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Does CFO Board Membership Benefit Shareholders? The Case of Corporate Acquisitions

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Abstract

We investigate whether chief financial officers (CFOs) serving on U.S. corporate boards benefit shareholders in M&A transactions. We find that acquisitions made by firms with CFOs on boards have significantly better acquirer announcement returns. This is due to the CFO director's ability to select targets with better strategic and financial fit. CFO board membership can create shareholder value if there are effective governance regimes restraining managerial entrenchment and CFOs' interests are closely aligned with those of shareholders through equity ownership. Furthermore, sitting on boards enables CFOs to secure more and cheaper financing for their acquisitions.

I. Introduction

Whether to have chief financial officers (CFOs) serve on boards is a long-standing dilemma faced by corporate boards. On the one hand, the financial expertise of board directors is important for boards to deliver effective decision-making (see Agrawal and Chadha (2005), Huang, Jiang, Lie, and Yang (2014), and Minton, Taillard, and Williamson (2014)). On the other hand, having insiders on the board may entrench managers by diluting board independence (see Bebchuk and Fried (2003)). Since the Sarbanes–Oxley Act (SOX) and the consequent listing requirements from major stock exchanges, there has been a clear trend of minimizing insiders' presence on U.S. corporate boards (see Masulis and Mobbs (2011), Mobbs (2018)). For regulators and companies, board independence has been prioritized to the quasi-dogmatic status in the corporate governance domain.[1]

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[1]In conjunction with the passage of SOX in 2002, major U.S. stock exchanges, including the NYSE and NASDAQ, started requiring that independent directors must make up the majority of boards for their listed firms. In addition, Choi, Fisch, and Kahan (2008) document that proxy advisor Glass Lewis issued

However, it is possible that excluding important insiders like CFOs from making a meaningful impact in the boardroom may be suboptimal when it matters the most. Surprisingly, limited research has been conducted on whether it is optimal for firms and regulators to exclude CFOs from board memberships together with other non-CEO executives uniformly. In this study, we seek to fill this research gap by examining the impact of CFO board membership on shareholder value through an important corporate decision: mergers and acquisitions (M&As).

The predicted impact of CFOs' directorship on M&A deal outcomes is unclear ex ante. On the one hand, the *optimal contracting theory* suggests that CFO directors' skills and knowledge are valuable to firms when making important decisions (see, e.g., Fama and Jensen (1983), Rosenstein and Wyatt (1997), Klein (1998), and Masulis and Mobbs (2011)). Fama and Jensen (1983) argue that in order to achieve effective board decision-making and control, top managers are expected to serve on the board because of their better understanding of the firm's daily operations. The substantial difference in time commitment to the company between internal and external directors further amplifies such benefits (see Klein (1998)).[2] Furthermore, CFOs are especially important in the context of a firm's investment and financial policies where sophisticated financial expertise is required.[3] CFO directors are able to utilize their financial expertise to identify targets with good strategy fit and facilitate corresponding financing arrangements. In addition, CFO directors can significantly reduce communication friction between management and the board by sharing important financial information and convincing other board members, leading to more engagement and transparency among leadership. As a result, CFOs sitting on boards have greater incentives to suggest good M&A deals to the board and deliver their financial insights during the M&A process. Consequently, the theory predicts that valuable financial expertise, firm-specialized knowledge, as well as less communication friction facilitate the CFO director's positive role in a firm's acquisition process, leading to a positive effect on shareholder wealth.

On the other hand, the *managerial entrenchment theory* implies that CFO directors might empower CEOs and other insiders in the boardroom, which is detrimental to the monitoring role of corporate boards (see Winter (1977), American Law Institute (1982), and Knyazeva, Knyazeva, and Masulis (2013)). Winter

withhold recommendations for 19.6% of non-CEO employee director nominations in S&P 1500 companies from 2005 to 2006, while ISS issued 10.9%.

[2]The positive role of executive directors is further supported by studies such as Rosenstein and Wyatt (1997), Acharya, Myers, and Rajan (2011), and Masulis and Mobbs (2011).

[3]CFOs are documented to have a significant impact in firm decision-making settings where sophisticated financial expertise is required. Previous research finds that CFOs play important roles in firm decisions such as those relating to capital structure (see Bertrand and Schoar (2003), Frank and Goyal (2007)), acquisitions (see Bertrand and Schoar (2003), Huang and Kisgen (2013), and Ferris and Sainani (2021)), leverage (see Frank and Goyal (2007)), debt-maturity choices (see Chava and Purnanandam (2010)), and earnings management (see Chava and Purnanandam (2010), Jiang, Petroni, and Wang (2010)).

(1977) argues that only outside directors can stand up to the CEO for shareholder interests, compared with inside directors whose executive appointments are significantly influenced by the CEO.[4] In particular, Bedard, Hoitash, and Hoitash (2014) find that granting board membership to CFOs can offer them greater power on their boards, afford them excessive compensation, and protect them from dismissal following poor performance. The diluted board independence can escalate agency issues such as tunneling and shirking firm resources (see Fracassi and Tate (2012)). Consequently, the theory predicts that acquisitions made by acquirers with CFOs serving on boards are associated with worse performance and increased agency costs. Though the two competing theories predict different directions on how CFO board membership affects firm acquisitions, one should not ignore the possibility that the advantages and disadvantages of CFO board membership can coexist. This makes it empirically interesting to examine the overall effect of CFO board membership on firms' M&A transactions.

There are several advantages of using corporate takeovers as a setting to empirically examine our research question. First, M&A deals comprise one of the most important investment decisions for firms based on total investment value, thus requiring substantial financial expertise in which CFOs play a core role throughout the entire process (see Huang and Kisgen (2013), Ferris and Sainani (2021)).[5,6] Second, M&A transactions have directly measurable outcomes, which allows us to quantify the impact of these decisions on shareholder wealth. The comprehensive data on M&A transactions allows us to investigate in detail the sources of value creation or destruction in this decision-making process. Third, M&A deals are often found to intensify the agency conflicts of interest between shareholders and managers, which results in the average detrimental effect of M&A deals on acquirer shareholder value (see, e.g., Jensen (1986), Masulis, Wang, and Xie (2007), and Harford, Humphery-Jenner, and Powell (2012)). Therefore, M&A transactions provide an ideal setting to investigate whether CFO board membership exacerbates managerial entrenchment, which ultimately harms shareholder value.

To investigate these predictions, we study a sample of 4,118 U.S. acquisitions from 1996 to 2018. Focusing on the U.S. market is important when examining this research question, as there has been a clear rejection of having non-CEO insiders on boards since SOX and consequent listing requirement changes in major U.S. stock exchanges (see Masulis and Mobbs (2011)).[7] We collect board composition

[4]This is further supported by numerous studies (see, e.g., Byrd and Hickman (1992), Cotter, Shivdasani, and Zenner (1997), Duchin, Matsusaka, and Ozbas (2010), and Knyazeva et al. (2013)).

[5]In the fiscal year 2020, the M&A expenses of U.S. public firms listed on the NYSE, NASDAQ, and AMEX totaled $405.56 billion.

[6]In a study by McKinsey & Company in 2020, CFOs are described as the "synergy leader," "transformation sponsor," "communication leader," and "cultural role model" in M&A transactions. In their survey of 200 global CFOs, 76% and 67% of companies met their cost and revenue synergies in M&A deals, respectively, when their CFOs were actively involved, while the corresponding figures were just 46% and 32% for firms without CFO involvement in the M&A process. The study is available at: https://www.mckinsey.com/business-functions/m-and-a/our-insights/the-one-task-the-cfo-should-not-delegate-integrations.

[7]In comparison, regulations in the rest of the world are significantly less stringent and the chances of non-CEO executives obtaining board seats are much higher (see Ferreira and Kirchmaier (2013), Mishra (2018), and Ferris and Sainani (2021)).

information of the acquirers from RiskMetrics and CFO information from RiskMetrics, ExecuComp, and 10-K and DEF 14A filings. An acquirer is defined to have its CFO serving on the board if its CFO serves on its own board for the fiscal year preceding the deal announcement. On average, approximately 8.67% of the acquiring firms in our sample have their CFOs serving on their boards when they announce the acquisitions.

Consistent with the *optimal contracting theory*, we find that the presence of CFOs on boards adds value to shareholders: acquirers with CFOs serving on the board experience significantly higher announcement returns. This effect is both statistically and economically significant: ceteris paribus, acquiring firms with CFOs on the board are associated with a 0.84% increase in announcement returns over a 3-day event window surrounding the deal announcement. This is equivalent to an increase of $89.71 million in shareholder value for an average-sized acquiring firm in our sample.

We further examine whether the superior acquirer announcement returns associated with CFO board directorship come from better target selection, improved financing, and/or higher negotiation power of the acquiring firm. After controlling for deals' financing characteristics, we find that acquisitions by acquirers with their CFOs serving on boards are associated with an average of $474.08 million extra synergistic gains for an average-sized deal in our sample. We document no systematic association between CFO board membership and the proportion of deal synergies allocated to the acquirer relative to the target. Taken together, our results suggest that acquiring firms benefit from CFO directors' financial expertise by selecting targets with better strategic and financial fit with them, while having the CFO serve on the board does not affect firms' negotiation power in M&A deals.

