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An Estimation of the Inside Bank Premium

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Abstract

This paper is an empirical examination of the existence of the inside bank premium arising from relationship banking, which is predicted in the extant theoretical models. These models predict that the contracted interest rate of a loan extended by an inside bank when there exist asymmetries between the inside bank and outside banks, such as the information advantage of the inside bank or the implicit insurance and other borrower-specific services exclusively provided by the inside bank, is higher than that without such asymmetries. Our statistical estimations are based on the dataset collected through the survey for small and medium-sized firms in Japan, which were designed to contain the questions about a firm's loan application process, and the agreed-upon loan terms that are crucial to our tests. Our estimations show that such an inside bank premium is 30-50 basis points on average for short-term loans. This is economically significant for the median short-term interest rate of 1.9 %. The subsample regressions show that this premium is more likely to come from the implicit insurance and that this premium is more significant for smaller inside banks in more competitive loan markets.

Keywords: relationship banking, implicit contract, and information rent.
JEL classification: G21, L14, D82.

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1 Introduction

A number of theoretical models have shown that a bank that maintains long-term and exclusive lending relationship with an informationally opaque firm, such as a small firm that is not listed on the stock market, can earn a positive rent despite the competitive pressures in the loan markets. The first strand of studies shows that such a bank, which is often referred to as an inside bank, a relational bank, or a main bank in the literature, acquires proprietary information that is accessible only through the existing lending relationship and as a result gains the rent arising from the information advantage over rival lenders (Sharpe, 1990; Rajan, 1992; Dell'Ariccia et al., 1999; von Thadden, 2004; Hauswald and Marquez, 2006). The second strand of studies shows that a bank can earn a quasi-rent by strategically establishing the reputation that it is not only competent in collecting proprietary information but also able to tell apart clients under temporary distress from those under permanent ones by utilizing the collected proprietary information and to flexibly respond to the renegotiations with the former (Chemmanur and Fulghieri, 1994; Dinç, 2000). Similarly, a bank may earn a premium for an implicit insurance against such liquidity shortage of a repeated borrower (Osano and Tsutsui, 1985).[1] The third strand of studies points out that the inside bank may differentiate its services from those of rivals, for example, by providing borrower-specific consulting services that improve the success probability of its borrowers based on the collected client-specific proprietary information (Boot and Thakor, 2000; Yafeh and Yosha, 2001). It is well understood that these activities, collectively known as *relationship banking*, enhance the credit availability not only to the firms that keep close preexisting relationships with their inside banks but also to the firms without such relationships since banks that are willing to engage in relationship banking are also willing to preemptively establish and dominate the lending relationship with a firm ahead of rivals (Sharpe, 1990; Petersen and Rajan, 1995).

Thus, the feasibility of relationship banking, which potentially has significant impacts on

[1] A number of empirical studies provide evidence supportive of the positive impact of a bank-firm relationship on credit availability of small firms (e.g., Petersen and Rajan, 1994; Cole, 1998; Elsas and Krahnen, 1998; Jiangli et al., 2008).

the credit availability to informationally opaque firms, inevitably depends on the possibility that an inside bank can earn a rent by developing such asymmetry between the inside bank and outside banks. A number of empirical studies provide indirect evidence supportive of the existence of such rent earned by the inside bank. For example, Weinstein and Yafeh (1998) find that Japanese listed companies affiliated with an industrial group of firms linked through cross-shareholding paid higher interest costs until the 1980s. Degryse and van Cayseele (2000) find that, in Belgium, the interest rate is higher for firms that maintain a longer lending relationship with their main bank.[2] Schenone (2009) find that the interest rate imposed by an inside bank depicts a U-shaped curve against the length of the relationship before the initial public offering (IPO), whereas it turns decreasing after the IPO in the U.S. Several studies estimate positive switching costs in switching main banks in Norway (Kim et al., 2003) and Bolivia (Ioannidou and Ongena, 2010).

All these findings are suggestive of the existence of the rents earned by inside banks. However, an empirical question remains, namely, what is the primary source of these rents? The primary objective of this paper is to move the empirical study on this question one step ahead by implementing an empirical strategy that is more tightly in alignment with the theoretical model of the lending competition among an inside bank and outside banks with the dataset collected from a survey that we originally designed.

The simplified versions of the existing analytical models presented in the next section show, first, that a firm almost surely borrows from a single bank among competing banks if there exists either the information advantage of the inside bank or the relation-specific benefit of the continuing relationship with the inside bank, such as the implicit insurance driven by the reputational motivation of the inside bank or differentiated consulting services. In contrast, a firm borrows from both the inside bank and outside banks simultaneously with a positive

[2]In contrast, Petersen and Rajan (1994) and Elsas and Krahnen (1998) find no significant tendency, while Berger and Udell (1995) and Bharath et al. (2009) find a negative and significant impact on contracts of lines of credit of small businesses and on syndicated loan contracts of listed companies, respectively. Recent empirical studies find evidence supportive of rents that banks, but not necessarily inside banks, obtain. Santos and Winton (2008) find that credit spreads get disproportionately higher in a recession for firms without an access to the public debt market than for those with it. Hale and Santos (2009) find that credit spreads of companies with high credit ratings diminish significantly after their bond IPOs.

probability if these asymmetries do not exist among competing banks.[3] Second, the interest rate agreed upon with the inside bank is always higher in the former case of a single lender than in the latter case of multiple lenders despite the competitive bidding of the banks.

We made use of these properties to test the existence of the rent resulting from the asymmetry between the inside bank and outside banks; namely, we test whether a firm's borrowing rate contracted with the inside bank when it is the sole lender is significantly higher than the rate contracted with the inside bank when the firm borrows from multiple banks. We call this gap in contracted interest rates of the inside bank the *inside bank premium*. The existence of the asymmetry between the inside bank and outside banks is not rejected if the inside bank premium is positive and statistically significant.

Many of the existing empirical studies on this subject had looked mainly at the difference between the cost of borrowing from inside banks and the cost of borrowing from outside banks since they focused on the relational-contract aspect of relationship banking that are presented by the earlier literature (Bolton and Sharfstein, 1990; Boot and Thakor, 1994). However, this identification strategy is not necessarily the best one in estimating the the possible rent for the inside bank resulting from relationship banking. Indeed, it is possible to verify that asymmetric information per se does not yield the difference between the mean of contracted interest rates of informed banks and that of uninformed banks if the lending competition is formulated as a first-price auction under asymmetric information (Engelbrecht-Wiggans et al., 1983; Rajan, 1992). Our simple analytical model that assumes a benefit for a borrower to continue a lending relationship with an inside bank also predicts that the estimated inside bank premium is less biased toward zero than the interest-rate difference between the inside bank and outside banks. For these reasons, instead of adopting the traditional strategy, we focus on the inside bank premium, on which the analytical model provides us with a unique testable prediction.

Another novel contribution of our empirical study is the use of a unique dataset based on

[3]On this point, Black (2009) analytically and empirically shows that the outside bank is less likely to win in lending competition as the informational transparency with respect to the creditworthiness of a borrower improves. Our statement here does not contradict this result because what we are looking at is the probability that both an inside bank and outside banks simultaneously lend.

the originally designed survey questions. We used the dataset based on the *Fact Finding Survey on Transactions between Enterprises and Financial Institutions*, which was designed by the members of the Study Group on Changes in Financial and Industrial Structures at the Research Institute of Economy, Trade, and Industry (RIETI) in Japan, including ourselves, and was conducted by RIETI in February 2008. To our great advantage in light of our research agenda, we originally designed the questions about a firm's loan application process, the agreed terms of contracts with its largest and second-largest lenders, and the detailed information on the relationship with each of them including services purchased in addition to loans and the firm's subjective evaluation of the lenders' behavior, which can serve as a proxy for the reputation of lenders. Assuming that the bank from which a firm obtains the largest loan outstanding is the bank that corresponds to the theoretical inside bank, we empirically examine the average difference between the contracted interest rate of a short-term loan extended by the inside bank when it is the sole lender and the rate when both the inside bank and outside banks lend simultaneously, after controlling for loan contract characteristics including collateral coverage and other additional services provided by each bank as well as bank- and firm-specific attributes.

The results of the regressions, which are based on the system of equations that characterize the propositions directly drawn from our analytical model, show that the inside bank premium is positive and statistically significant. The estimated average premium on short-term loans is 30-50 basis points. It is economically significant for the median short-term borrowing interest rate of 1.9 percent.

In addition, the subsample regressions show that this premium does not differ by whether a firm perceives that the inside bank knows the unquantifiable strengths of the firm at least as well as outside banks, while the premium is more significantly observed in firms whose primary measure in case of a temporary liquidity shortage is to ask for additional loans to the inside bank. This finding suggests that the information advantage of the inside bank is insufficient for generating the inside bank premium but that the ability or willingness of the inside bank to exclusively provide a borrower with the implicit insurance by utilizing the information advantage over rival banks is required for it. Additional subsample regressions also show that the inside

bank premium is more significant statistically and economically when the size of an inside bank is smaller and the lending market is more competitive.

The rest of this paper is organized as follows. In Section 2, the simple analytical model is introduced and the testable propositions that address the existence of the asymmetries between the inside bank and outside banks are derived. In Section 3, our empirical identification strategy based on the analytical model demonstrated in Section 2 is proposed. In Section 4, our unique dataset is illustrated. In Section 5, the baseline results are reported. In Section 6, the subsample regression results are presented. Section 7 is the conclusion.

2 Theory

The existing theory provides various explanations for the rent that an inside bank can expect from maintaining a lending relationship with a borrower. The first strand of theoretical studies shows that proprietary information that an inside bank has exclusively accumulated during the course of repeated transactions with a firm yields information rents to the inside bank despite the competitive pressures from rivals (Sharpe, 1990; Rajan, 1992; von Thadden, 2004). We call this theoretical prediction the *information hypothesis*. The second strand of theoretical studies shows that the lending relationship with an inside bank serves as an implicit insurance against temporal liquidity shortages of firms. Firms that perceive this insurance valuable are willing to pay an insurance premium in the form of higher borrowing interest rates on loans. Thus, an inside bank that has established a reputation that it is competent in collecting proprietary information and telling apart temporary distressed clients from permanently distressed ones and is willing to respond properly to the renegotiation with the former can earn quasi-rents even in fierce lending competition (Chemmanur and Fulghieri, 1994; Dinç, 2000).[4] We call this theoretical prediction simply the *insurance hypothesis*. In our simple model, the other benefits for borrowers to maintain a lending relationship with the inside bank, such as borrower-specific advice and other additional services, are captured in almost the same way as the model of the

[4]Osano and Tsutsui (1985) show theoretically and empirically the possible existence of the implicit insurance by intertemporally smoothing interest rates under the assumption that borrowers are more strongly risk-averse than lenders.

implicit insurance. Nonetheless, we name the effect of the benefit the insurance hypothesis in order to keep the exposition simpler.

Both hypotheses predict that the rent that arises from the information advantage or the implicit insurance is reflected in the interest rate on a loan extended by the inside bank, which is increasing in the information advantage of the inside bank over rivals and the value of the implicit insurance to a firm. Furthermore, a firm almost surely borrows from a single bank if these asymmetries exist in spite of the competitive bidding by the inside and outside banks, while the firm borrows simultaneously from both the inside bank and outside banks with a positive probability otherwise. In this section, we elucidate this proposition underlying our empirical strategy to identify and estimate the inside bank premium.

Needless to say, these hypotheses only partially explain the difference of interest rates between an inside bank and outside banks. The difference in collateral coverage or financing costs among the competing banks also brings about a difference in loan interest rates. This point is noted later in this section.

2.1 Setup

We suppose a loan market in which a firm (potential borrower), an inside bank that has already extended a loan to the firm in the past, and N outside banks that have never done so exist.[5] All agents are assumed to be risk-neutral. The detailed assumptions for each agent are as follows.

