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The decline of bank ownership and firm's capital structure:

Evidence from Japanese business groups

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Abstract

This paper examine how firms adjust their capital structure when their relationship with banks weaken. To this end, we use the data from Japan, a country that has experienced a sharp decline in the traditional bank-oriented business group system after its banking crisis in the late 1990s. We document the decline of financial leverage of Japanese firms after the crisis. The dynamic GMM model reveals that the decline is pronounced as the bank's influence weakens firm's financial leverage decreases. Finally, we show that as the bank relationship weakens, the speed of adjustment for target leverage fastens. These results indicate that the shift of bank-oriented to market-oriented economic system change the firm's financial decision making.

JEL classification: G21, G30

Keywords: Bank ownership; Business groups; Keiretsu; Financial leverage; Speed of adjustment

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1 Introduction

Japan had long been regarded as a country dominated by large bank-centralized business groups. In each group, a bank, called the main bank, played an essential role in supporting firms, not only by lending but also by taking equity positions.² This tight bank-firm relationship can increase the main bank's private information and reduce asymmetric information. This, in turn, may mitigate the firm's financial constraints and increase its access to bank loans (Fukuda and Hirota, 1996; Hoshi et al., 1990). Consistent with this view, strong relationship banking allows related firms to be more leveraged (Byoun, 2008; Fukuda and Hirota, 1996; Gopalan et al., 2007; Hoshi et al., 1990, 1991; Khanna and Yafeh, 2007) and reduces their incentive to adjust their capital structure (Yamada, 2019).

While previous studies have already examined the impact of the bank-firm relationship on financial leverage, such a relationship is often assumed to be static. Thus there is little evidence on how the *dynamics* of the bank-firm relationship affect financial decision-making. Accordingly, the relationship is sometimes criticized for being costly, i.e., for having switching costs (Kim et al., 2003) and leading to credit crunch problems (Chava and Purnanandam, 2011). Thus, understanding the consequence of abandoning such a relationship is non-trivial. Unlike in many other countries where internal capital markets remain strong, the bank-firm relationship in Japan has been weak in the last few decades. Specifically, the collapse of the land price bubble in early 1990 generated a tremendous number of bad loans. Consequently, the Japanese banking sector experienced a severe credit crunch, making it difficult for banks to support their member firms and weakening the solidarity of Japanese business groups (Hoshi and Kashyap, 2010).

²The role of banks in Japanese business groups is explained in Hoshi et al. (1990) and Aoki (1994).

The shift towards a market-oriented system has reduced both the board membership and equity ownership of banks (Kato et al., 2017), and has increased equity ownership of foreign investors (Miyajima et al., 2018), which, in turn, increased the importance of institutional investors in corporate decision making (Ueda, 2015). In this study, we seek to further our understanding of the consequences of the move toward a market-oriented system. While prior studies have documented the weakening of bank power in the Japanese economy, the impact of such a weakening of power on a firm's financial leverage is yet to be explored. Our focus on financial leverage ought to complement the previous evidence, which shows that firm's capital structure decisions are affected by the strength of bank-firm relationships (Hoshi et al., 1990, 1991).

Using data from Japanese listed companies over the period 2001–2014, we examine the impact of the decline of banks' influence on firms' financial structure. We find that the financial leverage of group-affiliated firms (i.e., firms with bank ownership) declines significantly each year, with a total decline of 8.7% between 2001 and 2014, while the change in the financial leverage of independent firms (i.e., firms without bank ownership) is not statistically significant. We also find that the speed at which group-affiliated firms adjust to their target leverage is 6.6% per year, whereas that of independent firms is 19% each year. Further analysis shows that the deterioration in the bank-firm relationship increases the speed of adjustment toward the target leverage.

Our contribution to the literature is twofold. First, prior studies examine the costs and benefits of the group structure by comparing the different activities of group-affiliated firms and independent firms in stable market conditions (Gopalan et al., 2007; Hoshi et al., 1990; Khanna and Yafeh, 2007). We argue that such a comparison may be misleading, as group-affiliated firms

may choose to borrow more than their independent counterparts not because of their group membership, but because they have other (unobserved) characteristics that make them more attractive to lenders. To mitigate this concern, we investigate whether changes in the group structure affect the financial behavior of member firms. Our findings support the view that bank-relationship matters - capital structure dynamically changes as the bank-firm relationship changes.

Second, we provide the first evidence on the impact of the bank-firm relationship on firm's financial leverage and the speed at which firms adjust their leverage toward an optimal target level during a period that is characterized by a weakening in the internal capital market. We argue that firms' capital structure decisions may differ greatly across stable and deteriorating internal capital markets. Stable markets allow firms to develop strong links with their lenders and increase the availability of cheap bank loans (Weinstein and Yafeh, 1998). Thus, in such conditions, firms are expected to borrow more and adjust slowly to their target leverage. However, the decline in bank ownership associated with the deterioration of the group structure is expected to exacerbate information asymmetries between banks and borrowers and increase the cost of debt. Thus, in deteriorating internal capital markets, firms are expected to adopt a conservative capital structure and adjust faster to their target leverage.

The remainder of this paper is organized as follows. Section 2 provides a brief review of the related literature. Section 3 discusses the methodology used. Section 4 presents the data and the descriptive statistics. Section 5 discusses our results. Section 6 provides the necessary robustness tests. Section 7 concludes.

2 Literature review and hypothesis development

2.1. Bank-oriented business groups in Japanese

Japan was an example of a bank-oriented business group (called *keiretsu*) that contributed to the fast growth of the Japanese economy up to the 1980s (Aoki, 1994; Hoshi et al., 1990; Kang and Shivdasani, 1997; Kaplan and Minton, 1994). In the *keiretsu* system, a bank had to take care of member firms, not only by providing liquidity but also by monitoring management (Aoki, 1994; Hoshi et al., 1990). Furthermore, banks played a role in the certification of firm quality (Kang et al., 2000).

Unlike those in many other countries, the main banks in Japan played the role of both lenders and stockholders. This dual role reduced any potential conflict of interest between creditors and equity holders, as well as the agency cost of Japanese firms (Prowse, 1990; Aoki and Patrick 1994).

Theoretical predictions illustrate that bank-firm relationships impose high switching costs, making it difficult for firms to change their main bank or have multiple bank relationships (Rajan, 1992; Weinstein and Yafeh, 1998). The collapse of the Japanese land price bubble in 1990 highlighted the dark side of the tight bank-firm relationship. The recession of the 1990s generated a severe bad loan problem (Hoshi and Kashyap, 2010), forcing some of the Japanese banks to abandon their role as liquidity providers and reduce their equity stakes in group-affiliated firms (Nitta, 2008). In other words, the Japanese banking crisis weakened the relationship between banks and firms as well as between firms within the same business group.