One of the major costs of having CFOs on boards is that it reduces board independence. Without effective monitoring from outside directors, increased agency costs can outweigh the advantages of financial expertise on boards, ultimately harming shareholder value. Hence, we next explore cross-sectional heterogeneity and examine under what circumstances the benefits of CFO board membership outweigh its costs. Our findings indicate that CFO board membership creates value when effective governance mechanisms exist to oversee executive power, when CFOs' interests are closely aligned with those of shareholders through equity ownership, or when the transaction requires external financing.

One of the difficulties in interpreting our empirical results is the endogeneity in the firms' decision about whether to have CFOs serve on the board. First, it is possible that firms with acquisition plans are more likely to have their CFOs serve on the board because of their financial expertise. To mitigate this reverse causality concern, we exclude deals where acquirer CFOs are appointed to the board less than 1, 2, or 3 years prior to the corresponding M&A announcement. Our results remain robust. Second, to alleviate concerns about observable factors, we find a positive association between CFO board membership and acquirer announcement returns using the propensity score matching (PSM) analysis. Third, to mitigate concerns related to reverse causality and omitted variables in our analysis, we conduct a 2-stage instrumental variable (IV) analysis, with the instrument being the

percentage of public firms with CFOs on their boards in the same city as the acquiring firm, and find similar results.

Next, we examine the impact of CFO board membership on firms' financing choices and the associated costs of their acquisition transactions. We conjecture that the financial expertise associated with CFO directors can enhance firms' ability to secure more and cheaper external financing for their acquisitions. In line with our expectation, we find that acquirers with CFOs serving on boards are more likely to finance their acquisitions through external debt financing. Furthermore, by having CFOs serving on boards, acquirers can save an average of 11.17 basis points (6.73% lower than the mean value) in the interest rates of their loans issued during the acquisition window.

In the Supplementary Material, we conduct tests to explore how having the CFO serve on the board affects the time to close the deals and the financial advisory fee of M&A transactions. We find that companies with CFOs on the board accelerate their acquisition processes. In addition, we observe a sharp decrease in the overall financial advisory fees paid by merging firms when acquirers require external financing and merge publicly traded target companies. We also perform several robustness tests. First, we control for additional factors, including corporate governance, managerial abilities, additional CEO and CFO characteristics, and additional deal-specific attributes. Second, we repeat our baseline tests with the requirement that the transaction value be at least $100 million or a minimum of 10% of the acquiring firm's market value, and our findings remain robust. Therefore, our conclusions are not driven by minor acquisitions. Third, we find similar results when reexamining our baseline results on M&A deal performance using different event windows and estimation models.

Our study contributes to the existing literature in several important ways. First, our study provides important insights into whether firms should have their CFOs serving on their boards. Distinct from the managerial entrenchment hypothesis about inside directors' role in the boardroom (see Winter (1977), Byrd and Hickman (1992), Cotter et al. (1997), Hermalin and Weisbach (1998), and Duchin et al. (2010)), we show that CFOs serving as executive directors are beneficial to shareholders by improving the firm's decision-making quality. The economic magnitude of the positive effect is large: by having CFOs on their boards, firms are able to secure an additional $89.71 million in shareholder value within a 3-day event window surrounding the announcement of an acquisition. Our article thus contributes to the ongoing debate on whether to have CFOs serve on boards and raises an important question for regulators: Should CFOs be treated the same way as other non-CEO executives when we evaluate a firm's board independence?

Second, our article complements existing papers that focus on the important question of whether firms should appoint their own CFOs to serve on their boards (see Bedard et al. (2014), Mobbs (2018)). Rather than focusing on firm decisions such as financial reporting (see Bedard et al. (2014)) or cash holding (see Mobbs (2018)), whose impacts on shareholder value are difficult to measure, we are able to quantify the direct impact of CFO board directorship on shareholder wealth through one of the firm's most important strategic decisions: M&A transactions. In addition, we further advance the discussion by examining how to reduce the potential agency costs associated with CFOs' board membership by aligning the CFO's interests

with those of shareholders. By suggesting governance regimes and CFO equity ownership as two possible ways, this study provides suggestions for regulators and firms on how to meet their needs for financial expertise and independence on corporate boards at the same time.

Third, we contribute to the literature by investigating possible channels through which CFO directors improve the effectiveness of board decisions. We document that their ability to select suitable target firms together with stronger financing ability and reduced transaction costs are the mechanisms through which CFO directors generate value for shareholders in M&A transactions. This is particularly important given that, on average, takeovers destroy acquirer value (see, e.g., Bruner (2002), Moeller, Schlingemann, and Stulz (2005)).

Fourth, our study also relates to the existing studies on the importance of the CFO in the firm decision-making process (see Bertrand and Schoar (2003), Frank and Goyal (2007), Chava and Purnanandam (2010), Jiang et al. (2010), Huang and Kisgen (2013), Florackis and Sainani (2018), and Ferris and Sainani (2021)). We focus on the benefits and costs of assigning board seats to non-CEO executives in the U.S., where regulators and stock exchanges impose strict restrictions on their presence in the boardroom. The conclusions of the study can be widely applied to various corporate policies because sophisticated financial expertise in the boardroom is of great importance to many corporate decisions (see Güner, Malmendier, and Tate (2008), Custódio and Metzger (2013), and Huang et al. (2014)) and independent directors spend the majority of their time advising rather than monitoring (see Adams and Ferreira (2007)).

The rest of this article proceeds as follows: Section II describes our sample, Section III presents our main empirical analyses, and Section IV concludes the article.

II. Data and Methodology

A. Sample Construction

Our M&A data are obtained from Thomson Financial's Securities Data Company (SDC) and comprise U.S. deals announced from 1996 to 2018.[8] The sample includes both completed and withdrawn acquisitions of U.S. public, private, and subsidiary targets made by U.S. public acquirers. Minority stake purchases, acquisitions of remaining interest, privatizations, repurchases, exchange offers, self-tenders, recapitalizations, and spinoffs are excluded. We also require that the transaction value is at least $1 million and represents at least 1% of the bidder's market capitalization. Furthermore, the acquirer must own less than 50% of the target's shares before the transaction and 100% afterward. Transactions are excluded if the acquirer is classified as a financial institution (SIC codes 6000–6999) or a utility company (SIC codes 4900–4999) by either SDC or Compustat. The acquirer must have available accounting and industry information in Compustat, stock price information in CRSP, and board composition and governance

[8]Our sample includes deals announced from 1996 because board composition information from RiskMetrics is only available starting from 1996.

information in RiskMetrics. In addition, we exclude observations for which we are unable to find CFO information. The sample selection criteria yield a final sample of 4,118 M&A transactions.

B. CFO Data

We obtain the board composition information of acquirers for the fiscal year preceding the deal announcement from RiskMetrics. The dummy variable CFO_ON_BOARD is defined to indicate whether the acquiring firm's CFO was on the board of directors when the deal was announced. We first obtain CFOs' names and associated characteristics from ExecuComp, where we identify CFO information using the indicator variable CFOANN for deals announced after the fiscal year 2006. For deals announced before 2006, we follow Jiang et al. (2010) and use the keywords "CFO," "chief financial officer," "treasurer," "controller," "finance," and "vice president-finance" from the annual titles of executive (TITLEANN) in ExecuComp to identify the CFO of the acquirer for the fiscal year preceding the deal announcement.[9] For transactions where we are unable to obtain the acquirer's CFO information from ExecuComp, we refer to the acquirer's corresponding 10-K and DEF 14A filings to find the CFO's name. We then compare the CFO's name with the names of all the acquirer's directors from RiskMetrics to determine whether the acquirer's CFO was serving on the board during the fiscal year preceding the deal announcement. At the same time, we compare the CFO's name obtained from 10-K and DEF 14A filings with executive names from ExecuComp to supplement information about CFO characteristics for the acquirer in cases where the CFO may have been incorrectly classified as non-CFO by ExecuComp.

C. Deal Financing Data

According to Rauh and Sufi (2010), private bank loans and public bonds account for the majority of external borrowing sources for firms. Accordingly, we obtain loan financing data from Loan Pricing Corporation's (LPC) DealScan and bond issuance data from SDC Global New Issues. Specifically, we collect the external borrowing information of the acquirer through private loans and public bonds 3 years before the deal announcement until the deal becomes effective or is withdrawn. We match our M&A sample with DealScan loan data using the link table provided by Chava and Roberts (2008) and with Global New Issues bond data using the acquirer's CUSIP. Accordingly, we define 3 dummy variables, BORROWING_FINANCING, LOAN_FINANCING, and BOND_FINANCING, indicating whether the acquirer secures external financing during the M&A transaction period through external borrowing (either loans or bonds), loans, or bonds, respectively. In addition, we construct the variable LOAN_BORROWING_COST to indicate the borrowing cost of each loan issued by the acquirer during the M&A transaction window. LOAN_BORROWING_COST is defined as the percentage

[9]The indicator variable CFOANN is not available for observations before the fiscal year 2006 in ExecuComp.

point spread of a loan over the London Interbank Offered Rate (LIBOR) or LIBOR equivalent after adjusting for any related origination fees.

D. Summary Statistics

Table 1 describes the distribution of our sample M&A transactions by deal announcement year and acquirer industry. Panel A shows a clear decline in the number of transactions when the internet bubble burst in 2000 and during the financial crisis around 2008. Panel B shows the distribution of the M&A deals by acquirer industry based on Fama–French 48 industry definitions. Business services, electronic equipment, and petroleum and natural gas are the top 3 acquirer industries in our sample. Overall, our sample transactions are distributed widely across different announcement years and acquirer industries, and we do not observe any systematic selection biases in our baseline sample.

