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The Corporate Investment Benefits of Mutual Fund Dual Holdings

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Abstract

Mutual fund families increasingly hold bonds and stocks from the same firm. We present evidence that dual ownership allows firms to increase valuable investments and refinance by issuing bonds with lower yields and fewer restrictive covenants, especially when firms face financial distress. Dual holders also prevent overinvestment by firms with entrenched managers. Overall, our results suggest that mutual fund families internalize the agency conflicts of their portfolio companies, highlighting the positive governance externalities of intra-family cooperation.

I. Introduction

In the past decade, an increasingly popular way to invest in corporate bonds has been 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 hold

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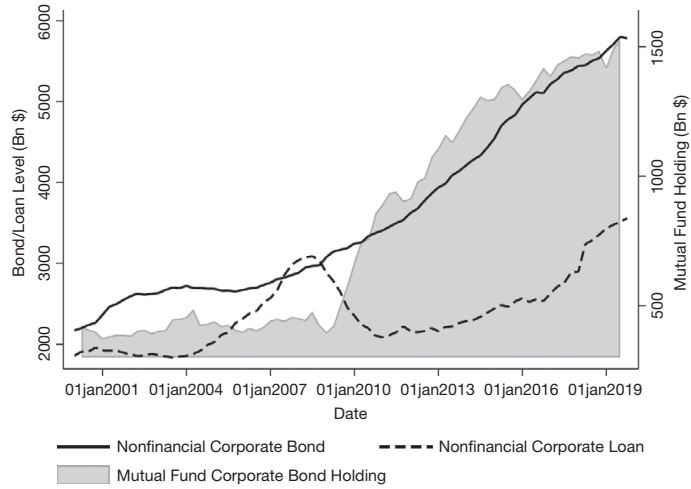
[1]The U.S. corporate bond market itself has also grown substantially since the 2008 financial crisis, with the amount of outstanding non-financial corporate bonds increasing from 3 trillion dollars in 2009 to more than 5.7 trillion dollars in 2019. According to data from the Fed, the corporate bond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

FIGURE 1

Corporate Bond/Loan Market and Mutual Fund Bond Holding

The solid line in Figure 1 plots the total amount of outstanding corporate bonds issued by U.S. non-financial companies from Jan. 2000 to Oct. 2019, and the dashed line plots the total amount of outstanding corporate loans issued by U.S. non-financial companies from Jan. 2000 to Oct. 2019. With respect to the secondary-axis on the right, the gray shadow area represents the trend of mutual fund ownership in the U.S. corporate bond market from Apr. 2000 to July 2019. *Source*: FRED & Fed Financial Stability Report Nov. 2019.



stocks and bonds from the same portfolio companies simultaneously. This trend naturally raises the question of whether the families' fund managers coordinate their decisions on these firms. More specifically, would such dual holdings internalize the agency problems of their portfolio companies? 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), and 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, Jank, Saffi, and Sturgess (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.

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 in their portfolio companies.

In addition, the double stake of dual holding families in the portfolio companies may incentivize the funds to monitor management more closely. Dual ownership could also make monitoring more effective, as firm managers are more likely to listen to the "voice" of dual holders or be threatened by the potential "exit" of dual holders because of their double stakes in the company. As such, monitoring by dual holders has the potential to mitigate investor-management agency conflicts by preventing self-interested managers from pursuing their own agenda at the expense of investors' money.

We empirically study how mutual fund dual holdings affect agency problems 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 (NPV; e.g., Myers (1977)). The resulting underinvestment is known as the debt overhang problem. We find that cooperation within dual holding mutual fund families helps prevent debt overhang problems, allowing firms to increase valuable investments and refinance at lower costs. Firm investment is also at the heart of the shareholder-management agency problem (e.g., Jensen and Meckling (1976), Grossman and Hart (1982), and Jensen (1986)). Because of the separation of ownership and control, entrenched managers may engage in "empire-building" by making excessive investments. We find that dual holding mutual fund families help prevent overinvestment problems by limiting the investments of firms with entrenched managers.

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 increased from 38% in 2008 to 58% in 2018, and firm-level mutual fund dual holding intensity increased threefold (see Figure 2). Dual ownership is also more likely to occur among fund families that provide cooperative rather than competitive incentives to their managers.[2]

Next, we estimate the causal effects of mutual fund dual holdings on corporate investment. This is empirically challenging as mutual fund dual holdings are not randomly assigned to firms.[3] Picking the right stocks and bonds at the right time is exactly the fund managers' job, which suggests that funds could select to become

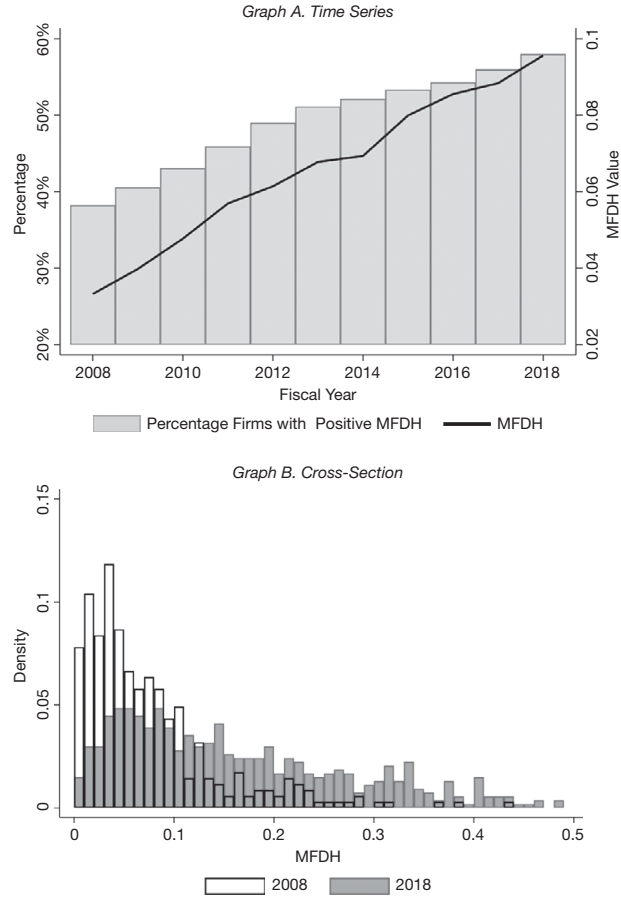
[2]Measurement details are explained in Section III.B. The cooperative versus competitive fund family distinction originates from Evans, Prado, and Zambrana (2020).

[3]For example, Peyravan (2020) finds that institutional dual holders are more likely to participate in firms with low financial reporting quality.

FIGURE 2

Time-Series and Cross-Sectional Variation of MFDH

The solid line of Graph A in Figure 2 plots the time-series trend of the firm-level mutual fund dual holding measure (MFDH) from fiscal year 2008 to 2018 for firms that have non-zero mutual fund equity ownership. The bars in Graph A represent the time-series trend of the percentage of firms that have non-zero MFDH from the fiscal year 2008 to 2018, conditional on having non-zero mutual fund equity ownership. Graph B plots the distribution of MFDH in 2008 and 2018 for firms with non-zero mutual fund dual holdings. Variable definitions are provided in the Appendix.



dual holders when firms are about to change their investments. There may also be other time-varying unobserved firm characteristics that are simultaneously correlated with both funds' holding decisions and firms' future investments. To address these endogeneity concerns, we use cross-family mutual fund mergers as a source of exogenous variation in dual holdings. Funds merge across families 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 implement an instrumented difference-in-differences (DID) framework and classify firms as treated when they receive more dual holdings due to cross-family fund mergers. We match each treated firm with a control firm within the same industry-year cohort based on the 1-year pre-treatment dual holding level and firm characteristics such as size, the market-to-book (MB) ratio, and institutional ownership variables. We find that cross-family fund mergers increase firm-level dual holding intensity by 0.032, representing a 33% increase relative to the mean before the mergers.

Using the cross-family fund mergers as instrumental variables for firm-level mutual fund dual holdings, we estimate 2-stage least squares (2SLS) regressions and find that an increase in dual holdings increases capital expenditures for distressed firms. While distressed firms cut investments by about 3.5 percentage points on average, a unit increase in dual holdings is sufficient to offset this investment decline, potentially resolving the underinvestment problem. For firms with entrenched managers, we find that dual holdings reduce investments, in line with a reduction in "empire-building." When we differentiate the dual ownership of cooperative families from that of competitive families, the investment effect is shown to be predominantly driven by the dual holding families that encourage cooperation.

All of our tests control for a rich set of firm characteristics and include industry × year fixed effects and 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. We further control for the equity ownership of large syndicated lenders to differentiate mutual fund dual ownership from loan-equity dual ownership.

A further examination of the dynamics of the treatment effect confirms that the observed effect can be subscribed to the fund mergers. Moreover, we test the effect of potentially confounding factors by assigning a placebo treatment to firms that are involved in fund mergers but that do not experience any change in their dual ownership. We find no effects in these and other placebo tests, highlighting the relevance of dual ownership.

We also study the financing aspect and provide evidence that dual holding families are willing to supply capital to firms that need to finance their investments. Our analysis shows that a distressed firm with a 1-unit increase in dual holdings becomes about 10% more likely to issue new bonds. Entrenched managers are less likely to issue bonds when there is dual ownership. We confirm that a significant share of the newly issued bonds are bought by mutual fund dual holders, and that pricing and contracting terms also depend on mutual fund dual holders. More specifically, dual holdings reduce the offering yield by 41 bps for issuers with high-yield credit ratings, effectively lowering these 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 future debt or equity issuance.

To further study the mechanisms through which mutual funds reduce potential agency conflicts of their portfolio companies, we examine mutual fund voting records. We show that equity funds are less likely to miss votes but more likely

to vote against ISS recommendations 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 increasing involvement in corporate governance also helps explain why dual holders are willing to supply additional capital against lower yields and with fewer restrictions. All these effects also come mostly from dual holding families that encourage cooperation.

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. We predict that, with dual ownership, empire building is less likely to be the perceived reason for a takeover, and for distressed firms the takeover could signal to the market that debt overhang problems are mitigated. We find that acquirers' bondholder and shareholder returns are higher when bidders have more mutual fund dual holdings, especially when the bidders are financially distressed. Moreover, firm risk does not increase with mutual fund dual ownership, which is evidence against the possibility of risk-shifting behavior.

Overall, our findings suggest that cooperative mutual fund dual holders enable firms to increase value-enhancing investments by allowing them to refinance at lower costs and with fewer restrictive covenants, mitigating shareholder–creditor agency conflicts. At the same time, dual holders monitor management more actively and effectively, thereby reducing investor-management agency problems. As such, our work contributes to the literature on the relationship between corporate governance and mutual funds (e.g., Appel, Gormley, and Keim (2016), Duan and Jiao (2016), and Bebchuk, Cohen, and Hirst (2017)).