A firm plans a project that costs I and yields a revenue equal to $(1+v)I$ $(v>0)$ in state S (success) or 0 in state F (failure). The firm applies for a loan I to the inside bank and n outside banks. It chooses the offer that maximizes its total expected return. We assume that the size of the project is sufficiently small so that each bank does not set the upper limit for loans extended at a level lower than I. The firm repays the face value of the loan in state S, while the collateral, which is mentioned later, is seized in state F. We assume that the firm has

[5]Here, we assume this extreme situation to keep the exposition simple. However, the point is that the inside bank has the *strongest relationship* with the firm among competing banks. The subsequent argument does not qualitatively change as long as one bank maintains a stronger relationship than the other banks.

the same information as that of the most informed bank and knows which bank is the inside bank.

The inside bank and N outside banks have the common prior belief regarding the success probability of the project $Prob(S) = \alpha$ and $Prob(F) = 1 - \alpha$. This represents, for example, the publicly available financial statement, the external credit score of the firm, or its public reputation. The inside bank and outside banks competitively and simultaneously bid the interest rates r^i and r^o, respectively. The ratios of the amount of a loan covered by the collateral, which we assume are exogenously given and publicly observable, are denoted by c^i for the inside bank and c^o for outside banks. Financing costs for the inside bank and outside banks are denoted by ρ^i and ρ^o, respectively. We also assume

$$\alpha(v - \bar{\rho}) + (1 - \alpha)(\underline{c} - 1 - \bar{\rho}) > 0, \tag{1}$$

where $\bar{\rho} \equiv \max[\rho^i, \rho^o]$, $\underline{c} \equiv \min[c^i, c^o]$; this inequality assures that at least a bank is willing to offer a loan ex ante. Finally, we assume that each bank wins with an equal probability when they offer the rates that are indifferent to the firm.

2.2 The information hypothesis

To show the impact of private information that the inside bank exclusively obtains on the interest rate of a loan extended by the inside bank, we add the following assumptions regarding the private information. First, we assume that the inside bank has private information $s_i \in [\underline{s}, \bar{s}]$ that is not observable by outside banks. s_i is assumed to be distributed according to the probability density function $f(s_i|state)$ conditional on $state = S, F$. The corresponding cumulative distribution function is denoted by $F(s_i|state)$. We also assume the following standard common value assumptions with respect to the distribution function.

$$\frac{d}{ds_i}\frac{f(s_i|S)}{f(s_i|F)} > 0 \quad \forall s_i \in [\underline{s}, \bar{s}], \tag{2}$$

$$\frac{d}{ds_i}\frac{f(s_i|state)}{F(s_i|state)} < 0, \quad \forall s_i \in [\underline{s}, \bar{s}],\ state = S, F. \tag{3}$$

A simple calculation shows that the likelihood ratio dominance (2) implies;

$$F(s_i|S) < F(s_i|F) \quad \forall s_i \in (\underline{s}, \bar{s}), \tag{4}$$

$$\frac{f(s_i|S)}{F(s_i|S)} > \frac{f(s_i|F)}{F(s_i|F)} \quad \forall s_i \in [\underline{s}, \bar{s}]. \tag{5}$$

The inside bank updates their belief on the success probability of the firm from α to β_i in the Bayesian manner after obtaining the private signal s_i;

$$\beta_i \equiv \frac{\alpha f(s_i|S)}{\alpha f(s_i|S) + (1-\alpha) f(s_i|F)}. \tag{6}$$

Based on this updated belief, the inside bank bids an interest rate $r^i(s_i)$ in the lending competition. We focus on the case in which $r^i(s_i)$ is monotonically decreasing in s_i. To make the exposition simpler, we assume that

$$\frac{1-\alpha}{\alpha} \frac{1+\rho-c}{v-\rho} < \frac{f(\underline{s}|S)}{f(\underline{s}|F)}. \tag{7}$$

This assumption ensures that the inside bank always participates in the competitive bidding. Dropping this assumption does not change the statement in Proposition 1 qualitatively. We assume $c^i = c^o = c$ and $\rho^i = \rho^o = \rho$ in order to keep the exposition simpler.

The inside bank and N outside banks play a first-price auction under asymmetric information for a loan. The expected return of each bank is

$$\begin{aligned} \pi^o(r^o) &= \{(1-G(r^o))p + 1 - p\}^{N-1} \times \\ &\qquad \left\{ F(r^{i^{-1}}(r^o)|S)\alpha(r^o - \rho) + F(r^{i^{-1}}(r^o)|F)(1-\alpha)(c-1-\rho) \right\} I, \end{aligned} \tag{8}$$

$$\pi^i(r^i) = \{(1-G(r^i))p + 1 - p\}^N \left\{ \beta_i(r^i - \rho) + (1-\beta_i)(c-1-\rho) \right\} I, \tag{9}$$

where $G(\cdot)$ is the cumulative distribution function (mixed strategy) of r^o, $r^{i^{-1}}$ is the inverse function of $r^i(s_i)$, and p is the probability of an outside bank to participate in the competition. By applying the methodology presented in Engelbrecht-Wiggans et al. (1983) and applied in Rajan (1992), we can derive the Bayesian Nash equilibrium in the lending competition as is summarized in the next proposition. The proof of the proposition is presented in Appendix 1. [6]

[6] $\frac{1-\alpha}{\alpha}$ in Equation (12) is replaced with $\frac{1-\alpha}{\alpha}\frac{f(s_i|F)}{f(s_i|S)}$ if both the inside bank and outside banks are informed. However, the subsequent argument does not change qualitatively by (5).

Proposition 1 *In the equilibrium of the loan competition under asymmetric information among the inside bank and outside banks, the equilibrium offer rate of the inside bank is*

$$r^i(s_i) = \rho + \frac{F(s_i|F)(1-\alpha)}{F(s_i|S)\alpha}(1+\rho-c). \tag{10}$$

Each outside bank bids an interest rate according to the mixed strategy with the cumulative distribution:

$$G(r^o) = 1 - \{F(r^{i^{-1}}(r^o)|S)\}^{1/N}, \tag{11}$$

where $r^{i^{-1}}$ is the inverse function of Equation (10). Either an inside bank or an outside bank lends almost surely all the amount demanded by firm I.

This loan rate is higher than that under symmetric information where no bank has private information, which is equal to

$$r^i = \rho + \frac{1-\alpha}{\alpha}(1+\rho-c). \tag{12}$$

The premium arising from the information advantage results from the winner's curse against outside banks. If an outside bank wins a lending competition, the outside bank recognizes that the better-informed inside bank offered a rate higher than its offer because the inside bank received negative information about the borrower's creditworthiness (see the proof of Lemma 2 in Appendix 1). The inside bank never suffers from this problem because outside banks are uninformed and the inside bank knows that their offer rates do not reflect any information. To cover the loss from this winner's curse problem, uninformed outside banks are urged to offer higher interest rates. This strategy by outside banks yields an opportunity for the inside bank to earn a rent.

2.3 The insurance hypothesis

The benefit for a firm of continuing a bank-firm relationship, such as the implicit insurance against a tentative financial distress and firm-specific advice provided by the inside bank, can yield qualitatively the same consequence as Proposition 1. To illustrate this point, we now assume that the inside and outside banks have symmetric information and that the value for

the firm of the implicit insurance by the inside bank is positive and denoted by $\psi I > 0$. This represents, for example, the expected increment in the net present value of the firm by receiving an emergency loan from the inside bank in the case of a temporal liquidity shortage in the future, which is not explicitly modeled in our static setup to keep the exposition as parsimonious as possible.[7] This benefit for the firm can also be interpreted as the benefit from firm-specific consulting services or the other services additionally provided by the inside bank[8]. This benefit keeps its positive value if the firm keeps surviving, i.e., in state S, and maintains the lending relationship with the inside bank, while its value becomes zero if the firm faces the permanent negative shock, i.e., in state F. If the lending relationship with the inside bank is terminated, the value of the implicit insurance from the previous inside bank becomes zero and the implicit insurance contract with the new inside bank begins. The value of the new implicit insurance is assumed to be equal to $\delta\psi I,\ \delta < 1$. This value is smaller than that with the original inside bank since it is likely to take a while for an outside bank to establish the new bank-firm relationship.

If at least a bank offers a loan to the firm, the expected return to the firm when the lender is an inside bank is

$$\pi_i^f = \alpha(v - r^i + \psi)I - (1-\alpha)c^i I. \tag{13}$$

The expected return to the firm when the lender is an outside bank is

$$\pi_o^f = \alpha(v - r^o + \delta\psi)I - (1-\alpha)c^o I. \tag{14}$$

The firm chooses to borrow from the inside bank if and only if $\pi_i^f \geq \pi_o^f$, namely;

$$r^o \geq \tilde{r}^i, \quad \text{where } \tilde{r}^i \equiv r^i - (1-\delta)\psi + \frac{1-\alpha}{\alpha}(c^i - c^o). \tag{15}$$

We assume that $\psi > 0$, $\delta < 1$, $\rho^o = \rho^i = \rho$, $c^i = c^o = c$ in order to keep the exposition as simple as possible throughout the remainder of this subsection.[9]

[7] For more detailed explicit formulation with a dynamic setup, see Chemmanur and Fulghieri (1994).

[8] Another specification for the effect of the consulting service is an increase in the success probability α (Boot and Thakor, 2000). It can be easily verified by following the same procedure presented in this subsection that this alternative specification also reaches the qualitatively same conclusion as Proposition 1.

[9] If the depositors or shareholders of the inside bank expect that the provision of the implicit insurance can

The profits of the inside and outside banks when they win the lending competition are, respectively,

$$\begin{aligned}\pi^i(\tilde{r}^i) &= \alpha(r^i-\rho)I+(1-\alpha)(c-\rho-1)I,\\ &= \alpha\left(\tilde{r}^i-\rho+(1-\delta)\psi\right)I+(1-\alpha)(c-\rho-1)I. \qquad (16)\\ \pi^o(r^o) &= \alpha(r^o-\rho)I+(1-\alpha)(c-\rho-1)I. \qquad (17)\end{aligned}$$

The inside bank and N outside banks play a Bertrand competition with asymmetric marginal costs for the loan contract. Clearly the inside bank is advantageous because $\pi^i > \pi^o$ if $\tilde{r}^i = r^o$. Therefore, by the standard argument in the Bertrand competition under asymmetric marginal costs, it is readily shown that the inside bank bids down the rate r^i to a level at which no outside bank could expect a strictly positive return in the Nash equilibrium, i.e.,

$$\tilde{r}^i-\rho=\frac{1-\alpha}{\alpha}(1+\rho-c), \qquad (18)$$

and the inside bank wins almost surely. Namely, in the equilibrium, the inside bank bids

$$r^i-\rho=\frac{1-\alpha}{\alpha}(1+\rho-c)+(1-\delta)\psi. \qquad (19)$$

The expected return for each bank is

$$\begin{aligned}\pi^i &= \alpha(1-\delta)\psi I, \qquad (20)\\ \pi^o &= 0. \qquad (21)\end{aligned}$$

Each outside bank independently bids an interest rate according to the mixed strategy that satisfies

$$((1-H(r^o))q+1-q)\pi^i(r^o)=\alpha(1-\delta)\psi I, \qquad (22)$$

increase the credit risk of the bank, then they would require higher capital costs. This may render the financing cost of the inside bank higher than that of the outside bank. If the profit of the inside bank is still higher than that of an outside bank at $\tilde{r}^i = r^o$ despite the increase in ρ^i, then the subsequent analysis does not change qualitatively. Otherwise, the inside bank does not have an incentive to serve the implicit insurance for the firm, and the problem is thus reduces to the standard Bertrand competition. Thus, the effect on the financing cost does not qualitatively alter the implication stated below. To keep the exposition as simple as possible, we omit this effect in the analysis.

for any r^o in the equilibrium, where $H(\cdot)$ is the i.i.d. mixed strategy or the cumulative distribution function of the offered rate by each outside bank, r^o, and q is the i.i.d. probability that each outside bank will participate in the lending competition.