Table 2 reports the summary statistics of the variables used in our baseline tests. Detailed definitions of each variable are provided in the Appendix. The number of observations, mean values, standard deviations, and percentiles (p25, p50, p75) are reported for each variable. Among the 4,118 deals, 8.67% of the acquirers have their CFOs serving on their boards (CFO_ON_BOARD). On average, 7.34% of acquirer CFOs are female, and 1.94% of acquirer CEOs are female.

TABLE 1

Sample Distribution

Table 1 presents the distribution of the sample M&A deals. The sample includes 4,118 M&A transactions announced by U.S. public companies between 1996 and 2018. The acquirers should have complete information from CRSP, Compustat, and RiskMetrics. Panel A presents the distribution of sample M&A transactions by deal announcement year and Panel B by the Fama–French 48 industry of the acquirer.

Panel A. Distribution of M&A Transactions by Announcement Years

Year	Frequency	Percent	Year	Frequency	Percent
1996	182	4.42	2008	152	3.69
1997	165	4.01	2009	122	2.96
1998	189	4.59	2010	166	4.03
1999	260	6.31	2011	178	4.32
2000	204	4.95	2012	183	4.44
2001	185	4.49	2013	158	3.84
2002	152	3.69	2014	186	4.52
2003	193	4.69	2015	191	4.64
2004	194	4.71	2016	186	4.52
2005	194	4.71	2017	168	4.08
2006	182	4.42	2018	169	4.10
2007	159	3.86	Total	4,118	100.00

Panel B. Distribution of M&A Transactions by Fama–French 48 Industries

Fama–French 48 Industries	Freq.	Percent	Fama–French 48 Industries	Freq.	Percent
Business services	590	14.33	Construction materials	119	2.89
Electronic equipment	339	8.23	Steel works, etc.	118	2.87
Petroleum and natural gas	216	5.25	Healthcare	101	2.45
Computers	206	5.00	Chemicals	101	2.45
Machinery	201	4.88	Electrical equipment	91	2.21
Wholesale	201	4.88	Business supplies	91	2.21
Pharmaceutical products	195	4.74	Aircraft	82	1.99
Medical equipment	182	4.42	Consumer goods	73	1.77
Measuring and control equipment	181	4.40	Printing and publishing	64	1.55
Retail	165	4.01	Construction	64	1.55
Food products	131	3.18	Others	478	11.61
Communication	129	3.13	Total	4,118	100.00

TABLE 2

Summary Statistics

Table 2 reports the summary statistics of variables for the sample M&A deals described in Section II.A. The sample includes 4,118 M&A transactions announced by U.S. public companies between 1996 and 2018. The acquirers should have complete information from CRSP, Compustat, and RiskMetrics. The number of observations, mean, standard deviation, 25th percentile, median, and 75th percentile are reported for each of the dependent and independent variables used in our baseline tests. Detailed definitions of each variable are provided in the Appendix.

Variable	No. of Obs.	Mean	Std. Dev.	p25	p50	p75
Dependent Variables						
ACQUIRER_CAR	4,114	0.0036	0.0629	−0.0216	0.0035	0.0305
DEAL_SYNERGY	933	0.0188	0.0671	−0.0149	0.0128	0.0501
ACQUIRER_REL_GAIN	933	−0.0384	0.0653	−0.0726	−0.0272	0.0015
BORROWING_FINANCING	4,118	0.8290	0.3765	1.0000	1.0000	1.0000
LOAN_FINANCING	4,118	0.7960	0.4030	1.0000	1.0000	1.0000
BOND_FINANCING	4,118	0.4220	0.4939	0.0000	0.0000	1.0000
LOAN_BORROWING_COST	10,521	1.6599	1.2984	0.7500	1.5000	2.2500
Independent Variables						
CFO_ON_BOARD	4,118	0.0867	0.2814	0.0000	0.0000	0.0000
RELATED_INDUSTRY	4,118	0.4750	0.4994	0.0000	0.0000	1.0000
RELATIVE_SIZE	4,117	0.1827	0.3466	0.0278	0.0682	0.1779
SIZE	4,118	0.0790	0.2946	0.0073	0.0181	0.0514
TOBIN'S_Q	4,070	2.1696	1.9366	1.3256	1.7365	2.3827
LEVERAGE	4,118	0.4772	0.2002	0.3462	0.4781	0.6011
STOCK_MAJOR	4,118	0.1433	0.3504	0.0000	0.0000	0.0000
PRIVATE_TARGET	4,118	0.4000	0.4899	0.0000	0.0000	1.0000
CASH_HOLDING	4,118	0.1499	0.1625	0.0290	0.0863	0.2203
CASH_FLOW	4,117	0.0692	0.1107	0.0417	0.0642	0.0965
BOARD_SIZE	4,118	2.1833	0.2400	2.0794	2.1972	2.3026
PPE	4,113	0.2354	0.2077	0.0858	0.1675	0.3143
CAPEX	4,101	0.0500	0.0595	0.0189	0.0330	0.0591
CFO_GENDER	3,816	0.0734	0.2608	0.0000	0.0000	0.0000
CEO_GENDER	3,976	0.0194	0.1378	0.0000	0.0000	0.0000
CFO_COMPENSATION	3,658	2.1964	3.0621	0.8161	1.4394	2.6196
CEO_COMPENSATION	3,962	6.4126	8.9518	1.8694	3.9799	7.4048
CEO_AGE	3,883	4.0089	0.1329	3.9120	4.0254	4.0943

The average size of the acquirers (SIZE) is about $7.90 billion, and the transaction value on average accounts for about 18.27% of the acquirer's market value in our sample (RELATIVE_SIZE). In addition, about 40.00% of the targets are private (PRIVATE_TARGET) and in 14.33% of the deals, acquirer stock is the primary method of payment (STOCK_MAJOR).

III. Empirical Tests

A. CFO Board Membership and M&A Deal Performance

1. Acquirer Announcement Return

In this section, we begin our empirical analysis by investigating how CFO board membership affects a company's acquisition performance. According to our hypothesis, if serving on the board enables the CFO to secure cheap financing and select suitable targets for the acquirer, there should be a positive relationship between CFO board membership and firm acquisition performance. Otherwise, if CFO board membership amplifies managerial entrenchment, the relationship should be negative. In addition to those opposing effects, we also admit the possibility of uncorrelated situations where CFOs on the board might produce outcomes that are neither beneficial nor detrimental. To formally test these

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hypotheses, we implement the following cross-sectional regression model in our baseline tests:

$$(1) \quad \text{ACQUIRER\_CAR}_i = \beta_0 + \beta_1 \text{CFO\_ON\_BOARD}_i + \beta_2 F_i + \gamma_k + \mu_t + \varepsilon_{i,k,t},$$

where i indexes deals, k indexes industries, and t indexes time. ACQUIRER_CAR$_i$ is the acquirer's cumulative abnormal return over the 3-day window (−1, +1) around the deal announcement. CFO_ON_BOARD$_i$ is an indicator variable that equals 1 if the acquirer's CFO serves on the firm's own board, and 0 otherwise. We perform OLS regressions, and Fama–French 48 industry (γ_k) and announcement year (μ_t) fixed effects are included. $\varepsilon_{i,k,t}$ is the error term. F_i is a vector of the deal, acquiring firm, and executive characteristics that have been found to affect M&A deal performance in prior literature (see, e.g., Jensen (1986), Faccio and Masulis (2005), Moeller et al. (2005), and Duchin et al. (2010)).[10]

The results are reported in Panel A of Table 3. In column 1, we run the OLS regression of ACQUIRER_CAR on CFO_ON_BOARD, controlling for acquirer firm and deal characteristics. The coefficient on the independent variable of interest CFO_ON_BOARD is positive and statistically significant at the 5% level. This suggests that by serving on the board of directors, CFOs are able to improve the acquisition performance of acquiring firms. We then further add industry and year fixed effects in column 2 and control variables for the acquirer's CFO and CEO characteristics in column 3. We find consistent results with a similar economic magnitude. For example, in column 3, ceteris paribus, deals undertaken by acquiring firms with their CFO on the board are, on average, associated with 0.84% higher announcement returns over a 3-day event window around the deal announcement date. This is equivalent to an increase of $89.71 million in shareholder value for an average-sized acquiring firm in our sample.[11]

2. Deal Synergy Creation and Allocation

The results so far suggest a positive relationship between CFO board membership and acquirer announcement returns. Next, we explore whether the superior acquirer announcement return comes from improved synergy creation or higher negotiation power. On the one hand, board membership enables CFOs to exert more impact on the firm strategic decision-making process. Firms, in turn, can benefit from CFO's financial expertise by selecting targets with whom they have a better strategic and financial fit. Furthermore, they can also benefit from CFO directors' financial expertise by obtaining more and cheaper financing in their M&A

[10]In particular, we control for acquirer size (SIZE), Tobin's Q (TOBIN'S_Q), leverage (LEVERAGE), cash holding (CASH_HOLDING), cash flow (CASH_FLOW), board size (BOARD_SIZE), long-term assets (PPE), and capital expenditure (CAPEX). We also control for deal characteristics such as industry relatedness between the acquirer and target (RELATED_INDUSTRY), the relative size of the deal value to the acquirer market value (RELATIVE_SIZE), payment method (STOCK_MAJOR), and target status (PRIVATE_TARGET). In addition, we control for the major characteristics of the acquirer's CFO and CEO, including CFO gender (CFO_GENDER), CFO compensation (CFO_COMPENSATION), CEO gender (CEO_GENDER), CEO compensation (CEO_COMPENSATION), and CEO age (CEO_AGE).

