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No Lending Relationships and Liquidity Management of Small Businesses during a Financial Shock

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No Lending Relationships and Liquidity Management of Small Businesses during a Financial Shock*

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Abstract

We investigate the determinants of the end of lending relationships with banks using small business data. We also investigate how small businesses without lending relationships financed credit demand during the global financial shock. First, we find that firms with high internal cash holdings, lower growth, and low working capital were more likely to end lending relationships with banks. Supply-side effects on the determinants of the end of relationships are insignificant. Second, when firms experienced credit demand during the financial shock, those with lending relationships increased bank borrowings while those without lending relationships reduced internal cash. However, if we examine cash-rich firms, both firms with and without relationships reduced cash holdings to finance working capital during the shock period. Third, firm performance (in terms of profitability) was neither lower nor higher for firms that did not have lending relationships with banks during the shock period.

Keywords: Lending relationship, Small business, Financial shock
JEL classification: G21; G32

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1 Introduction

We investigate whether having no lending relationships was costly for small businesses during the financial shock in 2008. As many studies (for example, Petersen and Rajan, 1994; Berger and Udell, 1995) argue, lending relationships with banks are valuable for small businesses. As Petersen and Rajan (1994) argue, long-term lending relationships with banks enhance the credit availability of small businesses because the relationships mitigate the information asymmetry between banks and small businesses. During the financial shock, these relationships played important roles for small businesses. As previous studies (for example, Berlin and Mester, 1999; Boot, 2000) argue, through intertemporal smoothing of loan interest rates, banks were able to offer credit during the financial shock. This is another benefit of lending relationships for small businesses.

Previous empirical studies of relationship banking (for example, Jiangli et al., 2008; Cotugno et al., 2013; Dewally and Shao, 2014; Gobbi and Sette, 2014) show that firms with strong relationships with banks can use bank loans during times of economic distress. For example, using Italian data, Cotugno et al. (2013) show that a strong lender–borrower relationship mitigates credit rationing for borrowing firms (including small businesses) during a credit crunch period. If small businesses with long-term relationships do not face credit constraints during financial shocks, they increase bank loans to finance their liquidity shortages. In contrast, small businesses without lending relationships face severe credit constraints if they face large and unexpected financial shocks.[1]

Using listed firm data, some studies (for example, Slovin et al., 1993; Yamori and Murakami, 1999; Sohn, 2010) show the negative effects of ending a relationship with a bankrupt bank for client firm performance. In addition, using Norwegian listed firm

[1]Recent studies about liquidity management argue that firms (especially large firms) use credit lines when they face liquidity shortages or financial shocks. Focusing on the recent financial crisis, Campello et al. (2011, 2012) show that larger-sized firms drew more funds from their credit lines during the crisis if they are relatively small, noninvestment grade, and unprofitable. Campello et al. (2012) define a "small firm" as one with sales revenue of less than $1 billion. Therefore, these small firms, as defined in Campello et al. (2012), are not small businesses. Small businesses, which have unstable cash flows and are more likely to suffer from low cash flows, cannot use credit lines.

data, Ongena and Smith (2001) investigate the determinants of the duration of bank relationships. Focusing on zero leverage, Strebulaev and Yang (2013) show that listed firms have zero debts when they have high cash holdings and are more profitable. However, to our knowledge, only a few papers (for example, Cole, 2010) investigate whether the cost of not having a lending relationship with any bank is significant for small businesses.[2] Furthermore, whether the negative effects of having no lending relationships are significant for small businesses during the financial shock is not clear from previous studies.

To address this issue, we first investigate what determined the decisions of small businesses to end lending relationships during the preshock period. As large amounts of precautionary cash holdings decrease the demand for bank loans, small businesses with large amounts of internal cash are more likely to end relationships with banks. Furthermore, firms with few investment opportunities only need small loans, so they are more likely to end their bank relationships. On the other hand, if credit supply determines the ending of bank relationships, small businesses end their relationships unless their credit demand is high. Second, we investigate the effects of the ending of bank relationships during the unexpected global financial crisis. If credit constraints for small businesses without lending relationships are severe, small businesses do not borrow sufficient funds from banks when they have credit demand. In addition, they have to borrow from expensive financing sources, which is a cost of having no lending relationships. Third, we investigate the effects of having no lending relationships on firm performance during the shock period. If banks do not offer sufficient funds for those without relationships, their firm performance (in terms of profitability) is lower.

We examine the above hypothesis using firm-level data of Japan for the 2000s. Japanese data are suitable for investigating the effects of ending lending relationships with banks. First, as Hoshi et al. (1991) argue, main bank relationships mitigate the effects of credit

[2]In addition, previous studies investigate the negative effects of firms exogenously ending lending relationships with a particular bank. Our study investigates the negative effects of an exogenous shock in which borrowers endogenously end lending relationships with all banks before the shock period.

rationing in Japan. Therefore, many studies argue that lending relationships are valuable for small businesses. Second, as Miwa (2012) argues, Japanese firms (including small businesses) are reducing their borrowings and the ratio of firms with no borrowings is increasing. Therefore, our Japanese dataset provides data on firms without lending relationships. For most small businesses, the shock was an unexpected event, so they could not decide to end their relationships while taking the shock into account. Therefore, the selection bias is not serious enough to prevent our investigation of the cost of having no relationships during the shock period. Third, as Uchino (2013) shows, although bond markets were seriously damaged by the global financial crisis, the banking market in Japan did not shrink. In addition, the real growth rates of GDP dropped from 1.8% in fiscal year (FY) 2007 to –3.7% in FY2008 and –2.0% in FY2009, implying that the real shock was serious for small businesses. This implies that the benefits of lending relationships existed in Japan during the shock period.

The main findings of this paper are as follows. First, small businesses with higher cash holdings and cash flow to total assets ratio are more likely to end lending relationships with banks. This implies that cash holdings are a substitute for bank loans. Furthermore, they are likely to end lending relationships when their asset growth rate is lower. This implies that they end relationships because they have less profitable investment opportunities. The ending of relationships caused by denied loan applications is not observed, implying that the supply effects on the ending of relationships are insignificant.

Second, following the global financial shock in 2008, small businesses without lending relationships increased their bank loans to finance credit demand, but by a smaller amount than small businesses with relationships. However, the interest rates for small businesses without relationships are not higher than those for small businesses with relationships, suggesting that they use expensive sources of financing. This implies that small businesses did not face severe financial constraints during the financial crisis if they did not have lending relationships. In addition, if we match the firms with relationships and those

without using the propensity score matching method, the differences are not statistically significant, implying that firms with lending relationships increased their bank borrowings by less if they had sufficient internal cash.

Third, the performance of firms without relationships (in terms of profitability) was neither lower nor higher than for firms with relationships during the shock period. This result also implies that credit constraints for firms without relationships were not severe.

The remainder of the paper is organized as follows. Section 2 describes the dataset and the hypotheses to be tested. We identify the determinants of the ending of lending relationships in Section 3. In Section 4, we present the estimated results for the effects of having no lending relationships during the shock period. Section 5 concludes the paper.

2 Data and Hypothesis

2.1 Data

We use annual firm-level data of Surveys for the Financial Statements Statistics of Corporations by Industry (hereafter FSSC; *Houjin Kigyou Toukei Chosa* in Japanese) conducted by the Ministry of Finance. According to the website of the Ministry of Finance,[3] the FSSC are "one part of the fundamental statistical surveys under the Statistics Act and have been conducted as sampling surveys so as to ascertain the current status of business activities of commercial corporations in Japan." The target firms of the FSSC are all commercial corporations in Japan. All firms with capital of 1 billion yen or more are included. Those with capital of between 100 million and 600 million yen are randomly selected with equal probability. Those with less than 100 million yen of capital are randomly sampled every fiscal year. Therefore, of the firms with less than 100 million yen in capital, a different sample of target firms is selected each fiscal year. The response rates for each fiscal year are around 80%. The FSSC covers a large number of small businesses,

[3]For details of the survey see: http://www.mof.go.jp/english/pri/reference/ssc/index.htm.

including firms with lending relationships and those with no relationships, implying that these data include various types of firms. The FSSC include data of firms' balance sheets and profit and loss statements. Data of firms' balance sheets are available at the beginning and end of each fiscal year. The data at the end of fiscal year t are set equal to the data at the beginning of fiscal year t+1. In this paper, we limit our analysis to "small and medium enterprises" (SMEs) as defined in the Small and Medium-sized Enterprise Basic Law.[4] Under this definition, our sample data include firms with a large number of employees and capital stock, so we omit firms with 500 or more employees and those with a capital stock of 500 million yen or more. The number of firm-year observations is 68,325 during the preshock period of 2001–2007. The number of firm-year observations during the shock period of 2008 is 9,788. Table 1 shows the number of observations divided by firm size. As this table shows, our data cover both smaller and larger small businesses.

2.2 Descriptive Statistics

Before the econometric analysis, we describe our data on small businesses' bank borrowings in the 2000s in Japan. Table 2 shows the quartiles of total bank borrowings normalized by total assets. The median of total bank borrowings decreased during the 2000s, from 24.30% (in FY2001) to 12.88% (in FY2008). Similarly, the third quartiles decreased. In particular, the first quartiles of total bank borrowings are 0.00% after 2001, suggesting that more than 25% of small businesses did not have lending relationships with any banks.[5]

[4]According to *the 2005 White Paper on Small and Medium Enterprises in Japan*, "small and medium enterprises" under the Small and Medium-sized Enterprise Basic Law are defined as "enterprises with capital stock of not in excess of ¥300 million or with 300 or fewer regular employees, and sole proprietorships with 300 or fewer employees. However, SMEs in the wholesale industry are defined as enterprises with capital stock not in excess of ¥100 million or with 100 or fewer employees; SMEs in the retail industry are defined as enterprises with capital stock not in excess of ¥50 million or with 50 or fewer employees; and SMEs in the service industry are defined as enterprises with capital stock not in excess of ¥50 million or with 100 or fewer employees. "Small enterprises" are defined as enterprises with 20 or fewer employees. In the commercial and service industries, however, they are defined as enterprises with five or fewer employees.