The shift towards the market-oriented system and its consequences has been subjects of intense academic inquiry. When a bank strongly influences client firms, the bank tends to send board members. However, Kato et al. (2017) find a decline in the frequency of board members from banks. The equity ownership by banks has been reduced since the 1990s, whereas that by

foreign investors has increased³. Such a shift in ownership structure has changed the CEO turnover decision, raised sensitivity of operating performance and CEO turnover (Miyajima et al., 2018), and enhanced the monitoring role of institutional investors Ueda (2015). Using a text analysis method, Tomeczek (2022) also shows that the bank-firm relationship has been the core of Japanese business groups, but currently the importance of the banks has deteriorated. Furthermore, the information rent obtained by the banks has been reduced as the power of the banks has declined (Wu and Yao, 2012).

This view of the decline of bank-firm relationship is also supported by some articles in the *Nikkei* newspaper, which is equivalent to the *Financial Times* and *Wall Street Journal*. The newspaper stated that Japanese listed firms started to cut off their relationships with banks because they were afraid that unhealthy banks would not be able to support them as before⁴ when they were in financial trouble (the *Nikkei*, September 15, 1998). Furthermore, there were several mergers between firms with different main banks, a phenomenon which had not been well observed for several decades under a strong bank-firm relationship.^{5,6}

2.2. Internal capital markets and financial leverage

³Zeitun and Goaid (2021) show the relationship between the ownership by foreign investors and financial policy of Japanese firms.

⁴Kang and Stulz (2000) illustrate a decline in the operating performance of unhealthy banks in Japan after the collapse of the land price bubble.

⁵The article titled “Nissan to take 34% stake in Mitsubishi Motors,” was published on May 12, 2016 in *Financial Times*. This article discusses the case of Mitsubishi Motors, a member company of the Mitsubishi Group. The automobile company faced financial distress in 2001, 2004, and 2016, due to scandals related to false fuel efficiency reports. In both 2001 and 2004, the company was saved and supported by other members of the Mitsubishi Group. However, in 2016, the other members in the group did not support the motor company. Consequently, it was purchased by a competitor motor company, Nissan Motors, a member of the Fuji Group.

⁶Another example is the joint venture company for thermal power generation, founded by Mitsubishi and Hitachi. These two companies belonged to different business groups. Mitsubishi Heavy Industry was in the Mitsubishi Group and Hitachi belonged to the Mitsui Group. The following quote is from an article entitled “Hitachi and Mitsubishi Heavy in tie-up,” published in *Financial Times* (November 29, 2012): “Two of Japan’s top industrial conglomerates are to merge their thermal power plant units, mounting a challenge to Siemens and GE, at a time of growing uncertainty over the global outlook for fossil-fueled power.”

Previous studies show that business groups provide liquidity in weak financial institutions and less-developed financial markets (Almeida et al., 2015; Masulis et al., 2011; Morck et al., 2005). In some countries, banks are the centers of the business groups, providing liquidity for other group members. In the case of Japan, a bank called the main bank is a liquidity transmitter within each group. Several studies show that the strength of the bank-firm relationship affects firms' capital structure decisions. Fukuda and Hirota (1996) find that firms with strong bank ties have higher leverage ratios. Fan et al. (2012) also show that Japanese firms are more leveraged than their counterparts in other countries. Similarly, Weinstein and Yafeh (1998) find that a bank-firm relationship increases the availability of bank loans, especially for firms with limited access to the capital markets. They attribute this finding to the fact that relationship banking reduces the asymmetric information between banks and borrowers (Diamond, 1984).

The relationship between market system (bank- or market-oriented systems) and financial leverage is well observed outside of Japan. Using the listed companies data from 42 developed countries, De Jong et al. (2008) show that firms in market-oriented countries tend use more equity financing. In other word, financial leverage of the firms in bank-dependent countries is higher than those in other countries. Based on the survey for the CFOs in European listed companies, Brounen et al. (2006) show that managers follow the trade-off theory.

In a theoretical study, Kim and Limpaphayom (1998) provide a detailed explanation of the pros and cons of the bank-firm relationship. They show that, under normal conditions, institutional ownership moderates the use of debt by playing a monitoring role in the *Keiretsu* business group. However, when firms are in financial difficulty, institutional investors take control by reducing debt levels.

Taking this a step further, we analyze how the weakening of the bank-firm relationship affects firm's capital structure decisions.⁷ If a bank plays the role of the main capital provider for its client firms, the amount of debt will decline as the bank's influence weakens. We argue that previous studies on the effect of bank ownership on firm's financial decisions may suffer from an endogeneity problem, as banks may choose to invest in more healthy firms that tend to be more leveraged.

The diminishing influence of Japanese banks over their client firms in recent decades provides a unique opportunity to examine the impact of the deterioration in the group structure on firm's capital structure decisions. As the bank-firm relationship weakens, the information advantage by banks diminishes, increasing the degree of asymmetric information between firms and stock investors.

While Fukuda and Hirota (1996) also investigate the effect of group membership on the capital structure decisions of Japanese firms, their analysis is conducted over the period up to the 1990s, a period characterized by the great influence of Japanese banks on group-affiliated firms. We extend their sample to 2014 in order to include the periods in which banks started to lose their dominating influence over firms. If the bank-firm relationship is indeed a determinant of firm leverage, we predict a decline in the financial leverage of group-affected firms as banks lose their influence over these firms due to the increased opacity about the quality of firm. Therefore, we propose the following hypothesis:

Hypothesis H1: *Financial leverage declines as the bank ownership weakens.*

⁷ This decline in the cross-shareholding in the Japanese corporations has been well documented in the previous literature. See, e.g., Isagawa (2007).

2.3.Internal capital markets and the speed of adjustment

We analyze the relationship between internal capital markets and the speed of adjustment toward firms' target leverage. Antoniou et al. (2008) compare the determinants of the capital structure between capital market- and bank-oriented institutions. Their results illustrate that firms in bank-oriented countries, such as Japan, are the slowest to adjust their leverage to the target ratios. Furthermore, Antoniou et al. (2008) argue that this speed of adjustment is significantly affected by the economic environment, institutions, tax systems, corporate governance mechanisms, and borrower-lender relationships. Moreover, Öztekin and Flannery (2012) also find that the adjustment speed toward target leverage ratios is slow in countries with bank-dominant economic systems.

Öztekin and Flannery (2012) identify several channels that can affect the speed of adjustment. The first channel is that market-level efficiency. Assuming that the financial market friction is low for market-oriented economies due to the effectiveness of the law, firms in these markets are required to pay low costs for adjusting their capital structure, as shown by Levine (2002). The second channel comes from individual firm-level characteristics, such as the level of information asymmetry. Firms in bank-oriented economies, which may be monitored by banks more closely and can access bank loans cheaply, due to low asymmetric information, are expected to will adjust their capital structure more slowly.

We distinguish between these two channels by using single-country data. If the slow adjustment speed comes from the economic level efficiency channel, the speed of adjustment does not change even if the bank-firm relationship weakens because firms belong to the same economy. Therefore, we propose the following hypothesis.