If $\psi = 0$ or $\delta = 1$, then the problem is reduced to a symmetric Bertrand competition. Therefore, the inside bank and outside banks bid the zero-profit interest rate; $\rho + \frac{1-\alpha}{\alpha}(1+\rho-c)$. They win with an equal probability. The next proposition summarizes these results.

Proposition 2 *In the equilibrium of the loan pricing competition under $\psi > 0$ and $\delta < 1$, the inside bank wins the loan contract almost surely by offering the rate equal to*

$$r^i = \rho + \frac{1-\alpha}{\alpha}(1+\rho-c) + (1-\delta)\psi. \tag{23}$$

Outside banks bid independently according to the mixed strategy $\{H(r^o), q\}$ that satisfies Equation (22) for any $r^o \in [\rho + \frac{1-\alpha}{\alpha}(1+\rho-c), V]$.

If $\psi = 0$ or $\delta = 1$, the inside bank and outside banks win the lending competition with an equal probability by offering a rate equal to

$$\rho + \frac{1-\alpha}{\alpha}(1+\rho-c). \tag{24}$$

The rate (23) is strictly higher than the rate (24) if $\psi > 0$ and $\delta < 1$.

Thus, under the insurance hypothesis, we obtain the result similar to that in Proposition 1; i.e., the inside bank can contract a higher interest rate when it generates a relation- specific benefit for a borrower.

2.4 Other factors that influence the inside bank premium

We summarize the other factors, namely collateralization and financing costs of banks, that can contribute to the difference between the contracted rate of the inside bank and that of outside banks. In contrast to the asymmetry due to the implicit insurance or the information asymmetry, these factors do not necessarily give the inside bank an advantage. We need to control for these observable factors when testing the insurance hypothesis and the information hypothesis.

2.4.1 Effect of the differences in the ratios covered by collaterals.

Now, we assume that $\psi = 0$, $\rho^o = \rho^i = \rho$, $c^i > c^o$, and the information is symmetric in order to elucidate the impact of the difference in collateralization on contracted interest rates. If collateralization is exogenously determined, then banks play the simple Bertrand competition (see the bank profit (16) and (17)). In the equilibrium, each bank wins with an equal probability by setting the rate $\tilde{r}^i = r^o$, and each bank earns zero profit. The loan interest rates that the inside bank and outside banks offer are, respectively,

$$r^i = \rho + \frac{1-\alpha}{\alpha}(1+\rho-c^i), \tag{25}$$

$$r^o = \rho + \frac{1-\alpha}{\alpha}(1+\rho-c^o). \tag{26}$$

The firm is indifferent in borrowing from either of offering banks while the contracted rate is decreasing in the collateral coverage. In contrast to the asymmetry discussed in the previous subsections, a firm may borrow from both the inside bank and outside banks simultaneously. Clearly, the interest rate is decreasing in collateral coverage.

However, if the collateral coverage is endogenously determined as is presented in the screening model (Bester, 1985) or the moral hazard model (Boot et al., 1991; Bester, 1994), the last point can change. Especially, the moral hazard model predicts that both interest rates and pledged collateral are decreasing in the borrower's creditworthiness. Thus, we may observe a positive correlation between the lending interest rate and the pledged collateral in data if this prediction is significant.

2.4.2 Effect of the differences in financing costs.

Next, we assume that $\psi = 0$, $c^i = c^o = c$ and the information is symmetric in order to elucidate the impact of the difference in financing costs on contracted interest rates. In this case, banks play the Bertrand competition with asymmetric marginal costs. Let us denote the jth lowest financing cost among $N+1$ banks by $\rho^{(j)}$. Then, the standard analysis of the Bertrand competition with asymmetric marginal costs shows that the bank with the lowest financing cost wins

the loan contract almost surely in the Nash equilibrium by offering

$$r^{(1)} = \rho^{(2)} + \frac{1-\alpha}{\alpha}(1+\rho^{(2)}-c). \tag{27}$$

Thus, the lowest contracted rate is increasing in the financing cost of the second-lowest financing cost.

3 Identification Strategy

Propositions 1 and 2 show that a contracted loan interest rate extended by the inside bank is higher when the information advantage for the inside bank and/or the implicit insurance provided by the inside bank exists than otherwise. We refer to this difference in interest rates due to information advantage and/or implicit insurance by the *inside bank premium*. The primary purpose of this study is to empirically examine the existence of this inside bank premium and to estimate it after controlling for the other factors that potentially affect it, which have been presented in the previous section and can be explicitly controlled by the variables available in our bank-firm matching dataset. In this section, we illustrate how to identify the inside bank premium due to the unobservable factors, such as asymmetric information and implicit insurance.

3.1 The inside bank premium

To keep the exposition as simple as possible, we assume that financing costs of banks and the ratio of collateral to a loan are controlled so that they are regarded as identical for all banks; i.e., $\rho^{(j)} = \rho$ for any j and $c^i = c^o = c$ in this subsection. The analysis in the previous section shows that the firm borrows from both the inside bank and outside banks simultaneously only when both (i) $\psi = 0$ (no implicit insurance) and (ii) symmetric information hold. The firm borrows from one single bank if any of these conditions does not hold (Propositions 1 and 2). In other words, if the firm borrows from multiple banks, then it implies that both (i) and (ii) hold. Therefore, the observed equilibrium rate contracted between the firm and the inside bank

in this case is equal to

$$r^i\Big|_{\text{multiple banks}} = \rho + \frac{1-\alpha}{\alpha}(1+\rho-c). \tag{28}$$

If the firm borrows only from the inside bank, then the observable equilibrium rate contracted between the firm and the inside bank is equal to

$$\begin{aligned} &r^i\Big|_{\text{single inside bank}} \\ &\quad = \begin{cases} \rho + \frac{1-\alpha}{\alpha}(1+\rho-c) + (1-\delta)\psi & \text{if } \psi > 0,\ \delta < 1, \text{ and sym. info.,} \\ \rho + \frac{F(s_i|F)(1-\alpha)}{F(s_i|S)\alpha}(1+\rho-c) & \text{if } \psi = 0 \text{ or } \delta = 1, \text{ and asym. info.,} \\ \rho + \frac{1-\alpha}{\alpha}(1+\rho-c) & \text{if } \psi = 0 \text{ or } \delta = 1, \text{ and sym. info.} \end{cases} \end{aligned} \tag{29}$$

Sym. info. and asym. info. are the abbreviation of "symmetric information" and "asymmetric information," respectively. Thus,

$$\begin{aligned} &r^i\Big|_{\text{single inside bank}} - r^i\Big|_{\text{multiple banks}} \\ &\quad = \begin{cases} (1-\delta)\psi > 0 & \text{if } \psi > 0,\ \delta < 1, \text{ and sym. info.,} \\ \left(\frac{F(s_i|F)}{F(s_i|S)} - 1\right)\frac{1-\alpha}{\alpha}(1+\rho-c) > 0 & \text{if } \psi = 0 \text{ or } \delta = 1, \text{ and asym. info.,} \\ 0 & \text{if } \psi = 0 \text{ or } \delta = 1, \text{ and sym. info.} \end{cases} \end{aligned} \tag{30}$$

The inequality in the second case arises from the assumption (4), which ensures the informativeness of the private signal s_i.[10] Thus, the interest rate of the inside bank is higher when a firm borrows only from the inside bank than when it borrows from multiple banks if and only if either the implicit insurance or the information advantage exists. In other words, we can infer the existence and the impact of these unobservable factors by estimating the difference between a firm's interest rate contracted with the inside bank when it is the sole lender and the rate when the firm borrows from multiple banks simultaneously after controlling for the each lender's financing cost and its collateral coverage.

[10] To keep the exposition as simple as possible, we do not list the case of $\psi > 0$ and asymmetric information. However, it is easy to check that $r^i|_{\text{ single inside bank}} = \rho + \frac{F(s_i|F)(1-\alpha)}{F(s_i|S)\alpha}(1+\rho-c) + (1-\delta)\psi$. The subsequent argument in this case is the same as the case of $\psi > 0$ or asymmetric information.

3.2 Benefit of the identification strategy based on the inside bank premium

Many of the existing empirical studies looked at the difference in the contracted interest rate of an inside bank and that of outside banks after classifying lenders into inside banks or outside banks according to a certain criteria regarding the length of relationship or the share of checking accounts. However, our simple model shows that looking at the inside bank premium is better in detecting and estimating the quasi-rent resulting from relationship banking than such traditional identification strategy.

First, the model of the information hypothesis predicts that the distribution of the lowest interest rate offered by N outside banks is $1 - F(r^{i^{-1}}(r^o)|S)$ (Eq.11). The model predicts that the distribution of the interest rate offered by the inside bank is $1 - \alpha F(r^{i^{-1}}(r^i)|S) - (1-\alpha)F(r^{i^{-1}}(r^i)|F)$ (Eq.10) conditional on the creditworthiness of each firm α. However, the dataset is often collected from an ex post survey targeting at firms that survives until the time of the survey. In this case, the dataset consists only of those in the successful state S. Therefore, the distribution of the interest offered by the inside bank is likely to be equal to $1 - F(r^{i^{-1}}(r^i))|S)$. Consequently, the distribution of the offered interest rate of the inside bank and the lowest one among those of N outside banks have the identical distribution in this case, and so the expected contracted rate of the inside bank $E(r^i|r^i \leq r^o)$ is equal to that of the outside bank $E(r^o|r^o \leq r^i)$ in theory. Thus, the difference in the contracted rate between the inside bank and the outside bank does not capture the quasi-rent resulting from the information advantage at all. The inside bank premium proposed in this paper is free from this problem.

Second, the inside bank premium is better as the measure of the quasi-rent of relationship banking also in the context of the model of the insurance hypothesis. To show this point, let us assume that the probability for a firm obtains a loan exclusively from its inside bank because of the benefit of continuing the lending relationship is $\phi \in (0,1)$. In this case, the contracted interest rate of the inside bank is equal to $r^i\Big|_{\text{single inside bank}}$ defined by the first case in Eq. (29) according to the model of the insurance hypothesis. The probability that the firm obtains a loan exclusively from its inside bank by accident despite that it does not recognize the benefit

of continuing relationship is $\phi' \in (0,1)$. The contracted interest rate of the inside bank in this case is equal to $r^i\Big|_{\text{multiple banks}}$ defined by Eq. (28). The probability that the firm borrows from both the inside bank and an outside bank is $\xi \in (0,1)$. Lastly, the probability that the firm borrows exclusively from the outside bank is $1-\phi-\phi'-\xi$. In these latter two cases, the contracted interest rate of the outside bank is equal to $r^i\Big|_{\text{multiple banks}}$.