[5]These results are consistent with those in Miwa (2012).

Table 3 shows the median of total bank borrowings using subsamples by firm size.[6] This table shows that all four groups of firms decreased their bank borrowings. Furthermore, the bank borrowings for very small firms (firms with 20 employees or fewer) and large firms (firms with 301 employees or more) were lower. Table 4 shows the ratio of firms without lending relationships, divided by firm size. This table shows that the ratios of firms without lending relationships increased during the sample period in all four groups. Furthermore, the ratio for the smallest-sized firms is the largest. Intuitively, very small firms depend on bank borrowings because they are informationally opaque and cannot borrow without relationship lenders. However, the results are inconsistent with this intuition. Figure 1 shows the kernel function of total bank borrowings having divided the sample by fiscal year. This figure also shows that the number of zero-lending firms is increasing by fiscal year. The peak of the function is less than 0.05 and the density of the peak is also increasing by fiscal year. This implies that many small businesses had no bank borrowings before the financial shock in 2008.

2.3 Hypothesis

2.3.1 Determinants of Ending Relationships with Banks

The one reason for small businesses continuing the lending relationships with banks is that they have credit needs to finance investment opportunities. Low investment opportunities lead to a low opportunity cost of holding cash, which causes low credit demand of bank loans and the end of lending relationships. We predict that firms with low investment opportunities are likely to end the relationships. As our data consisted mainly of information about small businesses, Tobin's q is unavailable. Instead, we use firm growth as a proxy for investment opportunities.

Additionally, internal cash can substitute for continuing lending relationships with

[6]We divide the sample into four groups: firms with 20 employees or fewer, firms with 21 to 100 employees, firms with 101 to 300 employees, and firms with 301 employees or more.

banks. According to Bates et al. (2009), one of the main reasons that firms accumulate cash holdings is because of a precautionary motive. In general, small businesses cannot use credit lines for financing sudden credit needs. Thus, they accumulate more cash in situations when they need to cope with adverse shock because they face credit constraint. If credit-constrained small businesses anticipate that they cannot borrow a sufficient amount from banks during adverse shock, they accumulate larger amounts of cash holdings. This leads to low demand for bank loans and the ending of lending relationships with banks. In addition, firms with high cash flows do not need to borrow from banks, and thus they are likely to end their lending relationships.

Furthermore, other sources of finance can substitute for bank loans. Some firms borrow funds from nonfinancial firms. If they can borrow sufficient funds from them, they are likely to end their lending relationships with banks. Lastly, firms with high working capital requirements have larger credit demands, so they are not likely to end their lending relationships.

In sum, we predict the following hypothesis: firm growth, cash holdings, cash flows, and lending relationships with nonfinancial firms have positive effects on ending relationships with banks. Furthermore, working capital requirements have negative effects on ending relationships with banks.

2.3.2 Effects of the Global Shock

During the financial crisis, many firms faced financial shortages (for example, temporary liquidity shortfalls and increasing working capital requirements). The shock was severe and unexpected, and firms reduced their financial shortfalls by increasing bank loans. Therefore, they increased the demand for borrowings to cope with the negative effects of the shock. Firms with lending relationships can increase their borrowings from banks if the banks can provide liquidity by intertemporal smoothing of loan rates (Berlin and Mester, 1999). In contrast, firms with no lending relationships can face severe financial constraints.

Under the severe credit constraints of small businesses without lending relationships, these firms must use expensive financing sources, implying they pay higher interest rates. Furthermore, they face underinvestment problems, which lower their performance.

On the other hand, if firms without lending relationships have sufficient cash holdings to cope with shocks, the credit constraint is not severe for them even though they have lending relationships with banks. If this is true, they do not use expensive financing sources and experience lower performance.

3 End of Lending Relationships

3.1 Estimation Strategy

In this subsection, we investigate the relationships between cash holdings and end of lending relationships with banks. We estimate the following equation:

$$\begin{aligned} End^*_{i,t} &= \alpha_1 Cash\ Holdings_{i,t} + \alpha_2 Cash\ Flow_{i,t} + \alpha_3 Firm\ Size_{i,t} \\ &+ \alpha_4 Firm\ Growth_{i,t} + \alpha_5 Nonbanking\ Relationships \\ &+ \alpha_6 WCR_{i,t} + \alpha_7 End_{i,t-1} + \epsilon_i + \zeta_t + \eta_{i,t} \\ & End_{i,t} = 1\ if\ End^*_{i,t} > 0 \\ & End_{i,t} = 0\ otherwise, \end{aligned} \tag{1}$$

where $\eta_{i,t}$ is the error term of firm i in year t, ζ_t is the year fixed effect from 2001 to 2007, and ϵ_i is the industry fixed effect.

The dummy variable $End_{i,t}$ takes a value of one if short-term and long-term borrowings from financial institutions at the end of fiscal year t are zero, and zero otherwise. As there are only a small number of instances of data for two or more consecutive fiscal years, we define ending relationships using data for one fiscal year.[7] $End^*_{i,t}$ is a latent

[7]If we use short-term borrowings to define $End_{i,t}$, the estimation results are similar to those described

variable indicating the end of lending relationships, which is the net benefit from ending the relationships. If $End^*_{i,t}$ is greater than zero, firms and banks end their lending relationships.

Independent variables are *End* at the beginning of the fiscal year, cash holdings, cash flows, firm size, firm growth, nonbanking relationships dummy, tangible fixed assets, and working capital requirements (hereafter, WCR). We also control year and industrial fixed effects using year and industrial dummies. Cash holdings are defined as the ratio of a firm's cash holdings to total assets at the beginning of each fiscal year. Cash flows are defined as firm earnings before interest, taxes, depreciation, and amortization (hereafter, EBITDA), normalized by total assets in fiscal year t. We predict that cash holdings and flows have positive effects on the end of relationships. Firm size is defined as the natural logarithm of a firm's total assets at the beginning of the fiscal year. Firm growth is defined as the natural logarithm of a firm's total assets at the end of the fiscal year minus those at the beginning of the fiscal year. If growing firms need to finance investment opportunities using bank loans, the coefficients of firm growth are negative.

Nonbanking relationships is a proxy variable for lending relationships with nonfinancial firms, which equals one if a firm's total borrowings from nonfinancial firms are nonzero, and zero otherwise. If lending relationships with nonfinancial firms are substitutes for relationships with banks, nonbank relationships have positive effects on the end dummy. In contrast, the relationships with nonfinancial firms complement those with banks, and thus the dummy has negative effects. Tangible fixed assets are defined as the ratio of a firm's tangible fixed assets to total assets. We predict that firms with high tangible fixed assets have long-term debts, so they are not likely to end their bank relationships. WCR is defined as the sum of trade receivables and inventories, minus trade payables (Hill et al., 2010), which is a proxy for credit demand. Firms with higher WCR require short-term credit, so they are not likely to end their lending relationships with banks.

in this paper.

3.2 Estimation Results

Table 5 shows summary statistics for the variables in equation (1). Table 6 shows the estimation result for equation (1). We show the results using all observations in column (1), those using small firms in column (2), and those using medium firms in column (3). Small firms are defined as firms with 20 or fewer employees, and medium firms are defined as firms with 21 or more employees. The marginal effects of each variable at the mean are provided in each column.

The coefficients of cash holdings and cash flows are positive and statistically significant at the 1% level (column 1). The effect of cash holdings for medium firms is insignificant, but that for small firms is still positive and statistically significant. Furthermore, the effects of cash flows are positive and statistically significant for both small and medium firms (columns 2 and 3). These results suggest that cash-rich firms are likely to end relationships with banks. The marginal effect of cash flow is 0.4144, which means a one standard deviation increase in cash flow raises the probability of ending relationships by 3.41%. The effects of firm size are negative and statistically significant apart from in column (3).

The coefficients of firm growth are all negative and statistically significant at the 1% level. These results suggest that firms end lending relationships with banks because they do not have enough investment opportunities. The marginal effect of firm growth is –0.2211, which means that a one standard deviation increase in sales growth reduces the probability of ending relationships by 4.42%. This suggests that the magnitude of sales growth is larger than those of cash flow and working capital. The coefficients of nonbanking relationships are all negative and statistically significant (not positive), suggesting that firms having relationships with nonfinancial firms are not likely to end their relationships with banks. This implies that the lending relationships with nonfinancial firms complement those with banks. As we predicted, the coefficients of tangible assets are all negative and statistically significant. The coefficients of WCR are all positive and

significant, which is also consistent with our prediction. Demand for short-term credit is high in firms with high WCR, so they are not likely to end their relationships with banks. A one standard deviation increase in working capital reduces the probability of ending relationships by 2.24%.

In columns (4)–(6), we only use observations whose lagged values equal zero, which are observations having relationships with banks in the previous year. The coefficient of cash flows for small firms changes to be statistically insignificant (column 5). Additionally, the coefficients of firm size are all statistically significant. The results for the other coefficients of the independent variables are similar to those in columns (1)–(3), suggesting that the results are robust.

In sum, the estimation results for ending relationships imply the following. First, firms with high liquidity are likely to end lending relationships. Second, firms are likely to end relationships because they have no demand for bank credit (for example, low growth, low working capital requirements, low tangible assets).[8]

3.3 Supply-Side Effects

From the results using FSSC, we cannot determine whether supply-side effects include the ending of relationships. We can conclude that because banks reject loan applications from small business borrowers, small businesses are forced to end their relationships with banks. To investigate the supply-side effects on the ending of relationships, we match the FSSC data to the aggregate diffusion index of financial institution lending attitudes (hereafter, "financial DI") from the Bank of Japan's TANKAN survey (Short-term Economic Survey of Enterprises). The TANKAN survey questions firms about their business conditions, including one question that addresses the lending attitude of financial institutions. Financial DI equals "accommodative" minus "severe" measured in percentage points and relates to the present lending attitude of financial institutions. A small value

[8]The main results are similar if we divide the sample by major industries.

of financial DI means that lending attitudes are severe. As financial DI is available at the industry level, we match financial DI using firm industry codes. The TANKAN survey is seasonal data, so the data are averaged for each fiscal year.