Hypothesis H2-A: *The weakening of bank-firm relationship does not affect the firms' speed of adjustments.*

If this hypothesis holds, then, we can argue that the adjustment speed is determined by the market-level characteristics.

The second possibility comes from the fact that the speed of adjustment comes from firm-level characteristics. If the firm-level characteristics are relevant, we would expect the change in the bank-firm relationship to exert influence of the adjustment speed. Previous studies document that bank ownership reduces information asymmetry (Puri 1996), grants firms more accessible access to debt financing, and reduces the need to use debt as a signal of quality. This, in turn, makes the cost of the speed adjustment relatively similar to the cost of being off-target. Hence, firms with bank ownership are expected to adjust their leverage toward their target ratios faster than their counterparts without bank ownership.

Then, what happens if the bank-firm relationship changes? The weakened bank-firm relationship could influence the speed of adjustment in two ways. First, while banks are known to generate private information, they are also known to utilize them by looking for informational rent because the private information is exclusively used by a bank (Rajan, 1992). Once the bank-firm relationship weakens, firms need to disclose more information to investors in order to reduce their cost of capital. To take advantage of the cheap financing associated with reduction in information asymmetry; firms may be inclined to increase the speed of their capital structure adjustment.

Hypothesis H2-B: *The decline in bank-firm relationship increases the speed of adjustment.*

On the other hand, if bank's monitoring role spurs that by market, the reduction of bank relationships increases the asymmetric information with investors (Puri, 1996). In this case, the agency cost increases due to the lack of monitoring on the company. Therefore, the adjustment cost increases, leading to a slower speed of adjustment.

Hypothesis H2-C: *The weakening of bank-firm relationship reduces the speed of adjustment.*

3 Methodology

Our empirical analysis consists of the following two parts. The first part examines the change in capital structure following the weakening of bank-firm relationship, while the second part tests the change in the speed of adjustment as bank-firm relationship weakens.

For the first part of our analysis, we estimate a fixed-effect model to capture the effect of bank ownership on a firm's financial leverage. Before testing the hypothesis, we replicate the model by Hirota (1998) by estimating following equation:

$$BLR_{i,t}^{\square} = \alpha + \delta Pct. Bank Ownership_{it} + \beta_i X_{i,t-1}^{\square} + \gamma_i + \omega_{i,t}^{\square}, \quad (1)$$

where the subscripts i and t represent firms and years, respectively. $BLR_{i,t}^{\square}$ denotes the book leverage ratio, defined as the book value of debt divided by total assets.⁸ $Pct. Bank Ownership_{it}$ is the bank ownership of firm i at year t . We expect a positive association between bank ownership and firm's capital structure (i.e., $\delta > 0$ is expected to be positive).

Then, we test our hypothesis H1 using the following specification:

⁸ For robustness purposes, we also use market leverage, defined as the ratio of the book value of debt to the market value of the firm, as an alternative leverage measure.

$$BLR_{i,t}^{\square} = \alpha + \delta^c \text{Change in Bank Ownership from 2001}_{it} + \beta_i X_{i,t-1}^{\square} + \gamma_i + \omega_{i,t}^{\square}, \quad (2)$$

where

$$\begin{aligned} \text{Change in Bank Ownership from 2001}_{it} \\ = \text{Pct. Bank Ownership}_{it} - \text{Pct. Bank Ownership}_{i2001} \end{aligned} \quad (3)$$

The variable *Change in Bank Ownership from 2001*_{it} is the change of the bank-ownership from 2001 to year *t*. H1 predicts $\delta^c > 0$.

The second empirical part examines the existence of target leverage in a framework that allows for an adjustment of costs and measures the speed of adjustment, we follow Antoniou et al. (2008), Öztekin and Flannery (2012), and Warr et al. (2012), and use a two-stage approach. In the first stage, we model each target leverage ratio as a function of observed firm characteristics.

$$BLR_{i,t}^* = \beta_i X_{i,t-1}^{\square} \quad (3)$$

where *X* is the vector of control variables defined in Equation (1). Using the standard representation of the partial adjustment model, we obtain:

$$BLR_{i,t}^{\square} - BLR_{i,t-1}^{\square} = \lambda (BLR_{i,t}^* - BLR_{i,t-1}^{\square}) + \delta_{i,t} \quad (4)$$

Equation (4) shows that a firm adjusts its target ratio based on a trade-off between the benefits by adjusting the capital structure and the cost of the leverage adjustment (Antoniou et al., 2008; Leary and Roberts, 2005). The $\lambda = 1$ indicates that the firm adjusts its capital structure perfectly to its target ratio, and hence that the transaction costs are zero, while $\lambda = 0$ suggests that the firm

does not adjust its capital structure and the current leverage ratio equals the previous year's leverage ratio. H2-A predicts $\delta^c = 0$, H2-B predicts $\delta^c < 0$, H2-C predicts $\delta^c > 0$.

Assuming that the target leverage ratio, $BLR_{i,t}^*$, is the predicted value from Equation (2), which is time-dependent and a function of the firm's explanatory variables (X), then by substituting Equation (2) into Equation (3) and rearranging, we obtain the following dynamic panel model:

$$BLR_{i,t} = (1 - \lambda)BLR_{i,t-1} + (\lambda\delta)Pct. Bank Ownership_{i,t-1} + (\lambda\beta)X_{i,t-1} + \omega_{i,t} + \delta_{i,t}(4)$$

The degree of bank-firm relationship is defined as the equity ownership by banks because, in Japan, holding equity is frequently observed as a signal of familiarity (Aoki 1994). Hence, we define the degree of bank-firm relationship by using the bank's equity ownership. We use two definitions for the bank equity ownership, *Pct. Bank Ownership*. First, we use the ownership by the main bank as a proxy for the bank's ownership percentage in a firm. In line with Fukuda and Hirota (1996), we identify the bank with the largest equity ownership in a particular firm in 2001. Second, we use the ownership by all banks as a proxy for bank ownership percentage in a firm. If multiple banks own the firm's shares, we use the total amount of ownership by all banks holding that firm's equity. A firm may have an incentive to construct close relationships with various banks to reduce switching costs (Kim, Kliger and Vale, 2003). Indeed, Weinstein and Yfeh (1998) point out the high cost of capital under traditional business groups. In this case, firms may have incentive to reduce switching costs by maintaining multiple bank relationships.