Under these notations, the expected value of the contracted interest rate of the inside bank and that of an outside bank are, respectively,

$$E(r^i|\tilde{r}^i \leq r^o) = \frac{\phi}{\phi+\phi'+\xi} \cdot r^i\Big|_{\text{single inside bank}} + \frac{\phi'+\xi}{\phi+\phi'+\xi} \cdot r^i\Big|_{\text{multiple banks}}, \quad (31)$$

$$E(r^o|\tilde{r}^i \geq r^o) = r^i\Big|_{\text{multiple banks}}. \quad (32)$$

Thus, the difference between them is

$$\begin{aligned} E(r^i|\tilde{r}^i \leq r^o) - E(r^o|\tilde{r}^i \geq r^o) &= \frac{\phi}{\phi+\phi'+\xi}\left(r^i\Big|_{\text{single inside bank}} - r^i\Big|_{\text{multiple banks}}\right), \\ &= \frac{(1-\delta)\psi\phi}{\phi+\phi'+\xi}. \end{aligned} \quad (33)$$

Under the above notation, the expected value of the contracted interest rate of the inside bank when it is the sole lender is

$$\begin{aligned} &E(r^i|\text{the inside bank is the sole lender}) \\ &= \frac{\phi}{\phi+\phi'} \cdot r^i\Big|_{\text{single inside bank}} + \frac{\phi'}{\phi+\phi'} \cdot r^i\Big|_{\text{multiple banks}}. \end{aligned} \quad (34)$$

That of the inside bank when multiple banks lend to the firm is

$$E(r^i|\text{multiple banks lend}) = r^i\Big|_{\text{multiple banks}}. \quad (35)$$

Thus, the expected value of the inside bank premium is equal to

$$\begin{aligned} &E(r^i|\text{the inside bank is the sole lender}) - E(r^i|\text{multiple banks lend}) \\ &= \frac{\phi}{\phi+\phi'}\left(r^i\Big|_{\text{single inside bank}} - r^i\Big|_{\text{multiple banks}}\right), \\ &= \frac{(1-\delta)\psi\phi}{\phi+\phi'}. \end{aligned} \quad (36)$$

This is clearly closer to the difference of the benefit of relationship between the inside bank and an outside bank $(1-\delta)\psi$ than (33). Thus, the inside bank premium is less biased toward zero than the difference in the contracted interest rates of the inside bank and that of an outside bank. For these two reasons, we focus on the inside bank premium in our statistical analysis.

3.3 Estimation model

Practically, we cannot simultaneously observe $r^i|_{\text{single inside bank}}$ and $r^i|_{\text{multiple banks}}$ of an identical firm by construction. Therefore, we adopt the dummy variable approach with the following linear regression model, which is the linear approximation of the equilibrium contracted rate between a firm and the inside bank;

$$r^i_m = \beta_0 + \beta_1 c^i_m + \beta_2 \rho^i_m + \beta_3 \rho^o_m + \beta_4 \alpha_m + \beta_5 D_m + \epsilon_m, \tag{37}$$

where m $(= 1, \cdots, M)$ is the index of firms, D_m is the dummy variable which is equal to one if a firm m borrows only from the inside bank and zero otherwise, α_m represents the public information about the creditworthiness of firm m, ϵ_m is the mean-zero error term that is identically and independently distributed across firms, and β's are the coefficients to be estimated. In the model of the information hypothesis, the right-hand side of this equation is supposed to contain the term with respect to the outside banks' collateral coverage c^o, while this term does not emerge in the model for the insurance hypothesis. In the empirical analysis, we drop the term of c^o because the information of c^o is not available when the inside bank is the sole lender. The estimated β_5 captures the average of the inside bank premiums over all sample firms. If it is not significantly positive, both the insurance hypothesis and the information hypothesis are rejected, at least, on average.

Among the explanatory variables, the public information of the creditworthiness of firm m, α_m, is most likely to contain a component that is unobservable to analysts although it is observable to all the banks in the market. If this is the case, the true α_m is the sum of the component observable to analysts $\tilde{\alpha}_m$ and the component unobservable to analysts ϵ^α_m.

Substituting $\alpha_m = \tilde{\alpha}_m + \epsilon^{\alpha}_m$ into Equation (37) yields

$$r^i_m = \beta_0 + \beta_1 c^i_m + \beta_2 \rho^i_m + \beta_3 \rho^o_m + \beta_4 \tilde{\alpha}_m + \beta_5 D_m + \eta_m, \tag{38}$$

where $\eta_m = \beta_4 \epsilon^{\alpha}_m + \epsilon_m$. This linear equation is the baseline model that we in fact use in our regression analyses. However, this baseline model potentially suffers from a simultaneous equation bias, since the first term in η_m is potentially positively correlated with the dummy variable D_m, as is shown in the next subsection.

3.4 Choice of either a single inside lender or multiple lenders

Firm m borrows solely from the inside bank if and only if Inequality (4) strictly holds; i.e.,

$$r^o_m > \tilde{r}^i_m, \quad \text{where } \tilde{r}^i_m \equiv r^i_m - (1-\delta)\psi_m + \frac{1-\alpha_m}{\alpha_m}(c^i_m - c^o_m).$$

By substituting the equilibrium offer rates r^i_m into this inequality and linearizing it, we can restate this condition as follows; a firm m borrows only from the inside bank if and only if

$$\begin{aligned} r^o_m - r^i_m &\approx \gamma_0 + \gamma_1 c^i_m + \gamma_2 \rho^i_m + \gamma_3 \rho^o_m + \gamma_4 \alpha_m + \nu_m, \\ &= \gamma_0 + \gamma_1 c^i_m + \gamma_2 \rho^i_m + \gamma_3 \rho^o_m + \gamma_4 \tilde{\alpha}_m + \zeta_m > 0, \end{aligned} \tag{39}$$

where $\zeta_m \equiv \gamma_4 \epsilon^{\alpha}_m + \nu_m$. ν_m is a mean-zero error term that possibly includes the deviation from the mean of the rates offered by outside banks that follow the mixed strategy (Propositions 1 and 2). The right-hand side is supposed to include the term of c^o in the model for the information hypothesis, but we omit it for the same reason as the term in the interest rate equation (37). The second expression in (39) comes from the equation $\alpha_m = \tilde{\alpha}_m + \epsilon^{\alpha}_m$ mentioned in the previous subsection. Since the public information unobservable to analysts ϵ^{α}_m is included in both η_m in (38) and ζ_m in (39), these error terms are potentially correlated. In other words, we have to treat the choice of borrowing from either the single inside bank or multiple banks as endogenous.

In the theoretical model, we eliminated the possibility that a firm's fund demand I is so large that the inside bank alone cannot meet it and the firm cannot help but borrow from multiple banks. In the real world, however, we cannot rule out this case. The fund demand I is

conceptually derived from the firm's profit maximization given its demand function. Therefore, I is considered to be the increasing function of the exogenous demand shifter for the firm. To treat the case introduced above explicitly, we include the demand shifter for firm m, such as the total sales of the firm, in the right-hand side of Inequality (39). We also include the financial soundness of the inside bank into it in order to control for the borrowing firm's incentive to keep relationships with multiple banks expecting to avoid early liquidation due to the failure of its inside bank and difficulty to obtain a loan from outside banks instead (Detragiache et al., 2000). Moreover, we include the dummy variables indicating whether a firm purchases services from outside banks, such as a checking account, salary wiring, and owner's personal asset management. These instrument variables that can be plausible excluded from the interest equation and are denoted by a vector κ_m enable us to identify the interest rate equation (38) when we estimate β's in (38) and γ's in (39) simultaneously.

Our empirical results are primarily based on the simultaneous estimation of the endogenous dummy variable model (38) and (39) under the assumption that η_m and ζ_m are joint-normally distributed (standard normal for ζ_m) and are possibly correlated (Heckman, 1978).

4 Data

The major part of our dataset is based on a unique survey, *the Fact-Finding Survey on Transactions between Enterprises and Financial Institutions*(hereafter referred to as the Survey), which was originally designed by the members of the Study Group on Changes in Financial and Industrial Structures at RIETI, including us, and was conducted by RIETI in February 2008. In particular, we ourselves designed the questions about a firm's loan application/negotiation process, the agreed terms of contracts with its primary and secondary banks, and the detailed information on the relationship with each of them including services purchased in addition to loans, and the firm's subjective evaluation of the lenders' behavior, which can serve as a proxy for the reputation of lenders.[11] The survey questionnaires were sent out to 17,180 firms, which

[11]The survey consists of two major sections, one on a respondent firm's use of trade credit and another for its relationships with financial institutions. We designed the latter.

were randomly sampled by industry and size classes of employees and capital from mostly small and medium enterprises that were registered at Tokyo Shoko Research (TSR) Ltd. Co., one of the largest private credit-reporting companies in Japan. A total of 6,124 firms replied to it (response rate: 36.0%).

In estimating the inside bank premium by the endogenous dummy variable model (38) and (39), we assume that the bank that extends the largest amount of loans outstanding to the firm[12] is the inside bank. We call this bank the *primary bank* in our subsequent empirical analyses. We assume that the other banks are outside banks. Among outside banks, the bank that extends the second-largest amount of loans outstanding to the firm is called the *secondary bank*. The questions about each firm's bank financing in the survey are designed so that we can obtain the information about terms of loans and transaction histories of both the primary bank, which plausibly corresponds to the inside bank in the analytical model, and the secondary bank, which is considered to be the most competitive outside bank in the model. The English translation of relevant questions in the survey is listed in Appendix 2.

From the original sample of 6,124 firms, a small number of firms that kept anonymity in the survey were dropped (the sample size was reduced to 6,079).[13] First, listed firms were dropped to ensure that the sample firms are not publicly transparent so that the quality of information held by (potential) lenders is likely to be strongly asymmetric (reduced to 5,876). The firms whose primary bank is a government financial institution were dropped since we aim at studying the pricing of privately underwritten loans. The firms whose primary bank is an agricultural, a forestry or a fishery cooperative, or a labor bank were dropped since the data of these financial institutions are unavailable. The firms whose primary bank is the *Norinchukin* Bank were dropped since this institution is the central institution of an agricultural, a forestry or a fishery cooperative, whose borrowers were eliminated (reduced to 3,998). Likewise, the firms whose secondary bank is one of the above-mentioned financial institutions, were dropped (reduced to 3,991). Among the remaining firms, 1,477 firms report their agreed rate on a short-

[12] Question 28 (1) in the survey questionnaire. See Appendix 2.

[13] A firm was identified by an identification number printed on a questionnaire book. A few respondent firms, however, intentionally erased the printed ID number in order to keep anonymity.

term loan borrowed from their primary bank. Finally, the firms whose surveyed short-term loan was publicly guaranteed were dropped. This is because most risks of a publicly guaranteed loan are borne by the government rather than the underwriter herself. The base sample universe consists of 1,135 firms for which there is no missing value for any of the independent variables introduced below. We estimate the system of equations (38) and (39) with this base sample.

Dependent variables We use the interest rate of a short-term loan that was extended by the primary bank within a year before the survey date, February 2008, as the dependent variable of Equation (38).[14] In the probit estimation or the linear probability estimation for the propensity to borrow solely from the inside bank (39), we use a dummy variable which is equal to one if a firm borrows short-term and/or long-term loans only from the primary bank or zero if it borrows loans from both primary and secondary banks.[15] We name this dummy variable **DMLOAN1**, which corresponds to D_m in Equation (38). In using this dummy variable, we implicitly assume that a firm borrows from the secondary bank first if they need to or would like to borrow from an outside bank.

Independent variables Measures for loan security of a primary bank c_m^i are a dummy variable to indicate that a loan is secured by physical collateral, COLLATERAL1, and a dummy variable to indicate that a loan is covered by personal guarantees, PRIVATESECURITY1.[16]

The measure for a bank's financing cost ρ_m^j $(j = i, o)$ is FINANCINGCOST$_j$, which is calculated by (interest expenses + general and administrative expenses)/(deposits + negotiable CD + debentures + call money + payables under repurchase agreements + payables under

[14]The Bank of Japan increased its target of the unsecured overnight call rate, which is the primary instrument for the monetary policy in Japan, from 0.25% to 0.5% on February 21, 2007. Since then, it kept the same level of the target rate until October 31, 2008. Thus, the money-market rate within our data period is stable. For example, the Tokyo interbank offered rate (TIBOR) of one week is stable at around 0.6.

[15]This dummy variable is constructed from Question 29 (4) ③ (Appendix 2). In our theoretical model, the inside bank premium disappears when a firm successfully borrows loans of any maturity from its secondary (outside) bank. On the other hand, in practice, a bank likely differentiates loan rates based on their maturity. To control for this maturity effect on a loan rate, we avoided consolidating short-term loan rates and long-term loan rates that are also asked in the Survey.