[11]The average market value of the sample acquirer is $10.68 billion at the end of the fiscal year preceding the deal announcement.

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TABLE 3

CFO Board Membership and Deal Performance

Table 3 presents the impact of CFO board membership on M&A deal performance and value creation. ACQUIRER_CAR is the acquirer cumulative abnormal return over the 3-day window (−1, +1) around the deal announcement. DEAL_SYNERGY is the weighted average of the acquirer's and target's cumulative abnormal returns over the 3-day window (−1, +1) based on their market values. ACQUIRER_REL_GAIN is the difference between the acquirer's and target's dollar gains over the 3-day window (−1, +1), scaled by the sum of their market value. The independent variable of interest is CFO_ON_BOARD, which is an indicator variable that equals 1 if the acquirer's CFO serves on its own board, and 0 otherwise. Panel A reports the baseline results on M&A deal performance, and Panel B disentangles the impact on target selection by additionally controlling for external borrowing variables. Panel C mitigates the reverse causality concern by removing any CFOs who are appointed to the board less than 1, 2, or 3 years prior to the deal announcement. The estimations are based on OLS regressions. *P*-values are reported in parentheses; *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. CFO Board Membership and Deal Performance

	ACQUIRER_CAR	ACQUIRER_CAR	ACQUIRER_CAR
	1	2	3
CFO_ON_BOARD	0.0084**	0.0086**	0.0084**
	(0.016)	(0.017)	(0.027)
RELATED_INDUSTRY	0.0008	0.0023	0.0022
	(0.675)	(0.271)	(0.315)
RELATIVE_SIZE	−0.0087***	−0.0112***	−0.0071**
	(0.005)	(0.000)	(0.038)
SIZE	−0.0047	−0.0038	−0.0006
	(0.172)	(0.308)	(0.877)
TOBIN'S_Q	0.0003	0.0006	−0.0015*
	(0.566)	(0.313)	(0.071)
LEVERAGE	0.0097	0.0108*	0.0051
	(0.102)	(0.083)	(0.441)
STOCK_MAJOR	−0.0276***	−0.0273***	−0.0284***
	(0.000)	(0.000)	(0.000)
PRIVATE_TARGET	0.0010	0.0015	0.0016
	(0.636)	(0.473)	(0.462)
CASH_HOLDING	−0.0118	−0.0040	−0.0053
	(0.106)	(0.609)	(0.522)
CASH_FLOW	−0.0049	−0.0059	−0.0173
	(0.612)	(0.553)	(0.108)
BOARD_SIZE	−0.0188***	−0.0227***	−0.0239***
	(0.000)	(0.000)	(0.000)
PPE	0.0171**	0.0166*	0.0168*
	(0.014)	(0.070)	(0.088)
CAPEX	−0.0803***	−0.0712***	−0.0453
	(0.001)	(0.004)	(0.117)
CFO_GENDER			−0.0036
			(0.362)
CEO_GENDER			0.0038
			(0.605)
CFO_COMPENSATION			−0.0002
			(0.694)
CEO_COMPENSATION			−0.0001
			(0.569)
CEO_AGE			0.0002
			(0.978)
Intercept	0.0462***	0.0700*	0.0016
	(0.000)	(0.065)	(0.973)
Year FE	No	Yes	Yes
Industry FE	No	Yes	Yes
No. of obs.	4,044	4,044	3,498
Adj. R^2	0.0348	0.0429	0.0464

(continued on next page)

TABLE 3 (continued)

CFO Board Membership and Deal Performance

Panel B. Disentangling the Effect on Target Selection

	ACQUIRER_CAR	DEAL_SYNERGY	ACQUIRER_REL_GAIN	ACQUIRER_CAR	DEAL_SYNERGY	ACQUIRER_REL_GAIN
	1	2	3	4	5	6
CFO_ON_BOARD	0.0096**	0.0262***	−0.0004	0.0082**	0.0186**	0.0002
	(0.020)	(0.006)	(0.964)	(0.047)	(0.050)	(0.984)
NEED_EXTERNAL_FINANCING	0.0092***	0.0164**	−0.0218***	0.0095***	0.0169***	−0.0241***
	(0.001)	(0.011)	(0.001)	(0.001)	(0.010)	(0.000)
BORROWING_AMT	−0.0006**	−0.0004	−0.0003			
[− 2 Years, Eff. date]	(0.012)	(0.210)	(0.324)			
BORROWING_AMT				−0.0004**	−0.0004	−0.0001
[− 3 Years, Eff. date]				(0.028)	(0.229)	(0.617)
TA_SIZE		−0.0289	−0.0097		−0.0219	−0.0133
		(0.595)	(0.860)		(0.691)	(0.810)
TA_LEVERAGE		−0.0032	−0.0008		0.0017	0.0006
		(0.768)	(0.944)		(0.874)	(0.952)
TA_CAPEX		0.0575	0.0605		0.0470	0.0593
		(0.342)	(0.323)		(0.442)	(0.332)
TA_CASH_FLOW		−0.0054	−0.0097		−0.0064	−0.0117*
		(0.427)	(0.161)		(0.359)	(0.097)
TA_PPE		−0.0343	−0.0033		−0.0297	0.0040
		(0.142)	(0.887)		(0.206)	(0.864)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Year and industry FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	3,187	651	651	3,167	645	645
Adj. R^2	0.0489	0.2022	0.1673	0.0491	0.1921	0.1522

Panel C. Robustness: Tenure on Board

	Tenure on Board ≥1 Year		Tenure on Board ≥2 Years		Tenure on Board ≥3 Years	
	ACQUIRER_CAR	DEAL_SYNERGY	ACQUIRER_CAR	DEAL_SYNERGY	ACQUIRER_CAR	DEAL_SYNERGY
	1	2	3	4	5	6
CFO_ON_BOARD	0.0093**	0.0197**	0.0106**	0.0175*	0.0099**	0.0178*
	(0.018)	(0.039)	(0.011)	(0.074)	(0.020)	(0.080)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes
Target and financing controls	No	Yes	No	Yes	No	Yes
Year and industry FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	3,475	644	3,450	642	3434	639
Adj. R^2	0.0473	0.1923	0.0472	0.1914	0.0477	0.1908

activities. On the other hand, the CFOs sitting on the board could use their financial expertise to negotiate a larger share of the value generated by the deal, even if the total value created from the deal does not change. Although the two arguments are not mutually exclusive (see Kale, Kini, and Ryan (2003), Custódio and Metzger (2013)), it is empirically interesting to examine where the superior acquirer announcement return comes from.

To examine the impact of CFO board membership on total value creation, in columns 2 and 5 of Panel B of Table 3, we replace ACQUIRER_CAR with DEAL_SYNERGY as the dependent variable, which proxies for the percentage of total value created for shareholders in an M&A deal over the combined market value of the acquirer and the target. Following Harford, Jenter, and Li (2011) and Harford et al. (2012), DEAL_SYNERGY is defined as the combined cumulative

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abnormal returns of both the acquirer and the target over a 3-day event window (−1, +1) around the deal announcement where market values are used as weights, after adjusting for the acquirer's toehold in the target prior to the deal announcement.[12]

To disentangle the effect of CFO board membership on target selection from that on external financing, we additionally control for the borrowing characteristic of M&A transactions.[13] Specifically, we control for whether the deal requires external financing (NEED_EXTERNAL_FINANCING) and the total amount of the external financing facilities for the M&A transaction (BORROWING_FINANCING_AMT). We select the transaction window, which is 2 years (3 years) before the deal announcement until the deal becomes effective or is withdrawn [−2 Years, Effective Date] ([−3 Years, Effective Date]) in column 2 (column 5) of Panel B of Table 3. In addition to the control variables in our baseline model (1), we include target characteristics such as target size (TA_SIZE), leverage (TA_LEVERAGE), capital expenditure (TA_CAPEX), cash flow (TA_CASH_FLOW), and long-term assets (TA_PPE) to control for the heterogeneity of target companies. The sample size is smaller for this test because the abnormal return of the target is only available for deals with publicly listed target firms. The positive and statistically significant coefficients on the variable CFO_ON_BOARD suggest that, on average, an additional 2.62% of synergistic gains are created in deals undertaken by acquirers with CFOs serving on their boards. This is equivalent to an increased value creation of $474.08 million for an average-sized deal in our sample.[14] This improvement is quite significant given that the average synergy creation is 1.88% of the combined market value of the acquirer and the target within our sample of M&A deals.[15]

Furthermore, we examine the shares of the total value created from a deal that belongs to the acquirer relative to the target (ACQUIRER_REL_GAIN) in columns 3 and 6. This measure is calculated as the difference between the acquirer's and target's dollar gains over the 3-day window (−1, +1) around the deal announcement, divided by the sum of their market value (see Ahern (2012)). The statistically insignificant coefficients on CFO_ON_BOARD suggest there is no systematic association between CFO board membership and the share of synergy allocated to the acquirer relative to the target.

Taken together, our results support the *optimal contracting theory* and suggest that by having CFOs serving on boards, firms are able to identify takeover targets with better strategic fit with them, which will then be translated into superior announcement returns. However, we do not find any evidence to support that CFO board membership increases a firm's negotiation power relative to the target in M&A transactions.