X is a vector of control variables shown by previous studies to affect a firm's leverage (Flannery and Rangan, 2006; Hovakimian et al., 2001; Öztekin and Flannery, 2012). These

variables include profit, market-to-book ratio, firm size, tangibility, R&D dummy, R&D expenses, liquidity, depreciation, and median industry leverage. *MB* represents the market-to-book ratio, defined as the market value of equity divided by the book value of equity. *Cash Flow* is defined as the EBITDA plus depreciation divided by total assets. *RDD* is an indicator variable with a value of 1 if the R&D expense is non-zero and 0 otherwise. *R&D Expense* is the R&D expense divided by the total assets. *Firm Size* is the natural logarithm of the total assets. *Tangibility* is the ratio of property, plant, and equipment to total assets. *Liquidity* is the current assets divided by the current liabilities. *Beta* is the market beta measured by the CAPM in previous year. *Industry Leverage* is the median value of the financial leverage in the same industry/year. Following Lemmon et al. (2008), we include the firm-level fixed effect to capture firm unobservable effects. $\delta, \beta_i, \gamma_i$ and $\omega_{i,t}^{\square}$ are unknown parameters that will be estimated. All continuous variables are winsorized at the 1st, and 99th percentiles.

All explanatory variables used in the estimation process are lagged one year to mitigate reverse causality concerns. We also control for unobserved firm heterogeneity by including firm- and year-fixed effects. Standard errors are clustered at the firm level.

Using the OLS model for the dynamic model brings a biased estimator (Balestra and Norlove, 1966). Furthermore, Blundell and Bond (1998) point out that the estimates are biased when the dependent variable is serially correlated, or the parameter of the lagged dependent variable $(1 - \lambda)$ is similar to 1.⁹ Hence, we use the system GMM (generalized method of moments) estimates proposed by Blundell and Bond (1998) to estimate the parameters in

⁹ Indeed, as we will show later, the estimates of lagged variables are near to one indicating using system GMM is preferable.

Equation (4).¹⁰ The system GMM estimator is obtained from two types of equations: (1) first differencing equations with a level of lagged dependent variables as instrumental variables, as Arellano and Bond (1991) suggest, and (2) levels equations with lagged first-differences as instruments. Flannery and Hankins (2013) compare the performance of several methods and shows that the system GMM is the best estimator of the coefficient on the dynamic panel's lagged-dependent variable when independent variables are exogenous.

The vector X contains a set of variables relate to financial leverage. Following on the previous studies such as Flannery and Rangan (2006) and Faulkender et al (2012), we choose the following variables *MB*, *Cash Flow*, *Depreciation*, *RDD*, *R&D Expense*, *Firm Size*, *Tangibility*, *Liquidity*, and *industry Leverage*. *MB* is the market to book leverage. *Cash Flow* is defined as the sum of EBITDA divided by total assets. *Depreciation* is depreciation divided by total assets. *RDD* is a dummy variable that takes the value of one if the R&D expenditure takes a non-zero value. *R&D Expense* is defined as the R&D expenditure divided by total assets. *Firm Size* is the natural logarithm of the total assets, *Tangibility* is defined as the tangible assets divided by total assets, *Liquidity* is defined as current assets divided by total assets. *Industry Leverage* is the median of book leverage for each industry based on the Nikkei's two-digits industry classification.

¹⁰ In dynamic panel data, where the lagged dependent variable is an explanatory variable, a number of estimation methods, such as pooled OLS, fixed effect model Arellano-Bond GMM, Blundell-Bond system GMM, and LSDVC, are used in previous literature.

4 Data and descriptive statistics

The financial dataset is provided by the Value Search data service at Nikkei Media Marketing. The sample employs annual firm-level financial and ownership information, covering the period from 2001 to 2014.¹¹ Our dataset begins in 2001 because Nikkei Media Marketing started to collect ownership data during that year. Our dataset ends in 2014 because of the change of the Japanese economic environment. Japanese economy has shifted from bank oriented to market oriented one. This shift was mainly characterized by the introduction of the stewardship code which was employed in Japan in 2014. This code gives substantial power to blockholders, namely institutional investors excluding commercial banks (for further discussion on this, see, i.e., Tsukioka 2020). Further, the bank of Japan stated to increase their heavily engage in the stock market through its ETFs purchasing program, hence, increasing the ownership by institutional investors (Sai and Yamada, 2020). Therefore, we have a strong reason to believe that the structure of the Japanese economy has drastically changed in 2014.

In our analysis, the closeness of a firm and its main bank is measured by the bank's equity ownership information. In Japan, it was common to hold stocks of firms in a close relationship. The ownership information contains the top 30 stockholders for each firm-year observation. This approach is slightly different from that used in traditional Japanese research, as such research identifies the membership of bank-oriented business groups by using *Japanese Company Handbook*, which ceased to exist after the year 2000. Furthermore, it is difficult to measure the closeness between the bank and firm using the membership information. Following prior literature and due to the differences in financial statements, we exclude financial firms, regulated

¹¹ We do not consider the business group information that has been used in traditional Japanese research. The previous literature mainly relies on information from the *Japanese Company Handbook*. However, the last issue of the *Japanese Company Handbook* was published in 2000. Furthermore, all large banks in Japan experienced mergers, so our dataset cannot adopt the method used in the traditional literature.

utilities, and ETFs from our sample. The final sample includes 45,443 firm-year observations representing 4,413 unique firms.

Table 1 reports the summary statistics of bank ownership and financial leverage, where bank ownership is computed as the total amount of bank's equity ownership in a firm each year. In other words, if more than two banks own part of a firm's equity, we sum up their equity holdings into one number. On average, 4% to 8% percent of a firm's stock is owned by banks. However, this percentage declines over time, from less than 6.4% in 2001 to less than 3.7% in 2014. Additionally, we find that this decline in bank ownership is accompanied by a decrease in the firm's financial leverage each year over the sample period, from 32% in 2001 to 24.5% in 2014.

<Insert Table 1 here>

To obtain a better understanding of the distribution of the financial leverage, we divide our sample into two groups. The first group consists of firms with bank ownership in 2001, while the second group comprises firms without bank ownership in 2001. Panel A of Table 2 reports the summary statistics for the variables used in the subsequent analyses. Firms with bank ownership differ significantly from those without bank ownership in terms of financial leverage and other characteristics. Specifically, firms with bank ownership have lower market-to-book leverage, cash flow, and depreciation. While firms with bank ownership report the R&D item more frequently, their mean value of R&D expenditure is lower than that of firms without bank ownership. Additionally, firms with bank ownership are larger in size, more liquid, in possession of more tangible assets, and more likely to belong to industries with high financial leverage than their counterparts without bank ownership.

Panel B of Table 2 reports the correlation matrix of the variables in our analysis. The highest correlation is between tangibility and depreciation (0.56), which is expected, as large numbers of

tangible assets increase the payment for depreciation. All the remaining correlations are less than 0.5, implying that multicollinearity is unlikely to be a problem in our analysis.

<Insert Table 2 here>

Table 3 compares the financial leverage of firms with and without bank ownership. We use the propensity score matching method to match each firm with bank ownership in 2001 with another firm without bank ownership in the same year. We use *MB, Cash Flow, Depreciation, RDD, R&D Expense, Firm Size, Tangibility, Liquidity, and Industry Leverage* as control variables in the matching process.