[16]In the current version, we do not include the variables that measure the loan security by a secondary bank because not all of the sample firms report the information about security of a loan borrowed from their secondary bank. Thus, including measures for c_m^o would result in a substantial reduction in sample size.

securities lending transactions + borrowed money + foreign exchanges + short-term corporate bonds + straight bonds + convertible bonds)×100 with respect to each of a firm's primary and secondary banks.

The primary measure employed for the public information of creditworthiness is a firm's credit score provided by TSR, SCORE. The firm size as defined by the logarithm of total assets (LNTASSET) and a dummy variable to indicate that the proportion of shares held by a firm's representative and her family who reside with her is more than half (OWNER) are included to supplement SCORE. The OWNER is included, as banks are said to perceive a stronger risk appetite in owner-managed firms.

A bank may offer a lower loan rate to a firm when it earns larger fees or to a firm with larger preexisting loans from the same bank. To control for such cross selling by a bank, we include a set of dummy variables to indicate that a firm's primary bank provides non-loan services to the firm. These variables include a dummy variable to indicate that a firm holds settlement accounts at its primary bank (SETTLE1), a dummy variable to indicate that a firm holds accounts to wire salaries to its employees at its primary bank (SALARY1), and a dummy variable to indicate that a firm uses personal asset management services provided by its primary bank. Similarly, to control for a bank's preexisting loans to a firm, we include the logarithm of the total loans that a firm borrows from its primary bank (LNLOANS1).

We also control for the facility size of the surveyed loan extended by a firm's primary bank (LNSHORT1). In addition, we control for the intensity of lending competition by the Herfindahl index of bank branches in each telephone area-code area where the head office of a sample firm is located (HI) in order to address the possibility that banks are competing in a Cournot manner for loans to firms that are intended to borrow from multiple banks. Lastly, we control for a firm's location by a set of region dummies as well as a firm's industry-by-industry dummies.[17]

Definitions and descriptive statistics of the dependent variable, independent variables, and instrumental variables that will be explained in the next subsection are summarized in Table

[17]The region dummies for Hokkaido, Tohoku, Chubu, Kansai, Chugoku, Shikoku and Kyushu are included. Kanto is the base region. Industry dummies for construction, communications/transportations, general trading, specialized trading, wholesale, retail and other industry are included. Manufacturing is the base industry.

1. As for our dependent variable and key independent variable, the average short-term interest rate is 2.09 percent (median 1.88), and 33 percent of the sample firms that borrowed from their primary bank did not borrow from their secondary bank. As for firm's relationships with their primary and secondary banks, on average, the length of the relationship with the former is 32 years, whereas that with the latter is 24 years. Thus, we know that firms have a longer relationship with their primary bank than with their secondary bank; however, these relationships are generally very long.

Table 2, Panel (a) shows the preliminary evidence for the existence of inside bank premiums. On average, the firms that borrowed from their primary bank only (in the case of DMLOAN1=1) had to pay 24 basis points more than those that borrowed from both primary and secondary banks (in the case of DMLOAN=0). Such a result may be a naive finding since we have not controlled for endogeneity of DMLOAN1 or for a firm's risk characteristics. Ultimately, this preliminary finding needs to be scrutinized using the rigorous regression framework laid out in the previous section.

Table 2, Panel (b) shows the difference between the contracted interest rate of the primary bank as the proxy for the inside bank and that of the secondary bank as the proxy for an outside bank when a firm borrows simultaneously from both of them. The interest rate of the inside bank is larger and this difference is statistically significant at the 5 % level. However, as is predicted in the section of the identification strategy (Section 3.2), the the difference is much smaller than that in Panel (a), merely 4 basis point. It is also worth metioning that some 38 % of the sample firms in Panel (b) report that the contracted rate of the primary bank and that of the secondary bank is identical.

5 Result

5.1 Full sample regression

Table 3 presents the regression results of equation (38). Panel A presents the results for the base sample, whereas Panel B presents the results for the sample of firms which subjectively

perceive their primary bank as their "main bank."[18] When a firm does not perceive its primary bank as its main bank, a primary bank may not suit the concept of an inside bank who is more informed of the firm than other banks. Thus, we expect that if our developed hypotheses hold true, the test results should appear stronger in Panel B than in Panel A.

In each Panel, column 1 presents the OLS results, whereas columns 2 and 3 present the results when our main independent variable DMLOAN1 is regarded as endogenous. For the instrumental variables in the first stage regression to estimate the propensity that DMLOAN1 is equal to 1, we use the logarithm of total loans that a firm borrows from its secondary bank (LNLOANS2), the lowest financing cost of a private bank other than primary and secondary banks that have at least one ordinary branch in the firm's vicinity (FINANCINGCOST3), a firm holds settlement accounts at its secondary bank (SETTLE2), a dummy variable to indicate that a firm holds accounts to wire salaries to its employees at its secondary bank (SALARY2), a dummy variable to indicate that a firm uses personal asset management services provided by its secondary bank (PERSONAL2), a firm's primary lender's Basel capital adequacy ratio (BIS), and the logarithm of a firm's sales (LNSALES).[19] The first five instrumental variables are the factors that affect the offered rate by the secondary bank. BIS is the measure for a firm's primary lender's financial health. LNSALES is an exogenous loan demand shifter of each borrower.

In column 2, Equation (38) is estimated by the standard two-stage least square technique, where in the first stage, DMLOAN1 is linearly regressed on instrumental variables, which include exogenous independent variables. In column 3, Equation (38) is estimated by the maximum likelihood estimation method. In the MLE estimation, the likelihood that DMLOAN1 takes a value of 1 is modeled using a probit model in which the same set of instrumental variables as employed in column 2 is used as the independent variables.

The large F statistic for excluded instruments for the standard 2SLS regressions and small J statistics (column 2 of Panels A and B) show that our instrumental variable regressions are valid

[18]This information is collected from Question 28 (2) in the survey questionnaire (Appendix 2).

[19]Since the instrumental variable in column 2 is the predicted value using exogenous variables only, this variable is uncorrelated with the independent variable by construction. Thus, this instrumental variable is valid.

whereas the statistics designed to test endogeneity of DMLOAN1 do not necessarily confirm the endogeneity of this independent variable at the 10 percent significance level.[20] It gives support to our instrumental variables that the regression results by two different methods (2SLS and MLE) are almost identical. The first-stage probit estimation results reported in column 3 in each Panel of Table 3, which are summarized in Appendix 3 (Table A1), ensure that our instrumental variables are valid. The coefficient of LNSALES, our proxy for the loan demand shifter, is positive and significant at the five percent significance level, implying that, as anticipated, the larger sales increase a firm's likelihood to borrow from both primary and secondary lenders. In addition, the coefficients of SETTLE2, SALARY2, and PERSONAL2, which are the variables indicating whether a firm uses non-loan services from the secondary bank, are all negative and significant, implying that as the standard relationship lending hypothesis suggests, a firm with a wider scope of the relationship with its secondary lender is more likely to be successful in borrowing from that lender. The coefficients of BIS are negative albeit insignificant. The negative relationship between a firm's lender's financial distress and a firm's likelihood to choose a single lender as opposed to multiple lenders is consistent with the theoretical prediction and the empirical evidence of Detragiache et al. (2000). On balance, it is fair to say that our instrumental variable results serve for our empirical objectives.

Regarding the coefficients of DMLOAN1, none of them is statistically significant for the full sample results reported in Panel A, whereas the coefficients are positive and significant in all columns of Panel B at least at the 10 percent significance level. The coefficients are significant at the 5 percent level when DMLOAN1 is regarded as endogenous (columns 2 and 3). At a closer look, the estimated coefficient of DMLOAN1 in each of columns 2 and 3 is not only significant but also economically significant. The results reported in Panel B indicate that a firm's primary bank perceived by the firm as its main bank charges 30 to 32 basis points higher when the firm does not borrow from its secondary bank. This shows that not only is our naive "estimate"

[20] If instrumental variables are not strongly correlated with endogenous variables, coefficients estimated by instrumental variable regression techniques such as 2SLS are generally inconsistent. Conventionally, the F statistic for instrumental variables that are excluded as an independent variable in the second stage above 10 ensures their validity. For technical discussions on the strength of instrumental variables, see Staiger and Stock (1997).

reported in Table 2 confirmed but it also is slightly underestimated. The empirically extracted premium is substantial as the sample median of the short-term rate is merely 1.875 percent. Our findings are consistent with our theoretical prediction summarized in Hypothesis 1. A firm's largest lender who is not recognized as its main bank may be a de facto outsider no matter how large the loan outstanding from that bank stands. The fact that the estimated coefficient in Panel A is not significant implies that the sample containing both the firms whose largest lender is a true inside bank that are consistent with the definition of the inside bank in the analytical model and those whose largest lender is closer to an outside bank.

Regarding other coefficients, irrespectively of the employed estimation technique or sample, the statistically significant coefficients of LNSHORTLOAN1, SCORE, FINANCINGCOST2 and LNLOANS1 are negative, negative, positive and positive, respectively. The negative coefficient of LNSHORTLOAN1, the facility size of the short-term loan, could reflect the scale economy in lending technology, i.e., the processing cost of extending each loan is fixed irrespective of the facility size, while the interest revenue for the bank is increasing in the facility size. The negative coefficient of the SCORE suggests that primary banks use public information underlying credit scores in their pricing, at least, as a part of information about the creditworthiness of firms. The positive coefficient of FINANCINGCOST2, the financing cost of the secondary bank, is consistent with the statement in Section 2.4.2, a prediction derived from the Bertrand competition model with asymmetric marginal costs. The positive coefficient of LNLOAN1, the logarithm of the total amount of all loans extended by the primary bank, suggests that a bank regards a greater exposure to a firm as a higher risk.

6 Subsample Regressions

6.1 Firms that negotiated loans with multiple banks

The results for the sample of the firms that negotiated short-term loans with at least one more bank along with their primary bank are shown in Table 4 . The results for the sample of the firms that negotiated loans with at least two banks including their primary bank are shown in Panel A, whereas the results for the sample of the firms that did so and identify their primary bank

as their main bank are shown in Panel B. These samples are more in line with our theoretical model, in which a firm is assumed to apply to both inside and outside banks. The results are largely consistent with those shown in Table 3. As in Panels A and B of Table 3, the coefficients of DMLOAN1 are not significant in Panel A where regressions are run on a full sample, but are positive and significant in Panel B where regressions are run on a sample of firms that identify their largest lender as their main bank. However, in Table 4, the coefficient is larger at 40 to 50 basis points and less precisely estimated than in Table 3. The larger estimate in Table 4 may indicate that the inside bank's effect on loan rates is strongly observed in the controlled environment, which is more consistent with our theory. Yet imprecise estimates in Table 4 may be due to the substantially smaller sample size (726 in Table 4 as opposed to 873 in Table 3)

As for other coefficients, the results are largely consistent between Tables 3 and 4. The only minor difference is that, when estimated using instrumental variables, the coefficients of PRIVATESECURITY1, which are not statistically significant in any Panel of Table 3, are weakly significant in every Panel of Table 4.

6.2 The information hypothesis versus the insurance hypothesis

So far, we have found that the inside bank premium is positive and, at least, marginally significant. However, it is still unclear whether this premium primarily comes simply from the information advantage of the inside bank or from the implicit insurance based on such information advantage.

One way to disentangle the insurance hypothesis from the information hypothesis is to ask whether the inside bank premium, the coefficient of DMLOAN1, differs across primary banks that are likely to have an informational advantage about borrowing firms and those that are less likely to have one. More precisely, if a firm's primary bank has an informational advantage about the firm over its secondary bank, the primary lender is more likely to enjoy a larger premium by becoming the firm's sole lender. To this end, we examine a way of subsampling based on the proxy for a firm's informational distance to its bank, namely, a firm's own report of its perception about its lenders' knowledge of itself, an indicator to measure the informational

distance from a firm to its lenders that caters to our research objective and is unique to our survey.