We estimate equation (1) using financial DI as an additional independent variable. Industry dummies are omitted because financial DI is measured at the industry level. Table 7 shows the estimation results. If we use all observations, the coefficient of financial DI is negative and statistically significant at the 10% level (column 1). This result suggests that firms end relationships when the lending attitude of banks is severe, implying that the supply-side effects on ending relationships are significant. However, if we split the sample by firm size, or limit our analysis to observations that have not ended relationships by the beginning of the fiscal year, the coefficients of financial DI are not statistically significant (columns 2–6). These results suggest that the supply-side effects are not robust.

Additionally, we use the "Basic Survey of Small and Medium Enterprises" in FY2004, conducted by the Small and Medium Enterprise Agency.[9] This survey targets firms defined as small and medium enterprises under the Small and Medium Enterprise Basic Law. Target firms are selected from the Establishment and Enterprise Census of Japan, conducted by the Ministry of Internal Affairs and Communications. The survey questionnaires were sent to around 110,000 selected firms. One of the questions relates to the status of loan applications to main banks: "Regarding your loan applications to your main bank during the past year, which of the following is most accurate?".

Respondents were asked to select one of the following six responses: 1) Applications rejected or amounts requested reduced, 2) Could borrow amounts requested without changes to borrowing terms, 3) Borrowing terms severe, but could borrow amounts requested, 4) Could borrow amounts requested after easing of borrowing terms, 5) Bank suggested increasing loan amount, and 6) Have not submitted loan applications.[10]

[9]See the website of the Small and Medium Enterprise Agency for a detailed explanation about this survey: http://www.chusho.meti.go.jp/koukai/chousa/kihon/index.htm (in Japanese).

[10]For the distributions of each answer, see Figure 2-3-14 in Agency (2007): http://www.chusho.meti.go.jp/pamflet/hakusyo/h19/download/2007hakusho_eng.pdf.

Table 8 shows the survey results for each response, in terms of both absolute number and percentage of total responses, after dividing the sample by whether relationships had ended or not. If the supply-side effects on ending relationships are significant, the percentage of firms selecting "Applications rejected or amounts requested reduced" would be high in the group of firms ending relationships. However, the percentage of firms selecting this response is 0.37%, or only four firms. This suggests that the ending of relationships because of banks denying applications of loans is rare. On the other hand, the percentage of firms selecting "Have not submitted loan applications" is 99.54% in the group of firms with no borrowings, suggesting that firms do not borrow because they do not need loans. These results indicate that the main causes of the end of lending relationships are firm factors, not supply-side factors.

4 Financial Shock and Liquidity Management

4.1 Estimation Strategy

4.1.1 Financial Shock and Financing Sources

In the previous section, we showed that firms with large internal cash holdings, those with lower growth opportunities, and those with lower credit demand are more likely to end lending relationships. In this section, we examine the financing sources that small businesses use for credit demand and when they face exogenous financial shocks.

If lending relationships are valuable for small businesses, those without lending relationships would face severe financial constraints during a financial shock. If this is true, they cannot borrow sufficient funds from banks when they have high credit demand. Furthermore, they have to use expensive financing sources. Consequently, firms without lending relationships experience lower firm performance because of severe credit constraints. If financial constraints for firms without lending relationships are insignificant, the firms can borrow from banks and do not suffer lower firm performance. As

we showed in the previous section, those without relationships have higher internal cash holdings. If firms without lending relationships have sufficient internal cash, they reduce cash holdings instead of increasing bank loans when they face a liquidity shock. Additionally, they do not face severe credit constraints, so they do not use expensive financing sources. As a result, this also means that the firm performance of these firms is not lower.

To test the above hypotheses, we identify which firms needed to increase bank loans during the shock period. We use WCR as a proxy of financial needs. As we argued, WCR is defined as the sum of trade receivables and inventories, minus trade payables. Firms need to finance their WCR using short-term financial debt or by reducing cash holdings (Preve and Sarria-allende, 2010). During an (unexpected) recession period, the WCR changes exogenously and is less controllable for firms for the following reasons. First, as firms' sales decrease unexpectedly in a recession period, the level of unsold inventories increases. Second, because firms' production costs should decline because of a reduction in sales, the level of trade payables should decrease. During a recession period, the change in trade payables is caused mainly by the reduction in the volume of real transactions (Tsuruta and Uchida, 2013). These cause an increase in WCR, so firms need to finance the short-term credit demand during the recession. For small businesses, the financing sources are limited to indirect finance, so they should use bank loans for financing. On the other hand, small businesses can reduce cash holdings if they accumulate precautionary savings.

4.1.2 Bank Borrowings

To investigate the effects of WCR on bank loans during the shock period, we estimate the following regression:

$$\Delta Bank\ Borrowings_{i,t} \quad = \quad \sum_{end} \sum_{shock} \beta_1^{end,shock} \Delta WCR_{i,t}^{end,shock}$$

$$+ \quad \mathbf{X}_{i,t}\beta_2 + \theta_i + \iota_t + \kappa_{i,t}, \tag{2}$$

where $\kappa_{i,t}$ is the error term of firm i in year t, ι_t is year fixed effects from 2006 to 2008, and θ_i is industry fixed effects. End equals one if firm i does not have lending relationships at the beginning of fiscal year t, and zero otherwise. Shock equals one if t equals 2008, and zero otherwise. $\mathbf{X}_{i,t}$ is a vector of control variables, which are firm scale at the beginning of fiscal year t, firm growth in fiscal year t, end dummy at the beginning of fiscal year t, cash flows in fiscal year t, collateral assets at the beginning of fiscal year t, leverage at the beginning of fiscal year t, and interest rate in fiscal year t.

$\Delta Bank\ Borrowings_{i,t}$ is the growth rate of a firm's total bank borrowings {[(short-term bank borrowings at the end of the fiscal year + long-term bank borrowings at the end of the fiscal year) – (short-term bank borrowings at the beginning of the fiscal year + long-term bank borrowings at the beginning of the fiscal year)] / total assets at the beginning of the fiscal year}. Firms generally use short-term borrowings to finance their working capital. However, some firms use long-term borrowings, so we also include long-term bank borrowings.[11]

The shock period is FY2008 and the preshock period is the fiscal year prior to 2007. To compare before and during the shock period, we include two fiscal years (2006 and 2007) before the Lehman shock. The end of FY2008 is March 2009 and is thus after the collapse of Lehman Brothers. To compare the effects of ending relationships before the shock period, we use only the data for FY2008.

We use the annual growth rate of WCR ($\Delta WCR_{i,t}$) between the beginning and the end of the fiscal year, which is defined as [(WCR at the end of the fiscal year – WCR at the beginning of the fiscal year) / total assets at the beginning of the fiscal year]. If firms with larger financial shortages increase bank borrowings, the coefficient of $\Delta WCR_{i,t}$ is positive. To investigate the heterogeneous effects of $\Delta WCR_{i,t}$ between firms with

[11] In FSSC, bank borrowings are borrowings from deposit-taking financial institutions, government-affiliated financial institutions, and nondeposit-taking financial institutions (finance company).

relationships and those without relationships during the shock and preshock periods, we use four variables: $\Delta WCR_{i,t}^{end,shock}$, where end (at the beginning of fiscal year t)=0,1 and shock=0,1. $\Delta WCR_{i,t}^{end,shock}$ equals $\Delta WCR_{i,t}$ if the end dummy at the beginning of the fiscal year is j and shock equals k, zero otherwise, where j=0,1 and k=0,1.

If firms use bank loans when they face increasing credit demand, the coefficients of $\Delta WCR_{i,t}$ are positive. If lending relationships with banks are valuable for small businesses, small businesses with lending relationships finance their increase in WCR using bank loans. In contrast, small businesses without lending relationships do not finance WCR using bank loans, so the effects of $\Delta WCR_{i,t}$ are larger for small businesses with lending relationships. In addition, those effects are larger during an unexpected financial shock. In sum, we predict that $\beta_1^{end=0,shock=0} > \beta_1^{end=1,shock=0}$ and $\beta_1^{end=0,shock=1} > \beta_1^{end=1,shock=1}$ if lending relationships are valuable for small businesses. Furthermore, $\beta_1^{end=0,shock=0} < \beta_1^{end=0,shock=1}$ is supported if small businesses depend on bank borrowings more during an unexpected financial shock.

The definitions of the control variables are as follows. We use the natural logarithm of total assets at the beginning of the fiscal year as a proxy of firm scale. Firm growth is defined as firm scale at the end of the fiscal year minus firm scale at the beginning of the fiscal year. We use EBITDA as a proxy of cash flows. We use the ratio of a firm's tangible fixed assets to total assets at the beginning of the fiscal year as a proxy of collateral assets. Leverage is the ratio of a firm's book value of total debts to book value of total assets at the beginning of the fiscal year. Interest rate is defined as the ratio of a firm's interest expenses in fiscal year t to the sum of its short- and long-term debt and discounted notes receivable averaged between the beginning and end of fiscal year t.

4.1.3 Financial Cost

If firms without lending relationships face severe credit constraints during a financial shock, they have to use high-cost financing, such as nonbank loans. To investigate whether

firms without lending relationships face severe constraints, we estimate the following regression:

$$Interest\ Rate_{i,t} = \sum_{end}\sum_{shock} \gamma_1^{end,shock} \Delta WCR_{i,t}^{end,shock} + \mathbf{Y}_{i,t}\gamma_2 + \lambda_i + \mu_t + \nu_{i,t}, \quad (3)$$

where interest rate is a dependent variable for firm i in fiscal year t; $\mathbf{Y}_{i,t}$ is a vector of control variables (firm scale at the beginning of fiscal year t, firm growth in fiscal year t, cash flow in fiscal year t, collateral assets at the beginning of fiscal year t, leverage at the beginning of fiscal year t, end dummy at the beginning of fiscal year t); $\nu_{i,t}$ is the error term of firm i in year t; μ_t is year fixed effects from 2006 to 2008; and λ_i is industry fixed effects.