Table 3 shows that the financial leverage of firms with bank ownership is significantly higher than that of firms without ownership. For example, in 2001, the average leverage of firms with bank ownership is 33.0%, whereas that of firms without bank ownership is 24.5%. The difference is significant at 1% or better. The results also reveal that financial leverage decreases (almost) monotonically over the study period, with the decrease being more pronounced for firms with bank ownership.

The mean financial leverage of firms with bank ownership decreases dramatically from 33.0% in 2001 to 28.8% in 2008 and 24.3% in 2014, while that of firms without bank ownership experiences a steady decline from 24.5% in 2001 to 20.4% in 2008 and 19.3% in 2014. Since we aim to identify the changes in financial leverage from the beginning of our sample period (2001), we also calculate the average of the differences between a firm's financial leverage in the given year and its leverage in the base year, 2001. Table 3 shows that the mean value of financial leverage for firms with bank ownership declines dramatically (by 10.67%) from 2001 to 2008; this result is statistically significant at the 1% level. However, although the financial leverage of firms without bank ownership also drops by 4.1% during the same period, the decline is not

statistically significant. For the period after 2008, firms' reliance on leverage decreases even further, but the decrease is still more noticeable for firms with bank ownership. Finally, the overall mean changes in the financial leverage associated with firms with (without) bank ownership falls a total of 8.7% (5.2%) from 2001 to 2014.

<Insert Table 3 here>

5 Empirical results

5.1 Bank ownership and firm leverage

Table 4 presents the estimation results of Equation (1). Columns (1) and (2) use the bank relationship by the equity ownership by the main bank, while columns (3) and (4) report the results from using equity ownership by all banks.

Columns (1) and (3) replicate the results by Hirota (1996) in our sample. We expect high financial leverage for firms with tight bank-relationship. Therefore, we expect a positive coefficient on *Pct Bank Ownership*. Column (1) uses the percentage of main bank's ownership as a main explanatory variable and finds a positive coefficient that is statistically significant at the 1% level. The estimated coefficient of 0.532 indicates that a 1% increase in ownership leads to a 0.532% increase in financial leverage. The results from using the ownership by all banks are qualitatively similar to those generated from the ownership by the main bank. Specifically, the ownership by all banks is positively associated with financial leverage at the 1% significance level (column (3)).

Columns (2) and (4) report the results of Eq. (2). Our variable of interest is *change in Bank Ownership from 2001_{it}*, which is defined as the difference of bank ownership from 2001 to year t . Our hypothesis H1 predicts positive value coefficient. Indeed, as per Table 3, for the majority of sample firms there was a decline in their bank ownership from

2001, therefore, the majority of our sample takes negative value for *Change in Bank Ownership from 2001_{it}*. Moreover, H1 expects a decline of firms' financial leverage for these firms with a negative value of *Change in Bank Ownership from 2001_{it}*. Therefore, we expect a positive value for δ .

The estimated coefficient of *Change in Bank Ownership from 2001_{it}* is positive and statistically significant at the 1% level in both columns (2) and (4), implying that the decline in book financial leverage following firms deterioration of the bank-firm relationship. The sample size in column (2) is 41,821, slightly smaller than that in column (1), because firms that were not listed on the stock market in 2001 are excluded from the estimation.

Furthermore, column (4) reports the result where the bank ownership is defined by the aggregated bank ownership. Similar to column (2), the change of equity ownership by all banks is also positively associated with financial leverage at the 1% level.

We note that the results for the control variables are generally consistent with those in the prior literature (Hovakimian et al., 2001; Öztekin and Flannery, 2012). For example, we find that market-to-book ratio, cash flow, depreciation liquidity, and RDD are negatively related to firms' financial leverage, while firm size, tangibility, and industry leverage are positively related to their financial power.

<Insert Table 4 here>

5.2 Bank ownership and speed of adjustment

Next, we test H2, which relates to the speed of adjustment of financial leverage by estimating equation (4). Table 5 shows that the one-period lagged dependent variable, financial book leverage, has a significantly positive impact on firms' capital structure decisions. Column 1 of Table 5 reports the results of the entire sample analysis, whereas columns 2 and 3 report those of

subsamples with different bank ownership. The estimated parameter λ suggests adjustment speed toward the optimal capital structure. The findings indicate that firms with bank ownership adjust their capital structures at a slower pace than their counterparts without bank ownership.

In column 1, the estimated coefficient of the *Leveage* is 0.816 indicating that the speed of adjustment of the firms with zero bank ownership is 18.4% annually. The parameter of the *Pct Bank Ownership* is 0.00852 implying that the speed of adjustment slow down 0.8% as the 1 percentage point increase of the bank ownership.

We also find the difference in the speed of adjustment by bank ownership by conducting the subsample analysis. The GMM estimates indicate that the speed of adjustment for firms with bank ownership is about 8.5% per year (column 2), while that of the firms without bank ownership reaches 20.5% per year (column 3). This evidence indicates that bank ownership helps mitigate agency and asymmetric information problems between firms and banks, leading to a reduction in the cost of the adjustment relative to the cost of being off-target. The results support H2-B, which predicts that the weakening of bank-firm relationship results in a faster speed of adjustment.¹²

<Insert Table 5 here>

Furthermore, to test how the yearly changes in bank ownership affect the speed at which firms adjust to their target leverage, we limit our sample to firms with a 2001 bank ownership higher than the industry median. We then divide the sample into two groups. The first group

¹² We also conduct an estimation with interaction term where we add a dummy variable that takes the value of one for none-zero bank ownership observations and lagged leverage ratio. The estimated coefficient of the interaction term is negative supporting the difference in two groups (columns 2 and 3) are statistically significant at the 5% level. However, the results of the Hansen's overidentification test is insignificant ($p=0.159$) possible due to the increase of the instrumental variables.

includes firms with a decline in bank ownership of more than 5 percentage points from 2001, while the second group consists of firms with a decrease in bank ownership of less than 5 percentage points for the same period. We predict that firms with a large decline in bank ownership will adjust faster to their target leverage.

To test this prediction, we use the system GMM method to estimate Equation (4) for each of the two groups and report the results in Table 6. We find that firms with a large decline in bank ownership (column (1)) adjust faster to their target leverage than their counterparts with a smaller drop in bank ownership (column (2)). The GMM estimates suggest that the speed of adjustment of firms with the high decline in bank ownership is 20.2% (column (1)), which is much higher than the 13.7% reported for firms with a low decline in bank ownership. Our findings suggest that large negative changes in bank ownership increase the asymmetric information and agency costs between the bank and the firm. These, in turn, increase the cost of debt and the cost of leverage adjustment for these firms.

<Insert Table 6 here>

6 Robustness Tests

6.1 Alternative measures of leverage

Parsons and Titman (2009) and Strebulaev and Yang (2013) argue that leverage measures can be highly ambiguous, and that scaling debt ratios by book or market values can lead to different conclusions. For robustness purposes, we follow Antoniou et al. (2008) and Öztekin and Flannery (2012) and define the market leverage ratio as the book value of debt divided by the sum of the book value of debt and the market value of equity. Table 7, Panel A reports the determinants of the market leverage by estimating Equation (1) with market leverage, rather than

book leverage, as the leverage measure. Similar to our findings in Table 4, we document a significantly positive association between bank ownership and market leverage in both bank ownership by the main bank (columns 1 and 2) and all banks (columns 3 and 4).