[12]We adjust for the acquirer's toehold in the target before the deal announcement by removing the percentage of shares held by the acquirer when calculating the market capitalization of the target.

[13]We thank an anonymous referee for pointing out this angle.

[14]The calculation is based on the average combined market value for the acquirer and the target in our sample acquisitions with public targets, after adjusting for the acquirer's toehold in the target prior to the deal announcement.

[15]We also repeat our baseline regression (1) on ACQUIRER_CAR by additionally controlling for deal financing characteristics to check whether the effect of CFO board membership on acquirer announcement returns survives after controlling for its impact on deal financing. The results in columns 1 and 4 of Panel B show that our results remain robust.

3. Possibility of Reverse Causality

One of the major concerns threatening the establishment of causality in this study is the possible reverse causality between CFO board membership and a firm's acquisition outcomes. It is possible that firms having acquisitions on their agenda appoint CFOs on boards to utilize their financial expertise and firm-specialized knowledge to undertake the planned acquisitions. In this way, the CFO board membership and the firm's acquisition outcomes would be jointly determined, leading to reverse causality. To mitigate this concern, we collect CFO directors' tenure on board information from RiskMetrics and exclude deals with CFOs appointed to the board less than 1, 2, or 3 years before the announcement of the corresponding M&A transaction, as reported in columns 1–2, 3–4, and 5–6 in Panel C of Table 3, respectively.[16] The results show that CFO_ON_BOARD continues to exhibit positive and statistically significant effects on both ACQUIRER_CAR and DEAL_SYNERGY, even after controlling for the potential influence of reverse causality.[17] This shows that our results are not driven by potential reverse causality.

4. When Is CFO Board Membership Beneficial to Shareholders?

Managerial entrenchment theory suggests there are significant agency costs associated with CFOs serving on boards. This is also reflected in the trend of having greater board independence with fewer executives serving firms' boards. One of the major concerns about the CFO serving on the board is the consequently reduced board independence. With less external monitoring from outside directors, the increased power of executive directors can exacerbate agency issues, thus reducing the quality of firms' decision-making. Hence, it is of our interest to examine under what circumstances the benefits of CFO board membership outweigh its drawbacks.

We first examine whether the firm's governance structure makes a difference. Bebchuk, Cremers, and Peyer (2011) use the CEO pay slice (CEO_PAYSLICE) to proxy for the CEO's power relative to its other executives (including CFO) and its ability to extract rents. Similarly, Bebchuk, Cohen, and Ferrell (2009) construct the corporate governance index (BCF_INDEX) based on 6 provisions: whether firms have classified boards, poison pills, golden parachutes, restrictions on shareholders' ability to amend the firm's bylaws and charter, and supermajority requirements to approve mergers. Based on the median value of CEO_PAYSLICE for sample acquirers in the same industry (the first 3-digit SIC code) and whether the BCF_INDEX value is higher than 3, we divide our sample into subsets with high (high CEO_PAYSLICE or BCF_INDEX >3) and low (low CEO_PAYSLICE or BCF_INDEX $\leq$ 3) probabilities of managerial entrenchment. We reestimate our baseline model (1) within these subsamples.

[16]Out of the 357 deals with acquirer CFOs serving on boards, there are 27, 30, and 30 M&A deals where acquirer CFOs are appointed to their boards within 1, 2, or 3 years of the deal, with average tenures as CFOs being 4.13 years, 2.93 years, and 2.18 years, respectively.

[17]The financing characteristics controlled are derived from the baseline transaction window [−3 Years, Effective Date].

TABLE 4

CFO_ON_BOARD and ACQUIRER_CAR: Subsample Analysis

Table 4 presents the impact of CFO board membership on M&A deal performance across different subsamples. The dependent variable ACQUIRER_CAR is the acquirer cumulative abnormal return over the 3-day window (−1, +1) around the deal announcement. The independent variable of interest is CFO_ON_BOARD, which is an indicator variable that equals 1 if the acquirer CFO serves on its own board, and 0 otherwise. Our full sample is divided into 2 subsamples based on the sample industry median of CEO_PAYSLICE, the value of BCF_INDEX, the sample industry median of CFO_OWNERSHIP, and NEED_EXTERNAL_FINANCING in columns 1–2, 3–4, 5–6, and 7–8, respectively. CEO_PAYSLICE is the ratio of the acquirer CEO's total compensation to the total compensation of the acquirer's 5 highest-paid executives. BCF_INDEX is the corporate governance index of the acquirer constructed based on 6 governance provisions (see Bebchuk et al. (2009)). CFO_OWNERSHIP is the percentage of acquirer shares owned by its CFO. NEED_EXTERNAL_FINANCING is an indicator variable that equals 1 if the firm's cash holding is less than the deal transaction value, and 0 otherwise. The estimations are based on OLS regressions. Detailed definitions of each variable are provided in the Appendix. For brevity, we omit the coefficients on other control variables included in our baseline regressions. We control for year and Fama–French 48 industry fixed effects in all regressions. *P*-values are reported in parentheses; *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	CEO_PAYSLICE		BCF_INDEX		CFO_OWNERSHIP		NEED_EXTERNAL_FINANCING	
	Low	High	≤3	>3	High	Low	Yes	No
	1	2	3	4	5	6	7	8
CFO_ON_BOARD	0.0107**	0.0033	0.0084**	0.0058	0.0089*	0.0020	0.0121**	0.0040
	(0.044)	(0.573)	(0.046)	(0.582)	(0.088)	(0.757)	(0.032)	(0.434)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	1,694	1,803	2,655	843	1,706	1,678	1,799	1,699
Adj. R^2	0.0449	0.0451	0.0495	0.0292	0.0448	0.0385	0.0788	0.0196

Columns 1–4 of Table 4 show that the coefficients on CFO_ON_BOARD are positive and statistically significant for observations where the acquirer has a good corporate governance structure. The results suggest that the superior deal performance associated with CFO board membership is concentrated among acquirers with good governance structure in place to monitor executive power, for which the agency costs associated with CFO board membership are less of a concern than those without such monitoring regimes.

Apart from the governance regimes monitoring executive power, another effective way to align executive interests with those of their shareholders is through executive shareholding. By offering shares of the company to its senior executives, firms are able to align the interests of management and shareholders as they share gains and losses together (see, e.g., Jensen and Meckling (1976), Jensen and Murphy (1990), and Datta, Iskandar-Datta, and Raman (2001)). Using CFO's equity ownership of the acquirer as a proxy for its alignment of interests with the shareholders, we split the sample into subsamples with high and low CFO_OWNERSHIP in columns 5 and 6, respectively, based on the industry median within the sample. CFO_OWNERSHIP is the percentage of acquirer shares owned by its CFO. We find that the coefficient on CFO_ON_BOARD is positive and statistically significant for the high CFO_OWNERSHIP subsample, but statistically insignificant for the low CFO_OWNERSHIP subsample. The results indicate that CFO board membership can significantly improve the firm's decision-making quality if CFOs' interests are aligned with those of shareholders through their equity holding.

In addition to governance regimes and executive shareholding, another important institutional dimension affecting the magnitude of CFO directors' impact is

whether the corporate decision needs a high level of financial expertise from board members. Given that CFOs' financial expertise in securing more and cheaper financing is valuable to firms when making important decisions, we conjecture that the superior deal performance associated with the CFO serving on the board should be further reinforced if the deal requires external financing. To investigate this prediction, we split our sample based on the indicator variable NEED_EXTERNAL_FINANCING, which equals 1 if the deal value exceeds the cash holding of the acquirer at the end of the fiscal year preceding the deal announcement, and 0 otherwise. The results in columns 7 and 8 show that the coefficient on CFO_ON_BOARD is positive and statistically significant when the deal needs external financing, while this superior deal performance does not occur for deals that do not require external financing.

5. Propensity Score Matching

We first compare the mean value of the control variables between deals with and without acquirer's CFO serving on its boards in Panel A of Table 5. The summary statistics indicate that acquirers with and without CFOs on boards differ in many observable dimensions. To further mitigate the concern that the variation of a firm's acquisition performance and their decisions of whether to have their CFOs on boards are driven by any of these observable factors, we employ the PSM estimation. We estimate the propensity of each acquirer to have its CFO serving on the board by implementing a logit model of the decision on all the firm, deal, and executive characteristics previously included in the baseline model (1). Based on the generated propensity scores, we then match the treated (CFO_ON_BOARD = 1) and control (CFO_ON_BOARD = 0) samples. Biweight kernel matching, 5-nearest matching, and 10-nearest matching are all employed to ensure that our results are not sensitive to the matching estimator choice.[18]

In Panel A of Table 5, the mean difference test between treated and control samples is performed for each control variable. As expected, all the considered control variables are comparable between the 2 groups in the matched samples, which suggests that the PSM process eliminates evident sample selection biases. We then reestimate our baseline model (1) using the matched samples, and the results are presented in Panel B. Our conclusion remains unaffected.[19]

6. Instrumental Variable Estimation

The endogenous nature of a firm's CFO board membership decision complicates the interpretation of our results so far. To mitigate endogeneity concerns over reverse causality and omitted variables, we perform an IV estimation to help establish the causality between CFO board membership and firm M&A performance. The IV we choose is based on the director choices of the acquirer's nearby firms. Existing literature has shown that a firm's policies are significantly affected by the decisions of

[18]A bandwidth or caliper of 0.1% is applied across all three matching procedures to reduce the inaccurate matches.