If firms without lending relationships face severe credit constraints, they use expensive financing sources, which increases interest rates for these firms. Therefore, we predict that the coefficient of the end dummy is positive if credit constraints are severe. Firms with higher credit demand use larger amounts of more expensive financing sources. Therefore, firms with higher WCR pay higher interest rates. In particular, during the financial shock, the constraint was severe for firms without lending relationships. We predict that the coefficient of $\Delta WCR_{i,t}^{end=1,shock=1}$ is positive if credit constraints are severe for firms without lending relationships.

4.1.4 Cash Holdings

As we show, the firms with large cash holdings are likely to end their lending relationships. If they face credit demands during the shock period, they would use cash holdings for these demands. However, if they do not have enough cash holdings because the credit demand during the shock period is unexpected and too large, they have to use external finance. We investigate whether firms with lending relationships and those without used cash holdings to finance credit demand during the shock and preshock periods. We estimate

the following equation:

$$\Delta Cash\ Holdings_{i,t} = \sum_{end}\sum_{shock} \delta_1^{end,shock} \Delta WCR_{i,t}^{end,shock} + \mathbf{Z}_{i,t}\delta_2 + \xi_i + o_t + \tau_{i,t}, \quad (4)$$

where $\tau_{i,t}$ is the error term of firm i in year t, o_t is year fixed effects from 2006 to 2008, and ξ_i is industry fixed effects. $\mathbf{Z}_{i,t}$ is a vector of control variables, which are firm scale at the beginning of fiscal year t, firm growth in fiscal year t, end dummy at the beginning of fiscal year t, cash flows in fiscal year t, collateral assets at the beginning of fiscal year t, leverage at the beginning of fiscal year t, and interest rate in fiscal year t. $\Delta Cash\ Holdings_{i,t}$ is the ratio of a firm's cash holdings at the end of the fiscal year minus those at the beginning of the fiscal year to total assets [(cash holdings at the end of the fiscal year – cash holdings at the beginning of the fiscal year) / total assets at the beginning of the fiscal year].

If firms without lending relationships use internal cash holdings to finance increasing WCR, the coefficients of $\Delta WCR_{i,t}^{end=1,shock=0}$ and $\Delta WCR_{i,t}^{end=1,shock=1}$ will be negative. Furthermore, if firms without lending relationships used more of their internal cash holdings than those with lending relationships during the shock period, the effects of $WCR_{i,t}^{end=1,shock=1}$ are larger than those of $WCR_{i,t}^{end=0,shock=1}$.

4.1.5 Firm Performance

Finally, we investigate the effects of lending relationships for firm performance. If firms without lending relationships face severe constraints, they cannot achieve sufficient investment and experience lower performance. If this effect is more severe during the shock period, the gaps in firm performance between firms with lending relationships and those without are larger during the shock period. To investigate this issue, we estimate the following equation:

$$\begin{aligned} Firm\ Performance_{i,t} &= \pi_1 Shock_t \times End_{i,t-1} + \pi_2 End_{i,t-1} \\ &+ \mathbf{W}_{i,t}\pi_3 + \tau_t + \upsilon_i + \phi_{i,t}, \end{aligned} \quad (5)$$

where $\phi_{i,t}$ is the error term of firm i in year t, τ_t is year fixed effects from 2006 to 2008, and υ_i is industry fixed effects. $\mathbf{W}_{i,t}$ is a vector of control variables, which comprise firm scale at the beginning of fiscal year t, firm growth in fiscal year t, collateral assets at the beginning of fiscal year t, and leverage at the beginning of fiscal year t. $Shock_t$ is a dummy variable that equals one if the fiscal year is 2008, and zero otherwise. $End_{i,t-1}$ is an end dummy at the beginning of fiscal year t.

Our sample data are for small businesses, which are mainly unlisted firms. Therefore, we cannot acquire stock data, such as stock prices and firm values. Many previous studies use Tobin's q or stock returns as a proxy of firm performance. However, these data are unavailable for small businesses. Instead, we use accounting profitability as a proxy of firm performance, defined as the ratio of a firm's operating income to total assets. If firms without lending relationships face severe constraints, they experience lower performance after the shock. As a result, the coefficients of $Shock_t \times End_{i,t-1}$ (π_1) will be negative if the lending relationships are valuable.[12]

4.2 Results

4.2.1 Bank Borrowings

Table 9 shows summary statistics for the variables in equations (2)–(5). Table 10 shows the estimation results for equation (2) using total bank borrowings as a dependent variable. In column (1), all estimated coefficients of ΔWCR are positive and statistically significant. These results imply that both types of firms increased bank borrowings during the nonshock and shock periods when they faced the increased WCR. Focusing on the magnitude of the estimated coefficients of ΔWCR, we see a difference between firms with lending relationships and those without. The estimated coefficients of ΔWCR for firms ending relationships are smaller than those with relationships, suggesting that firms

[12]Some data of firm performance in fiscal year t+1 are unavailable. Therefore, we focus only on short-term performance.

without lending relationships increase their bank borrowings by less to finance WCR. In addition, the estimated coefficient of ΔWCR for firms without lending relationships during the shock period is the smallest.

To investigate the heterogeneous effects between small and medium firms, we divide the sample into two groups. The definitions of small and medium firms are the same as in those used in Subsection 3.2. In column (2), we show the results for medium firms. All estimated coefficients of ΔWCR are similar to those in column (1), suggesting that firms increase bank borrowings when they face higher WCR. Furthermore, firms without lending relationships increase their bank borrowings by less. In column (3), we limit the sample to small firms. The signs of all estimated coefficients of ΔWCR are positive, but that of $\Delta \text{WCR}^{end=1,shock=1}$ is not statistically significant. This suggests that small firms without lending relationships did not significantly increase bank borrowings during the shock period when they faced higher WCR.

In sum, the estimation results of Table 10 imply that firms increased bank borrowings in both the shock and nonshock periods even if they ended their lending relationships. However, the amount of bank borrowings is smaller for firms without such relationships. In particular, the increase in bank borrowings is insignificant for small firms without lending relationships during the shock period. These results might imply that credit constraints are severe for firms without relationships. They also imply that firms without lending relationships do not increase bank borrowings because they have enough liquidity to finance credit demand.

The negative effects of cash flow suggest that firms with low liquidity increase bank borrowings. The effects of firm scale and firm growth are positive because they have high credit demand and are relatively informationally transparent. The effects of collateral assets are negative, suggesting that firms with more collateral assets decreased their bank borrowings. In general, credit supply for those firms is high, so the effects of collateral assets should be positive. However, the estimated results are inconsistent with this view.

Furthermore, the effects of interest rates are positive (not negative). A possible reason for these results is that credit demands in firms with lower collateral and higher interest rates are high.

4.2.2 Interest Rates

To investigate whether credit constraints are severe for firms without relationships, we estimate equation (3) using interest rates as a dependent variable. Table 11 shows the estimated results for equation (3). All coefficients of ΔWCR are statistically insignificant. This implies that firms do not pay higher interest rates to finance working capital. This result is similar for firms without lending relationships during the shock period. If firms without lending relationships face severe credit constraints, they should pay higher interest rates especially during the financial shock. As a result, the coefficient of $WCR_{i,t}^{end=1,shock=1}$ should be positive. The estimated results imply that firms without lending relationships do not face severe credit constraints. The results in columns (2) and (3) are for the small and medium firms, respectively. Similar to column (1), all estimated coefficients of ΔWCR are statistically insignificant, apart from $WCR_{i,t}^{end=0,shock=1}$ in column (2). The magnitude of the coefficient is –0.0067, suggesting that the economic significance is weak.

Some of the coefficients of firm scale and collateral assets are positive and statistically significant. Larger-sized small businesses and firms with more collateral assets are relatively creditworthy, so interest rates for those firms should be lower. On the other hand, they can borrow for longer maturities, so the cost of loans may become higher. As highly leveraged firms are risky for creditors, the effects of leverage are positive and statistically significant.

4.2.3 Cash Holdings

Table 12 shows the estimation results using cash holdings as a dependent variable. All estimated coefficients of ΔWCR are negative and statistically significant at the 1% level,

implying that both firms with lending relationships and those without reduce their cash holdings when they face WCR. The magnitude of the estimated coefficients for firms without lending relationships during both the nonshock and shock periods ($\Delta\text{WCR}^{end=1,shock=0}$ and $\Delta\text{WCR}^{end=1,shock=1}$) is larger than for those with lending relationships. This result suggests that firms without lending relationships reduce their cash holdings by more when they face WCR. In addition, the effect of ΔWCR is the largest in firms without lending relationships during the shock period. These firms use internal cash during the shock period to finance working capital requirements, instead of bank borrowings.

In Table 12, we show the results for medium firms in column (2), and small firms in column (3). Similar to the results using all observations in column (1), all estimated coefficients of ΔWCR are negative and statistically significant at the 1% level. The difference in ΔWCR between firms with lending relationships and those without is larger in small firms. Our estimated results suggest that small firms without lending relationships reduced their internal cash holdings by more to finance increasing WCR, instead of increasing their bank borrowings during the shock period.

4.2.4 Operating Income

Column (1) of Table 13 shows the estimation results of equation (5) using all observations. The estimated coefficient of the shock dummy is negative and statistically significant at the 1% level, suggesting that operating income for small businesses declines after the shock period. The estimated coefficient of the end dummy is not statistically significant. To investigate whether firms without lending relationships experienced lower performance after the shock, we focus on the coefficient of shock $\times$ end dummy. If their performance is lower, this coefficient will be negative. The estimated coefficient for the interactive variable is negative, but not statistically significant. This result implies that firms without lending relationships experienced significantly lower performance after the shock. Furthermore, credit constraints for firms without relationships are not severe.

