 2020). Recent evidence from dual ownership in the syndicated loan market also supports the argument that particular dual holdings could reduce conflict, as equity-syndicated loan dual holdings lead to lower loan yield spreads (Jiang, Li, and Shao, 2010), fewer capital expenditure restrictions in loan contracts (Chava, Wang, and Zou, 2019b), lower shareholder payout ratios (Chu, 2017), and higher investment efficiency (Antón and Lin, 2020).

Hence, if equity mutual funds coordinate with bond mutual funds to maximize the value for the family, mutual fund dual holdings could help align interests and reduce the underinvestment problem. The if-statement is important, because there are reasons to suggest that mutual funds care mostly about their own performance. Greppmair et al. (2020) find that mutual funds that lend securities do not share their knowledge about shorting demand with other fund managers in the same fund family. Fund flows to mutual funds chase performance, which creates short-term performance pressures, and management fees are proportional to fund size, which also creates incentives to compete (e.g., Brown et al., 1996; Chevalier and Ellison, 1997; Evans et al., 2020). In addition, individual funds have a fiduciary duty to their own investors, and equity and bond investors have significantly different risk appetites and investment objectives (Goldstein et al., 2017). If managers of equity and bond funds only seek to maximize the value of their own funds, dual holding families might not affect or even exacerbate the shareholder-creditor conflicts of their portfolio companies.

In the end, the effect of mutual fund dual holdings on firm investment is an empirical question. If mutual fund dual holders reduce the debt overhang problem, we predict that higher dual holdings allow financially distressed firms to increase capital investments.

3.2 Fixed-effect panel regression

We first use firm-level panel regressions to estimate whether there is a correlation between mutual fund dual holdings and different firm outcomes. Specifically, we estimate different versions of the following regression specification:

$$y_{it} = \alpha + \beta_1 Dualholding_{it} + \beta_2 FD_{it-1} + \beta_3 \left(Dualholding_{it} \times FD_{it-1}\right) + \gamma' X_{it-1} + FirmFE_i + Industry \times YearFE_{it} + \varepsilon_{it}. \quad (1)$$

where i indexes firms, t indexes years, and y_{it} is the dependent variable of interest (e.g., capital investments). *Dualholding* is the firm-level mutual fund dual holding measure that we construct as described in Section 2.2. The vector of control variables X_{it-1} includes lagged firm characteristics (firm size, fixed assets, market-to-book ratio, cash holdings, profitability, and payout value) and contemporaneous ownership characteristics (percentage of institutional ownership, institutional ownership concentration, and (non-dual ownership) mutual fund bond holdings). We cluster standard errors at the firm level.

If mutual fund dual ownership affects shareholder-creditor conflicts of their portfolio companies, we should observe significant correlations between *Dualholding* and the corresponding outcome variables. Moreover, because the potential agency problems are especially value-destroying when firms face financial distress (e.g., Myers, 1977; Ayotte, Hotchkiss, and Thomburn, 2013), the correlations should come mostly from distressed firms, which is captured by the coefficient β_3 on the interaction term between *Dualholding* and FD. FD is a dummy variable that equals one if the firm is identified as financially distressed. In our baseline analysis, we classify firms as financially distressed when they are in the upper quartile of the lagged leverage ratio, as this measure seems to clearly link to potential debt overhang. In additional tests, reported in Section 4.2, we employ a range of alternative financial distress measures: high default probability (Bharath and Shumway, 2008), poor credit ratings, the Kaplan and Zingales (KZ) index (Kaplan and Zingales, 1997), the Whited and Wu (WW)

index (Whited and Wu, 2006), the Size-Age index (Hadlock and Pierce, 2010), and the textual analysis based measure from Hoberg and Maksimovic (2014). Our results are robust to using these alternative measures.

By including industry × year fixed effects, we are effectively comparing firms within the same industry (Fama-French-12) at the same time, thereby controlling for common factors such as industry-wide shocks to investment opportunities. We also include firm fixed effects to control for firm-specific time-invariant unobserved factors that might influence the match between firms and mutual funds.

3.3 Diff-in-diff approach: cross-family mutual fund mergers

Mutual fund dual holdings are not randomly assigned to firms. For example, potentially funds select to become dual holders when firms are about to have favorable outcomes. There may also be other time-varying unobserved firm characteristics that are simultaneously correlated with both funds' dual holding decisions and firm policies. To address these endogeneity concerns, we use cross-family mutual fund mergers as a source of exogenous variation in dual holdings.

Our identification strategy is as follows. Consider two otherwise identical firms X and Y. Family A initially has only equity ownership in X. After acquiring a bond fund from family B, which holds bonds of firm X, family A becomes a dual holder of firm X. In contrast, firm Y is not affected. We can identify the causal effect of dual holdings by analyzing changes of firm X relative to firm Y before and after the merger (He and Huang, 2017; He, Huang, and Zhao, 2019). Since individual firms constitute only a very small fraction of the merging funds, it is unlikely that firm-specific characteristics lead to fund mergers. Instead, Jayaraman et al. (2002) show that cross-family mutual funds merge to achieve economies of scale and to offer a broader set of investment choices to their customers.

We implement this strategy in a difference-in-differences (DID) framework with a five-year window around merger events. To identify fund mergers, we start with funds with a

delisting code of M in the CRSP mutual fund database. We then follow Lou (2012) and McLemore (2019) to identify the merger event month. Specifically, we match a target fund to its acquirer fund one month before to five months after its last net asset value (NAV) report date, and use the month in which the acquiring fund has the largest flow as the event month.[5] We drop all mergers that happen within the same mutual fund family or those not involving our sample firms, which leaves 34 cross-family mutual fund mergers between 2010 and 2016. We consider the merger completion year and the two subsequent years as post-treatment years, whereas pre-treatment years are the two years before the merger. The results are similar if we exclude the year of merger completion.

On average, the fund mergers increase firm-level dual holding intensity by 0.021—a 30% increase relative to the sample mean (0.07). We classify firms as treated when they receive more dual holdings due to a fund merger, with an increase of at least 0.01, and exclude firms treated again in less than two years after receiving the first treatment. This procedure produces a sample of 484 treated firms. Our results are robust to alternative cutoff values. Note that even if the acquiring families were already dual holders of given firms before the merger, an increase in either equity or bond ownership would further strengthen their dual holdings' importance and, therefore, still affect treated firms.

To construct the control group, we apply a one-to-one non-replacement matching within the same industry-year cohort and use propensity scores to match on the following characteristics, measured at the fiscal year ending immediately before the mergers: log assets, market-to-book ratio, institutional ownership, other mutual fund bond holding, and mutual fund dual holding level.

To estimate the effect of fund mergers on firm outcomes, we use the following regression

[5]Fund flow is calculated following Sirri and Tufano (1998): $FLOW_{i,t} = \frac{TNA_{i,t} - (1+R_{i,t}) \times TNA_{i,t-1}}{TNA_{i,t-1}}$.

specification:

$$y_{it} = \alpha + \beta \left(Treated_i \times Post_{it} \right) + \gamma' X_{it-1} + EventFirmFE_i + Industry \times YearFE_{it} + \varepsilon_{it}, \quad (2)$$

where $Treated_{it}$ is a dummy variable indicating whether a firm is affected by a mutual fund merger event or not and X_{it-1} is the same as in the panel regression. We cluster standard errors at the merger event level, while confirming that the results remain similar if we cluster at the event-firm level. The key coefficient of interest is β, which measures the differential behavior of treated firms. If mutual fund dual holding reduces the debt overhang problem, β would be significant and positive when the dependent variable is capital investment and β would increase in magnitude when we focus on financially distressed firms.

Even though cross-family fund mergers are arguably exogenous to each individual portfolio company, confounding factors could exist if funds involved in the merger tend to hold firms of specific types. For example, poorly-performing target funds may hold firms that exhibited inferior recent performance. Thus, an increase in investment after the merger may just be a reversion to the mean for firms that exhibited disappointing performance over the prior years. Another potential concern with our DID analysis is that fund mergers may change not only firms' mutual fund dual ownership but also other ownership characteristics (such as ownership concentration), which could also affect firm outcomes. To test these alternative stories, we assign a placebo treatment to firms that are involved in fund mergers but do not experience any changes in their dual ownership. If our findings are driven by unobserved trends in firm characteristics or channels other than dual ownership, we would still find a significant treatment effect for those firms. However, as we discuss later in Section 4.2, the DID estimate of such a placebo treatment is indistinguishable from zero.

4 Results

This section presents our main results. We first document that firms with more dual holdings significantly increase capital investments, especially when they are financially distressed. We document that the diff-in-diff analysis exploiting variation in dual ownership resulting from cross-family fund mergers provides the same results. We further present findings on firm risk and value creation that suggest that the investments are not the result of overinvestment or risk-shifting.

4.1 Investment

To formally test the relation between dual holdings and firm investments, we estimate Equation (1) with capital investments as the dependent variable and report the results in Table II. Mutual fund dual holding has a significant positive correlation with capital investments after we control for a rich set of firm-specific characteristics in column (1), and additionally control for industry $\times$ year fixed effects and firm fixed effects in column (2). The industry $\times$ year and firm fixed effects ensure that our findings cannot be explained by macroeconomic or industry-wide investment cycles, or firm-specific time-invariant unobserved factors that might influence the match between firms and mutual funds.