[19]However, the results should be interpreted with caution. PSM cannot emulate all the experimental conditions related to unobservable factors and the treatment assignment may still not be random (see Shipman, Swanquist, and Whited (2017)).

TABLE 5

Robustness: Propensity Score Matching

Table 5 presents the impact of CFO board membership on M&A deal performance based on propensity scores estimated from a logit model of the propensity of a CFO serving on board (CFO_ON_BOARD). We construct matched samples using biweight kernel matching, 5-nearest matching, and 10-nearest matching. The comparison between deals with (treated) and without (control) the acquirer's CFO serving on its board is reported for each variable in Panel A. Panel B presents the OLS regression results of M&A deal performance (ACQUIRER_CAR) on CFO_ON_BOARD for the propensity score matched sample.

Panel A. Covariate Balance between the Treated and Control Samples

	Original Sample			Biweight Kernel Matching			5-Nearest Matching			10-Nearest Matching		
	Mean		*P*-Value	Mean		*P*-Value	Mean		*P*-Value	Mean		*P*-Value
	CFO_ON_ BOARD = 1	CFO_ON_ BOARD = 0		Treated	Control		Treated	Control		Treated	Control	
RELATIVE_INDUSTRY	0.4258	0.4797	0.051*	0.4167	0.4123	0.915	0.4167	0.4067	0.809	0.4167	0.4154	0.976
RELATIVE_SIZE	0.2339	0.1778	0.004***	0.2049	0.2301	0.449	0.2049	0.2242	0.560	0.2049	0.2291	0.450
SIZE	0.0477	0.0820	0.036**	0.0480	0.0660	0.313	0.0480	0.0592	0.386	0.0480	0.0607	0.347
TOBIN'S_Q	1.9490	2.1905	0.026**	1.9518	1.9444	0.946	1.9518	1.9496	0.983	1.9518	1.9533	0.989
LEVERAGE	0.4875	0.4762	0.311	0.4724	0.4667	0.705	0.4724	0.4566	0.300	0.4724	0.4626	0.522
STOCK_MAJOR	0.1737	0.1404	0.086*	0.1736	0.1933	0.543	0.1736	0.1824	0.783	0.1736	0.1890	0.632
PRIVATE_TARGET	0.3473	0.4049	0.034**	0.3576	0.3559	0.965	0.3576	0.3760	0.649	0.3576	0.3628	0.897
CASH_HOLDING	0.1215	0.1526	0.001***	0.1231	0.1183	0.676	0.1231	0.1200	0.795	0.1231	0.1172	0.611
CASH_FLOW	0.0874	0.0675	0.001***	0.0804	0.0825	0.731	0.0804	0.0833	0.651	0.0804	0.0832	0.657
BOARD_SIZE	2.2310	2.1788	0.000***	2.2258	2.2406	0.465	2.2258	2.2324	0.744	2.2258	2.2369	0.582
PPE	0.2764	0.2315	0.000***	0.2762	0.2764	0.992	0.2762	0.2778	0.933	0.2762	0.2818	0.769
CAPX	0.0627	0.0488	0.000***	0.0528	0.0542	0.754	0.0528	0.0564	0.430	0.0528	0.0557	0.517
CFO_GENDE	0.0361	0.0769	0.007***	0.0347	0.0356	0.955	0.0347	0.0389	0.791	0.0347	0.0355	0.958
CEO_GENDER	0.0122	0.0200	0.329	0.0139	0.0142	0.973	0.0139	0.0174	0.737	0.0139	0.0135	0.971
CFO_COMPENSATION	2.7531	2.1413	0.001***	2.4268	2.0400	0.179	2.4268	1.9649	0.104	2.4268	1.9768	0.117
CEO_COMPENSATION	6.1054	6.4401	0.519	5.8420	5.0285	0.277	5.8420	4.8528	0.183	5.8420	4.8912	0.203
CEO_AGE	4.0560	4.0047	0.000***	4.0511	4.0574	0.561	4.0511	4.0610	0.359	4.0511	4.0573	0.568

Panel B. Regression Results based on PSM

	Kernel Matching	5-Nearest Matching	10-Nearest Matching
	1	2	3
CFO_ON_BOARD	0.0110**	0.0117***	0.0115***
	(0.011)	(0.010)	(0.009)
Other controls	Yes	Yes	Yes
Year and industry FE	Yes	Yes	Yes
No. of obs.	2,926	1,218	1,723
Adj. R^2	0.1338	0.0840	0.1016

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firms in its neighborhood or the same industry. Firms tend to imitate the practices of their neighborhood firms in order to justify their decisions based on their neighborhood peer firms' similar behavior in case their policies are challenged.[20] Along these lines, we use the variable CFO_ON_BOARD_PERCENT_ (SAME_CITY) as our instrument, which is defined as the percentage of public firms in the same city as the acquirer's headquarters that have their CFOs serving on boards.

In the first stage, we implement the probit regression of the indicator CFO_ON_BOARD on the instrumental variable and other controls included in our baseline model (1). In the second stage, we conduct OLS regressions of the deal performance variable (ACQUIRER_CAR) on the fitted value of CFO_ON_BOARD from the first stage. As pointed out by Wooldridge (2010), the covariates and fitted values produced from the first stage will be correlated with the error term in the second stage if the endogenous explanatory variable (CFO_ON_BOARD) is binary. Thus, we adopt the Heckman treatment effect model (see Heckman (1978)).

To be a valid instrument, CFO_ON_BOARD_PERCENT_(SAME_CITY) must satisfy the relevance condition. In the first-stage regressions reported in columns 1 and 3 of Table 6, the coefficients on the instrumental variable CFO_ON_BOARD_PERCENT_(SAME_CITY) are all positive and statistically significant, indicating a strong correlation between the instrument and the firm's decision of whether to have the CFO on the board. Furthermore, in untabulated tests, the first-stage *F*-statistics exceed the "rule of thumb" threshold of 10 and the critical values suggested by Stock and Yogo (2005) for the weak instrument test. The second-stage results are reported in columns 2 and 4. The coefficient estimates on CFO_ON_BOARD are positive and statistically significant, which is consistent with our baseline results. The positive and statistically significant coefficients on CFO_ON_BOARD in both OLS and IV estimations provide strong support for the positive impact of CFO directorship on acquisition performance.

In addition to the relevance condition, CFO_ON_BOARD_PERCENT_ (SAME_CITY) must also satisfy the exclusion restriction that it should not directly affect the acquirer's acquisition performance. As suggested by Knyazeva et al. (2013), it should not capture the effects of local economic factors that can directly affect firm acquisition performance. To check the exclusion restriction, we further include an array of variables in our first-stage regression to control for local characteristics: population density, the prevalence of upper-income households, households receiving retirement income, the proportion of college-educated residents, and the local unemployment rate. Untabulated results show that the effects of our IV continue to hold even after controlling for these factors.

Following Knyazeva et al. (2013), we further control the impact of local industry concentration in our tests. Specifically, we control for the concentration

[20]Such imitation processes across firms have been found in various firm behaviors, such as capital structure decisions (see Grieser, Hadlock, LeSage, and Zekhnini (2022)), information spillovers (see Engelberg, Ozoguz, and Wang (2018)), capital expenditures and R&D expenses (see Grieser, LeSage, and Zekhnini (2022)), executive compensation (see Davis and Greve (1997)), and corporate payout policy (see Massa, Rehman, and Vermaelen (2007)).

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TABLE 6

Robustness: Instrumental Variable Estimations

Table 6 presents the impact of CFO board membership on M&A deal performance based on the instrumental variable estimations. The instrumental variable used in the first-stage regression is CFO_ON_BOARD_PERCENT_(SAME_CITY), which is the percentage of public firms in the same city as the acquirer that have their CFOs serving on their boards. The dependent variable in the second-stage regressions is ACQUIRER_CAR. The first-stage regression results are reported in columns 1 and 3, and the second-stage regression results are reported in columns 2 and 4. The estimations are based on the Heckman treatment effect model. *P*-values are reported in parentheses; *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	1st Stage	2nd Stage	1st Stage	2nd Stage
	1	2	3	4
CFO_ON_BOARD		0.0136***		0.0137***
		(0.004)		(0.008)
CFO_ON_BOARD_PERCENT_(SAME_CITY)	5.0471***		5.5743***	
	(0.000)		(0.000)	
RELATED_INDUSTRY	−0.3156***	0.0024	−0.4061***	0.0023
	(0.001)	(0.247)	(0.000)	(0.286)
RELATIVE_SIZE	0.1047	−0.0114***	0.1094	−0.0072**
	(0.356)	(0.000)	(0.431)	(0.032)
SIZE	−2.2186***	−0.0036	−2.6677***	−0.0004
	(0.000)	(0.320)	(0.000)	(0.927)
TOBIN'S_Q	−0.0280	0.0006	−0.0346	−0.0015*
	(0.423)	(0.287)	(0.431)	(0.074)
LEVERAGE	−0.7645***	0.0112*	−0.9170***	0.0055
	(0.007)	(0.070)	(0.008)	(0.397)
STOCK_MAJOR	0.0284	−0.0273***	0.1881	−0.0285***
	(0.820)	(0.000)	(0.217)	(0.000)
PRIVATE_TARGET	−0.0262	0.0015	0.1013	0.0016
	(0.777)	(0.457)	(0.364)	(0.451)
CASH_HOLDING	0.5529	−0.0040	0.8567*	−0.0053
	(0.131)	(0.605)	(0.055)	(0.515)
CASH_FLOW	1.6574***	−0.0063	2.0532***	−0.0177*
	(0.005)	(0.521)	(0.008)	(0.098)
BOARD_SIZE	0.8480***	−0.0232***	0.9954***	−0.0243***
	(0.000)	(0.000)	(0.000)	(0.000)
PPE	−0.2611	0.0171*	0.1467	0.0170*
	(0.488)	(0.060)	(0.734)	(0.081)
CAPEX	1.7734*	−0.0729***	0.8608	−0.0460
	(0.053)	(0.003)	(0.411)	(0.107)
CFO_GENDER			−0.7749**	−0.0035
			(0.020)	(0.376)
CEO_GENDER			0.5663	0.0038
			(0.128)	(0.599)
CFO_COMPENSATION			0.0619***	−0.0003
			(0.005)	(0.578)
CEO_COMPENSATION			−0.0128	−0.0001
			(0.152)	(0.635)
CEO_AGE			1.7257***	−0.0012
			(0.000)	(0.881)
Intercept	−3.6477***	0.0568***	−12.7149***	0.0658*
	(0.000)	(0.002)	(0.001)	(0.083)
Year and industry FE	Yes	Yes	Yes	Yes
No. of obs.	4,044		3,498	

