How do banks charge on loans to firms with insiders borrowing from banks with share pledges?

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Abstract

We examine the relation between the cost of bank loans and insiders' share pledging by using the pledging data of Taiwanese listed firms. Specifically, we investigate whether banks charge firms different rates when the insiders pledged shares for their personal loans. We find that bank loan spreads of a firm are positively related to insiders' share pledging, especially for closely held firms with controlling shareholders. The effects of insiders' share pledging on bank loans are more prominent for non-syndicated loans (lower risk-sharing effect) and loans with longer maturity (higher default risk), indicating that banks consider share pledging as an important moral hazard risk factor for lenders. Results also show that insiders' share pledging has a more pronounced influence on the cost of bank loans for firms with higher insiders' shareholding ratios, demonstrating that insiders with large shareholdings and higher pledge ratios may be associated with more severe agency problems in bank loan contracting.

JEL classification: G30, G34
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1. Introduction

Previous studies have reported that how a firm conduct the agency problems is associated with different terms of external financing. For example, Bhojaraj and Sengupta (2003) document that lower bond yields and higher credit ratings are associated with higher institutional ownership and a larger fraction of the board composed of non-officers. Anderson, Mansi, and Reeb (2004) indicate that the cost of debt is inversely related to board independence and that fully independent audit committees are associated with lower cost of debt financing. Bae and Goyal (2009) illustrate that banks charge lower spreads and offer longer maturities to firms in countries with better property rights. Lin, Ma, Malatesta, and Xuan (2011) demonstrate that the cost of borrowing is lower for firms with a narrower divergence between their voting and cash flow rights.

Share pledging denotes that firm executives or directors borrow money by providing personally owned shares of firm equity to lenders as a collateral for the loan. Do bankers take such insiders' personal borrowing backed by corporate stocks into consideration when pricing the corporate bank loans? Although prior research shows that bankers would access insiders' personal characteristics for bank loan contracting (Francis et al., 2013; Shen et al., 2015; Lin et al., 2020), we still have limited knowledge regarding the effect of share pledging on the cost of bank loans. In this study, we investigate whether there is a link between share pledging and the cost of bank loans. For most of the cases, the pledgers still hold the title and voting rights to the shares and may use the loan proceeds to finance their consumption or investments. If the decrease in the market value of pledged stocks results in an insufficient maintenance ratio, then the lender will require additional margins. If the pledgers do not pay back the loan or fulfill the maintenance requirement, then the lender can sell the pledged stocks for a part of the recovery. These pledging insiders will suffer a great loss due to the loss of pledged stocks or even the loss of control rights. Thus, insiders who pledge shares for bank loans have incentives to use corporate resources in policies, such as repurchases, to avoid their personal loss (Chan et al.,

2018). Share pledging may also increase the agency costs of risk-averse operation strategy and negative information hoarding (Dou et al., 2019).

When corporate insiders pledge their shareholdings for bank loans, the agency costs arising from the fear of losing control rights (Dou et al., 2019) and margin call pressures (Chan et al., 2018) may influence the corporate policy, which, in turn, influence bank lending. We discuss the following possible explanations for the agency effect of share pledging on the cost of bank loans with two opposite views. On the one hand, we propose the *moral hazard hypothesis* that share pledging is associated with a higher cost of bank loans for two reasons. First, for pledging insiders, their personal financial conditions are influenced by the share prices with leverage; hence, they may have private incentives to employ corporate policies to prevent a large decline of stock price (Chan et al., 2018; Li et al., 2020). Prior research also shows that the efficiency of information disclosure is likely to worsen, and the quality of financial reports can be poorer for firms with share pledging (Singh, 2018; DeJong et al., 2019). When assessing loan contracting, lenders require the integrity of the borrowing firms to pay back the loans. Bankers can also rely on soft information (Berger et al., 2008) in addition to formal financial statement analyses. The readability and tone ambiguity of firms' financial disclosures are influential in determining the cost of bank loans (Ertugrul et al., 2017). Thus, share pledging may have a negative effect on bankers' evaluation of a firm's credibility.

Second, share pledging serves as a common method to raise funds, and executives who pledge shares for bank loans can also use the funds for other investments. By doing so, their leverage increases and their portfolios are diversified, which, in turn, might raise the amounts involved with riskier investment projects (Faccio, Marchica, and Mura, 2011). The literature suggests that insider share pledging changes managerial incentives toward risk-taking. For example, prior studies have shown that share pledging lowers the pay-for-performance sensitivity for executives (Ouyang et al., 2019) and enhances the equity risk of firms (Anderson and Puleo, 2020). Evidence also indicates that the misconduct of pledging insiders will increase

the likelihood of financial distress if the corporate resources are exhausted (Lee and Yeh, 2004). Thus, the abundant funding effect of share pledging might increase extreme left-tailed risk that is detrimental to the lender, and insiders' share pledging can increase the cost of bank loans.

On the other hand, our *risk aversion hypothesis* suggests that share pledging is associated with a lower cost of bank loans. Banks usually charge a lower spread for firms with a lower risk because these firms are less likely to be default when the loan matures. Previous findings suggest that pledging insiders' incentives of margin call avoidance will constrain excessive corporate risk-taking (Dou et al., 2019; Meng et al., 2019). In addition, firms with insiders pledging shares have more positive tone of earning communication (Zhao et al., 2019), which may make it easier for such firms to raise external funds and perform the loans. For some cases, insiders can also employ the proceeds from share-pledging loans to relieve the financial constraints of a firm. In this context, we expect to see lower cost of bank loans for share-pledging firms.

We test our hypotheses by examining the association between share pledging and bank loan spreads for firms listed on Taiwan Stock Exchange (TWSE). Taiwan's administrative authority requires that listed companies should fully and regularly disclose the amount of insiders' share pledging for personal bank loans under Article 197–1 of the Company Act. Such regulations aim to mitigate information asymmetry between insiders and outside shareholders.[1] In addition, abundant anecdotal evidence is available regarding the effect of share pledging on corporate activities in Taiwan. For example, in January 2019, the Chunghwa Picture Tubes, Ltd. (CPT; a panel manufacturer) was accused of financial statement fraud for the sake of having never disclosed its pledged shares of Tatung Company (a listed subsidiary of CPT) for many years, which was found after the lending bank (King's Town Bank) sold the pledged

[1] Particularly, this Act addresses the inconsistency of interests between directors and outside shareholders when directors pledge their shareholdings, because the directors of listed firms in Taiwan are usually involved in the firms' management, operations, and decisions.

shares in the stock market. Thus, we use Taiwanese enriched pledging data (Chan et al., 2018; Wang and Chou, 2018; Dou et al., 2019; Chou et al., 2021) to utilize its effect on bank loans.