A contemporaneous paper by Chen et al. (2019) finds evidence that shareholders from dual-holding financial institutions design managerial compensation in a way that benefits the whole fund family. To test whether managerial compensation drives the effect of dual holding on firm investment, we include CEO incentive-pay as an additional control variable in our regression. We follow Chen et al. (2019) and use the variable Option/TDC1, which is the fair value of option awarded in year t divided by CEO's total compensation of that year. As shown in column (3), including managerial compensation reduces our sample size but does not materially affect the coefficient estimates of our dual holding measures.

When we interact *Dualholding* with firm leverage in column (4), the coefficient on

Dualholding becomes insignificant, whereas the coefficient on the interaction term is significantly positive, implying that dual holdings increase investments mostly for firms with higher leverage ratios. In column (5), we use a dummy variable instead of the continuous leverage ratio to capture financial distress. The dummy variable FD indicates whether the leverage ratio lies in the upper quartile of its empirical distribution. The results are similar to those in column (4). The coefficient estimate of *Dualholding* is not significant, but its interaction term with the FD dummy is significantly positive.

[Table II about here.]

The association with dual holdings is not only statistically significant but also economically sizable. The coefficient estimates in column (5) imply that an increase in dual holdings from zero to the median level (0.10) is associated with about 1 percentage point (0.10*0.100) increase in capital expenditures by financially distressed firms. More importantly, given that firms cut investments by 3.7 percentage points when facing financial distress, a median level of dual holdings helps to substantially offset this investment decline relatively by 27%.

We use a difference-in-differences analysis to help establishing causality between mutual fund dual holdings and capital investment. While our panel regressions include a rich set of firm characteristics and industry $\times$ year and firm fixed effects, it remains possible that some time-varying unobserved factors systematically correlate with both mutual fund dual holding and firm investment decisions. For example, some skilled equity and bond fund managers could potentially identify firms with more investment opportunities and increase their holdings. As described in Section 3.3, our difference-in-differences framework exploits variation in dual holdings generated by cross-family mutual fund mergers.

[Table III about here.]

Table III reports the DID results of estimating Equation (2) for capital investments. To ensure that the treated and control firms are comparable, we use non-replacement propensity

score matching to construct the control group.[6] Our main interest is in the $Treated \times Post$ variable, which shows how increases in dual holdings due to fund mergers relate to firm investment. The coefficient on $Treated \times Post$ is 0.014 and statistically significant ($t = 2.312$) in column (1), and increases to 0.018 ($t = 3.271$) when we include control variables in column (2). This latter DID estimate implies that in the post-treatment period treated firms increase investments by 1.8 percentage points more than control firms do. We further include CEO incentive-pay as an additional control variable in our DID regressions in column (3). This additional control variable does not materially affect the coefficient estimates of our variable of interest: $Treated \times Post$.

To examine whether the treatment effect is more pronounced for financially distressed firms, we divide the sample into firms that are below or above the upper-quartile of the leverage ratio measured in the year before the treatment and present the results in columns (3) and (4). While the treatment effect remains significant (0.013) for non-distressed firms in column (3), for distressed firms in column (4) we observe a treatment effect that is more than three times as large. The DID estimate for distressed firms suggests that treated firms increase investments by 4.3 percentage points in the post-treatment period—21% more relative to the control firms facing financial distress. As we show in Panel A of Table IV, our DID results are similar and even stronger when we cluster the standard errors at the event-firm level or when we exclude the year of merger completion.

4.2 Robustness tests

An important identification assumption in DID analysis is the parallel trend assumption. We conduct two robustness tests to validate this assumption, ensuring that our results are not confounded by differential trends in capital investment for treated and control firms. First, we examine the dynamic treatment effects of cross-family fund mergers on the treated

[6] Table A2 of the Appendix shows the pre-treatment firm characteristics comparison between treated firms and matched control firms. The two groups are similar, as the differences between treated and control firms are small and statistically insignificant.

and control firms. Instead of using *Post* to denote all years after the merger events, we construct dummy variables indicating each of the seven years around the merger event, from $Year(t-3)$ to $Year(t+3)$, where the merger takes place in year t. We interact these year-dummies with the $Treated$ dummy in the following regressions:

$$Capex_{it} = \alpha + \sum_{k=-3}^{3} \beta_k \left(Treated_i \times Year_{it}(t+k)\right) + \gamma' X_{it-1} + EventFirmFE_i + Industry \times YearFE_{it} + \varepsilon_{it}, \quad (3)$$

If the parallel trend assumption is valid, we expect β_{-3}, β_{-2}, and β_{-1} to be insignificant.

[Figure 3 about here.]

Figure 3 reports the point estimates of β_k's and the corresponding 90% confidence intervals. The coefficient on the pre-treatment interaction terms,β_{-3}, β_{-2}, or β_{-1}, is not significantly different from zero, which is consistent with a parallel trend between treated and control firms before treatment. The treatment effect becomes significant after the event year t, implying that the increase in mutual fund dual holdings resulting from fund mergers only starts to influence firm investment after the mergers have taken place.

[Table IV about here.]

In a related robustness test, we examine whether the treatment and control groups behave similarly in time periods that did not experience cross-family fund mergers. In Panel B of Table IV, we create placebo merger events three years before each actual event, and investigate whether treated firms respond to these pseudo treatments with Equation (2).[7] For brevity, we only report coefficients of interest and suppress control variables. We find that the coefficient on the interaction term $Treated \times Post$ is not statistically significant in any of the specifications, including the one where we only consider distressed firms. This

[7]For firms that receive multiple treatments within five years, we only consider the very first treatment, resulting in a smaller sample.

suggests that treated and control firms have similar investment trends in other time periods, which lends further support to the parallel trend assumption.

Because fund mergers may change not only firms' mutual fund dual ownership but also other ownership characteristics (such as ownership concentration), we perform another placebo test by assigning treatment to firms that are involved in a fund merger but that do not experience any changes in their dual ownership. If our findings are driven by channels other than dual ownership, we would still find a significant treatment effect on firm investment in this test. However, as shown in Panel A of Table IV, the DID estimate of this placebo treatment is indistinguishable from zero in any of the specifications. Note that our regressions also control for ownership variables such as institutional ownership and ownership concentration.

This placebo test also mitigates other potential concerns about whether cross-family mergers are fully exogenous and not driven by unobserved characteristics of portfolio companies, since funds could hold firms of specific types. For example, funds may have performed poorly and therefore become takeover targets, and the reason could be that these funds tend to hold firms or industries that exhibited inferior recent performance. Thus, our finding of an increase in capital expenditures after the merger may just be a reversion to the mean for firms with disappointing performance over the prior years. If our findings are driven by such confounding factors, then we would find a significant treatment effect for firms involved in fund mergers even if they do not experience any changes in mutual fund dual ownership. However, we fail to detect any effect on those firms.

We also perform robustness tests on the measure of financial distress in Panel C of Table IV. Rather than the leverage ratio, we employ the following empirical proxies for financial distress: high default probability from the Merton (1974) DD model (Bharath and Shumway, 2008), having no credit rating or being rated as high-yield, the Kaplan and Zingales (KZ) index (Kaplan and Zingales, 1997), the Whited and Wu (WW) index (Whited and Wu, 2006), the size and age index from Hadlock and Pierce (2010), and the textual analysis

based measure from Hoberg and Maksimovic (2014). We find that our conclusion that there is a positive link between dual holdings and firm investment for financially distressed firms is generally robust to these alternative empirical proxies of financial distress, as we observe a positive coefficient in 6 out of 6 cases, and the relationship is statistically significant at the 5% level or better in the majority of cases.

Finally, we look at cash acquisitions, R&D expenditures, and asset growth as alternative investment measures in Panel D of Table IV. Consistent with our baseline results, financially distressed firms with more dual holdings spend more on cash acquisitions and R&D and have higher asset growth. Overall, the DID results using cross-family fund mergers are consistent with our baseline finding that mutual fund dual holders allow financially distressed firms to increase investments.

4.3 Firm risk and investment quality

Next, we investigate whether firm risk increases with dual ownership because the increase in corporate investment could also potentially result from risk-shifting or asset substitution. Risk-shifting or asset substitution is a shareholder-creditor agency conflict where shareholders pursue long-shot negative NPV projects that benefit them over creditors (Jensen and Meckling, 1976). In Table V, we use Equation (1) to examine firm risk-taking behavior. As is standard in the literature, our first measure of risk-taking is realized equity volatility. In column (1) and (2), the dependent variable is the annualized stock return volatility over the 90 trading days prior to fiscal year-end. In column (3) and (4), we consider an alternative risk-taking measure by calculating the standard deviation of return-on-asset (ROA) changes over the past eight quarters. Neither the standalone *Dualholding* variable nor its interaction with the financial distress dummy FD has a significant coefficient in any of the specifications (and the sign of the interaction effect is even negative).

[Table V about here.]

In Table VI, we also use the DID framework to test the effect of mutual fund dual holdings on firm risk. We estimate Equation (2) when the dependent variable is stock return volatility in columns (1) and (2), and ROA volatility in columns (3) and (4). Columns (2) and (4) focus on the subsample of financially distressed firms. We find that the coefficient on the interaction term $Treated \times Post$ is indistinguishable from zero in all of the four columns, regardless of the sample. Overall, there is no evidence that mutual fund dual holdings are related to changes in firm risk.

[Table VI about here.]