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 (e.g., Jiang, Li, and Shao (2010), Chu (2017), Chava, Fang, Kumar, and Prabhat (2019a), Antón and Lin (2020), and Chu, Lin, Saffi, and Sturgess (2021)). However, it is ex ante unclear whether the extant findings apply to mutual fund dual holdings 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), and 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 syndicated loan members increases loan spreads (Lim, Minton, and Weisbach (2014)). We find evidence that mutual fund dual holdings lead to lower borrowing costs and fewer restrictive covenants. In addition, we provide novel evidence that shareholders with dual ownership monitor management more actively and thereby reduce the agency costs of managerial entrenchment. Moreover, we highlight heterogeneity across dual holders by showing that only dual holding families encouraging cooperation help mitigate shareholder–creditor agency conflicts. Our findings thus illustrate the importance of accounting for the cooperative/competitive incentives of dual-holding investors when analyzing their impact on corporate actions.

Our study further contributes to the empirical literature on debt overhang problems. Previous studies suggest that debt overhang problems can be mitigated by ex post debt renegotiation (Roberts and Sufi (2009), Roberts (2015), and Chu (2021)), by aligning managers' incentives with creditors (Becker and Stromberg (2012)), and by equity ownership concentration (Alanis, Chava, and Kumar (2018)). Our findings suggest that intra-family coordination between equity and bond mutual funds internalizes the potential debt overhang problems of their portfolio companies by allowing financially distressed firms to refinance at lower costs.

The rest of the article is organized as follows: Section II develops the hypotheses. Section III describes the data and the construction of our dual holding measure, and discusses the empirical methodology. Section IV presents our main findings. Section V studies potential mechanisms, and Section VI concludes.

II. Hypothesis Development

A. Shareholder–Creditor Agency Conflicts

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 not to finance investment projects when the firm is financially distressed, even if these projects have a positive NPV, because debt holders capture most of this value. This underinvestment reduces firm value and is commonly known as the underinvestment or debt overhang problem. The simultaneous holding of both equity and debt claims by mutual fund families 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), and 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)), lower precautionary cash saving motives (Liu (2019)), higher investment efficiency (Antón and Lin (2020)), fewer but more valuable patents (Yang (2021)), increased corporate social responsibility performance (Lopatta, Bassen, Kaprerit, Tideman, and Buchholz (2022)), an increased propensity of including performance pricing provisions in loans (Lim, Do, and Vu (2022)), higher corporate tax avoidance (Tang, Xu, Yan, and Yang (2022)), and a less risk-inducing compensation structure (Chen, Zhang, and Zhu (2023)).

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 between creditors and shareholders, thereby reducing 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), and 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)). Suppose managers of equity and bond funds only seek to maximize the value of their own funds. In that case, dual holding families might not affect or even exacerbate the shareholder–creditor conflicts of their portfolio companies.

The effect of mutual fund dual holdings on firm investment is, therefore, an empirical question. If mutual fund dual holders reduce the debt overhang problem, we predict that higher dual holdings allow firms to increase capital investments, especially when firms face financial distress. If the effects result from within-family coordination, we predict that our findings are mostly driven by dual ownership of cooperative fund families.

B. Shareholder-Management Agency Conflicts

The previous predictions implicitly assume that managers aim to maximize shareholder value. However, because of the separation of ownership and control, self-interested managers may pursue their own agenda at the expense of shareholders' money (e.g., Grossman and Hart (1982), Jensen (1986), and Hart and Moore (1995)). For example, entrenched managers may engage in "empire-building" by making excessive investments (i.e., undertaking negative NPV projects).

Potentially, dual ownership of mutual fund families helps to mitigate this agency problem as equity funds from dual holding families have a larger overall stake compared to other shareholders with the same equity ownership but no dual ownership. Investing in negative NPV projects is typically also not in the best interest of bondholders. This incentivizes dual owners to monitor and discipline management more actively. Dual ownership also makes monitoring more effective. Managers are more likely to listen to the "voice" of dual holders (when they engage with companies) because of their large overall stake in the company, and the threat of "exit" by dual holders is more significant because they can sell both stocks and bonds at the same time. Consequently, more intensive and effective monitoring from dual holders can prevent management from undertaking negative NPV investment projects.

Given the possibility that managers of equity and bond funds do not coordinate, the question of whether mutual fund dual holders help to mitigate the impact of managerial entrenchment is again an empirical question. Only if entrenched managers tend to overinvest and mutual fund dual holders help to discipline managers, we predict that higher dual holdings limit firms' investment when management is entrenched.

As explained in Section II.A, shareholder–creditor agency conflicts are particularly problematic when firms face financial distress. In such a scenario, firms often have low free cash flows, which leaves managers little room to overinvest. Conversely, when firms are financially healthy and free cash flows are available, shareholder–creditor agency conflicts are less problematic, while shareholder-management agency conflicts become more pronounced. As such, in this study, we focus on scenarios where one of the agency problems is particularly likely, and not on the more special scenarios where both type of agency problems could play a role.

III. Data and Empirical Methodology

A. 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), which leaves us with an initial sample consisting of 10,452 firm-year observations and 1,409 unique firms.[4] 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 4,423 acquisitions made by the firms in our sample.

B. Measuring Mutual Fund Dual Holdings

For each firm-year observation in this initial sample, we construct a firm-level measure of mutual fund dual holding intensity, denoted as MFDH. A higher value of MFDH 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 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, that is, $DH_{ijq} = 1$, if

$$5\% \leq \frac{\text{BOND\_MV}_{ijq}}{\text{BOND\_MV}_{ijq} + \text{EQUITY\_MV}_{ijq}} \leq 95\%,$$

where BOND_MV and EQUITY_MV denote family j's total bond and equity positions in firm i, respectively.

[4]The summary statistics of this initial sample are reported in Section A of the Supplementary Material.

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 i) firm i has more weight in j's portfolio, and ii) 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, Manconi, and Spalt (2016) and construct the weights as follows:

$$w_{ijq} = \frac{\text{Q\_PWEIGHT}_{ijq} + \text{Q\_OWN}_{ijq}}{\sum_{j \in J_{iq}} \left(\text{Q\_PWEIGHT}_{ijq} + \text{Q\_OWN}_{ijq}\right)},$$

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 Q_PWEIGHT. Similarly, we sort firm i's shareholders by ownership into quintiles Q_OWN. Finally, we scale by the term in the denominator so that the weights add up to 1. 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 with the incentive and ability to influence management.[5]

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

$$\text{MFDH}_{iq} = \sum_{j \in J_{iq}} w_{ijq} \times \text{DH}_{ijq},$$

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 4 quarters for each year t.

Moreover, as shown in Evans et al. (2020), some mutual fund families encourage cooperation among their managers while others encourage competition. In other words, not all dual-holding families provide incentives for coordination between bond and equity funds. To differentiate the dual ownership of more cooperative fund families from that of more competitive families, we define cooperative and competitive dual ownership, respectively, as

$$\text{COOPERATIVE\_MFDH}_{iq} = \sum_{j \in J_{iq}} w_{ijq} \times \text{DH}_{ijq} \times 1\left(\text{COOPERATIVE}_{jq} > 0.5\right),$$

and

[5]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%. Our results are robust to such alternative measurements of dual holdings.

$$\text{COMPETITIVE\_MFDH}_{iq} = \sum_{j \in J_{iq}} w_{ijq} \times \text{DH}_{ijq} \times 1\left(\text{COMPETITIVE}_{jq} > 0.5\right),$$

where COOPERATIVE_{jq} and COMPETITIVE_{jq} are the family-quarter level cooperative and competitive indices, respectively, from Evans et al. (2020). Their indices are based on manager compensation incentives (e.g., manager ownership of the fund corresponds to competitive, manager ownership of the investment advisor corresponds to cooperative) and fund management structure (e.g., solo-managed fund corresponds to competitive, team-managed corresponds to cooperative).[6] Both indices have a right-skewed distribution and take values between 0.1 and 1, with values above 0.5 indicating families with more cooperative and competitive incentives, respectively. We take the average over the 4 quarters in year t when aggregating the measure at the firm-year level.

Figure 2 shows the time-series and cross-sectional variation of mutual fund dual holdings. The percentage of firms with non-zero dual holdings increased 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 those in 2008. We also find that the average COOPERATIVE_MFDH exceeds the average of COMPETITIVE_MFDH, suggesting that dual ownership is more likely to occur among cooperative fund families than competitive families.

C. Empirical Methodology

A common approach to estimate the effect of mutual fund dual holdings is to regress outcome variables of interest on our mutual fund dual holding measure MFDH from Section III.B, controlling for other observable firm characteristics and industry, year, and firm fixed effects. The coefficient on MFDH would provide an unbiased estimation if mutual fund dual holdings are randomly allocated to firms. However, in practice, this assumption is unlikely to hold. For instance, some skilled equity and bond fund managers could potentially identify firms with more investment opportunities and increase their holdings accordingly. In addition, there may be time-varying unobserved firm characteristics that are simultaneously correlated with both funds' dual holding decisions and firm policies. When mutual fund dual holdings are endogenously determined, it is difficult to interpret the coefficient on MFDH as an estimate of the causal effect of such holdings.[7]

To overcome the endogeneity concerns, we utilize cross-family mutual fund mergers as a source of exogenous variation in dual holdings. This approach allows us to obtain a more reliable estimate of the causal effect of MFDH on the firm's outcome by isolating the variation in dual holdings independent of other factors affecting the firms. Therefore, the use of cross-family mutual fund mergers provides

[6]We thank the authors for kindly sharing their cooperative/competitive indices data.

[7]The estimation results from the common fixed effects regressions are reported in the Appendix. The results are qualitatively similar to our main results based on the instrumented DID analyses.

a stronger basis for making causal inferences about the relationship between mutual fund dual holdings and firm outcomes.

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.

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 1 month before to 5 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.[8] 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 classify firms as treated when they experience any increase in dual holdings due to a fund merger, and exclude firms treated again within 2 years after receiving the first treatment. We consider the merger completion year and the 2 subsequent years as post-treatment years, whereas pre-treatment years are the 2 years before the merger. The results are similar if we exclude the year of merger completion. This procedure produces a sample of 556 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: firm size, MB ratio, institutional ownership, other mutual fund bond holdings, and mutual fund dual holding level. Table A2 in the Supplementary Material reports 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.

We implement an instrumented DID framework with a 5-year window around merger events to estimate the effect of changes in mutual fund dual holdings resulting from fund mergers. We estimate a 2SLS regression model with the following first-stage specification:

$$\text{MFDH}_{it} = \theta_0 + \theta_1 * \text{MERGER}_{it} + \psi' X_{it-1} + \textit{Event FirmFE}_i + \textit{Industry} \times \textit{YearFE}_{it} + \eta_{it}, \tag{1}$$

where i indexes event firms, t indexes year, and MERGER_{it} is a dummy variable that equals 1 if an event firm has been treated by a mutual fund merger event by year t and 0 for pre-treatment years and firms in the control group.