Our empirical results show that share pledging is associated with higher bank loan spreads, supporting our *moral hazard hypothesis*. This relationship still holds when we use a two-stage least squares (2SLS) model to address the endogeneity concerns. Moreover, given that the agency problems behind share pledging may be more significant for controlling shareholders (Chan et al., 2018; Wang and Chou, 2018; Dou et al., 2019), we explore the differences in the effects of share pledging on bank loan rate by ownership structures. In line with previous findings, our main results are more pronounced for closely held firms with controlling shareholders, but not significant for widely held firms with decision makers. Such findings indicate that controlling shareholders' fear of losing control right might be the lenders' primary agency concerns affecting loan rates. In line with the bank loan literature, we also find that the relationship between share pledging and bank loan spreads is more prominent for non-syndicated loans (lower risk-sharing effect) and loans with longer maturity (higher default risk), indicating that banks consider share pledging as an important moral hazard risk factor for lenders. The results also show that insiders' share pledging has a more pronounced effect on the cost of bank loans for firms with higher insiders' shareholding ratios, demonstrating that insiders with large shareholdings and higher pledge ratios may be associated with more severe agency problems in bank loan contracting.

According to prior studies, share pledging *ex ante* can have an opposite effect on the cost of bank loans. Thus, whether banks charge different loan rates for firms with insiders pledging shares remains an empirical question. Although most of the agency problems for share pledging indicated in prior research is between insiders and minority shareholders, the costs may also arise for creditors. For example, share pledging is associated with insiders' self-concerned repurchases (Chan et al., 2018), declines in cash dividends (Li et al., 2020), and policies used to prevent from the loss of control rights. As such, pledging insiders can also use proceeds from

loans to release the margin call pressures. In the worst-case scenario, controlling shareholders who intend to tunnel their companies (Friedman et al., 2003) do not pay back loans and leave a "shell company" for creditors and minority shareholders. Thus, lenders may consider the conflicts as a higher propensity of moral hazard activities for firms' management and will thus charge higher lending rates for firms with pledging-related agency problems.

The contribution of this study is twofold. First, we contribute to the literature on share pledging. The main stream of related literature focuses on the potential agency problems behind such insiders' financing behavior. These studies examine whether and to what extent share pledging affects firms' information transparency and risk-taking (Anderson and Puleo, 2020; Singh, 2018; DeJong et al., 2019; Dou et al., 2019; Meng et al., 2019; Zhao et al., 2019), but pays less attention to the effect of share pledging on firms' cost of bank loans. One concurrent study is Puleo et al. (2020) who show that share pledging in the U.S. is associated with lower cost of debt, demonstrating the risk-reducing incentives driven by share pledging. While the U.S. is a market-based economy, Taiwan is a bank-based economy as many other markets (Levine, 2002). Our study provides evidence showing how bankers assess insiders' share pledging when lending relies on soft information, which is different from the market-based perspective of bondholders (Levine, 2002). Through shedding light on the positive association between share pledging and bank loan spreads, we can better understand the conduit through which share pledging negatively affects the value of firm and cash holdings (Wang and Chou, 2018, Dou et al., 2019; Chou et al., 2021) in the context of *moral hazard hypothesis*.

Second, we add to the large body of literature on bank loan contracting (Bhojaraj and Sengupta, 2003; Anderson et al., 2004; Bae and Goyal, 2009; Lin et al., 2011; Shen et al., 2015; Ertugrul et al., 2017; Lin et al., 2020). Although these studies have shown abundant findings concerning the factors of bank loans, we have limited knowledge about the effect of insiders' share pledging. This study attempts to mitigate the research gap in the finance literature by exploring the role of share pledging in bank loan contracting from the perspective of insiders'

personal financial incentives. By providing evidence regarding the association between the cost of bank loans and insiders' share pledging, the results help provide new insight on how bankers price corporate loans when firm insiders pledge stocks for personal loans.

The remainder of this paper proceeds as follows. In Section 2, we review the related literature and develop the hypotheses. In Section 3, we introduce our research design and data. Section 4 presents the empirical results, and Section 5 concludes this study.

2. Literature review and hypothesis development

Bankers naturally assess the risk of borrowers when determining loan contracts. Share pledging may have an association with corporate risk at least from two points of view. The first context states that corporate risk is associated with the structure of insiders' personal wealth (Cronqvist et al., 2012). For example, Guay (1999) finds that stock options, rather than common stockholdings, significantly increase the sensitivity of CEOs' wealth to equity risk. Rajgopal and Shevlin (2002) show that executive stock options risk incentives have a positive relation with future exploration risk-taking. Coles et al. (2006) find that firms with higher sensitivity of CEO wealth to stock volatility will implement riskier policy choices (high R&D). Faccio et al. (2011) show that firms controlled by diversified large shareholders undertake riskier investments than firms controlled by non-diversified large shareholders do. Cassell et al. (2012) find that CEO inside debt holdings are associated with lower levels of risk-seeking behavior.

In addition, lending banks attempt to mitigate the risk of information asymmetry between banks and borrowers (Berger et al., 2011) by requiring a collateral in loan contracts. In line with this argument, previous research indicates that a collateral is mostly often required when borrowers have a higher default risk (Berger and Udell, 1990). Thus, when banks are in doubt about whether borrowing insiders will engage in moral hazard activities, the pledged shares will serve as an insurance in case such unfavorable conditions happen. Given that pledged

shareholdings represent the degree of pledgers' leveraged financing and personal default risk, share pledging also enhances the volatility of insiders' wealth, thereby affecting corporate risk.

The second view indicates that corporate risk-taking is linked to firms' agency conflicts between executives and shareholders. For example, John, Litov, and Yeung (2008) show that corporate risk-taking is positively related to the quality of investor protection. They argue that insiders will choose to use corporate resources to pursue their own self-interest, especially in poor investor protection countries. Insiders expect to lessen their cash flow diversion when a company's cash flow is low, and they may thus avoid some risky projects that bring opportunities to enhance firm value to preserve their private benefits. King and Wen (2011) argue that weak shareholder governance (entrenched managers) leads to high-risk investments (in terms of more R&D expenditures). The agency problem of share pledging has been shown in the aspects of poorer accounting quality (Singh, 2018; DeJong et al., 2019), risk-taking (Dou et al., 2019), self-concerned payout policies (Chan et al., 2018; Li et al., 2020), cash management (Chou et al., 2021), and firm valuation (Lee and Yeh, 2004; Wang and Chou, 2018; Dou et al., 2019). Thus, the agency problems behind insiders' share pledging may influence corporate risks and thus play a role in determining bank loan contracting. However, whether share pledging increases or decreases the cost of bank loans remains empirically unanswered.

On the basis of the findings of prior research, we conjecture that share pledging may have two opposite *ex ante* effects on the cost of bank loans. The first strand of literature demonstrates that firms with insiders who pledge their shareholdings have higher degree of risk, less transparency, asymmetric or opaque information, and agency problems, which will increase the cost of bank loans. First, we discuss the relation between share pledging and corporate risk. Ouyang et al. (2019) use Chinese data and show that insider pledging leads to a decrease in executive pay-for-performance sensitivity. They indicate that share pledging does not alter the capital structure and ownership control of a firm; instead, it changes the behaviors of the insiders making agency problems more severe. The contingent risk of share pledging has

material adverse influence on firms via a decrease executive pay-for-performance sensitivity. Anderson and Puleo (2020) exploit S&P1500 firms and report that insider share pledging corresponds with a 15.4% relative increase in risk despite unchanged firm fundamentals. That is, they indicate the evidence of a causal relation between share pledging and risk. They argue that without accompanying changes in firm fundamentals, increasing equity risk arising through the contingency risk channel suggests that pledging insiders extract private benefits at the expense of outside shareholders, which may be a phenomenon of heightened principal–agent conflicts arising from the pledge decision.