Table 7, Panel B reports the determinants of speed of adjustment of market leverage. We also find that firms slow down their adjustment speed as their bank ownership increases (column 1). Furthermore, the speed of adjustment of the firms with high bank ownership (31.7%) is faster than those with bank ownership (23.4%).

<Insert Table 7 here>

7 Concluding remarks

Several studies investigate the costs and benefits of bank-firm relationship as a tool for mitigating financial constraints (Hoshi et al., 1990). In this study, we contribute to the literature by examining how group-affiliated firms alter their capital structure decisions when there is a decline in bank ownership of these groups. Such analysis allows us to understand whether group-affiliated firms choose to borrow more because of their membership or because of other (unobserved) characteristics that make them more attractive to lenders.

Despite our focus on Japan, we believe that our results may be relevant in other countries settings. As explained by La Porta et al. (1998), banks have strong power as the owner of listed companies around the world. Antoniou et al. (2008) described the low speed of adjustment in bank-oriented countries. Using the data from Europe, De Jong et al. (2008) also show low stock market financing dependency in bank oriented countries.

We examine whether and how the deterioration in the bank-firm relationship affects firms' leverage and speed of adjustment toward target leverage. Using a large sample of Japanese firms

over the period 2001–2014, we document a significant decrease in the financial leverage of group-affiliated firms following the decline in the power of business groups. However, we do not report any significant change in the financial leverage of independent firms during the same period. Further analysis indicates that firms with strong bank ties adjust to their target leverage more slowly than their counterparts with weaker ties. This finding is consistent with the view that bank ownership helps mitigate agency and information asymmetry problems between firms and banks, leading to a reduction in the cost of adjustment relative to the cost of being off-target.

8 Appendix: Variable Definitions

Variable Name	Definition	Data Sources
<i>Dependent variable</i>		
Financial Leverage (Book)	The book value of the debt (sum of long and short-term debt) divided by total assets, which is reported as a percentage.	Value Search
Financial Leverage (Market)	The book value of the debt (sum of long and short-term debt) divided by the market value of the firm, which is reported as a percentage.	Value Search
<i>Main Explanatory variables</i>		
Pct. Bank Ownership	Total amount of ownership by the banks.	Nikkei CGES
One-year Change in Bank Ownership	Lagged value of the first difference of the bank ownership.	Nikkei CGES
Change in Bank Ownership from 2001	Difference in the bank ownership from the year 2001 to the year t .	Nikkei CGES
<i>Control variables</i>		
MB	The market-to-book ratio, defined as the market value of equity divided by the book value of equity.	Value Search
EBITDA	The sum of operating profit and depreciations divided by total assets.	Value Search
RDD	An indicator variable with a value of 1 if the R&D expense is non-zero and 0 otherwise.	Value Search
R&D Expense	R&D expense divided by the total assets.	Value Search
Firm Size	Natural logarithm of the total assets.	Value Search
Tangibility	Property, plant, and equipment divided by total assets.	Value Search
Liquidity	Current assets divided by the current liabilities.	Value Search
Industry Leverage	Median value of the financial leverage in the same industry/year.	Value Search
Beta	Market beta measured by the CAPM in previous accounting year.	Nikkei Quick
TaxRate	Corporate tax rate.	Nikkei FinancialQuest

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Table 1

Time pattern for bank ownership and leverage mean values

	N.	Bank Ownership		Leverage	
		Mean	Median	Mean	Median
2001	3,836	6.35	4.99	32.00	29.99
2002	3,922	6.86	5.61	31.96	30.37
2003	3,987	5.82	4.74	31.20	29.56
2004	3,953	4.84	3.70	29.42	27.58
2005	3,926	4.33	3.11	27.84	25.37
2006	3,881	4.16	2.97	26.65	24.31
2007	3,848	4.06	2.86	25.88	22.83
2008	3,773	4.04	2.83	26.05	22.62
2009	3,696	4.10	2.83	28.06	24.92
2010	3,615	3.86	2.60	27.26	24.03
2011	3,536	3.81	2.53	26.51	22.77
2012	3,447	3.82	2.56	25.69	22.32
2013	3,425	3.77	2.44	25.15	21.51
2014	3,448	3.68	2.32	24.49	21.02

This table reports the summary statistics (mean and median) of bank ownership and financial leverage across each year during the sample period, from 2001 to 2014.

Table 2

Summary statistics and correlation matrix

Panel A Summary Statistics

Variable Name	With Bank Ownership N. = 35,029			Without Bank Ownership N. = 10,414			Test in Mean <i>t</i> -statistics
	Mean	Median	St. Dev.	Mean	Median	St. Dev.	
Financial Leverage (Book)	0.286	0.260	0.195	0.228	0.166	0.208	27.16***
Financial Leverage (Market)	0.406	0.397	0.252	0.267	0.188	0.250	51.8***
Pct Bank Ownership	6.308	5.270	4.682	0	0	0	
MB	1.464	0.704	2.431	3.897	1.589	5.590	-67.82***
EBITDA	0.095	0.086	0.069	0.116	0.107	0.116	-25***
RDD	0.408	0.000	0.492	0.305	0.000	0.460	19.23***
R&D Expense	0.007	0.000	0.016	0.009	0.000	0.021	-7.24***
Firm Size	10.565	10.377	1.480	9.735	9.428	1.872	48.75***
Tangibility	0.182	0.163	0.119	0.128	0.086	0.126	41.57***
Liquidity	1.287	1.026	0.980	1.916	1.397	1.593	-50.69***
Industry Leverage	0.268	0.267	0.077	0.223	0.233	0.089	52.78***
Beta	0.866	0.732	14.359	1.112	0.912	3.217	-1.73*

Panel B Correlation matrix

		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]
Financial Leverage (Book)	[1]	1											
Financial Leverage (Market)	[2]	0.843	1										
Pct Bank Ownership	[3]	0.141	0.259	1									
MB	[4]	-0.397	-0.517	-0.248	1								
EBITDA	[5]	-0.265	-0.381	-0.155	0.313	1							
RDD	[6]	0.092	0.012	-0.035	-0.032	0.227	1						
R&D Expense	[7]	-0.092	-0.095	0.074	0.062	-0.011	0.094	1					
Firm Size	[8]	-0.122	-0.172	-0.056	0.189	0.014	0.101	0.572	1				
Tangibility	[9]	0.128	0.149	0.187	-0.206	0.038	0.087	0.138	0.064	1			
Liquidity	[10]	0.355	0.265	0.133	-0.212	0.100	0.560	0.017	-0.034	0.215	1		
Industry Leverage	[11]	-0.616	-0.609	-0.201	0.682	0.122	-0.167	0.118	0.214	-0.246	-0.405	1	
Beta	[12]	0.302	0.325	0.229	-0.287	-0.095	0.041	-0.060	-0.193	0.172	0.344	-0.351	1