[8]Fund flow is calculated following Sirri and Tufano (1998): $\text{FLOW}_{i,t} = \frac{\text{TNA}_{i,t} - (1+R_{i,t}) \times \text{TNA}_{i,t-1}}{\text{TNA}_{i,t-1}}$.

TABLE 1

Summary Statistics

Table 1 reports summary statistics of the different variables used in the empirical analysis. 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. All variables are defined in the Appendix.

				Percentile				
	N	Mean	Std. Dev.	10th	25th	50th	75th	90th
Firm-Level								
MFDH	5,334	0.11	0.12	0	0	0	0.17	0.28
COOPERATIVE_MFDH	5,334	0.05	0.05	0.00	0.01	0.04	0.07	0.13
COMPETITIVE_MFDH	5,334	0.01	0.02	0.00	0.00	0.01	0.02	0.03
CAPEX	5,334	0.21	0.15	0.08	0.12	0.18	0.26	0.37
STOCK_VOLATILITY	5,286	0.29	0.15	0.16	0.19	0.25	0.34	0.48
ROA_VOLATILITY	5,333	0.01	0.02	0.00	0.01	0.01	0.02	0.03
TOTAL_ASSETS ($M)	5,334	27,555	48,787	2,045	4,282	10,106	30,571	62,497
MB	5,334	2.01	1.13	1.06	1.30	1.71	2.34	3.33
LEVERAGE	5,328	0.29	0.19	0.10	0.17	0.26	0.38	0.52
TANGIBILITY	5,334	0.31	0.28	0.06	0.10	0.20	0.46	0.74
CASH	5,334	0.01	0.07	−0.04	−0.01	0.00	0.03	0.07
ROA	5,334	0.12	0.10	0.04	0.07	0.11	0.17	0.22
PAYOUT	5,334	0.06	0.06	0	0	0.04	0.08	0.12
INST_OWN	5,334	0.78	0.22	0.58	0.70	0.82	0.91	0.97
OWN_HHI	5,334	0.06	0.12	0.02	0.03	0.03	0.05	0.07
MF_BOND_OWN	5,334	0.09	0.11	0	0	0	0.12	0.17
BANK_OWN	5,334	0.05	0.03	0	0	0	0.06	0.08
Acquisition-Level								
MFDH	4,423	0.04	0.09	0	0	0	0.02	0.13
DEAL_VALUE ($M)	4,423	610	2,504	18	38	112	360	1,159
CASH_DEAL	4,423	0.62	0.49	0.00	0.00	1.00	1.00	1.00
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) VW (%)	5,851	1.31	2.00	0.07	0.51	1.15	2.02	3.02
Bond-Level								
MFDH	3,454	0.12	0.13	0	0.01	0.09	0.19	0.30
FRACTION_BOUGHT_BY_DUAL_HOLDERS	3,454	0.11	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
INVESTMENT_RESTRICTIONS	2,985	0.09	0.29	0	0	0	0	0
DIVIDEND_ESTRICTIONS	2,932	0.07	0.26	0	0	0	0	0
SUBSEQUENT_FINANCE RESTRICTIONS	2,932	0.78	0.42	0	1	1	1	1
EVENT_RELATED_RESTRICTIONS	2,932	0.95	0.22	1	1	1	1	1

We next use the predicted value $\widehat{\text{MFDH}}_{it}$ to test for the effect of dual holdings on firm outcomes using the following second-stage specification:

$$y_{it} = \alpha + \beta * \widehat{\text{MFDH}}_{it} + \gamma' X_{it-1} + Event\ Firm FE_i + Industry \times Year FE_{it} + \varepsilon_{it}, \quad (2)$$

where y_{it} is the dependent variable of interest (e.g., capital investments). In both the first- and second-stage specifications, the same vector of control variables X_{it-1} includes lagged firm characteristics (firm size, MB ratio, tangibility, cash holdings, profitability, and payout value) and contemporaneous ownership characteristics (institutional ownership, institutional ownership concentration, other mutual fund bond holdings, and large bank ownership). All these variables are defined in the Appendix and their summary statistics are reported in Table 1. All continuous variables are winsorized at the 1% and 99% levels. The table shows that the average mutual fund dual holding of this DID sample is 0.11 and the average capital

investment is 21%. The average total assets is about $3 billion dollars, suggesting that the firms included in the sample are relatively large firms in the COMPUSTAT universe. The average leverage is about 29%, which is slightly higher than an average COMPUSTAT firm. The distribution of other variables is similar to the average firm in the COMPUSTAT universe.

A control variable of particular importance is large bank ownership. As loan-equity ownership could also mitigate shareholder–creditor problems (e.g., Jiang et al. (2010), Chu (2017)), it is important to control for loan-equity dual ownership. We leverage the fact that the syndicated loan market is concentrated in that a few major banks lead the syndicates for most loans. We follow Schwert (2018) to identify the top 30 U.S. syndicated lenders and obtain their equity ownership at each firm using the institutional (13F) ownership data from Refinitiv. We then aggregate the equity ownership of these large banks to construct a bank ownership variable. By including this variable in our regression analyses, we are able to control for a significant portion of the loan-equity dual ownership.

In both the first- and second-stage, we include industry × year fixed effects to effectively compare 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. Moreover, we include event firm fixed effects to control for firm-specific time-invariant unobserved factors. 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 in (2) is β, which provides the DID-2SLS estimate of the treatment effect of exogenous changes in mutual fund dual holdings on firms' outcomes. For example, if dual ownership reduces the debt overhang problem, β would be significant and positive when the dependent variable is capital investment. In addition, we consider COOPERATIVE_MFDH and COMPETITIVE_MFDH separately to differentiate the effects of dual ownership from different types of fund families. To further test the specific predictions regarding different agency problems, we interact MFDH (and MERGER in the first-stage) with variables that indicate financial distress and managerial entrenchment.

IV. Results

This section presents our main results. We first link mutual fund dual holdings to lead firms' capital investments. We also present findings on firm risk and value creation.

A. Investment

To estimate the causal effect of mutual fund dual holdings on firm investments, we estimate the DID-2SLS specifications using cross-family fund mergers as IVs for MFDH.

Column 1 of Table 2 presents the first-stage relationship between fund mergers and changes in firm-level mutual fund dual holdings MFDH. For brevity, we only report the coefficients on the key variables of interest and suppress all control

TABLE 2

2SLS-DID Analysis for Firm Investment

Table 2 contains the difference-in-differences (DID) and the instrumented difference-in-differences (2SLS-DID) regression estimates of the effect of mutual fund dual holdings on firm investment as in equations (1)) and (2). The dependent variable in columns 2–6 is firm investment, which is firm capital expenditure scaled by lagged tangible capital. The dependent variable in column 1 is our firm-level mutual fund dual holding measure MFDH. MERGER is a dummy variable that equals 1 if an event firm has been treated by a mutual fund merger event by year t and 0 for pre-treatment years and firms in the control group. In column 4, we re-estimate the 2SLS-DID regression by replacing MFDH with COOPERATIVE_MFDH and COMPETITIVE_MFDH constructed based on the family-level cooperative and competitive indices developed by Evans et al. (2020). In column 5, we interact MFDH with a dummy variable indicating financial distress (FD). We classify firms as financially distressed when their expected default probability measured as in Bharath and Shumway (2008) was among the top 5% of all COMPUSTAT non-financial firms in the previous year ($t-1$). In column 6, we interact MFDH with a dummy variable indicating managerial entrenchment (ENTRENCHMENT). We follow Chava et al. (2010) to classify firms with entrenched managers if their CEO has a long tenure (>9 years) in combination with a higher number of anti-takeover provisions (E-index > 3). All regressions include industry × year fixed effects and event-firm fixed effects. Control variables are defined in the Appendix and suppressed for brevity. Standard errors are clustered at the merger level, and corresponding t-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable					
	MFDH	CAPEX				
	1st-Stage	OLS	2SLS			
	1	2	3	4	5	6
MERGER	0.032*** (5.697)	0.014*** (3.287)				
MFDH			0.445*** (3.307)		0.429*** (3.216)	0.455** (2.273)
COOPERATIVE_MFDH				0.716** (2.044)		
COMPETITIVE_MFDH				−0.834 (−0.964)		
MFDH × FD					3.474*** (6.072)	
MFDH × ENTRENCHMENT						−0.552*** (−3.488)
FD					−0.035*** (−2.768)	
ENTRENCHMENT						0.036* (1.827)
No. of obs.	5,325	5,325	5,325	5,325	5,325	3,396
Adj. R^2	0.823	0.612				
F-statistic			32.452	59.143	16.085	14.589
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes
Event firm FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	log(ASSETS), MB, LEVERAGE, TANGIBILITY, CASH, ROA, PAYOUT, INST_OWN, OWN_HHI, MF_BOND_OWN, BANK_OWN					

variables.[9] The coefficient on the MERGER variable is estimated to be 0.032 and statistically significant ($t = 5.697$). Given that the average MFDH before fund mergers is about 0.097, this estimate implies an increase in MFDH of 33% for treated firms after the mergers. The F-statistic from this regression is 32.5, suggesting that the cross-family fund mergers are unlikely to be a weak instrument.

After finding a strong first-stage result, we analyze the reduced-form relationship between the instrument and firm investment. In column 2 of Table 2, we estimate the DID regression of equation (1) with capital investments as the dependent variable. We find a strong and positive correlation between investment and being treated by a fund merger. The coefficient on MERGER is 0.014 and

[9]We report the coefficient estimates of the control variables in Section D of the Supplementary Material.