of firms within the same industry in the acquirer's headquarters city in both the first and second stages of our IV estimations, and we find similar results. Although the above tests provide strong support for our choice of IV, the results should be interpreted with caution due to the difficulties of testing the exclusion condition.

B. CFO Board Membership and M&A Deal Financing

As documented in the existing literature (see, e.g., Güner et al. (2008), Custódio and Metzger (2014)), one of the prominent benefits of the director's financial expertise is the improved financing capacity and reduced financing costs. We thus expect that CFOs' board membership enables them to secure more and cheaper external financing for M&A activities.

1. Debt Financing for Acquisitions

In this section, we examine the relationship between CFO board membership and the likelihood of firms' debt financing in their acquisitions. We expect that the higher level of financial expertise associated with CFO directors will be directly reflected in the acquirer's ability to finance their acquisitions through debt issuance. To test this prediction, we implement the following cross-sectional regression model:

$$(2)\quad \text{DEBT\_FINANCING}_i = \beta_0 + \beta_1 \text{CFO\_ON\_BOARD}_i + \beta_2 F_i + \gamma_k + \mu_t + \varepsilon_{i,k,t},$$

where i indexes deals, k indexes industries, and t indexes time. We use 3 variables, BORROWING_FINANCING, LOAN_FINANCING, and BOND_FINANCING, to measure the debt financing of acquirers (DEBT_FINANCING_i) in their M&A transactions. BORROWING_FINANCING is an indicator variable that equals 1 if the acquirer uses any private or public credit facilities during the relevant M&A transaction window, and 0 otherwise. LOAN_(BOND_)FINANCING is an indicator variable that equals 1 if the acquirer uses any loan (bond) credit facilities during the relevant M&A transaction window, and 0 otherwise. Fama–French 48 industry (γ_k) and announcement year (μ_t) fixed effects are included.

The regression results for the baseline transaction window are presented in Panel A of Table 7. The baseline transaction window is defined as 3 years before the deal announcement until the deal becomes effective or is withdrawn. The probit regression results for BORROWING_FINANCING, LOAN_FINANCING, and BOND_FINANCING are presented in columns 1–2, 3–4, and 5–6, respectively. For each of the dependent variables, we first only control for firm- and deal-level variables in columns 1, 3, and 5, and then additionally control for CFO- and CEO-level characteristics in columns 2, 4, and 6. To facilitate the interpretation of the economic significance of our results, we report marginal effects for coefficients in our probit regression results. As the results show, the coefficients on CFO_ON_BOARD are positive and statistically significant in columns 1 and 2, indicating a positive relationship between CFO board directorship and a firm's ability to finance acquisitions through general debt issuance. In column 2, the marginal effect indicates that the likelihood of utilizing debt financing is 7.54% higher (9.10% higher than the mean value) for acquirers with CFOs serving on boards than for those without. Furthermore, column 4 shows that when the CFOs serve on the board, firms on average are 4.12% more likely (5.18% higher than the mean value) to adopt loan financing in their acquisitions. However, we find that the coefficients on CFO_ON_BOARD are not statistically significant in columns 5–6 for BOND_ FINANCING. This might be because of the higher possibility of renegotiating private loan contracts compared to publicly traded contracts, offering

TABLE 7

CFO Board Membership and M&A External Financing

Table 7 presents the impact of CFO board membership on M&A external borrowing. BORROWING_FINANCING is an indicator variable that equals 1 if the acquirer secures any private or public credit facilities during the transaction window, and 0 otherwise. LOAN_FINANCING is an indicator variable that equals 1 if the acquirer secures any loan credit facilities during the transaction window, and 0 otherwise. BOND_FINANCING is an indicator variable that equals 1 if the acquirer secures any bond credit facilities during the transaction window, and 0 otherwise. The baseline transaction window is defined as 3 years before the deal announcement until the deal becomes effective or is withdrawn, as shown in Panel A. Results for alternative transaction windows are presented in Panel B. The independent variable of interest is CFO_ON_BOARD, which is an indicator variable that equals 1 if the acquirer's CFO serves on its own board, and 0 otherwise. The estimations are based on probit regressions and we report marginal effects for coefficients. Detailed definitions of each variable are provided in the Appendix. Coefficients on the other control variables included in our baseline regressions are omitted for brevity. We control for year and Fama–French 48 industry fixed effects in all regressions. *P*-values are reported in parentheses; *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Baseline Transaction Window: [−3 Years, Effective Date]

	BORROWING_FINANCING		LOAN_FINANCING		BOND_FINANCING	
	1	2	3	4	5	6
CFO_ON_BOARD	0.0810***	0.0754***	0.0523**	0.0412*	−0.0250	−0.0221
	(0.001)	(0.004)	(0.019)	(0.087)	(0.286)	(0.381)
Firm and deal controls	Yes	Yes	Yes	Yes	Yes	Yes
CEO and CFO controls	No	Yes	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	3,623	3,119	3,968	3,429	4,040	3,495
Pseudo R^2	0.2719	0.2817	0.241	0.2526	0.2862	0.3013

Panel B. Alternative Transaction Windows

	[−3 Years, Effective Date +3 Years]		[−2 Years, Effective Date]		[−2 Years, Effective Date +2 Years]	
	1	2	3	4	5	6
CFO_ON_BOARD	0.0659***	0.0494*	0.0563**	0.0610**	0.0572***	0.0613**
	(0.007)	(0.063)	(0.014)	(0.015)	(0.009)	(0.013)
Firm and deal controls	Yes	Yes	Yes	Yes	Yes	Yes
CEO and CFO controls	No	Yes	No	Yes	No	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
No. of obs.	3,033	2,586	4,033	3,490	3,486	2,990
Pseudo R^2	0.2847	0.2821	0.2652	0.2651	0.3214	0.323

acquirers more flexibility in contract renegotiation (see Denis and Mihov (2003)). Meanwhile, banks are less sensitive than public debtholders to information asymmetry, and the exacerbated information asymmetry between firm insiders and outsiders during acquisitions make firms more likely to choose private loans (see Li, Lin, and Zhan (2019)). To check the robustness of our results, we repeat our tests on BORROWING_FINANCING across 3 different alternative transaction windows in Panel B. Our results remain robust.

2. Borrowing Costs for Acquisitions

So far, we have shown a positive relationship between a CFO's board membership and the acquirer's ability to raise external loan financing for its acquisitions. In this section, we examine whether acquisitions made by acquirers with CFOs serving on the board are associated with a lower cost of external borrowing.

Similar to Section III.B.1, we include all loan facilities issued by the acquirers across different transaction windows. LOAN_BORROWING_COST is the percentage point spread of a loan over LIBOR or LIBOR equivalent after adjusting for