Columns (2) and (3) show the results using only small and medium firms. For both groups of firms, the estimated coefficients of the shock dummy are negative and statistically significant. The results for the end dummy are mixed: negative for small firms and positive for medium firms. The estimated coefficients of the shock $\times$ end dummy are not statistically significant, which is similar to the results using all observations. The results for the control variables show that the performance of larger firms, growing firms, and low leveraged firms is high. Furthermore, collateral assets have negative effects on performance except for small firms.

4.3 Propensity Score Matching

4.3.1 Constraints or Adequate Liquidity?

In the previous section, we showed that firms without lending relationships relied less on bank borrowings and more on internal cash holdings to finance credit demand during the financial shock period. These results imply that as firms without lending relationships did not use bank loans during the shock period, they reduced cash holdings to finance credit demand. These results also imply that these firms did not use bank loans because they had adequate cash holdings. The latter interpretation is consistent with a pecking order theory, which shows that firms use internal firm cash, and they borrow from outside lenders after exhausting their cash. This interpretation supports the result that they faced higher interest rates during the shock period.

It is also not clear whether firms with lending relationships increase bank borrowings if they have enough internal cash. Table 14 shows the median growth rates of total bank borrowings and cash holdings during the financial shock period (FY2008), separated according to the amount of cash holdings and whether or not the firms have lending relationships. To limit our analysis to only those firms having credit demand, only observations with positive ΔWCR are used in this table.

Panel A shows the results for bank borrowings. When we focus on the column with

the highest ΔWCR, the differences in bank borrowings between firms with relationships and those without are statistically significant in rows 1 to 3. In contrast, in row 4, the difference is not statistically significant, suggesting that firms with relationships do not increase their bank borrowings by more. Panel B shows the median growth rate of cash holdings. Focusing on the column with the largest ΔWCR, the growth rate of cash holdings in firms without relationships is smaller than in those with relationships in rows 1 to 3. In contrast, the difference is statistically insignificant in row 4, which is the group of firms having the largest cash holdings. These results suggest that cash-rich firms used internal cash to finance working capital during the shock period even if they had lending relationships.

4.3.2 Estimation Strategy

To investigate which explanations are plausible, we employ the propensity score matching method, first introduced by Rosenbaum and Rubin (1983). As we showed in Section 3, firms decide whether or not to continue lending relationships, which implies that the end dummy is an endogenous variable. Furthermore, firms with large cash holdings are likely to end their relationships. By using simple regressions using an end dummy, we can compare firms that are cash rich and those that are cash poor. The propensity score matching method helps mitigate the endogeneity problem.

The propensity score is the probability of receiving treatment, which in our paper is the probability of ending lending relationships. To calculate the propensity score $p(\mathbf{V}_{i,t})$, we estimate the probability of ending lending relationships using the following probit model:

$$p(\mathbf{V}_{i,FY2007}) \equiv P(End_{i,FY2007} = 1 \mid \mathbf{V}_{i,FY2007}) = \Phi(\mathbf{V}_{i,FY2007}\rho), \tag{6}$$

where $\mathbf{V}_{i,FY2007} = (Cash\ Holdings_{i,FY2006}, Cash\ Flow_{i,FY2007}, Firm\ Size_{i,FY2007}, Firm\ Growth_{i,FY2007}, End_{i,FY2006}, IndustryDummy)$. The definitions of variables $\mathbf{V}_{i,FY2007}$

are the same as in Section 3. To satisfy the balancing property, we omit the tangible fixed assets and WCR from the equation. Φ is the cumulative distribution function of the standard normal distribution. As we now employ outcome variables in fiscal year t+1, we limit the observations to those where the outcome variables in FY2008 are available. The number of observations is 1,671. We compare the periods before and after the financial shock in 2008. We estimate the determinants of ending relationships in FY2007, which means that the treatment and control groups are determined before the financial shock.

The estimation results for equation (6) are as follows.

$$\begin{aligned} P(End_{i,FY2007} = 1 \mid \mathbf{V}_{i,FY2007}) &= \Phi(-0.147 + 0.771 \times Cash\ Holdings_{i,FY2006} \\ &+ 1.481 \times Cash\ Flow_{i,FY2007} - 0.071 \times Firm\ Size_{i,FY2006} \\ &- 1.447 \times Firm\ Growth_{i,FY2007} \\ &+ 3.865 \times End_{i,FY2006}) \end{aligned} \tag{7}$$

The estimation results are similar to those in Table 6. All coefficients apart from firm scale are statistically significant. Using the estimated coefficients in equation (7), we calculate the estimated propensity score $[\hat{p}(\mathbf{V}_{i,FY2007})]$ for each observation, and match the observations based on the estimated propensity score. We employ a k-nearest neighbor-matching algorithm to match the treatment and control observations where k indicates the number of control observations matched with each treatment observation. We estimate the propensity score by matching each treatment observation using its five nearest neighbors.

To check whether the matching is suitable, we use the balancing test. First, we test the difference in the mean of each variable between the treated and matched observations. The means of each variable are shown in Table 15. Before matching, the differences of all variables apart from firm size and growth between treated and unmatched control observations are statistically significant at the 1% level. This suggests that the characteristics are not similar between firms with lending relationships and those without. The

differences between the treated and matched control observations are not statistically significant apart from firm growth and scale, so we fail to reject the null hypothesis that the differences in the means between the treated and matched control observations are zero. This suggests that after matching, the differences in characteristics between the treated and control observations are small. In particular, the differences in cash flows and holdings between the treated and matched control firms are statistically insignificant, so that both firms with lending relationships and those without have large internal cash holdings. Second, we estimate equation (6) using only the treated and matched control observations. Before matching, the pseudo R^2 value for the estimate of equation (6) is 0.779. After matching, the pseudo R^2 value for equation (6) decreases to 0.009, which is lower than that in the model using all observations. These results suggest that the differences between the treated and matched observations are not significantly large.

4.3.3 Results

Similar to Subsection 4.1, we employ bank borrowings, interest rates, cash holdings, and operating incomes as outcome variables. In Table 16, we show the results using all observations. Panel A of Table 16 shows the difference in bank borrowings ($\Delta Bank\ Borrowings$) between the treated and control firms. We show the results using all control firms in the column headed "Unmatched" and those using matched control firms in the column headed "Matched". The differences between the treated and both unmatched and matched control firms are statistically insignificant, which implies that firms with lending relationships and those without did not increase their bank borrowings after the shock.

The results at the bottom of the table in Panel A control for credit demand using firms with increased WCR after the shock. Using unmatched control firms, the difference in bank borrowings is negative and statistically significant. This result suggests that firms with lending relationships increase their bank borrowings by more to finance their WCR. In contrast, if we use matched firms for the control, the difference becomes statistically

insignificant. This result implies that both firms with lending relationships and those without them increased their borrowings by only small amounts.[13]

Panel B of Table 16 shows the results using interest rates as an outcome variable. To control for the differences between the control and matched firms, we show the difference-in-differences parameters, which measure the net effects of the financial shock for the treated firms. The differences in interest rates between the treated and unmatched control firms are statistically significant before and after the shock. If we use matched firms, the differences are significant only before the shock using all observations. The difference-in-differences is statistically insignificant if we compare treated firms and matched control firms, implying that firms without lending relationships do not face more severe credit constraints. The bottom of Panel B shows the results using firms that faced increasing WCR. The results are similar to those using all observations.

Panel C of Table 16 shows the results using cash holdings ($\Delta Cash\ Holdings$) as an outcome variable. Using all observations, the difference between the matched control and treated firms is statistically insignificant before the financial shock. The bottom of Panel C shows the results using firms with increasing WCR. The difference-in-differences is negative and statistically significant for unmatched control firms. If we use unmatched firms for controls, we see that the treated firms reduced their cash holdings by more than control firms after the shock. On the other hand, if we use matched firms for controls, the difference-in-differences of cash holdings is not statistically significant. Furthermore, the average cash holdings after the shock are negative in both the treated and matched control firms, suggesting that they reduced their cash holdings to increase their capital during the shock period.

In Section 4, using simple regressions, we showed that firms without lending relationships increased their bank borrowings by less and reduced their internal cash by more

[13] As Table 15 shows, many matched firms with lending relationships were unlikely to have relationships at the beginning of FY2007. Therefore, the growth rates of bank borrowings should be large in FY2007. As a result, the difference-in-differences of bank borrowings for matched firms becomes negative. We only show the difference in growth rates of bank borrowings in Table 16.

to finance their WCR during the shock period. The results from the propensity score matching do not support these results, implying that if firms have adequate internal cash holdings, both firms with lending relationships and those without did not use bank borrowings and reduced their cash holdings during the shock period.

To investigate the effects on firm performance, we show the results using operating incomes (normalized by total assets) as an outcome variable in Panel D of Table 16. Before the shock, the difference between the unmatched control and treated firms is statistically significant, suggesting that operating incomes for treated firms are higher. The difference-in-differences of operating incomes is negative before matching, but becomes positive after matching. These results imply that the performance of firms without relationships is not lower during the shock period.[14]

5 Conclusion

We investigated the reasons why small businesses do not have relationships with banks. We also investigated whether the main financing sources and firm performance differ between firms with lending relationships and those without such relationships during the global financial shock. We presented the following results. First, small businesses with high internal cash flows, low growth opportunities, little working capital, and few tangible assets are more likely to end their lending relationships with banks. These results imply that small businesses end their relationships because demand for bank loans is low. On the other hand, few small businesses end their relationships because banks deny loan applications, implying that the effects of reductions in bank credit on lending relationships are insignificant. Second, during the financial shock, firms with lending relationships increased their bank borrowings to finance increasing WCR. In contrast, firms without such

[14]To check the robustness of the results, we also estimate using FY2007 as a shock dummy. The difference in total bank borrowings and difference-in-differences of interest rates, cash holdings, and operating incomes are all statistically insignificant. This suggests that our estimation results hold for FY2008 onward, that is, after the bankruptcy of Lehman Brothers.

relationships reduced their cash holdings, rather than increasing their bank borrowings. Cash-rich firms used internal cash holdings even if they had lending relationships. This result implies that firms prefer internal cash holdings, which is consistent with a pecking order theory. Third, the differences in performance (in terms of profitability) between firms having relationships and those not having relationships are insignificant during the shock period, implying that credit constraints for firms without relationships are not severe.