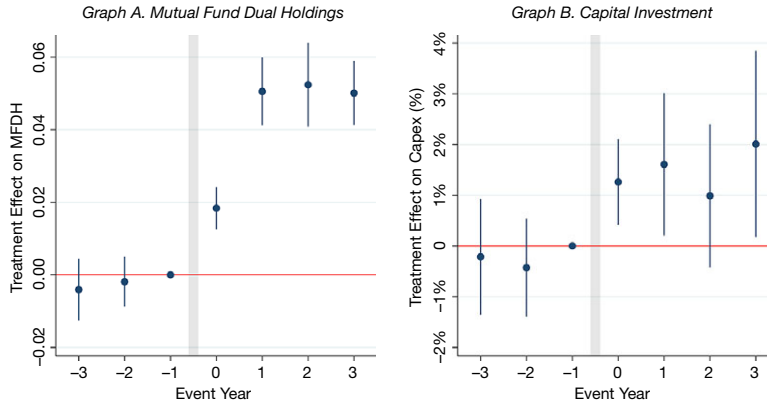
FIGURE 3

Dynamic Treatment Effect on MFDH and on Investment

Figure 3 displays the dynamic treatment effects of cross-family fund mergers on firm-level mutual fund dual holdings MFDH and on capital investments in Graph B. Specifically, we report the point estimates of β_k's from the following regression:

$$y_{it} = \alpha + \sum_{k=-3}^{3} \beta_k * (\text{MERGER}_i \times Year_{it}(k)) + \gamma' X_{it-1} + Event\ Firm FE_i + Industry \times Year FE_{it} + \varepsilon_{it},$$

where the dependent variable y_{it} is MFDH or CAPEX, MERGER_i is a dummy that equals 1 if event firm i is treated by a fund merger, and $Year_{it}(k)$ is a dummy that equals 1 if year t is the kth year relative to the merger event. The vector of control variables X_{it-1} and the set of fixed effects are the same as in Table 2. We cluster the standard errors at the merger level and plot the 90% confidence intervals of the coefficient estimates. Note that the relatively lower increase of MFDH in year 0 (compared to years 1 to 3) is because we average the quarterly MFDH measures over the year to get the yearly MFDH. If a merger happens after the first quarter of the year, the increase does not show up in all of the 4 quarters.



statistically significant ($t = 3.287$), implying that, after fund mergers, treated firms increase investments by 1.4 percentage points more than control firms do.

An important identification assumption in DID analysis is the parallel trend assumption. To ensure that our results are not confounded by differential trends in MFDH or capital investment for treated and control firms, we examine the dynamic treatment effects of cross-family fund mergers on the treated and control firms. We re-estimate the DID specification from columns 1 and 2 of Table 2 but with specific dummies indicating event years before and after fund mergers. Figure 3 shows the estimates of the dynamic treatment effects of fund mergers on firm-level MFDH and capital investment. None of the pre-treatment years has a significant coefficient, which is consistent with a parallel trend between treated and control firms before treatment. The treatment effect only becomes significant after event year 0, implying that the increase in mutual fund dual holdings resulting from fund mergers only starts to influence firm investment after the mergers have occurred.

The magnitude of the reduced-form effect does not reflect the fact that the intensity of the merger treatment varies by firm. We therefore move to the 2SLS results. In column 3 of Table 2, we proceed to the second-stage analyses in which we estimate equation (2) by using the fund mergers as the instrumental variable of MFDH. The DID-2SLS estimate of MFDH is 0.445 and statistically significant ($t = 3.307$), implying that a change of 0.01 in MFDH increases capital expenditures by 0.45 percentage points.

In column 4 of Table 2, we use COOPERATIVE_MFDH and COMPETITIVE_MFDH to differentiate the mutual fund dual holding effect of cooperative families from that of competitive families. The corresponding instruments are interaction terms with dummy variables indicating whether the acquiring fund families have a high (>0.5) cooperative index or a high (>0.5) competitive index in the quarter before the fund merger. We find a significantly positive coefficient estimate on COOPERATIVE_MFDH but an insignificantly negative estimate on COMPETITIVE_MFDH, which suggests that the effect of dual holdings on firm investment is mostly driven by the families that encourage cooperation.

In column 5 of Table 2, we re-estimate the specification from column 3 by interacting MFDH with a dummy variable FD, representing financially distressed firms. Firms are classified as financially distressed when their expected default probability measured as in Bharath and Shumway (2008) in the previous year ($t-1$) was among the top 5% of all COMPUSTAT non-financial firms in that year. The coefficient on the interaction term is large in magnitude (3.474) and statistically highly significant ($t=6.072$). This implies that dual holdings especially increase investments for firms facing financial distress. Importantly, given that firms cut investments by about 3.5 percentage points when facing financial distress, a unit increase in MFDH is sufficient to offset this investment decline. This is in line with the idea that mutual dual holdings help mitigate shareholder–creditor agency conflicts in their portfolio companies. In additional tests, reported in Section IV.B, we employ a range of alternative financial distress measures and confirm the robustness of this finding.

Note that the coefficient on MFDH in column 5 of Table 2 remains significant, indicating that MFDH increases investment for non-distressed firms as well, albeit to a much lesser degree. As we discuss later in Section V, dual holders could allow firms to refinance at lower costs. As such, even if firms are not in distress, they might still benefit from the capital supply and thereby pursue investment opportunities that might have been otherwise forgone. Also note that the chance of distress for our sample of firms classified as non-distressed is not 0. The main point of our distress measure is to distinguish firms with a relatively high and a relatively low chance of being financially distressed, without assuming that the latter subsample has a zero chance of distress.

In column 6 of Table 2, we study the impact of dual holdings on the potential agency conflicts between managers and shareholders. We re-estimate the specification from column 3 by interacting MFDH with a dummy variable ENTRENCHMENT, indicating firms with entrenched managers. We follow Chava, Kumar, and Warga (2010) and associate firms with managerial entrenchment when a firm's CEO has a long tenure (>9 years) and the firm has a relatively high number of anti-takeover provisions (E-index >3). We find that the coefficient on the interaction term is -0.552 and statistically significant ($t=-3.488$). This suggests that dual holdings reduce potential overinvestment when management is entrenched. The coefficient on the ENTRENCHMENT dummy is positive, implying that entrenched managers tend to make more investments, which is likely due to their "empire-building" incentives. Overall, these results are in line with mutual fund dual holders playing a role in disciplining management (e.g., by actively monitoring the company's investment activities). Indeed, as we show later in

Section V.C, equity funds from dual holding families become more active voters. This increased monitoring could help prevent entrenched managers from engaging in potential overinvestment and thereby mitigate agency conflicts between shareholders and management.

B. Robustness Tests

Panel A of Table 3 presents the robustness of our DID-2SLS results. We start by showing that the statistical significance of our regression estimates remains similar when we cluster the standard errors at the event-firm level instead of at the merger level. Our results become even stronger when we exclude the year of merger completion (event year 0 in the DID setting).

Next, we consider two placebo tests to strengthen the validity of our DID analyses further. First, we create placebo merger events 3 years before each actual event, and investigate whether treated firms respond to these pseudo treatments with the same DID-2SLS specifications.[10] We find that the DID estimate on MERGER and the DID-2SLS estimate on MFDH are statistically insignificant and negligible in magnitude, suggesting that treated and control firms have similar investment trends in other time periods, which lends additional support to the parallel trend assumption.

Second, 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 change 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, the DID estimate of this placebo treatment and the corresponding DID-2SLS estimate is indistinguishable from 0 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 exogenous, or whether they are driven by unobserved characteristics of portfolio companies. For example, funds may have performed poorly and therefore become takeover targets, and the underperformance could link to the characteristics of the firm they hold. However, if such confounding factors drive our findings, 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.[11]

Next, we examine the differential impacts of mutual fund families' bond-to-equity holdings on different intensive margins. As discussed in Section III.B, we follow Bodnaruk and Rossi (2016) to classify a fund family as a dual holder of a

[10]For firms that receive multiple treatments within 5 years, we only consider the very first treatment, resulting in a smaller sample.

[11]Corporate bond funds could hold firms' credit default swaps (CDS) to hedge their exposure to firm credit risk, which might create an empty creditor problem that reduces funds' incentive to coordinate and engage. In untabulated analysis, we interact our dual holding measures with whether the firm has CDS trading, and find that our results are robust.

TABLE 3

Robustness Tests

Table 3 presents robustness tests of our DID and DID-2SLS results. We only report the main coefficients of interest and suppress control variables for brevity. In Panel A, we examine the results of specifications 2 and 3 from Table 2. We first show the results estimated with clustered standard errors at the event-firm level or with the merger event year excluded from the analysis. Second, we show two placebo tests. In the first placebo test, we assign placebo treatments by moving each actual treatment event 3 years backward. We only consider the first treatment for firms that receive multiple treatments within 3 years. As our sample period is from 2008 to 2018, this placebo test excludes observations before 2011. In the second placebo test, we assign a placebo treatment to firms that are involved in a fund merger but do not experience any changes in their MFDH. Third, we evaluate the intensity margin of MFDH by classifying the mutual fund families' bond-to-equity holdings on different intensive margins: 0% to 20%, 20% to 80%, and 80% to 100%. Fourth, we consider three alternative measures of investment: cash acquisitions, asset growth, and capital expenditure scaled by total assets. In Panel B, we examine the results of specification 5 from Table 2 by considering four alternative empirical proxies for financial distress. First, we classify firms as financially distressed when they have a higher rollover risk during the 2008–2009 financial crisis, based on having more debt maturing during the financial crisis. Second, we classify firms as financially distressed when they have a leverage ratio among the top 10% of all COMPUSTAT non-financial firms. Third, we follow Asquith et al. (1994) and Hu et al. (2021) to classify firms as financially distressed when they have a lower interest coverage ratio. Fourth, we classify firms as financially distressed when they do not have a credit rating or are rated as high-yield firms. In Panel C, we examine the results of specification 6 from Table 2 by considering two alternative empirical proxies for managerial entrenchment. First, we classify firms with entrenched management if the board members are, on average, far away from their next elections (above-median years-to-election). Second, we classify firms with entrenched management when the firm faces low product market competition (lowest-decile product market fluidity) and has a higher number of anti-takeover provisions (E-index > 3). All regressions include industry × year fixed effect, event-firm fixed effects, and the same set of control variables as in Table 2. Standard errors are clustered at the merger level, and corresponding *t*-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Robustness Checks

	MERGER		MFDH	
	Coeff.	(*t*-Stat)	Coeff.	(*t*-Stat)
Estimation				
Standard errors clustered at the event-firm level	0.014***	(2.657)	0.445**	(2.565)
Excluding the year of merger completion (event year 0)	0.018***	(2.759)	0.396***	(3.169)
Placebo Test				
Moving treatment events 3 years backward	0.000	(0.029)	−0.049	(−0.029)
Treatment without any change in MFDH	0.003	(0.351)	−0.191	(−0.357)
DH Classification Threshold				
$0 < D/(D+E) < 20\%$	0.012	(1.218)	0.394**	(2.629)
$20\% \leq D/(D+E) \leq 80\%$	0.015**	(2.439)	0.519**	(2.455)
$80\% < D/(D+E) < 100\%$	0.005	(1.135)	0.404	(1.085)
Alternative Dependent Variables				
CASH_ACQUISITION	0.015***	(3.730)	0.468***	(3.067)
ASSET_GROWTH	0.042***	(3.395)	1.315***	(3.122)
CAPEX/TOTAL_ASSET	0.003***	(2.741)	0.100***	(2.746)

Panel B. Alternative Measures of Financial Distress

	MFDH		MFDH × FD	
	Coeff.	(*t*-Stat)	Coeff.	(*t*-Stat)
HIGH_ROLLOVER_RISK_DURING_2008–2009	0.463***	(3.204)	1.767***	(3.320)
HIGH_LEVERAGE	0.397***	(2.789)	2.099***	(3.137)
LOW_INTEREST_COVERAGE_RATIO	0.405***	(3.050)	1.958*	(1.732)
NOT_RATED/HIGH-YIELD_RATING	0.373**	(2.235)	0.811*	(1.718)

Panel C. Alternative Measures of Managerial Entrenchment

	MFDH		MFDH × ENTRENCHMENT	
	Coeff.	(*t*-Stat)	Coeff.	(*t*-Stat)
HIGHER_YEARS_TO_ELECTIONS	0.538***	(3.502)	−0.242**	(−2.232)
LOW_COMPETITION and HIGH_E-INDEX	0.459***	(3.362)	−0.231*	(−1.704)

given firm if the family's bond-to-total (bond and equity) holding of the company is between 5% and 95%. Alternatively, when we identify dual holding families as having a bond-to-total ratio between 0 and 20%, between 20% and 80%, or between 80% and 100%, we find that the effect comes mostly from the middle group, reinforcing the idea that the dual ownership is mostly effective when the families

have significant equity and debt stakes at the same time and have shareholder- and creditor-incentives simultaneously.