Second, we discuss how share pledging affects informational transparency. Singh (2018) shows that one of every three S&P1500 firms pledge their ownership in the firm as a collateral to obtain loans at least once, and share pledges distort the incentives of insiders and motivate them to inflate earnings. This risk of downside pressure and margin calls may motivate insiders to engage in earnings manipulation (to report higher profits,) and other similar activities that may generate private benefits at a cost to the firm. DeJong et al. (2019) investigate whether and how controlling shareholders' share pledging leads firms to manipulate accounting numbers to avoid the risks of losing control right. They find that firms with controlling shareholders pledging their shares engage in more positive discretionary accruals, more income-increasing real earnings management, and a higher propensity of using non-recurring items to avoid a net loss.

Third, share pledging may influence the cost of bank loans through other agency costs arising from pledging executives' management and decisions. For example, Chan et al. (2018) suggest that the motivation to buy back shares for pledging firms is to avoid margin call pressure that might result in a loss of controlling shareholders' dominance. By contrast, Li et al. (2020) examine how share pledging behavior of controlling shareholder affects the corporate payout policy by using Chinese data. Their results indicate that cash dividend payments for firms with shares pledged by controlling shareholders are significantly decreased

relative to those without such pledged shares. As for the agency's influence on valuation, Wang and Chou (2018), Dou et al. (2019), and Chou et al. (2021) report a negative causal influence of pledging on shareholder wealth and the value of cash holdings. These findings suggest that controlling shareholders with share pledging are more likely to obtain private benefits at the expense of outside shareholders.

Given that higher degree of risk, information opaqueness, and agency problems are crucial in determining bank loan contracting (Ertugrul et al., 2017), we propose the first hypothesis that firms with insiders pledging shares have a higher cost of bank loans.

H1: Moral hazard hypothesis. Share pledging is associated with higher bank loan spreads.

Another line of literature indicates that share pledging is associated with insider risk aversion because margin calls arising from share pledging may cause insiders to suffer personal liquidity shocks or forego private benefits of control. For example, Dou et al. (2019) investigate Taiwanese firms and find that pledging is associated with reduced firm risk-taking. Using data from the Chinese stock market, Meng et al. (2019) show that the level of share pledging is associated with less volatile earnings and tightened R&D expenditures, demonstrating that share pledging can constrain excessive corporate risk-taking. Shen et al. (2021) indicate that risk-averse insiders tend to pledge their stocks to reduce their exposure to firm risk.

The positive valuation view of share pledging asserts that the threat of a margin call can exert disciplining effects on the majority shareholders, discouraging them from engaging in expropriation (such as tunnelling) at the expense of minority shareholders. Thus, share pledging may play a role in aligning the interests of large shareholders with those of minority shareholders by creating incentives for the insiders to avoid decreases in share price. In line with such a context, relevant research provides evidence from China. Zhao et al. (2019) examine how share pledging influences the tone of earnings communication conferences, and they find that share pledging created by controlling shareholders can indicate their need to

increase stock prices through positive tones of information. In some cases, insiders can also pledge their stocks and use the proceeds from loans to relieve the firms' financial constraints. As a result, these findings indicate lower risk-taking and higher valuations for pledging firms, which illustrates our following hypothesis.

H2: Risk aversion hypothesis. Share pledging is associated with lower bank loan spreads.

3. Research design and data

3.1. Empirical models

This study examines whether the cost of bank loans is associated with share pledging. We approach this question by examining the relationship between corporate insiders' pledge ratio and bank loan spreads. We perform Equation (1) in an attempt to clearly demonstrate a direct mechanism by which share pledging affects the cost of borrowing.

$$\begin{aligned} Spread_{i,j,t} = {} & \beta_0 + \beta_1 Pledge_{i,t-1} + \delta \mathbf{Firm}_{i,t-1} + \lambda \mathbf{Loan}_{i,j,t} + Year\_FE \\ & + Industry\_FE + Bank\_FE + \varepsilon_{i,\tau}, \end{aligned} \tag{1}$$

where subscripts *i*, *j*, and *t* denote firm *i*'s *j*th contract during year *t*; and the dependent variable *Spread* is the natural logarithm of spread (loan rate minus risk-free rate on the initiation day in basis points). The main explanatory variable *Pledge* denotes the insiders' pledge ratio. In the baseline results, *InsPledgeRatio* is measured as insiders' total pledged shares for bank loans divided by their shareholdings. We also account for different ownership types of insiders (including board members, CEO, and managers) because agency problems may be more severe with the separation of ownership and control (La Porta et al., 1999; Claessens et al., 2000). We consider the pledge ratios of all insiders (*InsPledgeRatio*) and the largest pledgers (*LGSPledgeRatio*) for the whole sample, those of controlling shareholders (*CtrPledgeRatio*) for closely held firms, and those of decision makers (*DMPledgeRatio*) for widely held firms. Following Chou et al. (2021), we define a closely held firm with controlling shareholders if it

meets at least one of the following criteria. First, the chairperson and CEO are relatives. Second, a family or group controls more than half of the board seats, and outside directors comprise less than one-third of the board. Third, a family or group controls more than one-third of the board, and at least three members from the family or group are appointed in the board. Fourth, the control rights of a family or group are higher than the critical control level required to control a firm (Cubbin and Leech, 1983). If a firm does not meet any one of the criteria of a closely held firm, then it is defined as a widely held firm. The chairperson in a widely held firm will be considered as the decision maker because, under the regulation of Taiwan's Company Act, a chairperson acts as the legal representative of a corporation, has the highest authority, and is responsible for the firms' overall operations. Thus, his (her) pledge ratio is applied as the *DMPledgeRatio*.

Other independent variables are mainly selected following the research on bank loan spreads (Graham et al., 2008; Shen et al., 2015). **Firm** denotes the vector of firm characteristic variables, namely, *MktCap*, *LEV*, *Cash*, *PPE*, *Age*, *MB*, *SG*, *Profit*, *Z-Score*, *InsidHold*, *InstiHold*, and *Deviation*. *MktCap* is the natural logarithm of market capitalization in millions new Taiwan dollars. *LEV* is the ratio of long-term debt plus debt in current liabilities to total assets. *Cash* is measured as cash and cash equivalents divided by total assets. *PPE* is the ratio of net property, plant, and equipment to total assets. *Age* is the natural logarithm of one plus firm age, measured as the period since a firm listed by year. *MB* is the ratio of market value of equity plus book value of debt to total assets. *SG* is the yearly sales growth rate. *Profit* is the ratio of EBIT to total assets. *Z-Score* is measured following Altman (1968) as (1.2 * working capital + 1.4 * retained earnings + 3.3 * pretax income + 0.999 * total sales)/total assets. *InsidHold* is the ratio of insiders' shareholdings to total outstanding shares. *InstiHold* is the ratio of institutional investors' shareholdings to total outstanding shares. *Deviation* is the deviation between controlling shareholders' control (voting) rights and cash flow rights. All firm financial characteristic variables are estimated one year prior to the loan initiated year.