In addition, we examine whether the investment projects made by dual holding firms create value. Value-destroying investments might occur, for example, because of overinvestment (Jensen, 1986). Although overinvestment would be more likely for non-financially distressed firms, an analysis of wealth effects still helps in establishing whether the investments were perceived to be beneficial.

We focus our analysis on firms' takeover decisions, which are relatively easy to observe. Our sample includes 4,423 acquisitions. The corresponding acquisition announcement returns are useful indicators of whether a deal creates or destroys firm value. We first report the abnormal returns for bondholders, and then report the abnormal returns for equity holders.

[Table VII about here.]

Table VII reports the results of whether dual holdings create value by studying acquirer abnormal returns around announcements of acquisition deals. We first report bondholders' returns in columns (1) and (2). We follow Bessembinder, Kahle, Maxwell, and Xu (2009) in computing weekly bond log returns and obtaining abnormal bond returns by subtracting average bond returns on a portfolio of bonds with similar bond ratings and maturity. We use a three-week event window (-1,+1) around the deal announcement, and sort all TRACE

bonds into six rating categories: AAA, AA, A, BBB, BB, and B–D, and three maturity bins: 0-5, 5-10, and $>$ 10 year. Specifically, we aggregate and compute the benchmark bond returns by forming equally-weighted (EW) portfolios in column (1) and par-value weighted (VW) portfolios in column (2). We exclude bonds that are not traded within our event window and are able to construct abnormal returns for 5,851 bonds of 389 unique bidders. To mitigate the impact of small bond issues, we use weighted least square regressions with observations weighted by issue size.

If dual holdings reduce debt overhang problems and increase the probability that positive NPV projects are pursued, then we expect a positive effect of dual holdings on bondholder announcement returns, especially in case of financial distress. The results indeed show a positive relation between our dual holdings measure and bidders' abnormal bond returns around acquisitions. The results in column (2) imply that bondholders of an acquirer with a median level of dual holdings earn a 27 bps higher return than if there were no dual holdings, and this effect increases by an additional 21 bps in case of financial distress.

We then examine shareholder returns in columns (3) and (4) of Table VII. For equity holders, the investments might be good news as they could signal to the market that debt overhang problems are mitigated, which should result in lower financing costs (we study and confirm this in the next section). The dependent variable is acquirers' cumulative abnormal returns around deal announcements measured over a (-1,+1) 3-day event window and estimated over trading days (-280,-31). We calculate abnormal returns by using the CAPM model in column (3), and Carhart (1997) four-factor model in column (4). We find a positive relation between dual holdings and acquirer shareholder announcement returns, but only in case of financial distress.

Taken together, our findings thus far suggest that mutual fund dual holdings allow financially distressed firms to increase value-enhancing investments. Value could be created when investments show that debt overhang problems are reduced. To obtain more insights into the benefits of dual holdings, our next section includes an analysis of the relation between

dual holdings and debt financing costs.

5 Potential mechanisms

In this section, we shed light on the potential mechanisms through which mutual fund dual holders allow financially distressed firms to increase investment, namely, through capital supply and corporate governance. We find that dual holdings allow more bond issues with lower yields and fewer restrictive covenants, and equity funds from dual holding families vote more actively at shareholder meetings.

5.1 Capital supply

We first examine firms' bond issuance decisions. Bodnaruk and Rossi (forthcoming) show that a firm's ability to access the bond market is greatly improved by the presence of potential dual holders among its shareholders. Bond investors with an equity stake in a firm are more likely to buy bonds in its bond IPO and take larger positions than bond investors without an equity stake. Zhu (2019) shows that existing bondholders are more likely to acquire new bonds issued by the same firm. As such, we expect capital supply from mutual fund dual holders to persist after bond IPOs. In particular, when their portfolio companies need to finance valuable investment projects, equity funds can share information and coordinate with sister bond funds to supply capital. As a result, we hypothesize that firms are more likely to issue additional bonds when dual holdings increase.

[Table VIII about here.]

We use the DID framework to cleanly test whether dual holdings increase the probability of bond issuance. Table VIII reports the results from estimating Equation (2). The dependent variable is a dummy variable that equals one if a firm issues a bond at any time in the following year $(t+1)$. The DID estimates are statistically significant across all specifications

($t \geq 3.054$) and range from 0.093 to 0.238, which implies that treated firms are, on average, at least 9.3% more likely to issue new bonds in comparison to control firms. This finding is consistent with the idea that dual holders supply capital to finance firm investment.

In addition, we provide bond-level evidence that dual holders indeed buy the newly issued bonds. We use all bonds issues from our sample firms between 2008 and 2018, and match the Mergent FISD data with CRSP holding data to identify mutual fund participation. For each bond issue, we identify mutual fund buyers based on their holdings of this bond at the first quarter-end after the issue date. In Panel A of Table IX, we examine the impact of mutual fund dual holdings on bond issue participation. In columns (1) and (2), the dependent variable is the fraction of the issue bought by dual holding mutual funds. We classify a mutual fund buyer as a dual holder if its fund family is a dual holder of the issuing firm according to our measure in section 2.2 at the first quarter-end after the issue date. We regress the fraction bought by dual holding funds on firms' pre-issuance dual holding level, measured over the four quarters prior to the bond issue date, while controlling for industry $\times$ year fixed effects, bond characteristics such as issue size and maturity, and the same set of firm characteristics as in Table II.

[Table IX about here.]

The estimated effect of pre-issue dual holdings on new-issuance participation by dual holders is positive and highly significant ($t = 6.703$). Moreover, as shareholder-creditor agency conflicts are particularly relevant for financially distressed firms, we expect the effect to be more pronounced among high-yield issuers. In column (2), we show that the effect is indeed significantly different between investment-grade (IG) and high-yield (HY) issuers. A median level of pre-issue dual holdings (0.09) increases dual holder participation by 1.1% ($= 0.121 * 0.09$) for IG issuers but by 2.1% ($= (0.121 + 0.109) * 0.09$) for HY issuers.

The increased capital supply from dual holders could reduce financing costs for the associated firms. We test this prediction by examining the offering yields of newly issued bonds, which directly relate to the financing costs for the issuers. Panel A of Table IX shows the

results on the offering yields in columns (3) and (4). Dual holdings are negatively related to offer yields and the effect is mostly driven by HY issuers. We find that an increase in pre-issue dual holdings from zero to the median level (0.09) is associated with a 17.2 bps decrease in the offering yield for HY issuers. This is a 7.1% relative reduction in financing cost, given that the HY bonds have on average a 2.42 percentage points higher yield.

In sum, mutual fund dual holdings lead to more bond issues and reduce issuers' financing costs. These results are consistent with a capital supply channel in which dual holding families allow firms to finance their investments at lower costs.

5.2 Bond contracting

Creditors often include restrictive covenants to reduce the likelihood of risk-shifting investment and to prevent potential wealth expropriation by shareholders (Smith and Warner, 1979). For example, Nini, Smith, and Sufi (2009) show that about one-third of loan contracts have a covenant limiting the borrower's capital expenditure. While such covenants can lower debt costs ex-ante by reducing potential agency costs, these covenants might increase default risk in certain states of the world by constraining managers' operational and financial flexibility. However, if dual holdings already help align incentives between shareholders and creditors and internalize potential agency conflicts, debt contracts of borrowers with dual ownership do not need to contain many restrictive covenants. In line with this idea, Chava et al. (2019b) find that firms with equity-loan dual ownership are less likely to have capital expenditure restrictions in loan contracts.

We relate mutual fund dual holders to restrictive covenants in Panel B of Table IX. We examine the use of the following six restrictive covenants at new bond issues: investment restrictions in column (1), future indebtedness limit in column (2), restrictions on certain business transactions with affiliates in column (3), requiring net proceeds from the asset sales to redeem the bonds in column (4), restrictions on non-dividend payments to shareholders and others in column (5), and on dividend-related payments in column (6). All of these

restrictions are more likely to be imposed on borrowers with a high-yield credit rating, for whom the shareholder-creditor agency conflicts are particularly relevant.

The results indicate that more dual holdings are associated with fewer restrictive covenants for high-yield borrowers, providing these borrowers with more room to make investments and to refinance through debt or asset sales. These findings suggest that dual holders effectively reduce debt overhang problems through a bond contracting channel. We also find that bonds issued by firms with dual holdings are less likely to contain restrictions on payments to shareholders, implying that bond funds also protect the interests of sister equity funds. This result suggests that dual holdings incentivize coordination between bond and equity funds within families.

5.3 Voice: mutual fund voting

In this subsection, we study mutual fund voting participation at annual shareholder meetings to obtain some insights into whether dual holdings increase the probability of "voice". Voting is an important corporate governance mechanism (e.g., Iliev and Lowry, 2014) and could provide one channel through which dual holders affect corporate decision-making.

To match mutual fund voting records in ISS Voting Analytics with the CRSP Mutual Fund Database, we download all the N-PX files from SEC Edgar, and extract necessary information, including *accession*, *series name*, *comp cik*, *series cik*, and *contract cik*. Then, we use the $CRSP\_CIK\_MAP$ dataset to link the mutual fund CRSP identifier *fundno* with each SEC Edgar mutual fund's identifier *series name*, and thus create a linked table between the *series name* in Edgar and *fundno* in CRSP. We further match the ISS voting analytics to the Edgar-CRSP linked dataset. For each mutual fund filing (unique *accession*) in Edgar, we use python's SequenceMatcher class to find the closest match between each *fund name* in ISS voting data and each mutual fund's *series name* in the Edgar-CRSP linked dataset. This procedure produces a table that links SEC Edgar, the CRSP mutual fund dataset, and the ISS voting analytics dataset. For each firm and shareholder meeting, we aggregate voting

records across different funds at the family level and average their voting participation rates across all voting issues, resulting in 754,299 family-firm-meeting observations.