Moreover, we look at cash acquisitions and asset growth as alternative investment measures. Consistent with our baseline results, firms with more dual holdings spend more on cash acquisitions and have higher asset growth. We also scale our baseline investment measure capital expenditure by total assets instead of only fixed assets and again find similar results.

Panel B of Table 3 focuses on our measure of financial distress. A concern is that financial distress is endogenous. We attempt to obtain a more exogenous measure of financial distress by exploiting the 2008–2009 financial crisis. The idea is that the unexpected economic collapse and funding freeze during the financial crisis significantly impacted firms' ability to refinance their debt, and, as a result, firms with high rollover risks during 2008–2009 are then more likely to be financially distressed. Following Gopalan, Song, and Yerramilli (2014), we proxy for rollover risk by using firms' long-term debt (as a percentage of total assets) maturing in 1 year. Firms with a high rollover risk during 2008–2009 are classified as financially distressed firms during that period. We examine observations surrounding the crisis, from 2007 to 2012. Our estimation in Panel B of Table 3 shows that the interaction term of our firm-level dual holding measure (MFDH) and the financial distress measure based on rollover risk is positive (1.767) and statistically significant ($t = 3.320$), which is in line with our predictions.

We also report the results for three additional measures of financial distress. The first classifies firms as financially distressed when they have a high leverage ratio (i.e., yearly top-10% leverage of all COMPUSTAT non-financial firms). The second classifies firms as financially distressed when they have a low-interest coverage ratio (i.e., in any 2 consecutive years, a firm's EBITDA is less than its reported interest expenses or in any year EBITDA is less than 80% of its interest expenses (Asquith, Gertner, and Scharfstein (1994), Hu, Li, Li, and Pei (2021)). The final additional measure classifies firms as financially distressed when their bonds are not rated or rated as high yield. Using each of these measures, we find a larger effect of dual holdings among distressed firms.

In Panel C of Table 3, we consider two alternative measures of managerial entrenchment. First, we follow Fos, Li, and Tsoutsoura (2017) to measure directors' proximity to elections and classify firms with entrenched management when its board has an above-median (> 1.1) years-to-election. The idea is that CEOs face heightened monitoring from directors nearing elections, as these directors have potential labor market rewards for disciplining CEOs. Conversely, when the board's distance to election lengthens, CEOs enjoy greater leeway to pursue their own personal interests. The second measure follows from Giroud and Mueller (2010), who show that competition disciplines management and that the threat of hostile takeovers matters primarily in non-competitive industries. As such, the combination of low competition and anti-takeover protection allows managers to entrench themselves. We classify firms with entrenched management when firms face low competition (lowest-decile product market fluidity from Hoberg, Phillips, and Prabhala (2014)) while having a relatively high number of anti-takeover provisions (E-index > 3). In line with our initial findings, Panel C shows that for

both of the additional managerial entrenchment measures, the effect of dual holdings on investment is significantly reduced when management is more entrenched.

C. Firm Risk and Investment Quality

In this section, we investigate whether firm risk increases with dual ownership. An increase in corporate investment could 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 4, we examine firm risk-taking behavior by estimating the DID-2SLS specifications using cross-family fund mergers as IVs for MFDH.

As is standard in the literature, our first measure of risk-taking is realized equity return volatility. In columns 1–4 of Table 4, the dependent variable is the annualized stock return volatility over the 90 trading days prior to fiscal year-end. In columns 5–8, we consider an alternative risk-taking measure by calculating the standard deviation of return-on-asset (ROA) changes over the past 8 quarters. None of MFDH, COOPERATIVE_MFDH, COMPETITIVE_MFDH, or the interaction term between MFDH and the financial distress dummy FD has a significant coefficient in any of the specifications. The interaction term between MFDH and the ENTRENCHMENT dummy is negative and statistically significant at the 10% level in column 8, suggesting that dual holdings reduce ROA volatility for firms with entrenched management. Overall, there is no evidence that mutual fund dual holdings are related to increases in firm risk.

In addition, we examine whether the investment projects made by dual holding firms create value. Value-destroying investments might occur (e.g., because of overinvestment (Jensen (1986))). We focus our analysis on firms' takeover decisions, which are relatively easy to observe. Our sample includes 3,826 acquisitions, collected from SDC. 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 shareholders.

Table 5 reports the results of whether dual holdings create value by studying acquirer abnormal returns around announcements of acquisition deals. In this cross-sectional analysis, we estimate 2SLS regressions where the instrumental variable for MFDH is the number of cross-family fund mergers in which the firm was involved over the 3 years prior to the deal announcement date. We first report bondholders' returns in columns 1–4. 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 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. Specifically, we aggregate and compute the benchmark bond returns by forming par-value weighted portfolios. We exclude bonds that are not traded within our event window and are able to construct abnormal returns for 7,955 bonds of 427 unique bidders.

TABLE 4

Diff-in-Diff Analysis for Firm Risk

Table 4 reports the second stage DID-2SLS results of estimating equation (2) for firm risk. The first stage of the DID-2SLS is estimated as in column 1 of Table 2. The dependent variables are stock return volatility in columns 1–4 and ROA volatility in columns 5–8. In columns 1 and 5, MFDH is the firm-level mutual fund dual holding measure. In columns 2 and 6, we replace MFDH with COOPERATIVE_MFDH and COMPETITIVE_MFDH constructed based on the family-level cooperative and competitive indices developed by Evans et al. (2020). In columns 3 and 7, we interact MFDH with a dummy variable indicating financial distress (FD). We classify firms as financially distressed when their expected default probability measured as in Bharath and Shumway (2008) was among the top 5% of all COMPUSTAT non-financial firms in the previous year ($t-1$). In columns 4 and 8, we interact MFDH with a dummy variable indicating managerial entrenchment (ENTRENCHMENT). We follow Chava et al. (2010) to classify firms with entrenched managers if their CEO has a long tenure (>9 years) in combination with a higher number of anti-takeover provisions (E-index > 3). All regressions include industry × year fixed effects and event-firm fixed effects. Control variables are defined in the Appendix and suppressed for brevity. Standard errors are clustered at the merger level, and corresponding *t*-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable							
	STOCK_VOLATILITY				ROA_VOLATILITY			
	1	2	3	4	5	6	7	8
MFDH	−0.018		0.035	0.004	−0.021		−0.021	0.002
	(−0.093)		(0.180)	(0.018)	(−1.666)		(−1.646)	(0.162)
COOPERATIVE_MFDH		0.005				0.001		
		(0.010)				(0.022)		
COMPETITIVE_MFDH		0.836				−0.124		
		(0.935)				(−0.851)		
MFDH × FD			0.017				−0.002	
			(0.056)				(−0.123)	
MFDH × ENTRENCHMENT				0.204				−0.049*
				(1.001)				(−1.729)
FD			0.139***				0.001	
			(6.066)				(0.210)	
ENTRENCHMENT				−0.020				0.005*
				(−1.042)				(1.896)
No. of obs.	5,277	5,277	5,276	3,396	5,324	5,324	5,323	3,396
F-statistic	28.060	71.912	13.041	14.589	32.207	59.040	46.891	14.589
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Event firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	log(ASSETS), MB, LEVERAGE, TANGIBILITY, CASH, ROA, PAYOUT, INST_OWN, OWN_HHI, MF_BOND_OWN, BANK_OWN							

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 relationship between our dual holdings measure and bidders' abnormal bond returns around acquisitions. The results in column 1 of Table 5 imply that bondholders of an acquirer with an average level of dual holdings (0.11) earn a 23 bps higher return than if there were no dual holdings, and column 3 shows that this effect increases by an additional 24 bps in case of financial distress.

We examine shareholder returns in columns 5–8 of Table 5. For shareholders, 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 Section V.A). 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 using the Fama–French and Carhart (1997) 4-factor model. We find a positive relation