Question 28(6) in the survey asks a respondent firm to rate its lender's knowledge about its unquantifiable strengths one to five, where one represents "knows well" and five represents "does not know."[21] This is a unique direct measure for the degree of a lender's soft information about a borrowing firm albeit a respondent's subjective measure. Since a vast majority of firms (76 percent) answered that the primary lender and the secondary lender are equally knowledgeable, we constructed two subsamples that are not mutually exclusive, namely, the sample of the firms that answer that their primary bank is at least as knowledgeable about them as their secondary bank and the sample of the firms that answer that their secondary bank is at least as knowledgeable as their primary bank.[22] The results of the maximum likelihood estimation regressions are presented in Table 5. The regressions are run on the sample of firms that perceive their primary bank as their main bank and that apply for a loan to multiple banks for which we found the marginally significant coefficient of DMLOAN1 in Table 4.

As is shown in Table 5, the coefficient of DMLOAN1 is positive and statistically significant at least at the 10 percent level for both subsamples. The coefficient is slightly larger and more strongly significant in column 2, which is the opposite of what the information hypothesis would suggest. The difference by 14 basis points, however, is neither statistically nor economically significant. On balance, these results imply that a firm's primary lender's informational advantage over its secondary lender is of little importance.

This could be the result of the relatively low probability of defaults of SMEs in the sample year. The ratio of non-performing loan (*risk management loans*, Japanese Financial Services Agency) over total loans of regional banks and cooperative banks, whose clients are mostly SMEs, was 5.2 % in FY 2007. This implies that $(1-\alpha)/\alpha$ in the second line of Eq. (30) is as low as 0.055, and so the portion of the premium explained by the information hypothesis is

[21] Two, 3, and 4 represent "knows considerably," "knows fairly," and "knows little."

[22] Twenty-four percent of sample firms answered that their primary lender is more knowledgeable about them than their secondary lender and 76 percent answered that their primary lender and their secondary lender are equally knowledgeable about them. On the other hand, only 0.8 percent answered that their secondary lender is more knowledgeable than their primary lender.

estimated to be very small. The anecdotal evidence is also against the information hypothesis. A number of banks we interviewed, which include both regional banks and community cooperative banks; *shinkin* banks, agreed that there is little difference in the quality of collected information about their borrowing clients between the case in which they are the largest lender for the borrowers (the borrowers' main bank from the bank's perspective) and the case in which they are the second-largest lender (the borrowers' submain bank).

Now, the inside bank premium of considerable magnitude reported in Tables 3 and 4 is unlikely to stem from the asymmetric information between primary and secondary banks; the possibility remains that the premium is evidence that the primary bank charges a premium for the liquidity insurance that the primary lender provides to its borrowers. To test this hypothesis, we ran an additional maximum likelihood estimation with a subsample that consists of firms that replied to a survey question that their primary measure in case of a temporary liquidity shortage is to ask for a loan from their main bank (See Question 13 in Appendix 2). We also did so with another subsample that consists of the former group of firms and those whose primary measure is to ask their main bank to postpone repayments in case of a liquidity shortage. Both estimations are done with the sample of firms that perceive their primary bank as their main bank and that applied to multiple banks.

The estimated coefficients are reported in Table 6. In either subsample estimation, the coefficient of DMLOAN1 is statistically more significant than that estimated with the less focused sample in Table 4, Panel B. Thus, the insurance hypothesis plausibly has more explanatory power for the inside bank premium. These findings from the subsample estimations suggest that the information advantage of the inside bank is not sufficient for generating the inside bank premium but that the implicit insurance, or at least the reputation that the inside bank is competent in telling apart temporarily distressed clients from permanently distressed ones and is willing to properly respond to the renegotiation with the former is the primary factor to yield the inside bank premium.

6.3 Comparative statics of the inside bank premium

We ran additional subsample regressions to conduct the empirical comparative statistics of the inside bank premium. First, the existing theory predicts that loan officers at smaller and decentralized financial institutions have stronger incentive to acquire private soft information about the creditworthiness of borrowers (Aghion and Tirole, 1997; Stein, 2002), which results in a more efficient screening of a temporary financial distress from a permanent one that is the presumption for the implicit insurance. To examine this prediction, we estimated the same model as that in the previous sections by the maximum likelihood estimation with the subsample split by the median size of the primary bank, which is measured by the number of branches. The median is 145 branches; this is comparable to a medium-size regional bank. Each subsample consists of firms that perceive the primary bank as their main bank and apply to multiple banks. Rows (1) and (2) in Table 7 report the estimated coefficient of DMLOAN1 when the primary bank is smaller than median and that when it is not, respectively. The estimated coefficients of the other control variables are omitted from the report. Clearly, the estimated coefficient of DMLOAN1 is positive and significant only when the primary bank is smaller than the median. This result seems to be consistent with the above prediction but may driven by the fact that the group of smaller banks contains a number of cooperative institutions; *Shinkin* banks. By the regulation, these cooperative institutions are allowed to lend only to member firms that hold a share of the institution. Therefore, these institutions are more likely to serve as liquidity insurers for their borrowers, who are, in turn, their financiers, than the usual type of commercial bank. To examine this point, we estimated the model with the subsample of firms whose primary bank is a regional bank. The estimated coefficient is still positive and significant statistically and economically (Rows (3) in Table 7). Thus, the data shows that bank size matters more than ownership structure.

The result of some existing empirical studies show that larger firms are likely to borrow from larger banks and smaller firms are likely to borrow from smaller banks (Cole et al., 2004; Berger et al., 2005; Uchida et al., 2008). The larger banks need not or cannot acquire proprietary

information as the larger firms are plausibly less uncertain and have a more established public record and reputation. Thus, the difference of the inside bank premium could be driven by the difference of sizes of borrowers. However, as is shown in Rows (4) and (5), Table 7, it turns out that the estimated inside bank premium is significant both in larger firms and smaller ones; thus, this effect is not significant in our dataset, which consists of relatively smaller firms that are not listed in the stock market.

Many empirical studies have used the length of relationship as the measure of the strength of bank-firm relationships. To obtain information about the impact of a length of lending relationship, we estimated the model in the previous section with the subsample of firms whose lending relationship with the primary bank was longer than the median and with that of firms who had a relationship that was shorter than the median. It is noteworthy that the sample median is 37 years and is by far longer than 6 years in the U.S. (Berger et al., 2005), 7 years in Belgium (Degryse and Ongena, 2007) and 15 years in Germany (Elsas, 2005). The estimated coefficient of DMLOAN1 is positive and statistically significant only for firms with lending relationships shorter than the median. This finding suggests that a lending relationship that is too long could be worthless since the simple fact that the firm survives for so long is a public signal for its creditworthiness.

Lastly, we examined the impact of the loan market structure on the inside bank premium with the subsample split by the median of the Herfindahl index of bank branches. The estimated coefficient is positive and significant in competitive markets but not in concentrated markets. This result sharply differs from the existing empirical findings in other countries; relationship lending is increasing in concentration in the U.S. (Petersen and Rajan, 1995; Ogura, 2010), but is U-shaped against the concentration measure in Germany (Elsas, 2005) and Belgium (Degryse and Ongena, 2007). This is puzzling since the level of credit market concentration in our sample (the median of the Herfindahl index is 0.17) is comparable to 0.18 in Germany and 0.15 in Belgium. A detailed empirical investigation is required for a solid explanation of this difference.

7 Conclusion

In this paper, we found that the inside bank premium is positive and significant on average despite the competitive bidding by competing banks. The additional subsample regression shows that the soft information regarding a firm's creditworthiness that the inside bank holds has little explanatory power for the inside bank premium, while the inside bank's potential function as an insurer for firms in case of temporary (not permanent) liquidity shortage has significant impact on the inside bank premium. Thus, our findings suggest that the inside bank premium is better explained by the insurance hypothesis, which is proposed by Chemmanur and Fulghieri (1994) and Dinç (2000). We also find that this inside bank premium is more significantly observed for firms whose inside bank is small in size and located in a more competitive loan market.

Despite these findings, there is room for other interpretations because we did not test the impact of other differentiated services that can yield the inside bank premium as modeled in Boot and Thakor (2000) and Yafeh and Yosha (2001). Moreover, we lack sufficient empirical results to understand the interaction between the private information managed by the inside bank and the implicit insurance or other differentiated services. In relation to this point, Dass and Massa (2009) present the finding that the stronger bank-firm relationship tends to improve the corporate governance structure in the dataset consisting of publicly traded companies. This finding is supportive of the possibility of the asymmetric ability between the inside bank and outside banks to provide monitoring or consulting services for borrowers. In addition, they also find that the stronger bank-firm relationship tends to increase stock trading motivated by private information and decrease the market liquidity of the stock of the firm. Schenone (2004) also finds that IPO underpricing is significantly less severe if the offering firm has a pre-IPO banking relationship with its underwriter. These findings are supportive of the information advantage of the inside bank.

A more direct statistical investigation on the relative importance of these hypotheses in the context of more bank-dependent, more uncertain, and more informationally opaque small businesses remains a future research subject.

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Appendix 1: Proof of Proposition 1

Lemma 1 *The range of r^i is identical with the range of r^o that is assigned with the positive density $g(r^o)$ in the Bayesian Nash equilibrium.*

(Proof) See the proof of Theorem 1 in Engelbrecht-Wiggans et al. (1983).

Lemma 2 *The expected return for an outside bank is zero in the equilibrium.*

(Proof) Given that a bank wins by offering $r^i(s_i) = r^o = \hat{r}$, the expected return for banks is

$$\pi^{iw} = \{\beta_i(\hat{r} - \rho) + (1 - \beta_i)(c - 1 - \rho)\}I, \quad \text{(inside bank)} \tag{40}$$

$$\pi^{ow} = \{\beta_{ow}(\hat{r} - \rho) + (1 - \beta_{ow})(c - 1 - \rho)\}I, \quad \text{(outside bank)} \tag{41}$$

where $\beta_{ow} \equiv \alpha F(s_i|S)/\{\alpha F(s_i|S) + (1-\alpha)F(s_i|F)\}$, which is the outside banks' posterior belief about the success probability of the borrower after observing that an outside bank wins the lending competition and reasoning that the inside bank's private signal is lower than s_i. Since

$$\frac{1 - \beta_{ow}}{\beta_{ow}} > \frac{1 - \beta_i}{\beta_i} \tag{42}$$

from Assumption (2), $\pi^{ow} < \pi^{iw}$. Therefore, by Theorem 2 in Engelbrecht-Wiggans et al. (1983), the statement in the lemma follows. □

From Lemma 2, setting $\pi^o = 0$ and rearranging it gives the equilibrium bid by the inside bank:

$$r^i - \rho = \frac{F(s_i|F)(1-\alpha)}{F(s_i|S)\alpha}(1 + \rho - c). \tag{43}$$

The first order condition for $\max_{r^i} \pi^i$ is

$$\frac{d\{(1 - G(r^i))p + 1 - p\}^n}{\{(1 - G(r^i))p + 1 - p\}^N} = \frac{-\beta_i dr^i}{(r^i(s_i) - \rho)\beta_i + (c - 1 - \rho)(1 - \beta_i)}. \tag{44}$$

Substituting Equation (43) into this equation yields

$$\frac{d\{(1 - G(r^i))p + 1 - p\}^N}{\{(1 - G(r^i))p + 1 - p\}^N} = \frac{f(s_i|S)}{F(s_i|S)} ds_i. \tag{45}$$

Integrating both sides from $r^i(\bar{s})$ to r^o gives the cumulative distribution function of the minimum bid among the outside banks in the Bayesian Nash equilibrium:

$$\{(1 - G(r^o))p + 1 - p\}^N = F(r^{i^{-1}}(r^o)|S). \tag{46}$$

$p = 1$ since $r^{i^{-1}}(v) = \underline{s}$, $F(\underline{s}|S) = 0$ and $G(v) = 1$. Thus,

$$\{1 - G(r^o)\}^N = F(r^{i^{-1}}(r^o)|S). \tag{47}$$

□

Appendix 2: English translation of relevant questions in *The Fact-Finding Survey on Transactions between Enterprises and Financial Institutions*

Question 13 What is the priority order for the following measures that your company could take against the temporary deterioration of your company's cash flow? Please specify priority order numbers (1-8) for each of the following measures.