Loan denotes the vector of loan characteristic variables. *Amount* is the natural logarithm of loan amounts in thousands. *Maturity* is the natural logarithm of the loan period in months. *Secured* is a dummy variable that equals one if a loan is secured, and zero otherwise. *Syndicated* is a dummy variable that equals one if a loan is a syndicate loan, and zero otherwise. Year fixed effects (*Year_FE*) is included to control for changes in general loan market conditions over time. Unobservable industry characteristics may also affect loan contract terms. Thus, we include *Industry_FE* to control for industry fixed effects. Given that each bank in our sample has at least two loans at different points in time, we include bank fixed effects (*Bank_FE*) in the regression models to control for potential unobservable time-invariant bank-specific effects. In addition, loans borrowed by the same firm can potentially correlate with each other, and this correlation may lead to biased standard errors. We use White's (1980) robust standard errors and Petersen's (2009) approach to adjust heteroskedasticity and clustering at the firm level to address this issue.

3.2. Sample and data collection

Our sample firms are listed companies on the TWSE during 1997–2019, excluding financial companies, foreign firms, and Taiwan depositary receipts. To the best of our knowledge, Taiwan is one of the few emerging markets with legal requirement on listed companies to disclose the information of insiders' personal pledged stocks. Article 197–1 of the Company Act mandates listed companies to report the amount of pledged shares at the insider level on an open data website (See Market Observation Post System: http://emops.twse.com.tw/emops_all.htm). This official regulation allows us to study the effects of insiders' share pledging by these insiders' identification. In Taiwan, listed firms are also required by law to record all bank loan contracts in their yearly financial reports. These loan-level data contain detailed information, including the amount, period (i.e., beginning and expiration times), interest rate, and type (i.e., fixed or floating and syndicated or single) for each corporate loan contract.

We collect share pledging, bank loan contracting, and all the required financial characteristics from the Taiwan Economic Journal database. We eliminate data without the beginning and expiration dates of bank loans to obtain loan-level observations for individual firms. Table 1 presents the summary statistics of our variables. The mean pledge ratios are 12.51% for all insiders, 49.59% for the largest pledgers, 16.23% for controlling shareholders, and 14.7% for decision makers. More than half of our observations exhibit share pledging by insiders and controlling shareholders, whereas less than half by decision makers.

[Table 1 about here]

4. Empirical results

4.1. Share pledging and bank loan spreads

Table 2 presents the regression results regarding the association between share pledging and bank loan spreads. In Model (1), the coefficient of *InsPledgeRatio* is positive (0.468) and significant at the 1% level, indicating that insiders' share pledging is associated higher bank loan spreads. The evidence provides support for H1, the *moral hazard hypothesis*, which predicts a higher cost of bank loans for firms with agency problems arising from share pledging. From Model (2), we also find that the largest pledgers' pledge ratios (*LGSPledgeRatio*) have a significant incremental effect on bank loan spreads. Thus, bankers' evaluation of loans for firms with insiders pledging shares imply how they expect the severity of information asymmetry and moral hazard problems, rather than whether such firms can be excessively risk averse.

[Table 2 about here]

For firms with controlling shareholders, the concentration of ownership makes expropriation more likely. Controlling shareholders' pledging may have more prominent influence on bank loan contracting. Thus, we also account for the difference in the effects of share pledging between controlling shareholders for closely held firms and decision makers for

widely held firms (Dou et al., 2019). In Model (3) of Table 2, with a subsample of closely held firms, *CtrPledgeRatio* enters the bank loan spread regression with a positive coefficient (0.263), which is statistically significant at the 1% level. By contrast, the coefficient of *DMPledgeRatio* in Model (4) is found to be positive but less significant by using a subsample analysis of widely held firms. The results demonstrate that the positive effects of share pledging on bank loan spreads are more pronounced for closely held firms with controlling shareholders than for widely held firms with decision makers. Such a finding is consistent with prior studies, showing that controlling shareholders' pledging results in more severe agency problems for minority shareholders (Chan et al., 2018; DeJong et al., 2019; Dou et al., 2019).

4.2. Robustness tests: Endogeneity issue

One challenge in interpreting our baseline findings is the endogeneity driven by unobservable characteristics that are related to the insiders' choice of share pledging and bank loan rates. The reverse causality is also likely that controlling shareholders who comprehend the corporate cost of bank loans will choose whether to pledge their shareholdings. Therefore, in addition to using the lagged values of share pledging and control variables in the regressions, we conduct a robustness test by using a 2SLS regression to alleviate the endogeneity concern. In Taiwan, the Legislative Yuan (the Taiwanese Congress equivalent) passed the amendment of Article 197–1 of the Company Act on October 25, 2011 to further improve the protection of minority shareholders. The amendment prohibits firm directors' exercise of voting rights of pledged shares over half of the shares held when board members are elected. Such a regulation *per se* does not directly limit the directors' behavior of pledging shares but aim at discouraging the directors' pledging on the shares of company under their management (Wang and Chou, 2018). In this sense, Taiwan's 2011 new regulation attempts to lower the incentives of moral hazard activities by raising the costs of expropriation, but does not have a direct effect on the corporate cost of bank loans. Thus, we utilize this exogenous event and treat it as the instrumental variable of share pledging (Chan et al., 2018; Dou et al., 2019; Chou et al., 2021).

We implement in the first-stage regression an event dummy variable *PostReg*, which takes a value of one for the period before 2011, and zero otherwise. We use all the exogenous variables in Equation (1) to estimate the regressions with *InsPledgeRatio* and *CtrPledgeRatio* as the dependent variable for the whole sample and the closely held subsample firms, respectively. Table 3 presents the 2SLS estimation results. In Models (1) and (3), the coefficients of *PostReg* are negatively significant, suggesting that the 2011 new rule affects the behavior of insiders' share pledging. Our findings remain consistent and supportive of our *moral hazard hypothesis* (H1) as the coefficients of *InsPledgeRatio* and *CtrPledgeRatio* are still positive and significant at the 1% level. The empirical results that share pledging increases bank loan spreads are robust after considering the endogeneity issue.

[Table 3 about here]

Another concern regarding the identification is that the loan spreads, amounts, and maturities might be jointly determined. In such cases, simple OLS regressions along may be insufficient to obtain an appropriate interpretation. Thus, we follow Asquith, Beatty, and Weber (2005) and use a 2SLS regression to account for potential simultaneity bias problem. In the first stage, we estimate a structural model for all loan characteristics other than *Spread*. The dependent variables are *Amount* and *Maturity*, and the independent variables include *InsPledgeRatio* and other firm characteristics. In the second stage, we regress *Spread* on *InsPledgeRatio*, firm characteristics, and the predicted values of *Amount* and *Maturity* obtained from the first-stage regression. Model 5 of Table 3 reports the results of the second-stage regression, which show that the relationship between share pledging and bank loan spreads is consistent with our baseline results. Thus, our main results are not biased by the simultaneity of multiple loan terms.[2]

[2] An alternative estimation approach in single contract feature studies (Berger and Udell, 1995) is not to include other debt contract terms as explanatory variables, and the estimate is thus interpreted as a reduced form where OLS is unbiased. Our results remain consistent after employing such analyses.

4.3. Additional tests

Given that banks charge firms with insiders pledging shares with higher rates, whether the agency effects of share pledging can be different with bank loan contracting and insiders' shareholdings is worth exploring. In this section we analyze the effects of share pledging on bank loan rates for the consideration of syndication, maturity, and insiders' shareholding ratios.