This table reports the summary statistics and correlation matrix of the variables used in the multivariate analyses. In Panel A, the mean, median, and standard deviations for the subsample with bank ownership and without bank ownership are reported. We also report the t-statistics for the two subsamples. The last column reports the t-statistics for the mean test between the two subsamples. Panel B reports the correlation matrix of the variables used in the multivariate analysis. All continuous variables are winsorized at the 1, and 99 percentiles. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 3
Mean comparison analysis

Financial leverage of the firms										
Year	with bank_owners in 2001 (Matched group)				without bank_owners in 2001 (Treatment group)				[a] - [b]	t-stats.
	Mean [a]	St. Dev.	Diff. from 2001	t-stats.	Mean [b]	St. Dev.	Diff. from 2001	t-stats		
2001	33.0%	21.3%			24.5%	21.7%			8.5%	-5.68 ***
2002	32.3%	21.3%	-0.7%	0.81	24.4%	22.1%	-0.1%	1.19	7.9%	-5.17 ***
2003	30.4%	20.4%	-2.6%	-9.05 ***	22.6%	20.5%	-1.9%	-0.25	7.8%	-5.21 ***
2004	28.9%	19.5%	-4.1%	-15.44 ***	21.0%	19.6%	-3.5%	-1.47	7.9%	-5.40 ***
2005	27.7%	18.8%	-5.3%	-19.27 ***	20.6%	19.4%	-3.9%	-1.59	7.1%	-5.02 ***
2006	26.6%	18.4%	-6.4%	-22.22 ***	20.4%	19.0%	-4.1%	-1.66 *	6.2%	-4.39 ***
2007	26.4%	18.7%	-6.6%	-21.31 ***	20.3%	18.7%	-4.2%	-1.81 *	6.1%	-4.19 ***
2008	28.8%	19.9%	-4.2%	-10.67 ***	20.4%	18.5%	-4.1%	-1.32	8.4%	-5.24 ***
2009	28.1%	19.5%	-4.9%	-12.91 ***	19.5%	17.8%	-5.0%	-1.67 *	8.6%	-5.40 ***
2010	27.2%	19.1%	-5.8%	-15.45 ***	19.9%	18.4%	-4.6%	-1.75 *	7.3%	-4.53 ***
2011	26.3%	18.7%	-6.7%	-17.55 ***	20.0%	18.3%	-4.5%	-1.57	6.3%	-3.97 ***
2012	25.7%	18.2%	-7.3%	-19.37 ***	19.2%	17.0%	-5.3%	-2.27 **	6.5%	-4.14 ***
2013	25.0%	17.7%	-8.0%	-20.83 ***	19.5%	17.3%	-5.0%	-2.38 **	5.5%	-3.52 ***
2014	24.3%	17.1%	-8.7%	-21.82 ***	19.3%	15.6%	-5.2%	-2.81 **	5.0%	-2.78 ***
2001 -2014	8.7%				5.2%				3.5%	

This table reports the mean and standard deviation values of the financial leverage, defined as the total debt divided by the total assets, across each year for two subsamples: firms with and without bank ownership in 2001. Subsamples are restricted to firms that exist in 2001. Differences in financial leverage values between the current year and 2001 are also reported for both subsamples. Columns [a] and [b] report the differences in mean values between both subsamples (with and without bank ownership) across each year. The last column includes the results from the t-test. The superscripts ***, **, and * indicate significance at the 1, 5, and 10% levels, respectively.

Table 4

Impact of bank ownership on book leverage

	Main Bank (1)	Main Bank (2)	All Banks (3)	All Banks (4)
Pct Bank Ownership	0.532*** (0.0476)		0.195*** (0.0166)	
Change in Bank Ownership from 2001		0.511*** (0.0477)		0.189*** (0.0165)
MB	0.0433** (0.0207)	0.0388* (0.0229)	0.0442** (0.0207)	0.0402* (0.0229)
EBITDA	-36.14*** (0.705)	-38.04*** (0.756)	-36.09*** (0.705)	-37.99*** (0.756)
RDD	-0.551*** (0.145)	-0.564*** (0.147)	-0.586*** (0.145)	-0.597*** (0.147)
R&D Expense	-23.87*** (6.266)	-24.78*** (6.503)	-23.27*** (6.266)	-24.16*** (6.503)
Firm Size	4.943*** (0.129)	5.078*** (0.135)	4.913*** (0.129)	5.043*** (0.135)
Tangibility	14.34*** (0.920)	14.39*** (0.949)	14.44*** (0.920)	14.48*** (0.949)
Liquidity	-4.570*** (0.0817)	-4.928*** (0.0875)	-4.574*** (0.0817)	-4.933*** (0.0875)
Industry Leverage	46.87*** (1.191)	46.29*** (1.199)	44.49*** (1.250)	43.86*** (1.260)
Beta	-0.000477 (0.00270)	-0.000362 (0.00267)	-0.000635 (0.00270)	-0.000518 (0.00267)
Constant	-29.12*** (1.419)	-29.18*** (1.511)	-28.08*** (1.425)	-28.04*** (1.524)
N. of observations	45,443	41,643	45,443	41,643
R-Squared	0.236	0.250	0.236	0.250

This table reports the results obtained from Equation (1), showing the relationship between the changes in bank ownership and the level of firms' financial leverage. The dependent variable represents the book leverage values. *Pct Bank Ownership* is ownership by main bank in columns 1 and 2, and is ownership by all banks in columns 3 and 4. *One-year Change in Bank Ownership* is the lagged value of the first difference of the bank ownership. *Change in Bank Ownership* from 2001 is the difference in the bank ownership from the year 2001 to the year t . The standard errors are presented in parentheses. All continuous variables are winsorized at the 1, and 99 percentiles. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 5
Speed of adjustment (Book leverage)

	(1)	(2)	(3)
	GMM		
	Entire Sample	Dividing the sample	
Bank Ownership is:		more than 0%	0%
Leverage (lagged)	0.852*** (0.0254)	0.915*** (0.0242)	0.795*** (0.0476)
Pct Bank Ownership	0.495*** (0.0617)		
MB	0.234*** (0.0322)	0.0283 (0.0359)	0.154*** (0.0364)
EBITDA	3.290** (1.544)	3.747** (1.712)	1.133 (2.399)
RDD	-0.984*** (0.140)	-0.254*** (0.0892)	-0.910*** (0.293)
R&D Expense	4.280 (4.356)	-1.460 (3.321)	-6.507 (7.725)
Firm Size	-0.172*** (0.0428)	-0.0219 (0.0270)	0.0179 (0.0659)
Tangibility	2.289** (0.890)	0.712 (0.808)	4.531*** (1.619)
Liquidity	-0.518** (0.234)	-0.323 (0.280)	-0.299 (0.322)
Industry Leverage	1.164 (0.995)	2.417*** (0.630)	10.31*** (1.854)
Beta	-0.00249*** (0.000539)	-0.00523 (0.00343)	-0.00244*** (0.000628)
Constant	2.723*** (1.008)	1.651* (0.997)	1.855 (1.690)
Number of Observations	45,443	32,003	13,440
$\lambda =$	0.148	0.085	0.205
AR(1)	-21.27	-20.67	-13.68
AR(2)	0.321	-1.001	0.705
Sargan	1518	1861	386.4
<i>p</i> -value	0	0	0
Hansen	602.3	623.7	175.4
<i>p</i> -value	0	0	0