TABLE 8

CFO Board Membership and M&A Borrowing Costs

Table 8 presents the impact of CFO board membership on M&A borrowing costs for loan credit facilities issued by the acquirer during different transaction windows. The dependent variable LOAN_BORROWING_COST is the percentage point spread of a loan over LIBOR or LIBOR equivalent after adjusting for any associated origination fees. The independent variable of interest is CFO_ON_BOARD, which is an indicator variable that equals 1 if the acquirer CFO serves on its own board, and 0 otherwise. The estimations are based on OLS regressions. The baseline transaction window is defined as 3 years before the deal announcement until the deal becomes effective or is withdrawn, as shown in column 1. Results for alternative transaction windows are presented in columns 2–4. Detailed definitions of each variable are provided in the Appendix. Coefficients on the other control variables included in our baseline regressions are omitted for brevity. We control for loan primary purpose, loan distribution method, and Fama–French 48 industry fixed effects in all regressions. *P*-values are reported in parentheses; *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	[−3 Years, Effective Date]	[−3 Years, Effective Date + 3 Years]	[−2 Years, Effective Date]	[−2 Years, Effective Date + 2 Years]
	1	2	3	4
CFO_ON_BOARD	−0.1117**	−0.0797**	−0.2102***	−0.1141***
	(0.029)	(0.029)	(0.000)	(0.009)
LOAN_AMOUNT	−0.1698***	−0.1725***	−0.1864***	−0.1774***
	(0.000)	(0.000)	(0.000)	(0.000)
SECURED	0.9211***	0.9565***	0.9107***	0.9469***
	(0.000)	(0.000)	(0.000)	(0.000)
LOAN_MATURITY	0.1596***	0.1378***	0.1363***	0.1291***
	(0.000)	(0.000)	(0.000)	(0.000)
SHORT_MATURITY	0.5781***	0.5155***	0.2378**	0.3753***
	(0.000)	(0.000)	(0.039)	(0.000)
Other controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Loan purpose FE	Yes	Yes	Yes	Yes
Loan distribution method FE	Yes	Yes	Yes	Yes
No. of obs.	5,750	10,718	4,193	7,570
Adj. R^2	0.4769	0.4890	0.4899	0.4939

associated origination fees. Following Graham, Li, and Qiu (2008) and Campello, Lin, Ma, and Zou (2011), we implement the following tests:

$$(3)\quad \text{BORROWING\_COST}_i = \beta_0 + \beta_1 \text{CFO\_ON\_BOARD}_i + \beta_2 F_i + \gamma_k + \theta_l + \lambda_m + \varepsilon_{i,k,l,m},$$

where i indexes loans, k indexes industries, l indexes loan primary purposes, and m indexes loan distribution methods. BORROWING_COST_i is the borrowing cost at the individual loan level (LOAN_BORROWING_COST) issued by the acquirer during the M&A transaction window. We perform OLS regressions and include the Fama–French 48 industry (γ_k), loan primary purpose (θ_l), and loan distribution method (λ_m) fixed effects. F_i is a vector of control variables.

For each M&A transaction window, we include the characteristics of the loan credit facility and all control variables in our baseline regressions in equation (1). The regression results are presented in Table 8. The coefficients on CFO_ON_BOARD are negative and statistically significant in all specifications, suggesting a negative relationship between CFO board membership and the borrowing costs for loans employed in acquisitions. Using the baseline transaction window of [−3 Years, Effective Date] in column 1 as an example, acquirers whose CFOs serve on their boards are associated with a saving of 11.17 basis points (6.73% lower than the mean value) in the interest rates of their loans issued during the acquisition transaction window. Overall, our results support the CFO director's

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positive role in reducing the loan borrowing costs associated with corporate acquisitions.

IV. Conclusion

In this study, we examine whether CFO board membership is beneficial to shareholders in the setting of M&A transactions, where agency conflicts of interest between managers and shareholders are likely to emerge. We find that acquisitions made by firms with CFOs serving on the board are associated with significantly better acquirer announcement returns. We further demonstrate that the superior deal performance comes from the CFO director's ability to select targets with better strategic and financial fit with the acquirer and their ability to secure more and cheaper external financing. This is consistent with the *optimal contracting theory* that board membership enables CFOs to contribute to a more effective decision-making process. This is because of their financial expertise, firm-specialized knowledge, and reduced communication costs between boards and executives.

Currently, regulators assume that CFOs' presence in the boardroom impedes the monitoring role of directors, and such perception makes it difficult for firms to meet their demand for financial expertise and firm-specialized knowledge in the boardroom. We raise the important question of whether regulators should treat CFOs the same way as other insiders. In addition, we shed light on how regulators and firms meet their demand for financial expertise and effective monitoring on corporate boards at the same time. In particular, we find that CFO board membership can create value for their shareholders if executive power is better monitored through effective governance regimes and the CFO's interests are closely aligned with those of shareholders through equity holding.

Appendix. Variable Definitions

Dependent Variables

ACQUIRER_CAR: Acquirer cumulative abnormal return over the 3-day window (−1, +1) around the deal announcement based on the market model. The market model is estimated from acquirer daily returns over the estimation window (−300, −91), with at least 30-day nonmissing observations. We use the CRSP value-weighted index as the benchmark. Source: CRSP.

DEAL_SYNERGY: The combined cumulative abnormal returns of the acquirer and target over a 3-day window (−1, +1) around the deal announcement where market values are used as the weights, after adjusting for the acquirer's toehold shareholding in the target before the deal announcement. Source: CRSP/SDC.

ACQUIRER_REL_GAIN: The difference between the acquirer's and target's dollar gains over the 3-day window (−1, +1) around the deal announcement, scaled by the sum of their market values. Source: CRSP/SDC.

BORROWING_FINANCING: Indicator variable that equals 1 if the acquirer secures loan or bond credit facilities during the transaction window. Source: DealScan/Global New Issue.

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LOAN_FINANCING: Indicator variable that equals 1 if the acquirer secures any loan credit facilities during the transaction window. Source: DealScan.

BOND_FINANCING: Indicator variable that equals 1 if the acquirer secures any bond credit facilities during the transaction window. Source: Global New Issue.

LOAN_BORROWING_COST: Percentage point spread of a loan over LIBOR or LIBOR equivalent after adjusting for associated origination fees. Source: DealScan.

Independent and Instrumental Variables

CFO_ON_BOARD: Indicator variable that equals 1 if the acquirer's CFO serves on its own board. Source: RiskMetrics/ExecuComp/10-K/DEF 14A.

CFO_ON_BOARD_PERCENT_(SAME_CITY): Percentage of public firms with their CFO serving on their board in the same city as the acquirer. Source: RiskMetrics/ExecuComp/10-K/DEF 14A/ Audit Analytics.

Deal Characteristics

RELATED_INDUSTRY: Indicator variable that equals 1 if the acquirer and the target have the same first 3-digit SIC code. Source: SDC.

RELATIVE_SIZE: Deal value divided by the market value of the acquirer at the end of the fiscal year preceding the deal announcement. Source: SDC/Compustat.

STOCK_MAJOR: Indicator variable that equals 1 if the target is paid with over 50% stock. Source: SDC.

PRIVATE_TARGET: Indicator variable that equals 1 if the target is private. Source: SDC.

NEED_EXTERNAL_FINANCING: Indicator variable that equals 1 if the deal value exceeds the cash holdings of the acquirer at the end of the fiscal year preceding the deal announcement. Source: SDC/Compustat.

BORROWING_AMT: The total amount of the loan and bond credit facilities secured by the acquirer during the transaction window, in billions of U.S. dollars. Source: DealScan/Global New Issue.

Firm and Executive Characteristics

SIZE: The book value of acquirer's total assets at the end of the fiscal year preceding the deal announcement, in 100 billion U.S. dollars. Source: Compustat.

TOBIN'S_Q: The acquirer's Tobin's Q at the end of the fiscal year preceding the deal announcement. Source: Compustat.

LEVERAGE: The book value of acquirer's debt divided by its book value of total assets. Source: Compustat.

CASH_HOLDING: The acquirer's cash holdings, including cash and short-term investments, divided by its book value of total assets. Source: Compustat.

CASH_FLOW: The acquirer's cash flow divided by its market value of common shares. The acquirer's cash flow is equal to its income before extraordinary items plus depreciation and amortization, minus dividends paid for common and preferred stocks. Source: Compustat.

BOARD_SIZE: The natural logarithm of the number of directors on the acquirer's board. Source: RiskMetrics.

PPE: The acquirer's value of property, plant and equipment, divided by its book value of total assets. Source: Compustat.

CAPEX: The acquirer's capital expenditures divided by its book value of total assets. Source: Compustat.

CFO_GENDER: Indicator variable that equals 1 if the acquirer CFO is female. Source: ExecuComp.

CEO_GENDER: Indicator variable that equals 1 if the acquirer CEO is female. Source: ExecuComp.

CFO_COMPENSATION: The total compensation of the acquirer CFO in millions of U.S. dollars, which equals the sum of their salary, bonus, and other annual compensation. Source: ExecuComp.

CEO_COMPENSATION: The total compensation of the acquirer CEO in millions of U.S. dollars, which equals the sum of their salary, bonus, and other annual compensation. Source: ExecuComp.

CEO_AGE: The natural logarithm of the acquirer CEO's age. Source: ExecuComp.

CEO_PAYSLICE: The ratio of the acquirer CEO's total compensation to the total compensation of its 5 highest-paid executives. Source: ExecuComp.

BCF_INDEX: The corporate governance index of the acquirer based on 6 antitakeover provisions (see Bebchuk et al. (2009)). Source: RiskMetrics.

CFO_OWNERSHIP: Percentage of acquirer shares owned by its CFO. Source: ExecuComp.

Loan Characteristics

LOAN_AMOUNT: The natural logarithm of the facility amount of a loan. Source: DealScan.

SECURED: Indicator variable that equals 1 if the loan is secured. Source: DealScan.

LOAN_MATURITY: The natural logarithm of the maturity of a loan before its expiration date, in number of years. Source: DealScan.

SHORT_MATURITY: Indicator variable that equals 1 if the loan maturity is less than eleven months (see Kumar and Rabinovitch (2013)). Source: DealScan.

LOAN_PURPOSE: The primary purpose of a loan, including corporate purpose, takeover, debt repayment, acquisition line, working capital, merger, and so forth. Source: DealScan.

LOAN_DISTRIBUTION_METHOD: The distribution method of a loan, including syndication, sole lender, club deal, and so forth. Source: DealScan.

Supplementary Material

To view supplementary material for this article, please visit http://doi.org/10.1017/S0022109024000061.

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