1. Ask the major supplier to extend payment periods
2. Ask the major supplier to accept cuts in payments
3. Ask the major sales destination to shorten payment periods
4. Ask the main bank to provide loans
5. Ask the main bank to postpone repayments
6. Ask other banks to provide loans
7. Ask other banks to postpone repayments
8. Others

Question 28 The following questions are about your company's transactions with the top two financial institutions that account for the largest and the second largest amounts of total loans extended by financial institutions to your company.

(1) Please write the name of the financial institutions that extend the largest and second-largest amounts of loans to your company.

(2) Which financial institution do you recognize as the main bank of your company? Please choose one among the multiple choices below: 1. the financial institution extending the largest loans, 2. the financial institution extending the second-largest loans, 3. other institutions (institution name:).

(3) Please fill in the columns (largest lender; second-largest lender) for outstanding transactions with financial institutions at the end of the latest fiscal year. (Note) Leave the columns empty if your company had no transactions with financial institutions;

① Outstanding borrowings (million JPY).

② Fixed/time deposits (million JPY).

③ Length of commercial relations (years, note:the length of your commercial relations starts from the year when your company borrowed the first loan from the lender).

[· · ·]

(5) Please choose the services that your company receives from each of the largest and the second-largest financial institutions, respectively, as many as applicable; 1. settlement account (current account), 2. transfers of employee wages, 3. investment and management of personal and family assets, 4. acceptance of directors and employees from financial institutions, 5. introducing new trading partners.

(6) Please evaluate each of the largest and the second-largest financial institutions and the most important supplier and buyer with respect to how well they know about each of the following matters of your company by the following five-grade evaluation for each: 1. knows well, 2. knows considerably, 3. knows fairly, 4. knows little, and 5. does not know.

① Business conditions.

② Cash flow conditions.

③ Financial conditions.

④ Unquantifiable strength.

Short-term borrowings in the past year (Note) Do not answer if your company has no loans or if none of the answers is applicable. Short-term loans include one-year or shorter debt on bills, bill discounts and overdrafts, excluding institutional borrowings from local governments.

Question 29 The following questions are about short-term loans from financial institutions in the past year.

[· · ·]

(3) With regard to each of the first and second-largest financial institutions in Question 28, circle the numbers for all applicable answers.

① Was there any inquiry for a loan from your company or the financial institution in the past year? 1. Yes, 2. No.

② Did your company start negotiations with the financial institution regarding the terms of short-term loans? 1. Yes, 2. The institution rejected the inquiry from your company, 3. Your company rejected the inquiry from the lender.

(4) This question is only for the respondents who chose "1. Yes" to Question 29(3) ② above. With regard to the negotiations with financial institutions, circle the numbers for all applicable answers.

[· · ·]

③ Did your company actually borrow from the largest or the second-largest financial institution?

The largest financial institution: 1. yes, 2. no.

The second-largest financial institution: 1. yes, 2. no.

(5) This question is only for the respondents who chose "1. Yes" in Question ③ above. Specify the details of actual short-term loans for each of the loans made by the largest and second-largest financial institutions.

① amount (million JPY).

② contracted interest rate (%).

③ secured by 1. collaterals, 2. the company owner's personal guarantee,
3. a third-party personal guarantee, or 4. a public credit guarantee association.

Appendix 3: The results of the first stage probit regressions (see Table A1)

In this appendix, the results of the first stage probit regressions for Panels A and B of Table 3 are presented. The results are discussed in Section 5.

Table 1: Definition and description of variables

(Note) The values of each variable are those as of the survey date, February 2008, unless otherwise noted.

Variables	Definition	# obs.	Mean	Median	S.E.	Min.	Max.
SHORTRATE	Interest rate of a short-term loan extended within a year before the survey date, February 2008, by the primary bank (%).	1,135	2.052	1.875	0.810	0.080	7.500
DMLOAN1	A dummy variable equal to 1 if a firm does not borrow from its secondary bank.	1,135	0.334				
HI	The Herfindahl Index of bank branches (city, trust, regional, and SHINKIN banks) within a telephone area-code area as of Oct. 2007.	1,135	0.190	0.185	0.119	0.051	1.000
SHORTLOAN1 (LNSHORTLOAN1)	(The logarithm of) the facility size of the short-term loan from the primary bank (,000 JPY).	1,135	320	60	3,577	1	119,000
SCORE	Credit score provided by Tokyo Shoko Research, Ltd., Co. as of April 2008.	1,135	55.7	55	6.261	15	79
TASSET (LNTASSET)	(The logarithm of) total assets of a firm (,000 JPY).	1,135	4,504	1,266	20,685	3	601,585
OWNER	A dummy variable equal to 1 if the share of stocks held by a firm's representative and its family residing with him exceeds half of the total.	1,135	0.578				
COLLATERAL1	A dummy variable equal to 1 if the loan from the primary bank is covered by collaterals or 0 otherwise.	1,135	0.248				
PRIVATESECURITY1	A dummy variable equal to 1 if the loan from the primary bank is guaranteed by a firm's representative or a third-party individual or 0 otherwise.	1,135	0.707				

Table 1: Definition and description of variables (continued)

Variables	Definition	#obs.	Mean	Median	S.E.	Min.	Max.
FINANCINGCOST1	Financing cost of the primary bank, defined by (interest expenses + general and administrative expenses)/(deposits + negotiable CD + debentures + call money + payables under repurchase agreements + payables under securities lending transactions + borrowed money + foreign exchanges + short-term corporate bonds + straight bonds + convertible bonds) × 100 (%) in the fiscal year ending in March 2008. English translation of the name of each accounting item follows that by the Japanese Bankers Association.	1,135	1.478	1.454	0.246	0.930	2.341
FINANCINGCOST2	Financing cost of the secondary bank, calculated in the same way as FINANCINGCOST1 (%). This is defined to be equal to FINANCINGCOST3 below if the secondary bank is not observed.	1,135	1.383	1.382	0.317	0.641	2.341
LOANS1 (LNLOANS1)	(The logarithm of) the total amount of loans borrowed from the primary bank (,000 JPY).	1,135	1,775.6	225	25,228.4	0	766,730
SETTLE1	A dummy variable equal to 1 if a firm holds settlement accounts at the primary bank, or 0 otherwise.	1,135	0.907				
SALARY1	A dummy variable equal to 1 if a firm holds accounts at the primary bank to wire salaries to its employees or 0 otherwise.	1,135	0.670				
PERSONAL1	A dummy variable equal to 1 if a firm uses the primary bank's personal asset management services, or 0 otherwise.	1,135	0.282				

Table 1: Definition and description of variables (continued)

Variables	Definition	#obs.	Mean	Median	S.E.	Min.	Max.
LOANS2 (LNLOANS2)	(The logarithm of) total amount of loans borrowed from the secondary bank (,000 JPY).	1,011	306.5	30	6,136.2	0	195,016
PERSONAL1	A dummy variable equal to 1 if a firm uses the primary bank's personal asset management services or 0 otherwise.	1,135	0.282				
LOANS2 (LNLOANS2)	(The logarithm of) total amount of loans borrowed from the secondary bank (,000 JPY).	1,011	306.5	30	6,136.2	0	195,016
FINANCINGCOST3	The lowest financing cost of a private bank other than primary and secondary banks that have at least one ordinary branch in the area (defined by the telephone area code) where the firm is located, calculated in the same way as FINANCINGCOST1(%).	1,125	1.127	1.139	0.278	0.641	1.915
SETTLE2	A dummy variable equal to 1 if a firm holds settlement accounts at the secondary bank or 0 otherwise.	1,135	0.623				
SALARY2	A dummy variable equal to 1 if a firm holds accounts at the secondary bank to wire salaries to its employees or 0 otherwise.	1,135	0.241				
PERSONAL2	A dummy variable equal to 1 if a firm uses the secondary bank's personal asset management services, or 0 otherwise.	1,135	0.122				
BIS	The Basel capital adequacy ratio of the primary bank as of March 2007.	1,120	11.739	11.84	2.527	4.89	34.67
SALES (LNSALES)	(The logarithm of) sales at the most recent fiscal year end (,000 JPY).	1,134	5,127.6	1,829	14,469.4	44	342,038

Table 2: The mean difference test for the contracted interest rate.

(Note) The mean difference test for the contracted interest rates of short-term loans are presented. ***,** shows that the difference is significant at the 1 percent and 5 percent level, respectively (two-tailed test). The sample in Panel (b) consists of firms borrowing from both the primary and secondary banks.

(a) DMLOAN1=1 vs. DMLOAN1=0

DMLOAN1	N	Mean	Std. Err.	
1	379	2.210	0.042	
0	756	1.973	0.029	
Difference	1,135	0.237	0.050	***

(b) The primary bank vs. the secondary bank

Lender	N	Mean	Std. Err.	
Primary Bank	536	1.914	0.034	
Secondary Bank	536	1.877	0.032	
Difference	536	0.037	0.017	**

Table 3: Baseline regression

(Notes) 1. ***, **, and * show significance at the 1 percent, 5 percent and 10 percent levels, respectively. 2. Numbers below J statistic and log likelihood test statistic for endogeneity of DMLOAN1 are p values for respective statistics. 3. 2SLS with a linear first stage is the standard two-stage least square model where the first stage is estimated using a linear ordinary square model. Excluded instrumental variables are LNLOANS2, FINANCINGCOST3, LNSALES, SETTLE2, SALARY2, and PERSONAL2. 4. MLE with a first stage probit is the maximum likelihood estimation where the likelihood for DMLOAN1 taking a value of 1 is estimated using the probit model, whose independent variables consist of all the exogenous variables and a set of excluded variables employed in column 2 (2SLS with a linear first stage), namely, LNLOANS2, FINANCINGCOST3, LNSALES, SETTLE2, SALARY2 and PERSONAL2. 5. Both Panel A and Panel B report the results for the sample of firms that entered negotiations with two banks or more. Panel A reports the results for the unrestricted sample, whereas Panel B reports the results for the sample that is restricted to the firms that perceive their primary bank as their main bank. 6. Panel A reports the results for the unrestricted sample, whereas Panel B reports the results for the sample that is restricted to the firms which perceive their primary bank as their main bank. 7. In addition, 7 region dummies (dummies for Hokkaido, Tohoku, Chubu, Kinki, Chugoku, Shikoku and Kyushu) and 5 industry dummies (dummies for construction, manufacturing, communication and transportation, wholesale and retail, real estate industries) are included to control for a firm's demography. Kanto and "other" (financial and insurance and any other uncategorized firms) are base region and industry, respectively. The estimated coefficients of these dummy variables and the constant term are omitted from the table.