TABLE 5

Mutual Fund Dual Holding and Investment Quality

Table 5 reports the regression results of acquisition announcement returns on mutual fund dual holding. We estimate the 2SLS regression with the number of cross-family fund mergers involving the firm over the 3 years before the deal announcement date as the instrumental variable for pre-acquisition MFDH, measured over the 4 quarters prior to the acquisition announcement quarter. We look at bond returns in columns 1–4. 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 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 par-value weighted (VW) portfolios. To mitigate the impact of small bond issues, we show results of weighted least square regressions with observations weighted by issue size. We show stock returns in columns 5–8. 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 using the Carhart (1997) 4-factor model. In columns 2 and 5, we re-estimate the 2SLS regression by replacing MFDH with COOPERATIVE_MFDH and COMPETITIVE_MFDH constructed based on the family-level cooperative and competitive indices developed by Evans et al. (2020). In columns 3 and 7, we interact MFDH with a dummy variable indicating financial distress (FD). We classify firms as financially distressed when their expected default probability measured as in Bharath and Shumway (2008) was among the top 5% of all COMPUSTAT non-financial firms in the previous year ($t-1$). In columns 4 and 8, we interact MFDH with a dummy variable indicating managerial entrenchment (ENTRENCHMENT). We follow Chava et al. (2010) to classify firms with entrenched managers if their CEO has a long tenure (>9 years) in combination with a higher number of anti-takeover provisions (E-index > 3). All regressions include industry × year fixed effects, deal-level characteristics, and the same set of firm-level control variables from Table A3 in the Supplementary Material, measured at the fiscal year-end before the merger. Columns 1–4 additionally include maturity and rating fixed effects and bond-level characteristics. All variables are defined in the Appendix. Standard errors are clustered at the firm level, and *t*-statistics are in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable							
	BOND_CAR (−1, +1)				STOCK_CAR (−1, +1)			
	1	2	3	4	5	6	7	8
MFDH	0.021*		0.020*	0.025*	0.119*		0.001	0.073
	(1.913)		(1.773)	(1.757)	(1.736)		(0.010)	(1.122)
COOPERATIVE_MFDH		0.049*				0.571**		
		(1.875)				(2.348)		
COMPETITIVE_MFDH		−0.006				−0.124**		
		(−0.972)				(−2.280)		
MFDH × FD			0.022***				0.144*	
			(3.000)				(1.836)	
MFDH × ENTRENCHMENT				−0.013				−0.099
				(−0.529)				(−0.826)
FD			−0.000				0.012	
			(−0.142)				(0.699)	
ENTRENCHMENT				0.000				0.002
				(0.026)				(0.445)
CASH_DEAL	−0.000	0.000	−0.000	−0.000	0.002	0.002	0.002	0.002
	(−0.587)	(0.197)	(−0.707)	(−0.237)	(0.657)	(0.716)	(0.569)	(0.950)
PRIVATE_DEAL	0.001	0.000	0.001	0.001*	0.027***	0.026***	0.026***	0.015***
	(1.074)	(0.656)	(0.965)	(1.728)	(5.246)	(5.140)	(5.164)	(3.884)
DIVERSIFYING_DEAL	−0.000	−0.001	−0.000	0.000	0.006	0.004	0.005	0.001
	(−0.764)	(−0.988)	(−0.630)	(0.160)	(1.263)	(0.857)	(1.263)	(0.290)
CROSS-BORDER_DEAL	−0.000	−0.001	−0.000	−0.000	−0.004	−0.005	−0.004	−0.004
	(−0.757)	(−1.200)	(−0.815)	(−0.429)	(−1.523)	(−1.634)	(−1.620)	(−1.623)
log(DEAL_SIZE)	0.000	0.000	0.000	0.000	−0.004	−0.004	−0.004	0.001
	(0.339)	(0.055)	(0.055)	(0.418)	(−0.868)	(−0.912)	(−0.953)	(0.655)
RELATIVE_DEAL_VALUE	−0.002*	−0.001	−0.002**	−0.000	0.074***	0.074***	0.075***	0.014
	(−1.790)	(−0.689)	(−2.014)	(−0.156)	(2.638)	(2.667)	(2.676)	(0.999)
COUPON	−0.007	−0.002	−0.008	−0.020				
	(−0.397)	(−0.095)	(−0.482)	(−1.202)				
log(BOND_AGE)	−0.001	−0.001	−0.001	−0.000				
	(−1.207)	(−1.149)	(−1.274)	(−0.601)				
No. of obs.	7,955	7,955	7,955	7,187	3,826	3,826	3,826	2,789
F-statistic	33.734	16.531	17.262	11.788	18.686	20.638	21.469	19.295
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maturity FE	Yes	Yes	Yes	Yes	No	No	No	No
Rating FE	Yes	Yes	Yes	Yes	No	No	No	No
Firm controls	log(ASSETS), MB, LEVERAGE, TANGIBILITY, CASH, ROA, PAYOUT, INST_OWN, OWN_HHI, MF_BOND_OWN, BANK_OWN							

between dual holdings and acquirer shareholder announcement returns, especially in case of financial distress. In particular, the estimate in column 7 implies that shareholders of a financially distressed acquirer with an average level of dual holdings (0.11) earn a 1.6 percentage points higher return than if there were no dual holdings.

In columns 2 and 5 of Table 5, we differentiate the dual ownership of cooperative families from that of competitive families. The effects are only significantly positive when the dual holding family encourages cooperation. This finding suggests that mutual fund dual ownership enhances value during mergers for both bondholders and shareholders only when families provide cooperative incentives.

In columns 4 and 8 of Table 5, we show that the effect of dual ownership on investment quality remains similar while controlling for managerial entrenchment, whereas the effect of managerial entrenchment itself is negligible. These findings are in line with the results from Table 2, which shows that dual ownership limits investment by entrenched managers. Consequently, any acquisitions undertaken by firms with entrenched managers that do get announced are likely to have undergone screening by dual holders, which reduces the risk of observing value-destroying deals for acquirers.

Taken together, our findings thus far suggest that mutual fund dual holdings allow financially distressed firms to increase value-enhancing investments, especially when the fund family encourages cooperation between bond and equity funds. To obtain more insights into the benefits of dual holdings, our next Section V includes an analysis of the relationship between dual holdings and debt financing costs.

V. Potential Mechanisms

In this section, we shed light on the potential mechanisms through which mutual fund dual holders allow firms to increase valuable investment while at the same time preventing entrenched managers from overinvesting. In particular, we examine capital supply and corporate governance. We find that dual holdings allow more bond issues with lower yields and fewer restrictive covenants, and that equity funds from dual holding families vote more actively at shareholder meetings.

A. Capital Supply

We first examine firms' bond issuance decisions. Bodnaruk and Rossi (2021) show that a firm's ability to access the bond market is 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 (2021) 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 6

Diff-in-Diff Analysis for Bond Issuance

Table 6 reports the second-stage DID-2SLS results of estimating equation (2) for firms' bond issuance decisions. The first-stage is estimated as in column 1 of Table 2. The dependent variable is a dummy variable that equals 1 if a firm issues a bond at any time in the following year ($t+1$). In column 1, MFDH is the firm-level mutual fund dual holding measure. In column 2, we re-estimate the 2SLS-DID specification by replacing MFDH with COOPERATIVE_MFDH and COMPETITIVE_MFDH constructed based on the family-level cooperative and competitive indices developed by Evans et al. (2020). In column 3, we interact MFDH with a dummy variable indicating financial distress (FD). We classify firms as financially distressed when their expected default probability measured as in Bharath and Shumway (2008) was among the top 5% of all COMPUSTAT non-financial firms in the previous year ($t-1$). In column 4, we interact MFDH with a dummy variable indicating managerial entrenchment (ENTRENCHMENT). We follow Chava et al. (2010) to classify firms with entrenched managers if their CEO has a long tenure (>9 years) in combination with a higher number of anti-takeover provisions (E-index > 3). All regressions include industry × year fixed effects and event-firm fixed effects. All variables are defined in the Appendix and suppressed for brevity. Standard errors are clustered at the merger level, and corresponding *t*-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable: BOND_ISSUANCE			
	1	2	3	4
MFDH	3.983***		3.933***	4.907***
	(5.059)		(5.066)	(5.102)
COOPERATIVE_MFDH		8.591***		
		(3.694)		
COMPETITIVE_MFDH		−6.262		
		(−1.079)		
MFDH × FD			6.542***	
			(2.809)	
MFDH × ENTRENCHMENT				−1.751*
				(−1.986)
FD			−0.125	
			(−1.432)	
ENTRENCHMENT				0.081
				(0.791)
No. of obs.	5,325	5,325	5,325	4,185
F-statistic	32.452	59.143	16.085	13.359
Industry × year FE	Yes	Yes	Yes	Yes
Event firm FE	Yes	Yes	Yes	Yes
Firm controls	log(ASSETS), MB, LEVERAGE, TANGIBILITY, CASH, ROA, PAYOUT, INST_OWN, OWN_HHI, MF_BOND_OWN, BANK_OWN			

We use the same DID-2SLS framework and cross-family fund mergers as IVs for MFDH to cleanly test whether dual holdings increase the probability of bond issuance. Table 6 reports the results from estimating equations (1) and (2). The dependent variable is a dummy variable that equals 1 if a firm issues a bond at any time in the following year ($t+1$).

In column 1 of Table 6, the DID-2SLS estimate of MFDH is 3.983 and statistically significant ($t=5.059$), which implies that treated firms with a 1-percentage point increase in dual holdings are, on average, about 4% more likely to issue new bonds in comparison to control firms. Column 3 shows that the bond issuance likelihood increases by another 6.5% if firms are in financial distress. In contrast, as shown in column 4, this effect is significantly smaller for firms with entrenched managers. Moreover, when we differentiate the dual ownership of cooperative families from that of competitive families in column 2, the effect is significantly positive when the dual holding family encourages cooperation and negative and insignificant when the family encourages competition. Overall, the findings are consistent with the idea that a range of dual holding families encourage within-family cooperation and 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 bond 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 7, we examine the impact of mutual fund dual holdings on bond issue participation. In columns 1–4, 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 III.B at the first quarter-end after the issue date. We use the 2SLS specifications and regress the fraction bought by dual holding funds on firms' pre-issuance dual holding level, measured over the 4 quarters prior to the bond issue date, of which the IV is the number of cross-family fund mergers where the issuing firm was involved over the 3 years prior to the bond issue date. We also control for industry × year fixed effects, bond characteristics such as issue size and maturity, and the same set of firm characteristics as in Table 2.

In column 1 of Table 7, the 2SLS estimate of pre-issue dual holdings on new-issuance participation by dual holders is positive and statistically significant ($t = 3.645$). Interestingly, the coefficient estimates of COOPERATIVE_MFDH and COMPETITIVE_MFDH in column 2 have opposite signs, implying that only bond funds from cooperative dual holding families buy the new bond issues. Moreover, as shareholder–creditor agency conflicts are particularly relevant for financially distressed firms, we expect the effect to be more pronounced among high-yield (HY) issuers. In column 3, we show that the effect is indeed mostly pronounced among HY issuers.[12]

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 7 shows the results on the offering yields in columns 5–8. Dual holdings are negatively related to offering yields, and the effect is mostly driven by cooperative dual holders and more pronounced for HY issuers. We find that an increase in pre-issue dual holdings from 0 to the average level (0.11) is associated with a 41 bps ($= (5.986 - 2.226) * 0.11$) decrease in the offering yield for HY issuers. This is a 14.5% relative reduction in financing cost, given that the HY bonds have, on average, a 2.86 percentage points higher yield.

In columns 4 and 8 of Table 7, we show that the effects of pre-issue dual holdings on new-issuance participation and financing costs remain similar when we control for managerial entrenchment, whereas the effect of managerial entrenchment itself is insignificant. These findings are in line with the results from Table 6, which shows that dual ownership limits bond financing by entrenched managers. Bond funds may only buy bonds issued by firms with entrenched managers when equity funds engage actively in monitoring and prevent managers from misusing the proceeds.

[12]In untabulated analysis, we find evidence that mutual fund dual holdings are associated with a reduced likelihood of credit downgrades for distressed portfolio companies.