This table reports the influence of bank ownership on the leverage speed of adjustment for the firms. The dependent variable represents the book leverage values. The results of the full sample analysis are reported in column 1. The results for the subsamples with bank ownership (without bank ownership) are reported in column 2 (3). Lambda λ measures the speed of adjustment, which is computed as 1—the coefficient of the lagged leverage. Blundell and Bond's (1998) two-step system GMM procedure is used. GMM specifications are reported (i.e., the *p*-values of the autoregressive test (AR1) and (AR2) and the *p*-value of Hansen's J tests for over-identifying restrictions.) The standard errors clustered at firm-level are presented in parentheses. All continuous variables are winsorized at the 1, and 99 percentiles. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 6

Changes of bank ownership and speed of adjustment

	(1)	(2)
	GMM	
Bank ownership at 2001 is higher than the median value, and reduce the bank ownership ...	more than 5%	less than 5%
Leverage (lagged)	0.913*** (0.0471)	0.877*** (0.0319)
MB	-0.0235 (0.0481)	0.220*** (0.0341)
EBITDA	4.123 (3.610)	1.730 (1.817)
RDD	-0.0939 (0.222)	-0.150 (0.144)
R&D Expense	-5.722 (4.757)	-9.441** (4.531)
Firm Size	0.131** (0.0633)	-0.0226 (0.0350)
Tangibility	1.253 (1.572)	2.124* (1.087)
Liquidity	0.00215 (0.478)	-0.376 (0.286)
Industry Leverage	4.536*** (1.428)	6.737*** (1.001)
Beta	-0.0294 (0.134)	-0.00318*** (0.000689)
TaxRate	2.467*** (0.817)	1.047*** (0.189)
Constant	-1.673 (1.661)	1.518 (1.392)
Number of Observations	8,378	37,037
$\lambda =$	0.087	0.123

This table reports the relationship between the change of bank ownership and the speed of adjustment. The sample is restricted to firms with more than the median of bank ownership in 2001. We divide the sample into two: firms that reduce their bank ownership by at least 5% (column 1) and firms that reduce their bank ownership by less than 5%, or increase their bank ownership (column 2). Lambda λ measures the speed of adjustment, which is computed as 1—the coefficient of the lagged leverage. Blundell and Bond's (1998) two-step system GMM procedure is used. GMM specifications are reported (i.e., the p-values of the autoregressive test (AR1) and (AR2) and the p-value of Hansen's J tests for over-identifying restrictions). The standard errors clustered at the firm level are presented in parentheses.

Table 7

Alternative definitions of the financial leverage

Panel A Determinants of the financial leveragel

	Main Bank (1)	Main Bank (2)	All Banks (3)	All Banks (4)
Pct Bank Ownership	1.323*** (0.0719)		0.525*** (0.0250)	
Change in Bank Ownership from 2001		1.300*** (0.0725)		0.526*** (0.0251)
MB	-0.374*** (0.0308)	-0.412*** (0.0342)	-0.372*** (0.0307)	-0.409*** (0.0342)
EBITDA	-58.30*** (1.047)	-63.30*** (1.129)	-58.17*** (1.046)	-63.16*** (1.128)
RDD	-2.764*** (0.216)	-2.669*** (0.220)	-2.863*** (0.216)	-2.767*** (0.220)
R&D Expense	-7.486 (9.328)	-10.17 (9.730)	-5.633 (9.318)	-8.137 (9.717)
Firm Size	9.894*** (0.192)	10.15*** (0.203)	9.793*** (0.192)	10.03*** (0.203)
Tangibility	20.11*** (1.367)	19.63*** (1.419)	20.33*** (1.365)	19.85*** (1.416)
Liquidity	-3.689*** (0.122)	-4.112*** (0.131)	-3.694*** (0.122)	-4.122*** (0.131)
Industry Leverage	60.71*** (1.768)	58.73*** (1.789)	53.63*** (1.855)	51.23*** (1.881)
Beta	0.00144 (0.00400)	0.00174 (0.00398)	0.00101 (0.00400)	0.00131 (0.00398)
Constant	-73.88*** (2.111)	-72.62*** (2.261)	-70.92*** (2.118)	-68.97*** (2.278)
N. of observations	45,228	41,443	45,228	41,443
R-Squared	0.225	0.239	0.227	0.241

Panel B Speed of Adjustment

	(1)	(2)	(3)
	GMM		
	Entire Sample	Dividing the sample	
Bank Ownership is:		more than 0%	0%
Leverage (lagged)	0.473*** (0.0435)	0.766*** (0.0453)	0.683*** (0.0645)
Pct Bank Ownership	0.0399*** (0.00246)		
MB	-0.695*** (0.0422)	-1.388*** (0.123)	-0.514*** (0.0380)
EBITDA	-32.15*** (2.481)	-41.31*** (3.329)	-16.89*** (3.298)
RDD	-1.554*** (0.319)	-0.372 (0.316)	-0.843 (0.537)
R&D Expense	-43.41*** (9.800)	-68.27*** (10.56)	-36.87*** (12.79)
Firm Size	-0.0433 (0.115)	-0.175 (0.122)	1.066*** (0.156)
Tangibility	-6.287*** (1.841)	-10.98*** (2.109)	1.684 (2.718)
Liquidity	-2.803*** (0.397)	-2.722*** (0.547)	-0.435 (0.467)
Industry Leverage	11.70*** (2.471)	13.67*** (2.496)	23.49*** (3.474)
Beta	-0.00422 (0.00323)	-0.0227 (0.0150)	-0.00190** (0.000961)
Constant	26.56*** (2.099)	28.95*** (2.252)	1.273 (2.726)
Number of Observations	45,228	32,003	13,225
$\lambda =$	0.527	0.234	0.317
AR(1)	-21.94	-20.67	-13.46
AR(2)	-9.514	-10.65	-2.717
Sargan	11867	1861	2539
<i>p</i> -value	0	0	0
Hansen	1576	1374	497.1
<i>p</i> -value	0	0	0

This table reports the results using the market leverage. The specification of Panel A (B) is same with that in Table 4 (5), except that the dependent variable is the market leverage value. The standard errors clustered at the firm-level are presented in parentheses. All continuous variables are winsorized at the 1, and 99 percentiles. The superscripts ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.