After the Financial Services Agency adopted the Action Program Concerning Enhancement of Relationship Banking Functions in 2003, close relationships between banks and small businesses were promoted by the government. Our estimated results show that small businesses with high liquidity end lending relationships with banks, implying that they have no need for such relationships. Furthermore, they have enough liquidity to finance credit demand during the unexpected shock period, so the credit constraints are not severe. Therefore, the policy effects on the strength of lending relationships for small businesses with low demand for bank loans are insignificant. On the other hand, some small businesses have neither sufficient cash holdings nor lending relationships. As Table 14 shows, small businesses with low liquidity and no relationships do not increase bank borrowings and reduce cash holdings when they face high credit demand. The credit constraints for these firms might be severe, so there might be a need to enhance credit supply for these firms by public credit guarantee or government lending.

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Table 1: Number of Observations, by Firm Size and Year

Employees	-20	21-100	101-300	301-500	Total
2001	3,080	3,235	2,081	564	8,960
2002	3,274	3,238	2,080	549	9,141
2003	3,528	3,413	2,214	535	9,690
2004	3,663	3,673	2,289	622	10,247
2005	3,776	3,576	2,292	567	10,211
2006	3,706	3,644	2,256	560	10,166
2007	3,558	3,487	2,288	577	9,910
2008	3,601	3,405	2,209	573	9,788

Note: This table shows the number of observations divided by year and number of employees.

Table 2: Distribution of Total Bank Borrowings (Normalized by Total Assets)

	p25	Median	p75
2001	0.00	24.30	50.42
2002	0.00	22.76	48.60
2003	0.00	19.07	46.04
2004	0.00	17.61	44.42
2005	0.00	15.61	43.69
2006	0.00	14.49	42.36
2007	0.00	13.54	42.01
2008	0.00	12.88	42.94

Note: This table shows the quartiles of total bank borrowings, normalized by total assets at the end of the fiscal year. The numbers are expressed in percentage terms.

Table 3: Median of Total Bank Borrowings (Normalized by Total Assets), by Firm Size

Employees	-20	21-100	101-300	301-	Total
2001	18.67	28.13	24.86	23.97	24.30
2002	17.11	26.28	23.75	20.52	22.76
2003	15.00	22.91	18.32	17.73	19.07
2004	14.22	21.83	17.86	11.86	17.61
2005	12.02	20.56	15.07	10.24	15.61
2006	9.24	19.88	15.00	7.79	14.49
2007	10.49	17.57	12.87	7.80	13.54
2008	10.53	16.67	12.23	5.62	12.88

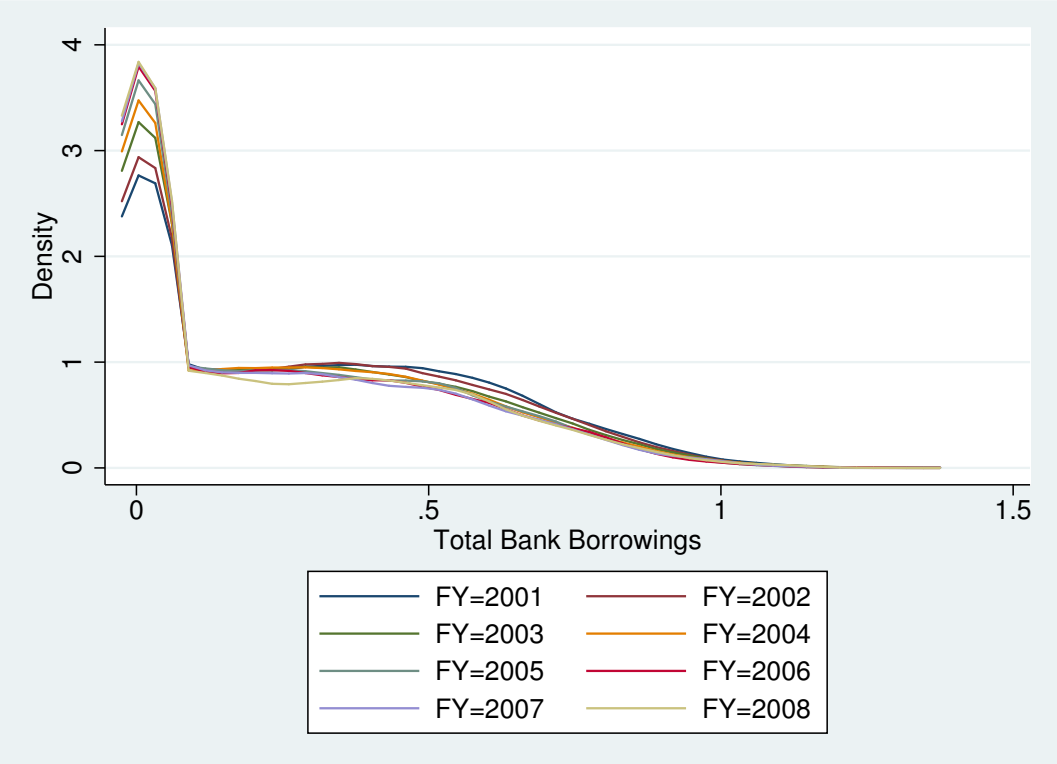
Note: This table shows the median of total bank borrowings (normalized by total assets) at the end of the fiscal year, divided by the number of employees. The numbers are expressed in percentage terms.

Table 4: Ratio of Number of Firms without Lending Relationships

Employees	-20	21-100	101-300	301-	Total
2001	34.3	23.8	23.3	22.7	27.2
2002	35.9	25.5	24.3	21.9	28.8
2003	38.2	27.2	28.5	28.8	31.6
2004	39.4	29.8	28.7	34.9	33.3
2005	40.2	31.0	32.1	34.6	34.8
2006	41.9	31.6	32.4	37.5	35.9
2007	41.9	31.7	34.2	38.0	36.3
2008	41.9	34.1	36.3	40.7	37.8
2009	43.1	32.6	35.6	40.8	37.7

Note: This table shows the percentage of firms whose total bank borrowings are zero in fiscal year t, divided by the number of employees. The numbers are expressed in percentage terms.

Figure 1: Distribution of Total Bank Borrowings by Fiscal Year



Note: This figure presents an Epanechnikov kernel function of total bank borrowings normalized by total assets, separated by fiscal year. Bandwidth is 0.0249.

Table 5: Summary Statistics for 2001–2007

Variable	N	mean	sd	min	p1	p50	p99	max
End	68,325	0.327	0.469	0.000	0.000	0.000	1.000	1.000
Lagged End	68,325	0.317	0.465	0.000	0.000	0.000	1.000	1.000
End if Lagged End=0	44,654	0.029	0.167	0.000	0.000	0.000	1.000	1.000
Firm Size	68,325	7.077	1.572	-4.722	3.497	7.149	10.223	14.372
Firm Growth	68,325	0.000	0.200	-4.653	-0.521	-0.005	0.557	5.325
Cash Holdings	68,325	0.165	0.173	-0.019	0.000	0.110	0.798	1.000
Cash Flow	68,325	0.053	0.082	-0.400	-0.220	0.046	0.285	0.347
Nonbanking Relationships	68,325	0.686	0.464	0.000	0.000	1.000	1.000	1.000
Tangible Fixed Assets	68,325	0.347	0.276	0.000	0.000	0.299	0.970	1.000
WCR	68,325	0.129	0.182	-1.156	-0.262	0.093	0.681	1.000

Note: This table shows summary statistics of variables used in the estimation of equation (1).

Table 6: Estimated Results of Probit Estimation for the Ending of Relationships

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	End	End	End	End	End	End
Size	All	Small	Medium	All	Small	Medium
End	All	All	All	Lagged End=0	Lagged End=0	Lagged End=0
Lagged End	0.9313***	0.9321***	0.9291***			
	(0.002)	(0.003)	(0.002)			
Cash Holdings	0.0914***	0.2142***	0.0133	0.0107*	0.0384***	-0.0093
	(0.022)	(0.039)	(0.027)	(0.006)	(0.009)	(0.009)
Cash Flow	0.4144***	0.1432**	0.5583***	0.0985***	0.0197	0.1407***
	(0.040)	(0.072)	(0.047)	(0.011)	(0.017)	(0.014)
Firm Size	-0.0080***	-0.0144***	-0.0039	-0.0015***	-0.0033***	-0.0014**
	(0.002)	(0.005)	(0.003)	(0.001)	(0.001)	(0.001)
Firm Growth	-0.2211***	-0.2226***	-0.2265***	-0.0440***	-0.0384***	-0.0471***
	(0.016)	(0.025)	(0.021)	(0.005)	(0.007)	(0.006)
Nonbanking	-0.0634***	-0.0359***	-0.0756***	-0.0143***	-0.0058**	-0.0192***
Relationships	(0.007)	(0.012)	(0.008)	(0.002)	(0.003)	(0.002)
Tangible Fixed Assets	-0.1870***	-0.1474***	-0.2164***	-0.0461***	-0.0301***	-0.0557***
	(0.014)	(0.024)	(0.018)	(0.004)	(0.006)	(0.005)
WCR	-0.1227***	-0.1543***	-0.1011***	-0.0262***	-0.0286***	-0.0243***
	(0.019)	(0.035)	(0.021)	(0.004)	(0.007)	(0.005)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	68,325	24,585	43,740	44,654	14,336	29,953

Note: This table presents estimates of maximum-likelihood probit regressions with $End_{i,t}$ as a dependent variable. The dummy variable $End_{i,t}$ takes a value of one if short-term and long-term borrowings from financial institutions at the end of fiscal year t are zero, and zero otherwise. Cash holdings are defined as the ratio of a firm's cash holdings to total assets at the beginning of each fiscal year. Cash flow is defined as EBITDA, normalized by total assets in fiscal year t. Firm size is defined as the natural logarithm of a firm's total assets at the beginning of fiscal year t. Firm growth is defined as the natural logarithm of a firm's total assets at the end of the fiscal year minus those at the beginning of the fiscal year. Nonbanking relationships equal one if a firm's total borrowings from nonfinancial firms are nonzero, and zero otherwise. Tangible fixed assets are defined as the ratio of a firm's tangible fixed assets to total assets at the beginning of the fiscal year. WCR is defined as the sum of trade receivables and inventories, minus trade payables at the beginning of the fiscal year. Six year dummies from 2002 to 2007 and 47 industry dummies are included. The reference year is 2001. The marginal effects of each variable at the mean are provided in each column. Estimated robust standard errors are shown in parentheses. The symbol * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level.