4.3.1. Role of syndication in the effect of share pledging on bank loan spreads

Loan syndication may provide the function of risk diversification. For example, Demsetz (2000) shows that credit–risk diversification is among the main reasons for loan sales by the lead bank. Lee and Mullineaux (2004) demonstrate that syndicates are structured to enhance monitoring efforts. Given that share pledging is insiders' financing behavior connected with banks, bankers from different financial institutions might have more information about the pledgers. Thus, the risk arising from share pledging might be diversified by a number of lenders. We examine whether the effect of share pledging on bank loan rates will be different between syndicated and non-syndicated loans. Models (1) and (2) of Table 4 present the subsample regression results. The coefficients of *InsPledgeRatio* are positive but only significant at the 1% level in Model (2). This evidence indicates that loan syndication might have a diversification effect on reducing the agency risk related to share pledging. Thus, insiders' share pledging has a more pronounced incremental effect on the cost of bank loans for non-syndicated loans.

[Table 4 about here]

4.3.2. Role of loan maturity in the effect of share pledging on bank loan spreads

Bae and Goyal (2009) show that banks will offer shorter maturities to firms when the enforceability of contracts is worse. Thus, when banks concern the agency problems of share

pledging, the effects might be different for loans with different maturities. To test this conjecture, we divide our loan sample into two groups based on the median of loan maturities and then re-run the loan spread regressions. Table 5 presents the results. The coefficients of *InsPledgeRatio* are positive but only significant at the 1% level in Model (1). Thus, the incremental effects of share pledging on bank loan rates are more pronounced for loans with longer maturities. This finding suggests the possibility that when creditors concern about share-pledging firms with poorer enforceability of contracts, they may choose to shorten loan maturities. In this context, the rates of loans with shorter maturities for share-pledging firms will not increase as much as those for non-pledging firms. By contrast, if share-pledging firms demand longer loans, then banks may choose to increase loan spreads compared with non-pledging firms.

[Table 5 about here]

4.3.3. Role of shareholding ratios in the effect of share pledging on bank loan spreads

Banks are likely to assess the severity of share pledging based on firm insiders' share holdings. If the insiders hold big shareholdings and pledge most of them for bank loans, the influence of share pledging may enhance. We address this issue by dividing our sample into two groups based on the median of insiders' shareholding ratios and then re-run the regressions. Table 6 shows that the coefficients of *InsPledgeRatio* are positive but only significant at the 1% level in Model (1), indicating that the effect of share pledging on bank loan rates is more pronounced when the insiders' shareholding ratios are high. Thus, high shareholding ratios *per se* might not necessarily reduce agency problems without considering other factors such as share pledging. The evidence may help provide explanations for previous research showing that the relationship between management ownership and firm valuation is not monotonic (Morck, Shleifer, and Vishny, 1988).

[Table 6 about here]

4.3.4. Does share pledging influence loan amounts or maturities?

Given that banks charge higher spreads on loans to firms with insiders pledging shares to reflect their risk assessment, one might premise whether banks lend fewer or offer shorter maturities on such borrowing firms. To investigate this question, we regress *Amount* and *Maturity* on *InsPledgeRatio* based on the regression model of Equation (1). Table 7 presents the results. Both models show that the coefficients of *InsPledgeRatio* are not statistically significant, suggesting that banks mainly adjust loan spreads rather than amounts or maturities in loan contracting when considering insiders' share pledging.

[Table 7 about here]

5. Conclusion

In this study, we explore the role of insiders' share pledging in the cost of corporate bank loans with the sample of Taiwanese listed firms during the period of 1997–2019. Our empirical results show that share pledging has an incremental influence on the cost of bank loans in terms of bank loan spreads, supporting our *moral hazard hypothesis* (H1). The positive relationship between share pledging and the cost of bank loans indicates that banks may regard insiders' personal borrowing with share pledging as a bad signal when assessing listed borrowing firms. This phenomenon is more pronounced when the loans are non-syndicated or longer. Such evidence is consistent with previous research on share pledging indicative of higher firm risk (Ouyang et al., 2019; Anderson and Puleo, 2020), information asymmetry (DeJong et al., 2019), and agency problems (Chan et al., 2018; Li et al., 2020). In summary, our results demonstrate whether and how firms' cost of capital is associated with the agency problems of insiders' share pledging and also help provide possible explanations for lower valuations of share-pledging firms (Wang and Chou, 2018; Dou et al., 2019).

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Table 1. Descriptive statistics

	Mean	S.D.	Min	Median	Max	N
Spread	4.6070	1.0442	−0.6931	4.7493	7.4886	108,317
InsPledgeRatio	0.1251	0.1680	0	0.0565	0.9700	108,317
LGSPledgeRatio	0.4959	0.4118	0	0.5174	1	108,317
CtrPledgeRatio	0.1623	0.2241	0	0.0579	1	108,317
DMPledgeRatio	0.1470	0.2899	0	0	1	108,317
MktCap	8.7090	1.4133	4.4430	8.5240	15.5990	108,317
LEV	0.5321	0.1412	0.0250	0.5320	0.9976	108,317
Cash	0.0796	0.0749	0.0001	0.0575	0.7327	108,317
PPE	0.3499	0.1950	0.0000	0.3485	0.9630	108,317
Age	2.4860	0.8342	0	2.5850	4.0580	108,317
MB	1.0921	0.4054	0.4602	0.9934	5.7611	108,317
SG	0.1877	4.1328	−0.9970	0.0581	325.9339	108,317
Profit	0.0386	0.0737	−0.9146	0.0403	1.0964	108,317
ZScore	1.0974	0.8005	−13.9327	1.0298	7.5091	108,317
InsidHold	0.4121	0.1627	0.0250	0.4017	0.9847	108,317
InstiHold	0.4057	0.2187	0	0.3835	0.9960	108,317
Deviation	0.0562	0.0932	−0.0703	0.0124	0.6059	108,317
Amount	11.3500	1.5968	0	11.4200	17.8200	108,317
Maturity	2.4260	1.4010	−3.4010	2.4850	5.7170	108,317
Secured	0.4582	0.4983	0	0	1	108,317
Syndicated	0.0984	0.2978	0	0	1	108,317

Notes: *Spread* is the natural logarithm of spread (loan rate minus risk-free rate on the initiation day in basis points). *InsPledgeRatio* denotes the insiders' pledge ratios measured as insiders' total pledged shares for bank loans divided by their shareholdings. *LGSPledgeRatio*, *CtrPledgeRatio*, and *DMPledgeRatio* denote the pledge ratios of the largest pledgers, controlling shareholders, and decision makers, respectively. *MktCap* is the natural logarithm of market capitalization in millions new Taiwan dollars. *LEV* is the ratio of long-term debt plus debt in current liabilities to total assets. *Cash* is measured as cash and cash equivalents divided by total assets. *PPE* is the ratio of net property, plant, and equipment to total assets. *Age* is the natural logarithm of one plus firm age, measured as the period since a firm listed by year. *MB* is the ratio of market value of equity plus book value of debt to total assets. *SG* is the yearly sales growth rate. *Profit* is the ratio of EBIT to total assets. *Z-Score* is measured following Altman (1968) as (1.2 * working capital + 1.4 * retained earnings + 3.3 * pretax income + 0.999 * total sales)/total assets. *InsidHold* is the ratio of insiders' shareholdings to total outstanding shares. *InstiHold* is the ratio of institutional investors' shareholdings to total outstanding shares. *Deviation* is the deviation between controlling shareholders' control (voting) rights and cash flow rights. *Amount* is the natural logarithm of loan amounts in thousands. *Maturity* is the natural logarithm of the loan period in months. *Secured* is a dummy variable that equals one if a loan is secured, and zero otherwise. *Syndicated* is a dummy variable that equals one if a loan is a syndicate loan, and zero otherwise.