[Table X about here.]

In Table X, we test whether mutual fund families have differential voting behavior when they are dual holders. The dependent variable is the percentage of missing votes, which provides information on whether investors actively participate in voting. The dual holding dummy variable equals one if the fund family is a dual holder of the firm that hosts the shareholder meeting. We control for the equity stake in the firm and include firm-meeting fixed effects to compare voting behavior between different fund families for the same firm at the same meeting, and family $\times$ year fixed effects to remove any differences in voting behavior across fund families in the same year.

We find that the estimated coefficient on dual holdings is significantly negative, implying that equity investors are less likely to miss votes when their families hold bonds from the same firm. When distinguishing between management-sponsored proposals and shareholder-sponsored proposals, we find that dual holdings especially increases participation in management-sponsored proposals, hinting at dual holders being incrementally more involved in monitoring than participating in shareholder activism. Overall, this test provides some suggestive evidence that equity funds from dual holding families are more active monitors, although it is important to realize that various forms of "voice" (such as talking to management) are difficult to observe.

6 Conclusion

This paper studies the impact of mutual fund dual holdings on shareholder-creditor conflicts. The size of the bond mutual fund industry has roughly tripled between 2009 and 2019, which leads fund families more likely to simultaneously hold stocks and bonds from the same portfolio companies. Using a difference-in-differences analysis that exploits cross-family mutual

fund mergers as a source of exogenous variation in dual holdings, we find evidence that such dual holdings lead firms to increase value-enhancing investments, especially for financially distressed firms. Dual holders allow distressed firms to refinance through new bond offerings with lower yields and fewer restrictive covenants. Further tests on voting behavior suggest that equity funds from dual holding families also exert more effort in monitoring. All these results are consistent with the idea that mutual fund dual holders help prevent debt overhang problems. Overall, our findings suggest that mutual fund families internalize the shareholder-creditor agency conflicts of their portfolio companies, highlighting the benefits of such institutional ownership.

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Figure 1: Corporate bond/loan market and mutual fund bond holding

The solid line plots the total amount of outstanding corporate bonds issued by US non-financial companies from January 2000 to October 2019, and the dashed line plots the total amount of outstanding corporate loans issued by US non-financial companies from January 2000 to October 2019. With respect to the secondary-axis on the right, the grey shadow area represents the trend of mutual fund ownership in the US corporate bond market from April 2000 to July 2019. Source: FRED & Fed Financial Stability Report November 2019.

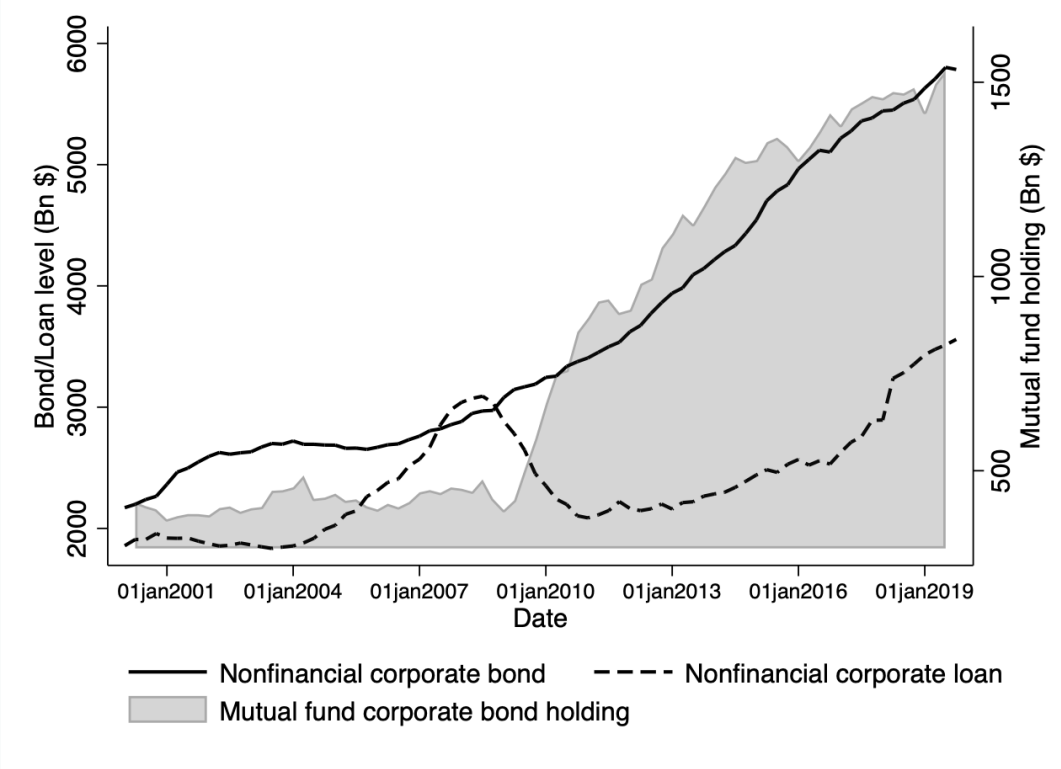
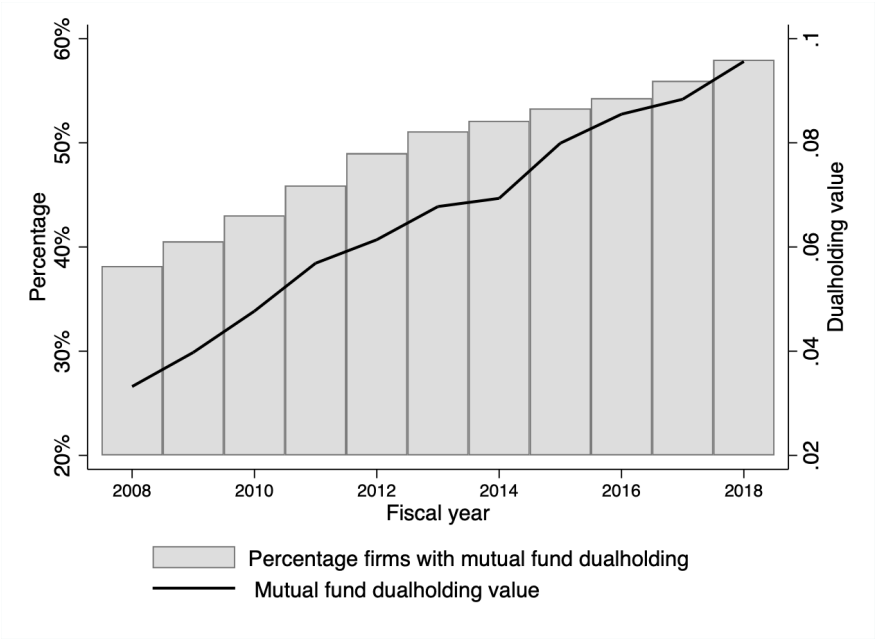
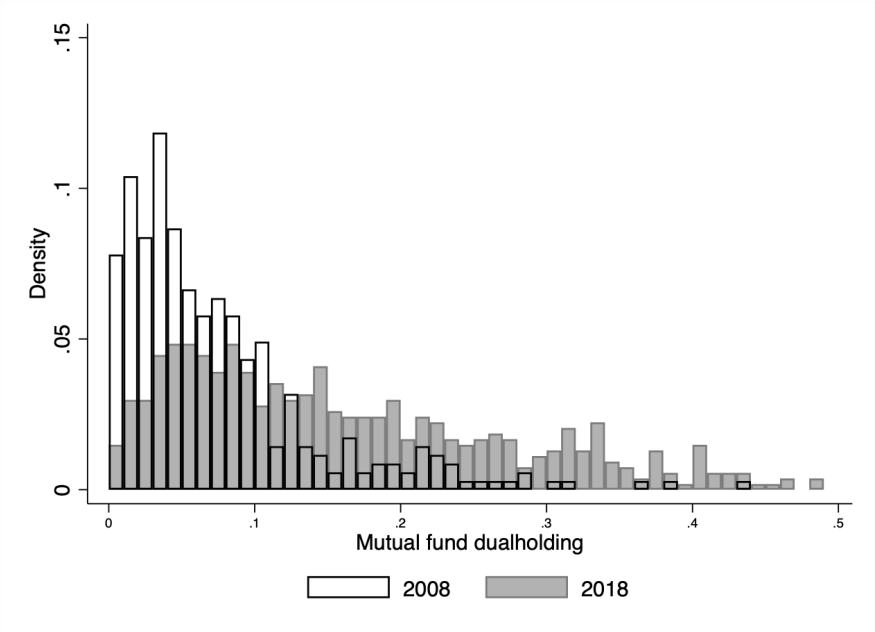


Figure 2: Time-series and cross-sectional variation of mutual fund dual holding

The solid line of figure (a) plots the time-series trend of the firm-level mutual fund dual holding measure from fiscal year 2008 to 2018 for firms that have non-zero mutual fund equity ownership. The bars in figure (a) represent the time-series trend of the percentage of firms that have non-zero mutual fund dual holding from fiscal year 2008 to 2018 conditional on having non-zero mutual fund equity ownership. Figure (b) plots the distribution of mutual fund dual holding in 2008 and 2018 for firms with non-zero mutual fund dual holdings. Variable definitions are provided in Appendix A1.