Table 7: Estimated Results of Probit Estimation for the Ending of Relationships Using Financial DI

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	End	End	End	End	End	End
Size	All	Small	Medium	All	Small	Medium
End	All	All	All	Lagged End=0	Lagged End=0	Lagged End=0
Financial DI	-0.0006*	-0.0009	-0.0005	-0.0000	-0.0000	-0.0001
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	No	No	No	No	No	No
Observations	66,306	23,384	42,922	43,239	13,658	29,581

Note: This table presents estimates of maximum-likelihood probit regressions with $End_{i,t}$ as the dependent variable. We estimate equation (1) using financial DI as an additional dependent variable. The estimated coefficients of other variables are omitted. The marginal effects of each variable at the mean are provided in each column. The estimated robust standard errors are shown in parentheses. The symbol * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level.

Table 8: Responses of Loan Applications to Main Banks and Lending Relationships

	Ans. 1	Ans. 2	Ans. 3	Ans. 4	Ans. 5	Ans. 6	Freq..
Continue	5.53	34.22	12.84	6.88	9.60	30.93	7,727
End	0.37	0.09	0.00	0.00	0.00	99.54	1,087
Total	4.89	30.01	11.25	6.04	8.42	39.39	8,814

Note: The numbers are expressed in percentages. The possible responses are 1) Applications rejected or amounts requested reduced, 2) Could borrow amounts requested without changes in borrowing terms, 3) Borrowing terms severe, but could borrow amounts requested, 4) Could borrow amounts requested after easing of borrowing terms, 5) Bank suggested increasing loan amount, and 6) Have not submitted loan applications.

Table 9: Summary Statistics for 2006–2008

Variable	N	mean	sd	min	p1	p50	p99	max
Interest Rate	29,864	0.015	0.016	0.000	0.000	0.014	0.067	0.172
Total Bank Borrowings	29,864	-0.002	0.059	-0.258	-0.174	0.000	0.199	0.305
Cash Holdings	29,864	-0.002	0.079	-1.000	-0.262	0.000	0.215	0.989
Operating Income	29,679	0.022	0.077	-0.448	-0.265	0.021	0.219	0.270
Δ WCR	29,864	0.004	0.072	-0.270	-0.205	0.000	0.246	0.352
Firm Growth	29,864	-0.006	0.195	-4.653	-0.548	-0.006	0.542	5.325
Firm Size	29,864	7.080	1.590	-3.533	3.434	7.153	10.282	14.273
Cash Flow	29,864	0.053	0.086	-0.400	-0.235	0.046	0.290	0.347
Leverage	29,864	0.640	0.308	0.000	0.008	0.677	1.512	2.162
Collateral Assets	29,864	0.338	0.276	0.000	0.000	0.287	0.968	1.000
End	29,864	0.359	0.480	0.000	0.000	0.000	1.000	1.000

Note: This table shows summary statistics of variables used in the estimation of equations (2), (3), (4), and (5).

Table 10: Estimated Results for Regression of Total Bank Borrowings

	(1)	(2)	(3)
Dependent Variable	Total Bank Borrowings	Total Bank Borrowings	Total Bank Borrowings
Firm Size	All	Medium	Small
$\Delta\text{WCR}_{i,t}^{end=0,shock=0}$	0.1595***	0.1763***	0.1318***
	(0.011)	(0.014)	(0.019)
$\Delta\text{WCR}_{i,t}^{end=1,shock=0}$	0.0294***	0.0311***	0.0262***
	(0.005)	(0.006)	(0.008)
$\Delta\text{WCR}_{i,t}^{end=0,shock=1}$	0.1175***	0.1364***	0.0855***
	(0.019)	(0.023)	(0.031)
$\Delta\text{WCR}_{i,t}^{end=1,shock=1}$	0.0149*	0.0184**	0.0082
	(0.008)	(0.009)	(0.015)
End	0.0103***	0.0090***	0.0135***
	(0.001)	(0.001)	(0.001)
Cash Flow	-0.1222***	-0.1397***	-0.1039***
	(0.005)	(0.006)	(0.008)
Firm Size	0.0010***	0.0011***	0.0002
	(0.000)	(0.000)	(0.000)
Firm Growth	0.0041*	0.0093***	-0.0006
	(0.002)	(0.003)	(0.003)
Leverage	-0.0009	-0.0037**	0.0018
	(0.001)	(0.002)	(0.002)
Collateral Assets	-0.0075***	-0.0054***	-0.0088***
	(0.001)	(0.002)	(0.002)
Interest Rate	0.1589***	0.0846***	0.2667***
	(0.026)	(0.030)	(0.046)
Year Dummy	Yes	Yes	Yes
Industrial Dummy	Yes	Yes	Yes
Observations	29,864	18,999	10,865
R-squared	0.064	0.076	0.059

[continue to next page]

Note: This table presents estimates of the OLS regressions with $\Delta Bank\ Borrowings_{i,t}$ as a dependent variable. $\Delta Bank\ Borrowings_{i,t}$ is the growth rate of a firm's total bank borrowings {[(short-term bank borrowings at the end of the fiscal year + long-term bank borrowings at the end of the fiscal year) – (short-term bank borrowings at the beginning of the fiscal year + long-term bank borrowings at the beginning of the fiscal year)] / total assets at the beginning of the fiscal year}. ΔWCR is defined as {[(trade receivables at the end of the fiscal year + inventories at the end of the fiscal year – trade payables at the end of the fiscal year) – (trade receivables at the end of the fiscal year + inventories at the end of the fiscal year – trade payables at the beginning of the fiscal year)] / total assets at the beginning of the fiscal year}. $\Delta WCR_{i,t}^{end=0,shock=0}$ equals $\Delta WCR_{i,t}$ if end dummy at the beginning of the fiscal year is zero and shock equals zero, zero otherwise. $\Delta WCR_{i,t}^{end=1,shock=0}$ equals $\Delta WCR_{i,t}$ if end dummy at the beginning of the fiscal year is one and shock equals zero, zero otherwise. $\Delta WCR_{i,t}^{end=0,shock=1}$ equals $\Delta WCR_{i,t}$ if end dummy at the beginning of the fiscal year is zero and shock equals one, zero otherwise. $\Delta WCR_{i,t}^{end=1,shock=1}$ equals $\Delta WCR_{i,t}$ if end dummy at the beginning of the fiscal year is one and shock equals one, zero otherwise. The dummy variable $End_{i,t}$ takes a value of one if short-term and long-term borrowings from financial institutions at the beginning of fiscal year t are zero, and zero otherwise. Cash flow is defined as a firm's EBITDA, normalized by total assets in fiscal year t. Firm size is defined as the natural logarithm of a firm's total assets at the beginning of the fiscal year. Firm growth is defined as the natural logarithm of a firm's total assets at the end of the fiscal year minus those at the beginning of the fiscal year. Leverage is defined as the ratio of a firm's book value of total debts to total assets at the beginning of fiscal year t. Collateral assets are defined as the ratio of a firm's tangible fixed assets to total assets at the beginning of fiscal year t. Interest rate is defined as the ratio of a firm's interest expenses to the sum of its short- and long-term debt and discounted bills receivable in fiscal year t. Two year dummies from 2007 to 2008 and 47 industry dummies are included. The reference year is 2006. Estimated robust standard errors are shown in parentheses. The symbol * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level.

Table 11: Estimated Results for Regression of Interest Rate

	(1)	(2)	(3)
Dependent Variable	Interest Rate	Interest Rate	Interest Rate
Firm Size	All	Medium	Small
$\Delta\text{WCR}_{i,t}^{end=0,shock=0}$	-0.0013	-0.0013	-0.0011
	(0.002)	(0.003)	(0.004)
$\Delta\text{WCR}_{i,t}^{end=1,shock=0}$	0.0034	0.0026	0.0040
	(0.002)	(0.003)	(0.004)
$\Delta\text{WCR}_{i,t}^{end=0,shock=1}$	-0.0014	-0.0067**	0.0061
	(0.003)	(0.003)	(0.006)
$\Delta\text{WCR}_{i,t}^{end=1,shock=1}$	-0.0023	-0.0005	-0.0058
	(0.003)	(0.004)	(0.006)
End	-0.0118***	-0.0111***	-0.0127***
	(0.000)	(0.000)	(0.000)
Cash Flow	0.0023**	-0.0004	0.0036**
	(0.001)	(0.001)	(0.002)
Firm Size	0.0002***	-0.0005***	0.0008***
	(0.000)	(0.000)	(0.000)
Firm Growth	0.0011**	0.0012	0.0008
	(0.001)	(0.001)	(0.001)
Leverage	0.0092***	0.0098***	0.0080***
	(0.000)	(0.000)	(0.000)
Collateral Assets	0.0011***	0.0026***	-0.0002
	(0.000)	(0.000)	(0.001)
Year Dummy	Yes	Yes	Yes
Industrial Dummy	Yes	Yes	Yes
Observations	29,864	18,999	10,865
R-squared	0.221	0.208	0.246

Note: This table presents estimates of OLS regressions with $Interest\ Rate_{i,t}$ as a dependent variable. $Interest\ Rate_{i,t}$ is defined as the ratio of a firm's interest expenses to the sum of its short- and long-term debt and discounted bills receivable in fiscal year t. Other definitions of each variable are given in the note for Table 10. Two year dummies from 2007 to 2008 and 47 industry dummies are included. The reference year is 2006. Estimated robust standard errors are shown in parentheses. The symbol * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level.