TABLE 7

Capital Supply, Financing Costs, and Contracting

Table 7 reports the cross-sectional estimation results for the effects of mutual fund dual holdings on bond issue characteristics. We estimate the 2SLS regression with the number of cross-family fund mergers involving the firm over the 3 years before the deal announcement date as the instrumental variable for pre-issuance MFDH, measured over the 4 quarters prior to the bond issue date. In columns 1–4 of Panel A, the dependent variable is the fraction of bond issues bought by dual-holding mutual funds measured at the first quarter-end after the bond issue date. We classify a mutual fund buyer as a dual holder if its fund family is a dual holder of the issuing firm. In columns 5–8, the dependent variable is the yield-to-maturity in percentage points. In columns 1 and 4, MFDH is the firm-level mutual fund dual holding level measured at the quarter prior to bond issuance. In columns 2 and 6, we replace MFDH with COOPERATIVE_MFDH and COMPETITIVE_MFDH constructed based on the family-level cooperative and competitive indices developed by Evans et al. (2020). In columns 3 and 7, we interact MFDH with the high-yield issuer dummy HY, where the dummy equals 1 if the corporate bond is classified as a high-yield bond. In columns 4 and 8, we interact MFDH with a dummy variable indicating managerial entrenchment (ENTRENCHMENT). We follow Chava et al. (2010) to classify firms with entrenched managers if their CEO has a long tenure (>9 years) in combination with a higher number of anti-takeover provisions (E-index > 3). In Panel B, the dependent variable in each column is a dummy variable indicating whether the bond includes a particular class of restrictive covenants. We follow Chava et al. (2010) to classify bond covenants into four groups. In columns 1, 3, 5, and 7, we interact MFDH with the high-yield issuer dummy HY. In columns 2, 4, 6, and 8, we interact MFDH with our CEO entrenchment dummy. All regressions include industry × year fixed effects, bond characteristics, and firm-level control variables (suppressed for brevity). All variables are defined in the Appendix. Standard errors are clustered at the firm level, and corresponding *t*-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Capital Supply and Financing Costs

	Dependent Variable							
	FRACTION_BOUGHT_BY_DUAL_HOLDERS				OFFERING_YIELD (%)			
	1	2	3	4	5	6	7	8
MFDH	0.363***		0.039	0.243**	−4.506***		2.226	−4.004*
	(3.645)		(0.204)	(2.475)	(−2.940)		(1.578)	(−1.733)
COOPERATIVE_MFDH		2.121**				−23.960**		
		(2.106)				(−2.391)		
COMPETITIVE_MFDH		−4.066				51.061		
		(−1.480)				(1.578)		
MFDH × HY			0.328*				−5.986***	
			(1.821)				(−3.972)	
MFDH × ENTRENCHMENT				0.029				2.752
				(0.093)				(1.206)
ENTRENCHMENT				−0.008				−0.246
				(−0.326)				(−0.987)
HIGH-YIELD (HY)	0.025***	0.008	−0.011	0.031***	2.242***	2.396***	2.858***	2.154***
	(3.674)	(0.657)	(−0.455)	(4.267)	(18.826)	(15.338)	(13.013)	(15.118)
log(PROCEEDS)	0.021***	0.023***	0.024***	0.025***	0.167*	0.134	0.119	0.154
	(3.828)	(3.716)	(4.171)	(3.884)	(1.947)	(1.567)	(1.434)	(1.574)
CALLABLE	0.017**	0.012	0.017*	0.016*	0.493***	0.545***	0.516***	0.463***
	(2.132)	(1.301)	(1.940)	(1.857)	(3.082)	(3.060)	(3.379)	(2.739)
MATURITY	−0.002***	−0.002***	−0.002***	−0.003***	0.086***	0.083***	0.086***	0.114***
	(−5.444)	(−4.039)	(−5.775)	(−5.029)	(6.120)	(5.816)	(6.087)	(6.154)
No. of obs.	3,442	3,442	3,303	2,907	3,442	3,442	3,442	2,907
F-statistic	17.349	3.352	6.833	10.714	20.769	7.083	10.359	7.322
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	log(ASSETS), MB, LEVERAGE, TANGIBILITY, CASH, ROA, PAYOUT, INST_OWN, OWN_HHI, MF_BOND_OWN, BANK_OWN							

Panel B. Restrictive Covenants

	Dependent Variable							
	INVESTMENT		SUBSEQUENT_FINANCING		DIVIDEND		DISTRESS_EVENT	
	1	2	3	4	5	6	7	8
MFDH	−0.293	−0.378*	0.635	−0.300	−0.045	−0.323	0.650	−0.006
	(−1.219)	(−1.681)	(0.869)	(−0.399)	(−0.188)	(−1.496)	(1.218)	(−0.013)
MFDH × HY	−1.159**		−1.614**		−1.096**		−1.172**	
	(−2.390)		(−2.069)		(−2.355)		(−2.151)	
MFDH × ENTRENCHMENT		−2.250*		−2.384**		−1.354***		−0.474
		(−1.790)		(−2.098)		(−2.749)		(−0.591)
ENTRENCHMENT		0.157		0.021		0.044		0.034
		(1.333)		(0.230)		(0.750)		(0.375)
HIGH-YIELD (HY)	0.508***	0.339***	0.463***	0.219***	0.501***	0.323***	0.084	−0.072*
	(6.182)	(7.795)	(4.091)	(3.232)	(6.317)	(7.590)	(1.071)	(−1.923)

(continued on next page)

TABLE 7 (continued)
Capital Supply, Financing Costs, and Contracting

Panel B. Restrictive Covenants

	Dependent Variable							
	INVESTMENT		SUBSEQUENT_FINANCING		DIVIDEND		DISTRESS_EVENT	
	1	2	3	4	5	6	7	8
log(PROCEEDS)	0.016	0.010	−0.009	−0.009	0.018*	0.014	0.010	0.010
	(1.605)	(1.083)	(−0.475)	(−0.508)	(1.832)	(1.559)	(0.522)	(0.521)
CALLABLE	−0.010	−0.005	−0.006	−0.002	−0.018*	−0.018**	0.007	−0.002
	(−0.825)	(−0.508)	(−0.201)	(−0.055)	(−1.842)	(−2.145)	(0.222)	(−0.072)
MATURITY	−0.002*	−0.001*	−0.002	−0.001	−0.001	−0.000	0.000	−0.001
	(−1.926)	(−1.715)	(−1.127)	(−0.359)	(−1.341)	(−0.305)	(0.147)	(−0.756)
No. of obs.	2,922	2,581	2,922	2,581	2,922	2,581	2,922	2,581
F-statistic	11.001	2.086	11.001	2.086	11.001	2.086	11.001	2.086
Industry × year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm controls	log(ASSETS), MB, LEVERAGE, TANGIBILITY, CASH, ROA, PAYOUT, INST_OWN, OWN_HHI, MF_BOND_OWN, BANK_OWN							

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 cooperative dual holding families allow firms to finance their investments at lower costs.

B. 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 included in new bond issues in Panel B of Table 7. We follow Chava et al. (2010) to categorize bond covenants into classes and examine investment restrictions in columns 1 and 2, subsequent-financing restrictions in columns 3 and 4, dividend restrictions in columns 5 and 6, and distress-event-related restrictions in columns 7 and 8. All of these restrictions are more likely to be imposed on borrowers with a high-yield (HY) credit rating, for whom the shareholder–creditor agency conflicts are particularly relevant. The results in columns 1, 3, and 7 indicate that for HY borrowers more dual holdings are associated with fewer restrictive covenants, which provides these borrowers with more room to make investments and refinance through debt or equity issuance. When we sum the coefficient on MFDH and the coefficient on the

interaction term between MFDH and the high-yield dummy, we find that the probability of having investment-related covenants is mostly reduced, in line with mutual fund dual holders especially providing more room for investments in case of financial distress. These findings suggest that dual holders effectively reduce debt overhang problems through a bond contracting channel. In column 5, we also find that bonds issued by firms with dual holdings are less likely to contain restrictions on payouts to shareholders, implying that bond funds also protect the interests of sister equity funds. This result suggests that dual holdings facilitate coordination between bond and equity funds within families.

When managers' interests are misaligned with those of shareholders, bondholders may be concerned about entrenched managers misusing bond proceeds to pursue their own interests, such as engaging in "empire building," which would eventually increase firms' default risk. Therefore, bondholders are more likely to use restrictive covenants when managers are entrenched. However, if equity funds from the dual holding family are incentivized to monitor the management more actively and intensively, the sister bond funds would worry less about the agency costs of overinvestment and therefore demand fewer restrictive covenants as opposed to situations without dual holdings. The results in columns 2, 4, and 6 of Table 7 lend support to this prediction. The coefficient estimates of the ENTRENCHMENT dummy are all positive (albeit statistically insignificant), but when those issuing firms have more dual holdings, they are significantly less likely to have restrictions on investment, subsequent financing, and dividends. The results for distress-event-related covenants in column 8 are insignificant but the signs are consistent with the other results.

C. 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 data set 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 data set. 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 data set. This procedure produces a table that links SEC Edgar, the CRSP mutual fund data set, and the ISS voting analytics data set. 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 751,290 family-firm-meeting observations.

TABLE 8

Family Dual Holding and Fund Voting Behavior

Table 8 reports regression results that estimate the effect of dual holding on mutual funds' voting behavior. The analysis is at the family-firm-meeting level. The dependent variable in columns 1–4 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. We include all voting in columns 1 and 2. We exclude director election voting in columns 3 and 4. The dependent variable in columns 5–8 is the percentage of voting issues on which the fund family votes with the ISS recommendation. We include all voting in columns 5 and 6. We exclude director election voting in columns 7 and 8. The independent variable of interest in columns 1, 3, 5, and 7 is the dual holding dummy variable, which equals 1 if the fund family is a dual holder of the firm hosting the shareholder meeting. In columns 2, 4, 6, and 8, we differentiate cooperative dual-holding families from competitive ones based on whether their cooperative/competitive index was above 0.5 in the previous quarter. 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 invests in the firm. Standard errors are 2-way clustered at the firm and fund family level. The corresponding *t*-statistics are reported in parentheses. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively.

	Dependent Variable							
	MISSING_VOTE (%)				VOTING_WITH_ISS (%)			
Proposal Type	All		Excl. Director Election		All		Excl. Director Election	
	1	2	3	4	5	6	7	8
DH	−0.079*		−0.126*		−0.411*		−0.485**	
	(−1.751)		(−1.692)		(−1.842)		(−2.136)	
COOPERATIVE_DH		−0.128*		−0.080*		−0.420*		−0.504**
		(−1.732)		(−1.729)		(−1.870)		(−2.138)
COMPETITIVE_DH		0.173*		0.200**		0.527		0.439
		(1.961)		(2.125)		(0.894)		(0.735)
EQUITY_OWNERSHIP	−1.633	−1.604	−1.483	−1.520	−2.878	−2.888	11.771	11.747
	(−1.179)	(−1.146)	(−1.063)	(−1.099)	(−0.568)	(−0.570)	(1.331)	(1.328)
NUMBER_OF_FUNDS	−0.006	−0.006	−0.006	−0.006	−0.108***	−0.108***	−0.246***	−0.246***
	(−0.855)	(−0.856)	(−0.891)	(−0.869)	(−2.680)	(−2.671)	(−4.955)	(−4.950)
No. of obs.	751,290	751,290	744,677	744,677	747,559	747,559	740,958	740,958
Adj. R^2	0.552	0.552	0.553	0.553	0.487	0.487	0.457	0.457
Firm-meeting FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Family × quarter FE	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes

In Table 8, we test whether mutual fund families have differential voting behavior when they are dual holders. In columns 1–4, the dependent variable is the percentage of missing votes, which provides information on whether investors actively participate in voting. The DH dummy variable equals 1 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 the number of equity funds in the family and include firm-meeting fixed effects to compare voting behavior between different fund families for the same firm at the same meeting and family × year fixed effects to remove any differences in voting behavior across fund families in the same year.