(a)



(b)

Figure 3: Dynamic treatment effect on firm investment

The figure shows the dynamic treatment effects on capital investments. We report the point estimates of β_k's from Equation (3) and the corresponding 90% confidence intervals. The coefficient estimates are in percentage points.

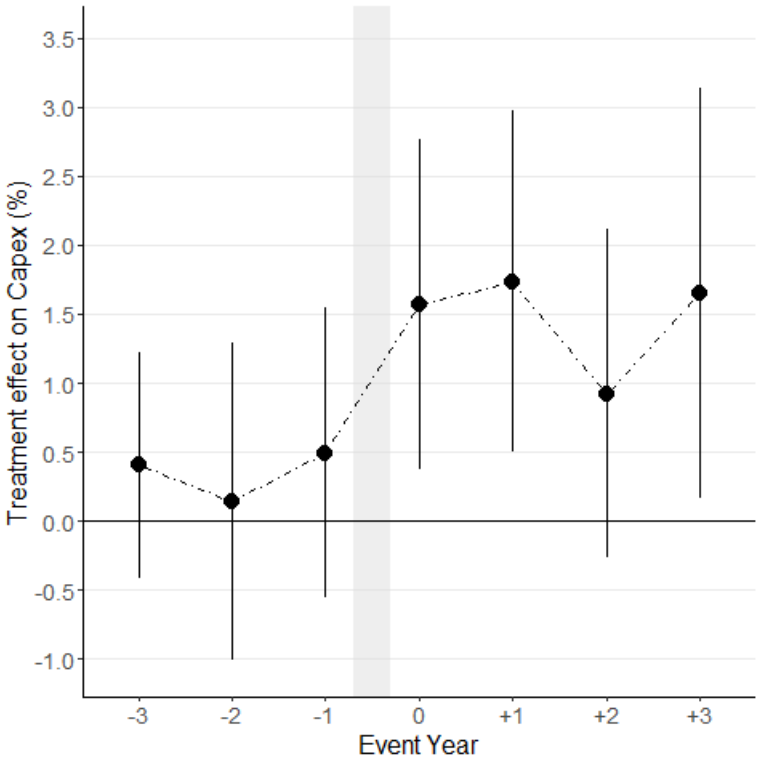


Table I: Summary statistics

This table reports summary statistics of the main variables. Panel A shows firm-level characteristics, panel B shows acquisition-level characteristics, and panel C reports bond-level characteristics. All continuous variables are winsorized at 1% and 99% levels. A complete list of variable definitions is provided in Appendix A.

				Percentile				
	N	Mean	St. Dev.	10th	25th	50th	75th	90th
Firm-level								
Dualholding	10,452	0.07	0.11	0	0	0	0.10	0.21
Dualholding (> 0)	5,151	0.13	0.12	0.02	0.05	0.10	0.19	0.29
Capex	10,438	0.24	0.28	0.07	0.11	0.18	0.28	0.46
Stock volatility	9,998	0.44	0.29	0.20	0.26	0.36	0.53	0.77
ROA volatility	10,449	0.02	0.05	0.00	0.01	0.01	0.02	0.04
Repurchase	10,452	0.02	0.04	0	0	0	0.03	0.07
Dividend	10,452	0.01	0.02	0	0	0	0.02	0.04
Total assets ($M)	10,452	11,906	31,049	372	984	2,815	8,734	28,538
Market-to-book	10,439	1.95	1.42	0.97	1.17	1.53	2.17	3.29
Leverage	10,446	0.34	0.27	0.05	0.17	0.29	0.45	0.65
Tangibility	10,449	0.33	0.30	0.04	0.10	0.22	0.50	0.78
Cash	10,452	0.02	0.12	-0.06	-0.02	0.00	0.03	0.09
ROA	10,452	0.07	0.16	-0.05	0.04	0.08	0.13	0.19
Payout	10,452	0.04	0.05	0	0	0.02	0.05	0.09
Institutional own	10,452	0.73	1.80	0.20	0.59	0.80	0.92	1.00
Own HHI	10,452	0.11	0.19	0.03	0.04	0.05	0.08	0.22
MF bondholding	10,452	0.04	0.09	0	0	0	0.06	0.12
Acquisition-level								
Dualholding	4,513	0.04	0.09	0	0	0	0.02	0.13
Deal value ($M)	4,513	609	2,499	18	38	112	360	1,152
Cash deal	4,513	0.62	0.49	0.00	0.00	1.00	1.00	1.00
Stock CAR(-1d, +1d) CAPM (%)	4,423	1.14	9.28	-4.48	-1.54	0.57	3.08	7.14
Stock CAR(-1d, +1d) FFC4 (%)	4,423	1.14	9.28	-4.53	-1.54	0.54	3.11	7.26
Bond CAR(-1w, +1w) EW (%)	5,851	-0.07	1.44	-0.38	-0.11	0.02	0.18	0.47
Bond CAR(-1w, +1w) VW (%)	5,851	1.29	2.00	0.06	0.48	1.12	1.99	3.00
Bond-level								
Dualholding	3,454	0.12	0.13	0	0.01	0.09	0.19	0.30
Fraction bought by dual holders	3,454	0.10	0.09	0.00	0.03	0.10	0.16	0.22
High-yield (HY)	3,454	0.25	0.44	0	0	0	1	1
Offering proceeds ($M)	3,454	850	2,788	250	350	500	1,000	1,381
Callable	3,454	0.91	0.28	1	1	1	1	1
Offering yield (%)	3,454	4.23	2.35	1.57	2.60	3.74	5.63	7.50
Restricted investments	2,932	0.01	0.10	0	0	0	0	0
Indebtedness	2,932	0.13	0.34	0	0	0	0	1
Transaction affiliates	2,932	0.07	0.25	0	0	0	0	0
Asset-sale clause	2,932	0.07	0.25	0	0	0	0	0
Restricted payments	2,932	0.07	0.25	0	0	0	0	0
Dividend payments	2,932	0.05	0.22	0	0	0	0	0

Table II: Mutual fund dual holding and firm investment

This table shows panel regressions of capital investments on mutual fund dual holdings. The dependent variable is the capital expenditures scaled by lagged capital. Dual holding is constructed as described in Section 2.2. FD is a dummy variable indicating financially distressed firms, which equals one if the firm is in the upper quartile of the leverage ratio. The control variables log(assets), market-to-book, tangibility, cash holding, profitability, and payout ratio are lagged. All variables are defined in Appendix A1. Standard errors are clustered at the firm level and corresponding t-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Capex				
	(1)	(2)	(3)	(4)	(5)
Dualholding	**0.064** **(2.096)**	**0.082*** **(2.878)**	**0.063**** **(2.280)**	**-0.013** **(-0.256)**	**0.027** **(0.814)**
Dualholding × Leverage				**0.202**** **(2.081)**	
Dualholding × FD					**0.100**** **(2.175)**
FD					-0.037*** (-3.206)
Leverage	-0.110*** (-8.176)	-0.088*** (-3.785)	-0.067*** (-3.536)	-0.097*** (-3.752)	
Log(Assets)	-0.025*** (-7.664)	-0.052*** (-3.724)	-0.042*** (-5.402)	-0.052*** (-3.721)	-0.056*** (-4.096)
Market-to-book	0.039*** (9.607)	0.033*** (4.091)	0.026*** (5.501)	0.033*** (4.077)	0.033*** (4.055)
Tangibility	-0.139*** (-10.530)	-0.339*** (-7.274)	-0.285*** (-10.037)	-0.342*** (-7.338)	-0.367*** (-8.291)
Cash	-0.070 (-1.556)	-0.107** (-2.322)	-0.069** (-2.277)	-0.106** (-2.291)	-0.121** (-2.558)
ROA	-0.147*** (-3.722)	0.076 (0.940)	0.092* (1.840)	0.073 (0.891)	0.081 (0.992)
Payout	-0.036 (-0.583)	0.019 (0.277)	0.088* (1.935)	0.022 (0.318)	0.020 (0.278)
Institutional own	-0.001 (-1.491)	0.000 (1.075)	0.043*** (2.620)	0.000 (1.258)	0.000 (1.211)
Own HHI	-0.039** (-2.294)	-0.093*** (-2.607)	-0.032 (-0.900)	-0.093*** (-2.607)	-0.093** (-2.566)
MF bondholding	0.037 (1.145)	0.126*** (2.672)	0.088** (2.071)	0.138*** (2.821)	0.122** (2.503)
Option/TDC1			0.003 (0.335)		
Observations	10,419	10,419	6,873	10,419	10,425
Adjusted R-squared	0.143	0.312	0.568	0.312	0.310
Industry × Year FE	No	Yes	Yes	Yes	Yes
Firm FE	No	Yes	Yes	Yes	Yes