Table 2. Share pledging and bank loan spreads

	Model (1) Whole sample		Model (2) Whole sample		Model (3) Closely held firms		Model (4) Widely held firms	
	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept	6.434***	16.226	6.508***	16.233	5.965***	12.318	7.078***	11.587
InsPledgeRatio	0.468***	3.336						
LGSPledgeRatio			0.148**	2.563				
CtrPledgeRatio					0.263***	2.833		
DMPledgeRatio							0.126	1.159
MktCap	−0.090***	−3.357	−0.099***	−3.681	−0.076***	−2.986	−0.130***	−2.671
LEV	0.725***	4.195	0.728***	4.171	1.002***	4.895	0.234	0.891
Cash	−0.064	−0.198	−0.075	−0.229	−0.170	−0.469	−0.161	−0.380
PPE	0.223	1.158	0.213	1.111	−0.120	−0.696	0.539*	1.950
Age	0.030	0.737	0.025	0.596	0.025	0.536	−0.013	−0.208
MB	−0.012	−0.226	−0.013	−0.251	−0.036	−0.560	0.017	0.268
SG	0.000	0.394	0.001	0.654	0.000	0.623	0.093	1.540
Profit	−0.295	−0.721	−0.294	−0.738	−0.315	−0.714	−0.776	−1.162
ZScore	−0.063	−1.206	−0.063	−1.206	−0.067	−1.230	−0.054	−0.640
InsidHold	−0.188	−1.116	−0.215	−1.254	0.058	0.370	−0.652**	−2.341
InstiHold	−0.112	−0.808	−0.059	−0.419	−0.162	−1.060	−0.014	−0.054
Deviation	−0.038	−0.109	−0.059	−0.167	−0.622	−1.523	1.082**	1.970
Amount	−0.075***	−7.214	−0.075***	−7.142	−0.076***	−6.491	−0.058***	−3.964
Maturity	0.155***	9.085	0.156***	9.047	0.158***	8.619	0.133***	5.822
Secured	0.125***	3.855	0.121***	3.763	0.136***	3.990	0.068	1.422
Syndicated	0.095**	2.304	0.088**	2.122	0.134***	2.671	−0.012	−0.166
Year fixed effect	Yes		Yes		Yes		Yes	
Industry fixed effect	Yes		Yes		Yes		Yes	
Bank fixed effect	Yes		Yes		Yes		Yes	
Adj. R^2	0.309		0.308		0.333		0.345	
N	108,317		108,315		81,104		27,921	

Notes: The dependent variable *Spread* is the natural logarithm of spread (loan rate minus risk-free rate on the initiation day in basis points). *InsPledgeRatio* denotes the insiders' pledge ratios measured as insiders' total pledged shares for bank loans divided by their shareholdings. *LGSPledgeRatio*, *CtrPledgeRatio*, and *DMPledgeRatio* denote the pledge ratios of the largest pledgers, controlling shareholders, and decision makers, respectively. *MktCap* is the natural logarithm of market capitalization in millions new Taiwan dollars. *LEV* is the ratio of long-term debt plus debt in current liabilities to total assets. *Cash* is measured as cash and cash equivalents divided by total assets. *PPE* is the ratio of net property, plant, and equipment to total assets. *Age* is the natural logarithm of one plus firm age, measured as the period since a firm listed by year. *MB* is the ratio of market value of equity plus book value of debt to total assets. *SG* is the yearly sales growth rate. *Profit* is the ratio of EBIT to total assets. *Z-Score* is measured following Altman (1968) as (1.2 * working capital + 1.4 * retained earnings + 3.3 * pretax income + 0.999 * total sales)/total assets. *InsidHold* is the ratio of insiders' shareholdings to total outstanding shares. *InstiHold* is the ratio of institutional investors' shareholdings to total outstanding shares. *Deviation* is the deviation between controlling shareholders' control (voting) rights and cash flow rights. *Amount* is the natural logarithm of loan amounts in thousands. *Maturity* is the natural logarithm of the loan period in months. *Secured* is a dummy variable that equals one if a loan is secured, and zero otherwise. *Syndicated* is a dummy variable that equals one if a loan is a syndicate loan, and zero otherwise. We use White's (1980) robust standard errors and Petersen's (2009) approach to adjust heteroskedasticity and clustering at the firm level. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 3. 2SLS regression analysis of bank loan spreads

	Whole sample				Closely held firms				Whole sample	
	Model (1) First stage		Model (2) Second stage		Model (3) First stage		Model (4) Second stage		Model (5) Second stage	
	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept	0.378***	79.510	2.495***	3.108	0.504***	66.694	2.069**	2.386	1.612***	2.573
PostReg	−0.048***	−40.781			−0.066***	−36.877				
InsPledgeRatio			10.855***	6.229					0.780***	5.307
CtrPledgeRatio							8.028***	6.157		
MktCap	−0.012***	−23.801	0.037	1.333	−0.011***	−13.742	0.007	0.263	−0.597***	−8.940
LEV	0.022***	6.285	0.496***	2.800	0.109***	19.546	0.157	0.628	−0.277	−1.168
Cash	−0.222***	−33.039	2.341***	4.182	−0.271***	−24.988	1.976***	3.492	−0.739**	−2.173
PPE	−0.015***	−6.113	0.349*	1.810	−0.024***	−5.976	0.044	0.243	0.655***	3.148
Age	0.010***	15.277	−0.062*	−1.791	0.002**	2.261	0.021	0.450	−0.117***	−2.792
MB	−0.023***	−17.817	0.224***	3.324	−0.028***	−13.121	0.181**	2.467	0.434***	5.835
SG	0.000***	4.327	−0.005***	−4.096	0.000**	−2.471	0.003***	4.027	0.002***	2.660
Profit	0.183***	21.159	−2.238***	−4.422	0.248***	19.183	−2.282***	−4.306	1.436***	3.415
ZScore	−0.037***	−44.607	0.325***	3.486	−0.059***	−44.417	0.400***	3.832	−0.220***	−4.257
InsidHold	−0.241***	−69.193	2.342***	4.616	−0.442***	−82.974	3.536***	5.614	0.098	0.579
InstiHold	0.168***	55.085	−1.862***	−6.117	0.280***	60.009	−2.354***	−6.367	−0.884***	−5.754
Deviation	−0.217***	−40.237	2.218***	4.594	−0.294***	−34.026	1.673***	3.384	−0.158	−0.451
Amount	−0.004***	−12.416	−0.030**	−2.423	−0.009***	−16.967	−0.006	−0.376	0.925***	9.085
Maturity	0.000	−0.464	0.156***	8.956	0.007***	12.476	0.107***	5.533	−0.466	−7.214
Secured	0.003***	2.733	0.095***	2.895	0.001	0.640	0.126***	3.714	0.138**	2.507
Syndicated	−0.008***	−4.883	0.182***	4.068	−0.004	−1.582	0.171***	3.379	0.315***	4.821
Year fixed effect	–		Yes		–		Yes		Yes	
Industry fixed effect	–		Yes		–		Yes		Yes	
Bank fixed effect	–		Yes		–		Yes		Yes	
Adj. R^2	0.138		0.305		0.188		0.331		0.309	
N	121,427		108,317		90,429		81,104		108,317	