We find that the estimated coefficient on the DH dummy is significantly negative, implying that equity investors are less likely to miss votes when their families hold bonds from the same firm. In column 2 of Table 8, we differentiate cooperative dual holding families from competitive families based on whether their cooperative/competitive index was above 0.5 in the previous quarter. The voting results are again mostly driven by the dual holding families that encourage cooperation. In columns 3 and 4, we follow Keswani et al. (2021) and Gormley and Jha (2022) to exclude proposals related to director elections, as the implications of such proposals for creditors is less clear. We find a slight increase in the magnitude of coefficient estimates.

In addition to the likelihood of missing voting, we also examine the likelihood of voting against ISS recommendations in columns 5–8 of Table 8. If equity funds from dual holding families become more active in monitoring and engaging in voting, they are less likely to rubber-stamp ISS recommendations and, therefore, more likely to vote against the recommendations (Gormley and Jha (2022)). That is indeed what we find. The results are again mostly driven by dual holding families that encourage cooperation and for proposals unrelated to director elections. Overall, this test provides some suggestive evidence that equity funds from cooperative dual holding families are more active monitors. Nevertheless, it is important to realize that other various forms of "voice" (such as talking to management) exist, and that these are difficult to observe.

VI. Conclusion

This article studies the impact of mutual fund dual holdings on agency conflicts. The size of the bond mutual fund industry has roughly tripled between 2009 and 2019, which makes it more likely that fund families hold stocks and bonds from the same portfolio companies simultaneously. Using an instrumented DID 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 and for fund families encouraging cooperation. Dual holders allow distressed firms to refinance through new bond offerings with lower yields and fewer restrictive covenants. Dual holders also prevent entrenched managers from overinvesting, thereby reducing shareholder-management agency problems. Tests on voting behavior suggest that equity funds from dual holding families exert more effort in monitoring. All these results are consistent with the idea that coordination within dual holding mutual fund families helps mitigate the agency conflicts between shareholders and creditors as well as between shareholders and management. Overall, our findings suggest that mutual fund families internalize the agency problems of their portfolio companies, highlighting the benefits of such institutional ownership and mutual fund cooperation.

Appendix. Variable Descriptions

Firm-Level Data

MFDH: Firm-level mutual fund dual holding intensity measure. We first measure dual holdings per mutual fund family 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, that is, $\mathrm{DH}_{ijq} = 1$, if

$$5\% \leq \frac{\mathrm{BOND\_MV}_{ijq}}{\mathrm{BOND\_MV}_{ijq} + \mathrm{EQUITY\_MV}_{ijq}} \leq 95\%,$$

where BOND_MV and EQUITY_MV 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. We follow Kempf et al. (2016) and construct the weights as follows:

$$w_{ijq} = \frac{\text{Q\_PWEIGHT}_{ijq} + \text{Q\_OWN}_{ijq}}{\sum_{j \in J_{iq}} \left(\text{Q\_PWEIGHT}_{ijq} + \text{Q\_OWN}_{ijq}\right)},$$

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 Q_PWEIGHT. Similarly, we sort firm i's shareholders by ownership into quintiles Q_OWN. Finally, we scale by the term in the denominator so that the weights add up to 1. Using this weighting scheme, we define mutual fund dual holding at the firm-quarter level as follows:

$$\text{MFDH}_{iq} = \sum_{j \in J_{iq}} w_{ijq} \times \text{DH}_{ijq},$$

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 4 quarters for each year t.

COOPERATIVE_MFDH: Firm-level dual holding by mutual fund families encourages cooperation among their managers:

$$\text{COOPERATIVE\_MFDH}_{iq} = \sum_{j \in J_{iq}} w_{ijq} \times \text{DH}_{ijq} \times 1\left(\text{COOPERATIVE}_{jq} > 0.5\right).$$

COOPERATIVE_{jq} is the family-quarter level cooperative indices from Evans et al. (2020). Their indices are based on manager compensation incentives (e.g., manager ownership of the fund corresponds to competitive, manager ownership of the investment advisor corresponds to cooperative) and fund management structure (e.g., solo-managed fund corresponds to competitive, team-managed corresponds to cooperative).

COMPETITIVE_MFDH: Firm-level dual holding by mutual fund families encourages competition among their managers:

$$\text{COMPETITIVE\_MFDH}_{iq} = \sum_{j \in J_{iq}} w_{ijq} \times \text{DH}_{ijq} \times 1\left(\text{COMPETITIVE}_{jq} > 0.5\right).$$

COMPETITIVE_{jq} is the family-quarter level competitive indices from Evans et al. (2020). Their indices are based on manager compensation incentives (e.g., manager ownership of the fund corresponds to competitive, manager ownership of the investment advisor corresponds to cooperative) and fund management structure (e.g., solo-managed fund corresponds to competitive, team-managed corresponds to cooperative).

CAPEX: Capital expenditures scaled by lagged net property, plant, and equipment, calculated using CAPEX/PPENT.

TOTAL_ASSETS: Log of total book assets (AT).

MB: Market-to-book ratio, calculated using (PRCC_F × CSHPRI + DLC + DLTT + PSTKL – TXDITC)/AT.

LEVERAGE: Book leverage, calculated using (DLTT + DLC)/AT.

TANGIBILITY: The ratio of tangible assets to total assets, calculated using PPENT/AT.

CASH: Cash holding, calculated using AQC/AT.

ROA: Return-on-assets, calculated using OIADP/AT.

PAYOUTS: Total payout ratio, combining share repurchase and dividend payout, calculated using PRSTKC/(PRCC_F × CSHO) + DVC/(PRCC_F × CSHO).

INST_OWN: Total equity holdings by institutional investors in the form of percent of shares outstanding (mutual funds, banks, corporations, and others) from Thomson Reuters 13F.

OWN_HHI: Ownership concentration by institutional investors (mutual funds, banks, corporations, and others) – Herfindahl–Hirschman Index from Thomson Reuters 13F.

BANK_OWN: Top 30 U.S. syndicated lending banks' total ownership aggregated at the firm level. The top 30 syndicated lending banks list is from Schwert (2018).

STOCK_VOLATILITY: Annualized volatility is calculated as the standard deviations of the daily stock returns over the 90 trading days before the fiscal year-end.

ROA_VOLATILITY: Calculated as the standard deviations of the eight quarterly ROA changes prior to the fiscal year-end.

BOND_ISSUANCE: The probability of issuing bonds in the next year.

FD: Financial distress dummy, equals to 1 if a firm's expected default probability measured as in Bharath and Shumway (2008) is among the top 5% of all COMPUSTAT non-financial firms in the previous year.

HIGH_ROLLOVER_RISK_DURING_2008–2009: Alternative financial distress dummy, equals to 1 if a firm's rollover risk, measured as in Gopalan et al. (2014) using DD1/AT, in the year 2007, is higher than 0.1.

HIGH_LEVERAGE: Alternative financial distress dummy, equals to 1 if a firm's book leverage ratio, measured yearly as (DLT + DLCC)/AT, among top 10% of all COMPUSTAT non-financial firms.

LOW_INTEREST_COVERAGE_RATIO: Alternative financial distress dummy, equals to 1 if a firm's EBITDA is less than its reported interest expenses in any 2 consecutive years, or in any year its EBITDA is less than 80% of its interest expenses, following Asquith et al. (1994) and Hu et al. (2021).

ENTRENCHMENT: Entrenchment dummy equals to 1 if a CEO has long tenure (> 9 years) in combination with a higher number of anti-takeover provisions (E-INDEX > 3).

HIGHER_YEARS_TO_ELECTION: Alternative managerial entrenchment dummy equals to 1 if the average years to the next election of the board of directors is higher than the median level. We follow Fos et al. (2017) to calculate this measure for ISS Riskmetrics covered firms. We first calculate each director-firm pair's years to election based on the information of when the term ends for the current board seat position for each year. For directors who sit on multiple boards, we average the

years to election across all firms the director sits on. For the firm-level years-to-election measure, we take the average years to election across all directors.

LOW_COMPETITION: Low product market competition measure dummy, equals to 1 if the product market fluidity measure using Hoberg et al. (2014), which measures competitive threats from rival firms toward the focal firm, is among the lowest decile.

Acquisition-Level Data

DEAL_VALUE: Log value of acquisition book value.

CASH_DEAL: A dummy variable equals 1 if the acquisition is a full cash deal.

STOCK_CAR $(-1, +1)$: Cumulative abnormal stock returns of the acquirer, calculated using the Carhart 4-factor model estimated over trading days $(-280, -31)$ and are measured over a $(-1, +1)$ event window around the announcement date.

BOND_CAR $(-1, +1)$: We follow Bessembinder et al. (2009) 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 years. We aggregate and compute the benchmark bond returns by forming par-value weighted (VW) portfolios.

Bond-Level Data

FRACTION_BOUGHT_BY_DUAL_HOLDERS: Fraction of a bond owned by dual holding funds measured at the first quarter-end after the issue date.

HIGH-YIELD(HY): A dummy variable equals 1 if the corporate bond is classified as high-yield.

OFFERING_PROCEEDS: The total value of a corporate bond issue.

CALLABLE: A dummy variable equals 1 if the corporate bond includes a call option.

OFFERING_YIELD: The yield-to-maturity of a corporate bond.

INVESTMENT_RESTRICTIONS: A dummy variable equals 1 if the bond's indenture contains at least one of the following restrictions: direct investment restrictions, indirect investment restrictions, the bond is secured, or stock sale restrictions.

DIVIDEND_RESTRICTIONS: A dummy variable equals 1 if the bond's indenture restricts either dividends or other payments.

SUBSEQUENT_FINANCE_RESTRICTIONS: A dummy variable equals 1 if the bond's indenture contains at least one of the following restrictions: debt priority restrictions, stock issuance restrictions, or subordinate debt restrictions.

EVENT_RELATED_RESTRICTIONS: A dummy variable equals 1 if the bond's indenture restricts either default related event or change in control poison put.

Supplementary Material

To view supplementary material for this article, please visit http://doi.org/10.1017/S0022109023001436.

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