Table 12: Estimated Results for Regression of Cash Holdings

	(1)	(2)	(3)
Dependent Variable	Cash Holdings	Cash Holdings	Cash Holdings
Firm Size	All	Medium	Small
$\Delta\text{WCR}_{i,t}^{end=0,shock=0}$	-0.2902***	-0.2842***	-0.3072***
	(0.011)	(0.013)	(0.020)
$\Delta\text{WCR}_{i,t}^{end=1,shock=0}$	-0.3620***	-0.2903***	-0.4724***
	(0.019)	(0.020)	(0.035)
$\Delta\text{WCR}_{i,t}^{end=0,shock=1}$	-0.3356***	-0.3127***	-0.3758***
	(0.018)	(0.018)	(0.035)
$\Delta\text{WCR}_{i,t}^{end=1,shock=1}$	-0.4043***	-0.3182***	-0.5636***
	(0.025)	(0.028)	(0.047)
End	0.0009	0.0001	0.0024
	(0.001)	(0.001)	(0.002)
Cash Flow	0.1056***	0.0808***	0.1414***
	(0.008)	(0.009)	(0.015)
Firm Size	-0.0013***	-0.0001	-0.0023***
	(0.000)	(0.000)	(0.001)
Firm Growth	0.0120	0.0295***	-0.0055
	(0.008)	(0.006)	(0.013)
Leverage	0.0048***	0.0051**	0.0048*
	(0.002)	(0.002)	(0.003)
Collateral Assets	0.0157***	0.0168***	0.0143***
	(0.002)	(0.002)	(0.003)
Interest Rate	-0.0422	-0.0263	-0.0598
	(0.035)	(0.046)	(0.055)
Year Dummy	Yes	Yes	Yes
Industrial Dummy	Yes	Yes	Yes
Observations	29,864	18,999	10,865
R-squared	0.106	0.102	0.126

Note: This table presents estimates of OLS regressions with $\Delta Cash\ Holdings_{i,t}$ as a dependent variable. $\Delta Cash\ Holdings_{i,t}$ is the growth rate of a firm's cash holdings [(cash holdings at the end of the fiscal year – cash holdings at the beginning of the fiscal year) / total assets at the beginning of the fiscal year]. Other definitions of each variable are given in the note for Table 10. Two year dummies from 2007 to 2008 and 47 industry dummies are included. The reference year is 2006. Estimated robust standard errors are shown in parentheses. The symbol * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level.

Table 13: Estimated Results for Regression of Operating Incomes

	(1)	(2)	(3)
Dependent Variable	Operating Income	Operating Income	Operating Income
Firm Size	All	Medium	Small
End × Shock	-0.0018	-0.0036	0.0006
	(0.002)	(0.003)	(0.004)
End	0.0005	0.0051***	-0.0065***
	(0.001)	(0.002)	(0.002)
Firm Size	0.0096***	0.0063***	0.0100***
	(0.000)	(0.000)	(0.001)
Firm Growth	0.0724***	0.0797***	0.0611***
	(0.004)	(0.005)	(0.007)
Leverage	-0.0131***	-0.0233***	-0.0084***
	(0.002)	(0.003)	(0.003)
Collateral Assets	-0.0153***	-0.0246***	-0.0038
	(0.002)	(0.003)	(0.003)
Year Dummy (FY2007)	-0.0003	0.0012	-0.0030
	(0.001)	(0.001)	(0.002)
Year Dummy (FY2008)	-0.0097***	-0.0090***	-0.0103***
	(0.001)	(0.001)	(0.002)
Industrial Dummy	Yes	Yes	Yes
Observations	29,679	18,901	10,778
R-squared	0.105	0.108	0.084

Note: This table presents estimates of OLS regressions with $Firm\ Performance_{i,t}$ as a dependent variable. We use the operating income ratio, which is defined as the ratio of a firm's operating income to total assets in fiscal year t, as a proxy of firm performance. Other variable definitions are given in the note for Table 10. Two year dummies from 2007 to 2008 and 47 industry dummies are included. The reference year is 2006. Estimated robust standard errors are shown in parentheses. The symbol * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level. The numbers are expressed in percentage terms.

Table 14: Median of Growth Rates of Total Bank Borrowings and Cash Holdings in FY2008, by Four Quantiles of Cash Holdings

Panel A: Total Borrowings

ΔWCR	Over 0% - 2.5%				2.5% or more			
4 quantiles of cash holdings	End=0	End=1	Difference		End=0	End=1	Difference	
1	-0.28	0.00	-0.28		1.00	0.00	1.00	***
2	0.00	0.00	0.00		2.16	0.00	2.16	**
3	-0.40	0.00	-0.40	**	1.35	0.00	1.35	**
4	-0.45	0.00	-0.45	***	0.18	0.00	0.18	

Panel B: Cash Holdings

ΔWCR	Over 0% - 2.5%				2.5% or more			
4 quantiles of cash holdings	End=0	End=1	Difference		End=0	End=1	Difference	
1	0.04	0.00	0.04		0.01	0.00	0.01	
2	-0.12	0.43	-0.55		-0.57	-1.77	1.19	***
3	-0.90	-0.74	-0.16		-2.24	-3.71	1.47	**
4	-1.42	-0.47	-0.95	*	-6.07	-6.24	0.17	

*Note: This table presents the median of growth rates of total bank borrowings and cash holdings. Growth rate of total bank borrowings is defined as [(total bank borrowings at the end of FY2008 – total bank borrowings at the beginning of FY2008) / total assets at the beginning of FY2008]. Growth rate of cash holdings is defined as [(cash holdings at the end of FY2008 – cash holdings at the beginning of FY2008) / total assets at the beginning of FY2008]. ΔWCR is defined as WCR at the end of FY2008 – WCR at the beginning of FY2008. The numbers are expressed in percentage terms. Each row is divided into four quantiles of cash holdings normalized by total assets at the beginning of FY2008. The symbol * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level.*

Table 15: Difference Between the Treated and Control Samples Before and After Matching

		Unmatched			Matched		
	Treated	Control	t statistics		Control	t statistics	
Lagged End	0.941	0.020	99.74	***	0.940	0.04	
Cash Holdings	0.167	0.107	7.92	***	0.176	-0.96	
Cash Flow	0.078	0.071	1.68	*	0.073	1.16	
Firm Size	7.822	8.257	-6.85	***	7.566	3.73	***
Firm Growth	0.005	0.000	0.72		-0.012	2.12	**

Note: This table details the means of the independent variables used in the probit estimation in equation (6). The column headed "Treated" contains the means for the firms ending lending relationships (treated firms). The column headed "Unmatched" contains the means for firms continuing lending relationships (control firms). The column headed "Matched" contains the means for the matched observations of firms continuing lending relationships. * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level.

Table 16: Estimation Results for Ending Relationships during the Shock Period

Panel A: Bank Borrowings

(1) All Observations		Matched		Unmatched	
	Treated	Controls	Difference	Controls	Difference
FY2008	0.0018	-0.0043	0.0062	0.0041	-0.0023

(2) Positive ΔWCR		Matched		Unmatched	
	Treated	Controls	Difference	Controls	Difference
FY2008	0.0022	-0.0014	0.0036	0.0092	-0.007*

Panel B: Interest Rate

(1) All Observations		Matched				Unmatched			
	Treated	Controls	Difference	Diff.-in-Diff.	Std. Err.	Controls	Difference	Diff.-in-Diff.	Std. Err.
FY2007	0.0073	0.0154	-0.0081***			0.0188	-0.0115***		
FY2008	0.0075	0.0122	-0.0047	0.0034	0.0027	0.0193	-0.0117***	-0.0003	0.0005

(2) Positive ΔWCR		Matched				Matched			
	Treated	Controls	Difference	Diff.-in-Diff.	Std. Err.	Controls	Difference	Diff.-in-Diff.	Std. Err.
FY2007	0.0078	0.0114	-0.0036			0.0187	-0.011***		
FY2008	0.0076	0.0145	-0.0068	-0.0032	0.0032	0.0188	-0.0112***	-0.0002	0.0008

Panel C: Cash Holdings

(1) All Observations		Matched				Unmatched			
	Treated	Controls	Difference	Diff.-in-Diff.	Std. Err.	Controls	Difference	Diff.-in-Diff.	Std. Err.
FY2007	-0.0039	-0.0117	0.0078			-0.0045	0.0006		
FY2008	-0.0014	-0.0054	0.004	-0.0038	0.0242	0.0046	-0.006*	-0.0067	0.0049

(2) Positive ΔWCR		Matched				Unmatched			
		Controls	Difference	Diff.-in-Diff.	Std. Err.	Controls	Difference	Diff.-in-Diff.	
FY2007	0.0084	-0.0156	0.024			-0.0028	0.0111***		
FY2008	-0.0121	-0.0063	-0.0058	-0.0297	0.0242	-0.0051	-0.007	-0.0181***	0.0065

Panel D: Operating Incomes

(1) All Observations		Matched				Unmatched			
	Treated	Controls	Difference	Diff.-in-Diff.	Std. Err.	Controls	Difference	Diff.-in-Diff.	Std. Err.
FY2007	0.0445	0.0474	-0.0029			0.0327	0.0117***		
FY2008	0.0234	-0.0060	0.0293*	0.0323**	0.0140	0.0192	0.0042	-0.0076***	0.0030

Note: This table provides the treatment effects on the *Bank Borrowings*, *Interest Rate*, *Cash Holdings*, and *Operating Incomes* for treated and matched firms before and after the shock. The definitions of each variable are given in the note for Table 10. The column denoted as "Diff.-in-Diff." shows the difference-in-differences between FY2007 and FY2008 and the treated and matched firms. Standard errors for the difference-in-differences are in the column headed "Std. Err.". * denotes significance at the 10% level, ** denotes significance at the 5% level, and *** denotes significance at the 1% level.