Notes: The table presents a 2SLS analysis of the value of cash holdings. In the first-stage probit regression, the dependent variable is pledge ratio (*InsPledgeRatio* and *CtrPledgeRatio* for Models (1) and (3), respectively). *InsPledgeRatio* denotes the insiders' pledge ratios measured as insiders' total pledged shares for bank loans divided by their shareholdings. *CtrPledgeRatio* denotes the pledge ratios of controlling shareholders. The instrumental variable is a *PostReg* dummy that equals 1 for the period after 2011, and zero otherwise. The dependent variable in the second-stage regressions (Models (2) and (4)) is *Spread*, which is the natural logarithm of spread (loan rate minus risk-free rate on the initiation day in basis points). *MktCap* is the natural logarithm of market capitalization in millions new Taiwan dollars. *LEV* is the ratio of long-term debt plus debt in current liabilities to total assets. *Cash* is measured as cash and cash equivalents divided by total assets. *PPE* is the ratio of net property, plant, and equipment to total assets. *Age* is the natural logarithm of one plus firm age, measured as the period since a firm listed by year. *MB* is the ratio of market value of equity plus book value of debt to total assets. *SG* is the yearly sales growth rate. *Profit* is the ratio of EBIT to total assets. *Z-Score* is measured following Altman (1968) as (1.2 * working capital + 1.4 * retained earnings + 3.3 * pretax income + 0.999 * total sales)/total assets. *InsidHold* is the ratio of insiders' shareholdings to total outstanding shares. *InstiHold* is the ratio of institutional investors' shareholdings to total outstanding shares. *Deviation* is the deviation between controlling shareholders' control (voting) rights and cash flow rights. *Amount* is the natural logarithm of loan amounts in thousands. *Maturity* is the natural logarithm of the loan period in months. *Secured* is a dummy variable that equals one if a loan is secured, and zero otherwise. *Syndicated* is a dummy variable that equals one if a loan is a syndicate loan, and zero otherwise. We use White's (1980) robust standard errors and Petersen's (2009) approach to adjust heteroskedasticity and clustering at the firm level. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 4. Share pledging and bank loan spreads: The effect of syndication

	Model (1) Syndicated		Model (2) Non-syndicated	
	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept	6.046***	13.014	6.573***	15.911
InsPledgeRatio	0.089	0.527	0.478***	3.225
MktCap	−0.109***	−3.740	−0.091***	−3.339
LEV	0.283	1.118	0.744***	4.286
Cash	−0.161	−0.275	−0.115	−0.348
PPE	−0.009	−0.039	0.165	0.785
Age	0.035	0.819	0.032	0.753
MB	0.030	0.411	−0.016	−0.300
SG	0.001	1.600	0.003	1.372
Profit	−0.895**	−2.032	−0.234	−0.543
ZScore	−0.034	−0.566	−0.072	−1.300
InsidHold	−0.217	−1.198	−0.174	−0.999
InstiHold	0.084	0.496	−0.103	−0.720
Deviation	−0.235	−0.780	−0.061	−0.165
Amount	−0.003	−0.244	−0.084***	−7.693
Maturity	0.094***	3.085	0.163***	9.336
Secured	−0.018	−0.320	0.124***	3.666
Year fixed effect	Yes		Yes	
Industry fixed effect	Yes		Yes	
Bank fixed effect	Yes		Yes	
Adj. R^2	0.361		0.320	
N	10,653		97,664	

Notes: The dependent variable *Spread* is the natural logarithm of spread (loan rate minus risk-free rate on the initiation day in basis points). *InsPledgeRatio* denotes the insiders' pledge ratios measured as insiders' total pledged shares for bank loans divided by their shareholdings. *MktCap* is the natural logarithm of market capitalization in millions new Taiwan dollars. *LEV* is the ratio of long-term debt plus debt in current liabilities to total assets. *Cash* is measured as cash and cash equivalents divided by total assets. *PPE* is the ratio of net property, plant, and equipment to total assets. *Age* is the natural logarithm of one plus firm age, measured as the period since a firm listed by year. *MB* is the ratio of market value of equity plus book value of debt to total assets. *SG* is the yearly sales growth rate. *Profit* is the ratio of EBIT to total assets. *Z-Score* is measured following Altman (1968) as (1.2 * working capital + 1.4 * retained earnings + 3.3 * pretax income + 0.999 * total sales)/total assets. *InsidHold* is the ratio of insiders' shareholdings to total outstanding shares. *InstiHold* is the ratio of institutional investors' shareholdings to total outstanding shares. *Deviation* is the deviation between controlling shareholders' control (voting) rights and cash flow rights. *Amount* is the natural logarithm of loan amounts in thousands. *Maturity* is the natural logarithm of the loan period in months. *Secured* is a dummy variable that equals one if a loan is secured, and zero otherwise. *Syndicated* is a dummy variable that equals one if a loan is a syndicate loan, and zero otherwise. We use White's (1980) robust standard errors and Petersen's (2009) approach to adjust heteroskedasticity and clustering at the firm level. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 5. Share pledging and bank loan spreads: Difference in loan maturity

	Model (1) Longer maturity		Model (2) Shorter maturity	
	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept	6.083***	13.122	6.190***	13.422
InsPledgeRatio	0.632***	4.121	0.262	1.311
MktCap	−0.062*	−1.766	−0.120***	−3.484
LEV	0.460*	1.884	0.931***	5.069
Cash	0.383	0.822	−0.516	−1.633
PPE	0.389	1.390	−0.068	−0.320
Age	−0.008	−0.124	0.046	1.171
MB	−0.011	−0.147	0.006	0.094
SG	0.002	1.101	0.000	−0.184
Profit	−1.033	−1.817	0.359	0.879
ZScore	0.032	0.494	−0.164***	−2.925
InsidHold	−0.087	−0.364	−0.198	−1.038
InstiHold	−0.102	−0.458	0.157	0.700
Deviation	0.032	0.098	0.221	0.331
Amount	−0.079***	−5.105	−0.064***	−5.931
Maturity	0.168***	6.689	0.135***	8.292
Secured	0.179***	3.869	0.063*	1.956
Syndicated	0.111*	1.708	0.069	1.397
Year fixed effect	Yes		Yes	
Industry fixed effect	Yes		Yes	
Bank fixed effect	Yes		Yes	
Adj. R^2	0.311		0.383	
N	46,932		61,385	