Table III: Diff-in-diff analysis for firm investment

This table reports the difference-in-differences results of estimating Equation (2) for capital investments. The dependent variable is capital expenditure scaled by lagged capital. Firms are treated if they experience an increase in mutual fund dual holdings due to a cross-family fund merger. To construct the control group, we apply a one-to-one non-replacement matching within the same industry and use propensity-scores to match on the following characteristics measured at the fiscal year ending immediately before the mergers: log assets, market-to-book ratio, institutional ownership, other mutual fund bond holding, and mutual fund dual holding level. *Post* indicates the post-treatment period including the merger completion year and two subsequent years. In columns (1) and (2), we consider all treated and control firms. To see whether the treatment effect is more pronounced for financially distressed firms, columns (3) and (4) split the sample into firms that are below or above the upper-quartile of the leverage ratio measured in the year before the treatment. All regressions include industry × year fixed effects and event-firm fixed effects. All variables are defined in Appendix A1. Standard errors are clustered at the merger level and corresponding t-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Capex				
	All			FD=0	FD=1
	(1)	(2)	(3)	(4)	(5)
Treated × Post	**0.014****	**0.018*****	**0.017****	**0.013***	**0.043*****
	(2.312)	**(3.271)**	**(2.595)**	**(1.751)**	**(3.452)**
Leverage		-0.054**	-0.057***	-0.090***	0.004
		(-2.189)	(-2.962)	(-3.823)	(0.083)
Log(Assets)		-0.068***	-0.079***	-0.047**	-0.098***
		(-2.846)	(-3.367)	(-2.215)	(-2.770)
Market-to-book		0.021**	0.020**	0.025***	0.014
		(2.553)	(2.669)	(3.938)	(0.773)
Tangibility		-0.333***	-0.282***	-0.312***	-0.391***
		(-4.397)	(-4.912)	(-4.643)	(-3.110)
Cash		0.054	0.115	0.057	0.045
		(0.748)	(1.498)	(0.893)	(0.313)
ROA		-0.018	0.045	0.015	-0.047
		(-0.154)	(0.626)	(0.184)	(-0.171)
Payout		-0.034	-0.043	-0.065	0.078
		(-0.853)	(-0.994)	(-1.275)	(0.961)
Institutional own		0.007	0.025	-0.008	0.037
		(0.699)	(1.602)	(-0.763)	(1.268)
Own HHI		-0.008	0.023	-0.023**	0.042
		(-0.278)	(0.630)	(-2.144)	(0.916)
MF bondholding		0.123***	0.197***	0.101*	0.157**
		(3.812)	(3.951)	(2.001)	(2.232)
Option/TDC1			0.006		
			(0.752)		
Observations	4,681	4,676	4,161	3,609	1,061
Adjusted R-squared	0.521	0.590	0.582	0.625	0.506
Industry × Year FE	Yes	Yes	Yes	Yes	Yes
Event Firm FE	Yes	Yes	Yes	Yes	Yes

Table IV: Robustness tests

This table presents robustness tests of our DID results. The baseline refers to specification (2)-(4) from Table III. For brevity, we only report main coefficients of interest and suppress control variables. Panel A shows the results estimated with clustered standard errors at the event-firm level or with the merger event year excluded from the analysis. Panel B shows two placebo tests. First, we assign placebo treatments by moving each actual treatment event three years backward. For firms that receive multiple treatments within three years, we only consider the very first treatment. As our sample period is from 2008 to 2018, this placebo test excludes observations before 2011. Second, we assign a placebo treatment to firms that are involved in a fund merger but do not experience any changes in their dual ownership. In Panel C, we use five alternative empirical proxies for financial distress: high default probability from the Merton (1974) DD model (Bharath and Shumway, 2008), having no credit rating or rated as high-yield, KZ index from Kaplan and Zingales (1997), WW index from Whited and Wu (2006), the size and age index from Hadlock and Pierce (2010), and a measure based on 10-K text developed by Hoberg and Maksimovic (2014). For each proxy (except the credit-rating based one), we classify firms as financially distressed (FD=1) if they are in the upper quartile of that proxy measured in the year before the treatment. In Panel C, we use alternative investments as dependent variables: cash acquisitions, R&D expenses, and growth in total assets. All three variables are scaled by lagged total assets and winsorized at 1% and 99% levels. All regressions include industry × year fixed effect and event-firm fixed effects. Standard errors are clustered at the merger level (except in Panel A) and corresponding t-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Sample	Treated × Post					
	All		FD=0		FD=1	
	Coeff.	(t-stat)	Coeff.	(t-stat)	Coeff.	(t-stat)
Baseline	0.018***	(3.271)	0.013*	(1.751)	0.043***	(3.452)
Panel A: Estimation						
Standard errors clustered at the event-firm level	0.018***	(3.263)	0.013**	(2.228)	0.043***	(3.036)
Excluding the year of merger completion (event year 0)	0.019***	(2.688)	0.013*	(1.815)	0.048***	(2.858)
Panel B: Placebo test						
Moving treatment events three years backward	0.002	(0.125)	0.001	(0.056)	0.004	(0.128)
Treatment without changes in dual ownership	-0.002	(-0.280)	-0.000	(-0.008)	-0.003	(-0.171)
Panel C: Alternative measures of financial distress						
High Default Probability			0.014*	(1.892)	0.026**	(2.542)
Not Rated/High-Yield Rating			0.015*	(1.928)	0.023***	(2.873)
Kaplan-Zingales Index			0.016**	(2.407)	0.025*	(1.830)
Whited-Wu Index			0.007	(1.476)	0.040**	(2.604)
Size-Age Index			0.015***	(4.010)	0.034*	(1.714)
Hoberg-Maksimovic (2014)			0.015	(1.531)	0.028**	(2.270)
Panel D: Alternative dependent variables						
Cash Acquisition	0.014***	(3.194)	0.006**	(2.065)	0.039**	(2.432)
R&D Expenses	0.001	(1.244)	0.000	(0.536)	0.011**	(2.117)
Asset Growth	0.055***	(5.987)	0.012	(1.467)	0.181***	(3.683)

Table V: Mutual fund dual holding and firm risk

This table shows panel regressions of firm risk on mutual fund dual holdings. Firm risk is measured by realized equity volatility in columns (1) and (2), and by return-on-asset (ROA) volatility in columns (3) and (4). Dual holding is constructed as described in Section 2.2. FD is a dummy variable indicating financially distressed firms, which equals one if the firm is in the upper quartile of the leverage ratio measured by the fiscal year end prior to the acquisition announcement. All regressions include industry × year and firm fixed effects, and the same set of control variables from Table II. All variables are defined in Appendix A1. Standard errors are clustered at the firm level and corresponding t-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Stock volatility		ROA volatility	
	(1)	(2)	(3)	(4)
Dualholding	**0.002**	**0.004**	**0.005**	**0.008**
	(0.706)	**(1.440)**	**(0.847)**	**(1.319)**
Dualholding × FD		**-0.003**		**-0.002**
		(-0.786)		**(-0.306)**
FD		0.001*		0.004**
		(1.910)		(2.175)
Leverage	0.004***		0.013***	
	(4.014)		(2.931)	
Log(Assets)	-0.000	0.000	-0.015***	-0.014***
	(-0.058)	(0.336)	(-4.077)	(-3.915)
Market-to-book	-0.000	-0.000	0.004***	0.003***
	(-0.064)	(-0.106)	(2.928)	(2.920)
Tangibility	-0.004**	-0.002	-0.020**	-0.016
	(-2.220)	(-1.370)	(-1.968)	(-1.594)
Cash	-0.004***	-0.004***	0.015*	0.017*
	(-3.124)	(-2.589)	(1.671)	(1.895)
ROA	-0.006***	-0.006***	-0.038	-0.039
	(-2.712)	(-2.845)	(-1.171)	(-1.194)
Payout	-0.009***	-0.009***	0.015*	0.015*
	(-2.676)	(-2.671)	(1.788)	(1.770)
Institutional own	-0.001**	-0.001**	-0.000	-0.000
	(-2.064)	(-2.084)	(-0.920)	(-0.930)
Own HHI	0.002	0.002	0.014**	0.014**
	(0.821)	(0.799)	(2.149)	(2.168)
MF bondholding	0.013***	0.013***	0.003	0.005
	(3.562)	(3.515)	(0.363)	(0.564)
Observations	9,889	9,895	10,334	10,340
Adjusted R-squared	0.668	0.667	0.469	0.468
Industry × Year FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes

Table VI: Diff-in-diff analysis for firm risk

This table reports the difference-in-differences results of estimating Equation (2) for firm risk. The dependent variables are the same as in Table V: stock return volatility in columns (1) and (2) and ROA volatility in columns (3) and (4). Firms are treated if they experience an increase in mutual fund dual holding due to a cross-family fund merger. To construct the control group, we apply a one-to-one non-replacement matching within the same industry and use propensity-scores to match on the following characteristics measured at the fiscal year ending immediately before the mergers: log assets, market-to-book ratio, institutional ownership, other mutual fund bond holding, and mutual fund dual holding level. *Post* indicates the post-treatment period including the merger completion year and two subsequent years. Columns (2) and (4) focus on the subsample of financially distressed firms, which belong to the upper-quartile of the leverage ratio measured in the year before the treatment. All regressions include industry × year fixed effects and event-firm fixed effects. All variables are defined in Appendix A1. Standard errors are clustered at the merger level and corresponding *t*-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Stock volatility		ROA volatility	
	All	FD=1	All	FD=1
	(1)	(2)	(3)	(4)
Treated × Post	**0.003**	**0.012**	**0.000**	**0.001**
	(0.918)	**(1.142)**	**(0.386)**	**(0.910)**
Leverage	0.049**	0.023	0.008***	0.004
	(2.471)	(0.835)	(3.205)	(1.590)
Log(Assets)	-0.001	0.007	-0.004*	-0.002
	(-0.132)	(0.431)	(-1.949)	(-1.088)
Market-to-book	0.001	0.002	0.001	0.002***
	(0.347)	(0.322)	(1.658)	(2.878)
Tangibility	0.018	0.015	-0.013**	-0.004
	(0.595)	(0.426)	(-2.624)	(-0.616)
Cash	0.004	-0.018	0.003**	0.000
	(0.252)	(-0.716)	(2.056)	(0.069)
ROA	-0.098**	-0.035	-0.026***	-0.033**
	(-2.617)	(-0.398)	(-3.359)	(-2.613)
Payout	-0.048	-0.153*	0.004	0.009
	(-1.530)	(-2.043)	(0.945)	(1.403)
Institutional own	0.003	0.013	-0.000	-0.002
	(0.451)	(1.144)	(-0.314)	(-1.242)
Own HHI	-0.024	-0.003	0.009***	0.010***
	(-1.282)	(-0.087)	(4.461)	(3.019)
MF bondholding	-0.001	0.101***	0.002	-0.006
	(-0.025)	(3.045)	(0.192)	(-0.782)
Observations	4,652	1,057	4,675	1,061
Adjusted R-squared	0.778	0.754	0.704	0.734
Industry × Year FE	Yes	Yes	Yes	Yes
Event Firm FE	Yes	Yes	Yes	Yes

Table VII: Mutual fund dual holding and investment quality

This table reports the regression results of acquisition announcement returns on mutual fund dual holding. We first look at bond returns in columns (1) and (2). We follow Bessembinder, Kahle, Maxwell, and Xu (2009) closely to compute weekly bond log returns and obtain abnormal bond returns by subtracting average bond returns on a portfolio of bonds with similar bond ratings and maturity. We use a 3-week event window (-1,+1) around the deal announcement and sort all TRACE bonds into six rating categories: AAA, AA, A, BBB, BB, and B–D, and three maturity bins: 0-5, 5-10, and > 10 year. We aggregate and compute the benchmark bond returns by forming equally-weighted (EW) portfolios in column (1) and par-value weighted (VW) portfolios in column (2). To mitigate the impact of small bond issues, we show results of weighted least square regressions with observations weighted by issue size. We then look at stock returns in column (3) and (4). The dependent variable is acquirers' cumulative abnormal returns around deal announcements measured over a (-1,+1) 3-day event window and estimated over trading days (-280,-31). We calculate abnormal returns by using the CAPM model in column (3), and the Carhart (1997) four-factor model in column (4). We measure dual holdings over the four quarters prior to the acquisition announcement. FD is a dummy variable indicating financially distressed firms, which equals one if the firm is in the upper quartile of the leverage ratio measured by the fiscal year-end prior to the acquisition announcement. All regressions include industry × year fixed effects, deal-level characteristics, and the same set of firm-level control variables from Table II, measured at the fiscal year-end before the merger. Column (1) and (2) additionally include maturity and rating fixed effects and bond-level characteristics. All variables are defined in Appendix A1. Standard errors are clustered at the firm level, and t-statistics are in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Benchmark return/Risk model	Bond CAR (-1, +1)		Stock CAR (-1, +1)	
	EW	VW	CAPM	FFC4
	(1)	(2)	(3)	(4)
Dualholding	0.033**	0.027*	-0.021	-0.030
	(2.568)	(1.840)	(-1.172)	(-1.629)
Dualholding × FD	**0.019***	**0.021***	**0.040****	**0.046****
	(1.942)	**(1.799)**	**(1.988)**	**(2.287)**
FD	-0.004	-0.003	0.005	0.004
	(-1.351)	(-0.787)	(1.179)	(1.105)
Cash deal	0.001*	0.003***	0.002	0.001
	(1.696)	(2.742)	(1.175)	(0.677)
Private deal	0.000	0.002	0.019***	0.020***
	(0.285)	(1.510)	(5.724)	(5.827)
Diversifying deal	-0.003**	-0.003*	-0.001	-0.000
	(-1.987)	(-1.676)	(-0.304)	(-0.072)
Cross-border deal	-0.001	-0.003**	-0.005**	-0.004**
	(-1.461)	(-2.191)	(-2.418)	(-2.025)
Log(Deal size)	0.000	-0.000	0.003***	0.002***
	(1.212)	(-1.278)	(2.835)	(2.670)
Relative deal value	-0.020*	-0.017	0.015***	0.015***
	(-1.834)	(-1.386)	(3.440)	(3.369)
Coupon	-0.015	-0.034*		
	(-1.606)	(-1.781)		
Log(Bond age)	0.002*	-0.002		
	(1.917)	(-1.421)		
Observations	5,851	5,851	4,423	4,423
Adjusted R-squared	0.270	0.287	0.046	0.047
Firm controls	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes
Maturity FE	Yes	Yes	No	No
Rating FE	Yes	Yes	No	No

Table VIII: Diff-in-diff analysis for bond issuance

This table reports the difference-in-differences results of estimating Equation (2) for firms' bond issuance decisions. The dependent variable is a dummy variable that equals one if a firm issues a bond at any time in the following year ($t+1$). Firms are treated if they experience an increase in mutual fund dual holding due to a cross-family fund merger. To construct the control group, we apply a one-to-one non-replacement matching within the same industry and use propensity-scores to match on the following characteristics measured at the fiscal year ending immediately before the mergers: log assets, market-to-book ratio, institutional ownership, other mutual fund bond holding, and mutual fund dual holding level. *Post* indicates the post-treatment period including the merger completion year and two years thereafter. In columns (1) and (2), we consider all treated and control firms. To see whether the treatment effect is more pronounced for firms facing financial distress, columns (3) and (4) split the sample into firms that are below or above the upper-quartile of the leverage ratio measured in the year before the treatment. All regressions include industry × year fixed effects and event-firm fixed effects. All variables are defined in Appendix A1. Standard errors are clustered at the merger level and corresponding t-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	Bond issuance			
	All		FD=0	FD=1
	(1)	(2)	(3)	(4)
Treated × Post	**0.123*** **	**0.124*** **	**0.093*** **	**0.238*** **
	(5.113)	**(5.031)**	**(3.054)**	**(4.420)**
Leverage		-0.494***	-0.705***	-0.356***
		(-6.466)	(-5.399)	(-3.017)
Log(Assets)		0.022	0.040	0.019
		(0.513)	(0.850)	(0.263)
Market-to-book		0.026**	0.032***	0.032
		(2.289)	(3.540)	(1.397)
Tangibility		0.154*	0.177	0.079
		(1.707)	(1.367)	(0.428)
Cash		0.098	-0.012	0.232
		(1.627)	(-0.132)	(1.557)
ROA		0.005	-0.004	0.168
		(0.042)	(-0.029)	(1.044)
Payout		0.621***	0.853***	-0.369
		(4.205)	(5.530)	(-1.059)
Institutional own		-0.057**	-0.047**	-0.077
		(-2.057)	(-2.390)	(-1.606)
Own HHI		-0.007	0.002	0.099
		(-0.167)	(0.022)	(0.920)
MF bondholding		0.580***	1.004***	0.186*
		(3.044)	(3.513)	(1.786)
Observations	4,681	4,676	3,609	1,061
Adjusted R-squared	0.218	0.233	0.219	0.328
Industry × Year FE	Yes	Yes	Yes	Yes
Event Firm FE	Yes	Yes	Yes	Yes

Table IX: Capital supply, financing costs, and contracting

This table reports the effects of mutual fund dual holdings on bond issues. We measure dual holdings over the four quarters prior to the bond issue date. In Panel A, the dependent variable in columns (1) and (2) is the fraction bought by dual holding mutual funds measured at the first quarter-end after the bond issue date, and the dependent variable in columns (3) and (4) is the yield-to-maturity in percentage points. In Panel B, the dependent variable in each column is a dummy variable indicating whether the bond includes a particular restrictive covenant. All regressions include industry × year fixed effect, bond issue-level characteristics, and suppressed issuer-level control variables: log assets, market-to-book ratio, leverage ratio, tangibility, cash holding, return-on-asset, total payout ratio, institutional ownership, ownership concentration, and other mutual fund bond ownership. All variables are defined in Appendix A1. Standard errors are clustered at the firm level and corresponding t-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Panel A: capital supply and financing costs

	Fraction bought by dual holders		Offering yield (%)	
	(1)	(2)	(3)	(4)
Dualholding	**0.173*** **	**0.121*** **	**-0.689** **	**0.237**
	(6.703)	**(3.960)**	**(-2.180)**	**(0.646)**
Dualholding × HY		**0.109*** **		**-1.912*** **
		(2.676)		**(-3.492)**
High-yield (HY)	0.030***	0.016**	2.189***	2.421***
	(5.053)	(2.096)	(21.342)	(19.548)
Log(Proceeds)	0.020***	0.020***	0.135	0.132
	(4.249)	(4.237)	(1.631)	(1.609)
Callable	0.017**	0.016**	0.447***	0.462***
	(2.210)	(2.079)	(2.822)	(2.941)
Maturity	-0.002***	-0.002***	0.088***	0.088***
	(-6.030)	(-5.832)	(6.582)	(6.457)
Observations	3,443	3,443	3,443	3,443
Adjusted R-squared	0.279	0.284	0.759	0.761
Issuer controls	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes

Panel B: restrictive covenants

	Restricted investments	Indebtedness	Transaction affiliates	Asset-sale clause	Restricted payments	Dividend payments
	(1)	(2)	(3)	(4)	(5)	(6)
Dualholding	0.028	0.112	0.042	0.151***	0.035	0.034
	(1.208)	(0.640)	(0.573)	(2.771)	(0.462)	(0.483)
Dualholding × HY	**-0.139*** **	**-0.489** **	**-0.335***	**-0.273***	**-0.362***	**-0.378*** **
	(-2.587)	**(-2.249)**	**(-1.871)**	**(-1.954)**	**(-1.944)**	**(-2.993)**
High-yield (HY)	0.061***	0.322***	0.354***	0.239***	0.364***	0.283***
	(4.735)	(6.745)	(9.821)	(7.843)	(9.536)	(8.699)
Log(Proceeds)	-0.002	-0.013	0.014*	0.001	0.014	0.007
	(-0.514)	(-0.920)	(1.657)	(0.157)	(1.590)	(0.944)
Callable	-0.002	0.000	-0.018*	-0.015	-0.016	-0.019**
	(-0.657)	(0.024)	(-1.932)	(-1.625)	(-1.618)	(-2.020)
Maturity	-0.000	-0.001	-0.001*	-0.001	-0.001	-0.001
	(-0.988)	(-0.497)	(-1.702)	(-0.961)	(-1.617)	(-1.582)
Observations	2,921	2,921	2,921	2,921	2,921	2,921
Adjusted R-squared	0.113	0.169	0.389	0.284	0.388	0.308
Issuer controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry × Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table X: Family dual holding and fund voting behavior

This table reports regression results that estimate the effect of dual holding on mutual funds' voting participation. The analysis is at the family-firm-meeting level. The dependent variable is the percentage of voting issues on which the fund family has missed voting. To calculate this percentage, we first calculate the missing vote percentage across all funds from the same family for each voting issue, and then aggregate this percentage across all voting issues at the same shareholder meeting. The independent variable of interest is the dual holding dummy variable, which equals one if the fund family is a dual holder of the firm hosting the shareholder meeting. All regressions include firm-meeting and family × year fixed effects, and family-firm level control variables: the family's total equity holding of the firm, and the number of equity funds from the family that invest in the firm. Column (2) additionally includes firm × family fixed effects. We separately focus on voting results of management-sponsored proposals in column (3) and shareholder-sponsored proposals in column (4). Standard errors are two-way clustered at the firm and fund family level. The corresponding t-statistics are reported in parentheses. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

Proposals	Missing vote (%)			
	All		Management	Shareholder
	(1)	(2)	(3)	(4)
Dualholding dummy	**-0.079***	**-0.054****	**-0.072*****	**-0.031**
	(-1.835)	**(-2.059)**	**(-2.615)**	**(-0.619)**
Equity holding	-1.608	-3.129	-3.445	-4.610
	(-1.114)	(-1.353)	(-1.143)	(-1.027)
Number of funds	-0.008	0.009	0.016**	0.015
	(-1.033)	(1.311)	(1.986)	(1.256)
Observations	754,299	754,299	609,019	147,406
Adjusted R-squared	0.508	0.627	0.614	0.727
Firm-meeting FE	Yes	Yes	Yes	Yes
Family × Year FE	Yes	Yes	Yes	Yes
Firm × Family FE	No	Yes	Yes	Yes

Appendix

A Variable Descriptions

Table A.1: Variable definitions

Dualholding	Firm-level mutual fund dual holding measure that calculated using the method in variable construction of Section 2. *Source: CRSP, Mergent FISD*
Capex	Capital expenditures scaled by lagged net property, plant, and equipment. *Source: COMPUSTAT*
Financial distress (FD)	Whether the firm is in the upper quartile of the financial distress measure based on leverage ratio *Source: COMPUSTAT*
Treated	Whether a firm that experiences at least 0.01 increase in mutual fund dual holding measure associated with a cross-family mutual fund merger. *Source: CRSP, Mergent FISD*
Dual holding dummy	Whether a mutual fund family is a dualhodler of a firm's equity and bond following the defination from Bodnaruk and Rossi (2016). *Source: CRSP, Mergent FISD*
Stock volatility	Annualized volatility calculated as the standard deviations of the daily stock returns over the 90 trading days prior to the fiscal year-end. *Source: CRSP*
ROA volatility	Calculated as the standard deviations of the eight quarterly ROA changes prior to the fiscal year-end. *Source: COMPUSTAT* *Source: CRSP*
Leverage	(DLTT + DLC)/Total $asset_{t-1}$ *Source: COMPUSTAT*
Total asset	Log value of total asset. *Source: COMPUSTAT*
Market-to-book	(AT + (CSHO*PRCC_F) - CEQ)/AT *Source: COMPUSTAT*
Tangibility	PPENT/ Total $asset_{t-1}$ *Source: COMPUSTAT*
Cash	AQC/Total $asset_{t-1}$ *Source: COMPUSTAT*
ROA	OIADP/Total $asset_{t-1}$ *Source: COMPUSTAT*
Payout	Repurchase + Dividend *Source: COMPUSTAT*
Institutional own	Total Equity holdings by institutional investors in the form of percent of Shares Outstanding (mutual funds, banks, corporations, and others). *Source: Thomson Reuters 13F*
Own HHI	Ownership Concentration by institutional investors (mutual funds, banks, corporations, and others) - Herfindahl-Hirschman Index *Source: Thomson Reuters 13F*
MF bondholding	Other (non-dual ownership) mutual fund bond holding aggregated at firm level *Source: CRSP*

BondIssueProb	The probability of issue bonds in next calendar year. *Source: Mergent FISD*
Deal value	Log value of acquisition book value *Source: SDC*
Cash deal	Whether the acquisition deal is funded fully by cash or not *Source: SDC*
Stock CAR(-1d, +1d)	cumulative abnormal stock returns of the acquirer, calculated using the Matket model, and Carhart 4 factor model estimated over trading days (-280, -31) and are measured over a (-1, +1) event window around the announcement date. *Source: CRSP*
Bond CAR(-1w, +1w)	We follow Bessembinder et al. (2009) closely to compute weekly bond log returns and obtain abnormal bond returns by subtracting average bond returns on a portfolio of bonds with similar bond ratings and maturity. We use a three-week event window (-1,+1) around the deal announcement, and sort all TRACE bonds into six rating categories: AAA, AA, A, BBB, BB, and B–D, and three maturity bins: 0-5, 5-10, and $>$ 10 year. We aggregate and compute the benchmark bond returns by forming either equally-weighted (EW) or par-value weighted (VW) portfolios. *Source: TRACE*
Fraction dual holding buyers	Fraction of a bond owned by dual holding funds measured at the first quarter-end after theF issue date. *Source: CRSP, Mergent FISD*
High-yield (HY)	Whether the corporate bond is classified as a high yield bond *Source: Mergent FISD*
Offering proceeds	Value of a corporate bond issuing *Source: Mergent FISD*
Callable	Whether the corporate bond include a call option *Source: Mergent FISD*
Offering yield	The yield-to-maturity of a corporate bond *Source: Mergent FISD*
Restricted investments	Whether the bond includes a covenant restricting issuer's investment policy to prevent risky investments. *Source: Mergent FISD*
Indebtedness	Whether the bond includes a covenant restricting issuer from incurring additional debt with limits on absolute dollar amount of debt outstanding or percentage total capital. *Source: Mergent FISD*
Transaction affiliates	Whether the bond includes a covenant that the issuer is restricted in certain business dealings with its subsidiaries. *Source: Mergent FISD*
Asset-sale clause	Whether the bond includes a covenant requiring the issuer to use net proceeds from the sale of certain assets to redeem the bonds at par or at a premium. *Source: Mergent FISD*
Restricted payments	Whether the bond includes a covenant that restricts issuer's freedom to make payments (other than dividend related payments) to shareholders and others. *Source: Mergent FISD*
Dividend payments	Whether the bond includes a covenant that payments made to shareholders or other entities may be limited to a certain percentage of net income or some other ratio. *Source: Mergent FISD*

Table A2: Pre-event: Treated vs. matched control comparison

This table reports univariate comparisons on firm characteristics of the treated and control firms used in the difference-in-difference analysis in the pre-event year. Firms in the treated group are firms that experience at least 0.01 increase in the mutual fund dual holding measure associated with a cross-family mutual fund merger. Control firms are selected by one-to-one propensity score matching from the same industry and time cohort of firms that are not impacted by cross-family mutual fund mergers. Differences in group means are reported along with p-values. ***, **, and * denote significance at 1%, 5%, and 10%, respectively.

	All firms	Treated	Control	Difference	P-value
Capex	0.21	0.21	0.22	0.00	0.73
Bond issuance	0.33	0.35	0.30	0.05	0.11
Log(Assets)	9.34	9.39	9.28	0.11	0.21
Market-to-book	2.00	2.02	1.98	0.04	0.63
Tangibility	0.31	0.30	0.32	-0.02	0.33
Institutional own	0.80	0.80	0.79	0.01	0.58
MF bondholding	0.08	0.08	0.08	0.01	0.28
Dual holding	0.10	0.10	0.10	0.01	0.46
Financial distress (FD)	0.25	0.23	0.27	-0.04	0.18
Number of Event Firms	971	484	487		
Number of Unique Event Firms	473	227	246		