Notes: The dependent variable *Spread* is the natural logarithm of spread (loan rate minus risk-free rate on the initiation day in basis points). *InsPledgeRatio* denotes the insiders' pledge ratios measured as insiders' total pledged shares for bank loans divided by their shareholdings. *MktCap* is the natural logarithm of market capitalization in millions new Taiwan dollars. *LEV* is the ratio of long-term debt plus debt in current liabilities to total assets. *Cash* is measured as cash and cash equivalents divided by total assets. *PPE* is the ratio of net property, plant, and equipment to total assets. *Age* is the natural logarithm of one plus firm age, measured as the period since a firm listed by year. *MB* is the ratio of market value of equity plus book value of debt to total assets. *SG* is the yearly sales growth rate. *Profit* is the ratio of EBIT to total assets. *Z-Score* is measured following Altman (1968) as (1.2 * working capital + 1.4 * retained earnings + 3.3 * pretax income + 0.999 * total sales)/total assets. *InsidHold* is the ratio of insiders' shareholdings to total outstanding shares. *InstiHold* is the ratio of institutional investors' shareholdings to total outstanding shares. *Deviation* is the deviation between controlling shareholders' control (voting) rights and cash flow rights. *Amount* is the natural logarithm of loan amounts in thousands. *Maturity* is the natural logarithm of the loan period in months. *Secured* is a dummy variable that equals one if a loan is secured, and zero otherwise. *Syndicated* is a dummy variable that equals one if a loan is a syndicate loan, and zero otherwise. We use White's (1980) robust standard errors and Petersen's (2009) approach to adjust heteroskedasticity and clustering at the firm level. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 6. Share pledging and bank loan spreads: The role of shareholding ratios

	Model (1) High insider shareholdings		Model (2) Low insider shareholdings	
	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept	6.083***	13.122	6.190***	13.422
InsPledgeRatio	0.632***	4.121	0.262	1.311
MktCap	−0.062*	−1.766	−0.120***	−3.484
LEV	0.460*	1.884	0.931***	5.069
Cash	0.383	0.822	−0.516	−1.633
PPE	0.389	1.390	−0.068	−0.320
Age	−0.008	−0.124	0.046	1.171
MB	−0.011	−0.147	0.006	0.094
SG	0.002	1.101	0.000	−0.184
Profit	−1.033	−1.817	0.359	0.879
ZScore	0.032	0.494	−0.164***	−2.925
InsidHold	−0.087	−0.364	−0.198	−1.038
InstiHold	−0.102	−0.458	0.157	0.700
Deviation	0.032	0.098	0.221	0.331
Amount	−0.079***	−5.105	−0.064***	−5.931
Maturity	0.168***	6.689	0.135***	8.292
Secured	0.179***	3.869	0.063*	1.956
Syndicated	0.111*	1.708	0.069	1.397
Year fixed effect	Yes		Yes	
Industry fixed effect	Yes		Yes	
Bank fixed effect	Yes		Yes	
Adj. R^2	0.327		0.308	
N	52,045		56,272	

Notes: The dependent variable *Spread* is the natural logarithm of spread (loan rate minus risk-free rate on the initiation day in basis points). *InsPledgeRatio* denotes the insiders' pledge ratios measured as insiders' total pledged shares for bank loans divided by their shareholdings. *MktCap* is the natural logarithm of market capitalization in millions new Taiwan dollars. *LEV* is the ratio of long-term debt plus debt in current liabilities to total assets. *Cash* is measured as cash and cash equivalents divided by total assets. *PPE* is the ratio of net property, plant, and equipment to total assets. *Age* is the natural logarithm of one plus firm age, measured as the period since a firm listed by year. *MB* is the ratio of market value of equity plus book value of debt to total assets. *SG* is the yearly sales growth rate. *Profit* is the ratio of EBIT to total assets. *Z-Score* is measured following Altman (1968) as (1.2 * working capital + 1.4 * retained earnings + 3.3 * pretax income + 0.999 * total sales)/total assets. *InsidHold* is the ratio of insiders' shareholdings to total outstanding shares. *InstiHold* is the ratio of institutional investors' shareholdings to total outstanding shares. *Deviation* is the deviation between controlling shareholders' control (voting) rights and cash flow rights. *Amount* is the natural logarithm of loan amounts in thousands. *Maturity* is the natural logarithm of the loan period in months. *Secured* is a dummy variable that equals one if a loan is secured, and zero otherwise. *Syndicated* is a dummy variable that equals one if a loan is a syndicate loan, and zero otherwise. We use White's (1980) robust standard errors and Petersen's (2009) approach to adjust heteroskedasticity and clustering at the firm level. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 7. Share pledging and bank loan contracting: Amounts and maturities

	Model (1): *Amount*		Model (2): *Maturity*	
	Coeff.	*t*-stat.	Coeff.	*t*-stat.
Intercept	6.430***	11.520	−2.060***	−3.230
InsPledgeRatio	−0.012	−0.087	−0.135	−0.709
MktCap	0.528***	14.754	0.063	1.545
LEV	1.334***	6.137	0.144	0.561
Cash	0.451	1.342	0.888**	2.453
PPE	0.124	0.734	0.651**	2.382
Age	0.069	1.618	−0.162***	−3.175
MB	−0.460***	−8.432	−0.045	−0.762
SG	−0.004***	−4.048	−0.003**	−2.459
Profit	−0.843*	−1.836	1.035**	2.389
ZScore	0.025	0.407	−0.118*	−1.899
Spread	−0.152***	−7.877	0.284***	8.762
Maturity	0.182***	11.055		
Amount			0.165***	10.143
Secured	0.265***	6.618	0.448***	8.609
Syndicated	0.260***	2.689	0.779***	6.717
InsidHold	−0.278	−1.503	0.274	1.189
InstiHold	0.543***	3.123	−0.304	−1.503
Deviation	0.321	0.878	0.302	0.609
Year fixed effect	Yes		Yes	
Industry fixed effect	Yes		Yes	
Bank fixed effect	Yes		Yes	
Adj. R^2	0.403		0.297	
N	108,317		108,317	

Notes: The dependent variable *Spread* is the natural logarithm of spread (loan rate minus risk-free rate on the initiation day in basis points). *InsPledgeRatio* denotes the insiders' pledge ratios measured as insiders' total pledged shares for bank loans divided by their shareholdings. *MktCap* is the natural logarithm of market capitalization in millions new Taiwan dollars. *LEV* is the ratio of long-term debt plus debt in current liabilities to total assets. *Cash* is measured as cash and cash equivalents divided by total assets. *PPE* is the ratio of net property, plant, and equipment to total assets. *Age* is the natural logarithm of one plus firm age, measured as the period since a firm listed by year. *MB* is the ratio of market value of equity plus book value of debt to total assets. *SG* is the yearly sales growth rate. *Profit* is the ratio of EBIT to total assets. *Z-Score* is measured following Altman (1968) as (1.2 * working capital + 1.4 * retained earnings + 3.3 * pretax income + 0.999 * total sales)/total assets. *InsidHold* is the ratio of insiders' shareholdings to total outstanding shares. *InstiHold* is the ratio of institutional investors' shareholdings to total outstanding shares. *Deviation* is the deviation between controlling shareholders' control (voting) rights and cash flow rights. *Amount* is the natural logarithm of loan amounts in thousands. *Maturity* is the natural logarithm of the loan period in months. *Secured* is a dummy variable that equals one if a loan is secured, and zero otherwise. *Syndicated* is a dummy variable that equals one if a loan is a syndicate loan, and zero otherwise. We use White's (1980) robust standard errors and Petersen's (2009) approach to adjust heteroskedasticity and clustering at the firm level. ***, **, and * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.