Panel A. Full sample regression

Variable	OLS			2SLS with a linear 1st stage			MLE with a 1st stage probit		
	Coef.	S.E.		Coef.	S.E.		Coef.	S.E.	
DMLOAN1	0.071	0.046		0.203	0.140		0.219	0.148	
LNSHORTLOAN1	-0.116	0.024	***	-0.118	0.026	***	-0.118	0.021	***
SCORE	-0.051	0.004	***	-0.051	0.005	***	-0.051	0.004	***
LNTASSET	-0.038	0.020	*	-0.033	0.023		-0.033	0.024	
OWNER	-0.014	0.044		-0.010	0.047		-0.010	0.047	
COLLATERAL1	0.093	0.051	*	0.089	0.054		0.089	0.054	
PRIVATESECURITY1	0.103	0.047	**	0.078	0.053		0.078	0.053	
FINANCINGCOST1	0.024	0.080		-0.031	0.087		-0.031	0.091	
FINANCINGCOST2	0.114	0.061	*	0.188	0.084	**	0.187	0.090	**
LNLOANS1	0.068	0.017	***	0.070	0.018	***	0.070	0.017	***
SETTLEMENT1	-0.026	0.072		-0.100	0.082		-0.100	0.081	
SALARY1	0.016	0.047		0.022	0.053		0.022	0.049	
PERSONAL1	0.040	0.044		0.030	0.047		0.030	0.047	
HI	0.275	0.197		0.288	0.206		0.288	0.205	
N	1,135			992			992		
F statistic for excluded instruments				21.07					
J statistic (p-value)				10.397(0.109)					
T test for endogeneity of DMLOAN1				-1.06					
Log likelihood							-1466.98		
LR test for endogeneity of DMLOAN1(p-value)							0.930 (0.335)		
R-squared	0.358								

Panel B. Sample of the firms that perceive their largest lender as their "main bank".

Variable	OLS			2SLS with a linear 1st stage			MLE with a 1st stage probit		
	Coef.	S.E.		Coef.	S.E.		Coef.	S.E.	
DMLOAN1	0.092	0.049	*	0.299	0.141	**	0.322	0.152	**
LNSHORTLOAN1	-0.119	0.026	***	-0.119	0.028	***	-0.118	0.023	***
SCORE	-0.051	0.005	***	-0.050	0.005	***	-0.050	0.004	***
LNTASSET	-0.022	0.021		-0.008	0.025		-0.007	0.026	
OWNER	-0.009	0.047		-0.014	0.049		-0.015	0.050	
COLLATERAL1	0.104	0.055	*	0.090	0.057		0.088	0.058	
PRIVATESECURITY1	0.098	0.051	*	0.086	0.057		0.088	0.057	
FINANCINGCOST1	0.051	0.089		0.008	0.095		0.009	0.100	
FINANCINGCOST2	0.122	0.067	*	0.220	0.088	**	0.228	0.092	**
LNLOANS1	0.061	0.020	***	0.061	0.020	***	0.061	0.018	***
SETTLEMENT1	-0.056	0.088		-0.104	0.098		-0.103	0.095	
SALARY1	-0.013	0.054		-0.004	0.060		-0.005	0.055	
PERSONAL1	0.028	0.047		0.026	0.049		0.026	0.050	
HI	0.199	0.209		0.225	0.216		0.226	0.219	
N	980			873			873		
F statistic for excluded instruments				21.19					
J statistic (p-value)				8.898(0.179)					
T test for endogeneity of DMLOAN1				-1.51					
Log likelihood							-1291.94		
LR test for endogeneity of DMLOAN1 (p-value)							2.47 (0.116)		
R-squared	0.349								

Table 4: The Results with the sample of firms with multiple loan applications

(Notes) 1. ***, **, and * show significance at the 1 percent, 5 percent and 10 percent levels, respectively. 2. Numbers below J statistic and log likelihood test statistic for endogeneity of DMLOAN1 are p values for respective statistics. 3. 2SLS with a linear first stage is the standard two-stage least square model where the first stage is estimated using a linear ordinary square model. Excluded instrumental variables are LNLOANS2, FINANCINGCOST3, LNSALES, SETTLE2, SALARY2, and PERSONAL2. 4. MLE with a first stage probit is the maximum likelihood estimation where the likelihood for DMLOAN1 taking a value of 1 is estimated using the probit model, whose independent variables consist of all the exogenous variables and a set of excluded variables employed in column 2 (2SLS with a linear first stage), namely, LNLOANS2, FINANCINGCOST3, LNSALES, SETTLE2, SALARY2 and PERSONAL2. 5. Both Panel A and Panel B report the results for the sample of firms that entered negotiations with two banks or more. Panel A reports the results for the unrestricted sample, whereas Panel B reports the results for the sample that is restricted to the firms that perceive their primary bank as their main bank. 6. Panel A reports the results for the unrestricted sample, whereas Panel B reports the results for the sample that is restricted to the firms which perceive their primary bank as their main bank. 7. In addition, 7 region dummies (dummies for Hokkaido, Tohoku, Chubu, Kinki, Chugoku, Shikoku and Kyushu) and 5 industry dummies (dummies for construction, manufacturing, communication and transportation, wholesale and retail, real estate industries) are included to control for a firm's demography. Kanto and "other" (financial and insurance and any other uncategorized firms) are base region and industry, respectively. The estimated coefficients of these dummy variables and the constant term are omitted from the table.

Panel A. Full sample regression

Variable	OLS			2SLS with a linear first stage			MLE with a first stage probit		
	Coef.	S.E.		Coef.	S.E.		Coef.	S.E.	
DMLOAN1	0.032	0.054		0.454	0.276		0.415	0.287	
LNSHORTLOAN1	-0.125	0.028	***	-0.128	0.031	***	-0.128	0.024	***
SCORE	-0.056	0.004	***	-0.058	0.004	***	-0.058	0.004	***
LNTASSET	-0.018	0.022		-0.001	0.026		-0.002	0.026	
OWNER	-0.029	0.045		-0.052	0.051		-0.050	0.052	
COLLATERAL1	0.051	0.054		0.040	0.060		0.042	0.060	
PRIVATESECURITY1	0.149	0.051	***	0.107	0.058	*	0.107	0.057	*
FINANCINGCOST1	-0.002	0.083		-0.043	0.095		-0.046	0.098	
FINANCINGCOST2	0.120	0.064	*	0.239	0.093	**	0.230	0.099	**
LNLOANS1	0.069	0.019	***	0.063	0.021	***	0.063	0.019	***
SETTLE1	-0.036	0.080		-0.142	0.093		-0.141	0.090	
SALARY1	0.012	0.052		0.032	0.060		0.031	0.054	
PERSONAL1	0.089	0.047		0.086	0.050	*	0.086	0.052	
HI	0.280	0.206		0.331	0.227		0.329	0.217	
N	965			838			838		
F statistic for excluded instruments				5.79					
J statistic (p-value)				9.19(0.163)					
T test for endogeneity of DMLOAN1				-1.57					
Log likelihood							-1191.29		
LR test for endogeneity of DMLOAN1 (p-value)							1.30 (0.254)		
R-squared	0.378								

Panel B. Sample of firms that perceive their largest lender as their "main bank".

	OLS			2SLS with the linear first stage			MLE with a first stage probit		
	Coef.	S.E.		Coef.	S.E.		Coef.	S.E.	
DMLOAN1	0.049	0.059		0.495	0.263	*	0.424	0.218	*
LNSHORTLOAN1	-0.131	0.030	***	-0.128	0.033	***	-0.129	0.025	***
SCORE	-0.058	0.004	***	-0.059	0.004	***	-0.059	0.005	***
LNTASSET	0.004	0.025		0.028	0.029		0.025	0.029	
OWNER	-0.020	0.049		-0.048	0.054		-0.044	0.055	
COLLATERAL1	0.054	0.059		0.031	0.063		0.034	0.063	
PRIVATESECURITY1	0.143	0.055	**	0.115	0.062	*	0.114	0.061	*
FINANCINGCOST1	0.022	0.093		-0.015	0.103		-0.019	0.106	
FINANCINGCOST2	0.136	0.071	*	0.243	0.091	**	0.230	0.090	**
LNLOANS1	0.063	0.022	***	0.051	0.024	**	0.052	0.021	**
SETTLE1	-0.067	0.105		-0.135	0.120		-0.134	0.107	
SALARY1	-0.014	0.062		0.010	0.071		0.008	0.060	
PERSONAL1	0.075	0.050		0.078	0.053		0.078	0.055	
HI	0.228	0.220		0.278	0.239		0.276	0.230	
N	820			726			726		
F statistic for excluded instruments				6.49					
J statistic (p-value)				8.37(0.212)					
T test for endogeneity of DMLOAN1				-1.71					
Log likelihood							-1029.13		
LR test for endogeneity of DMLOAN1 (p-value)							2.34 (0.126)		
R-squared	0.347								

Table 5: Subsampling results based on the relative informational advantage of the primary lender (sample of firms that applied to multiple banks and perceive the largest lender as their "main bank")

(Notes) 1. ***, **, and * show significance at the 1 percent, 5 percent, and 10 percent level, respectively. 2. Numbers below the log likelihood test statistic for endogeneity of DMLOAN1 is the p value. 3.The first and second columns in Panel B show the results for the sample where a firm reports that its primary lender is at least as knowledgable about the firm as its secondary lender and the results for the sample where a firm reports that its secondary lender is at least as knowledgeable about the firm as its primary lender. 4. The sample used in column 1 and that used in column 2 are not mutually exclusive. This is because 76 percent of sample firms report that their primary and secondary lenders are equally knowledgeable about them. Constructing the mutually exclusive samples would make the smaller of the two subsamples too small to run a regression. 5. Firms applied for a loan application only from their primary bank and firms that do not percieve the largest lender as their main bank are excluded from both subsamples. 6. The regressions are run using the maximum likelihood estimation where the likelihood for DMLOAN1 taking a value of 1 is estimated using the probit model whose independent variables consist of all the exogenous variables in the second-stage equation for SHORTRATE and LNLOANS2, FINANCINGCOST3, LNSALES, SETTLE2, SALARY2 and PERSONAL2 as excluded instrumental variables. 7. In addition, 7 region dummies (dummies for Hokkaido, Tohoku, Chubu, Kinki, Chugoku, Shikoku and Kyushu) and 5 industry dummies (dummies for construction, manufacturing, communication and transportation, wholesale and retail, real estate industries) are included to control for a firm's demography. Kanto and "other" (financial and insurance and any other uncategorized firms) are base region and industry, respectively. The estimated coefficients of these dummy variables and the constant term are omitted from the table.

	A firm's primary lender knows about the firm at least as well as its secondary lender			A firm's secondary lender knows about the firm at least as well as its primary lender		
	Coef.	Std. Err.		Coef.	Std. Err.	
DMLOAN1	0.385	0.215	*	0.525	0.175	***
LNSHORTLOAN1	-0.144	0.026	***	-0.164	0.029	***
SCORE	-0.058	0.005	***	-0.056	0.005	***
LNTASSET	0.019	0.029		0.001	0.030	
OWNER	-0.020	0.057		0.008	0.064	
COLLATERAL1	0.017	0.065		0.029	0.072	
PRIVATESECURITY1	0.107	0.063	*	0.039	0.070	
FINANCINGCOST1	0.013	0.110		-0.034	0.120	
FINANCINGCOST2	0.196	0.091	**	0.168	0.094	*
LNLOANS1	0.064	0.022	***	0.068	0.024	***
SETTLE1	-0.080	0.112		-0.027	0.124	
SALARY1	-0.008	0.062		-0.044	0.069	
PERSONAL1	0.074	0.056		0.116	0.065	*
HI	0.245	0.241		0.136	0.291	
N	685			547		
Log likelihood	-967.55			-725.83		
LR test for endogeneity of DMLOAN1 (p-value)	2.14 (0.143)			5.92 (0.015)		

Table 6: Results to examine the insurance hypothesis (sample of firms that applied to multiple banks and perceive the largest lender as their "main bank")

(Notes) 1. ***, **, and * show significance at the 1 percent, 5 percent, and 10 percent levels, respectively. 2. Numbers below the log likelihood test statistic for endogeneity of DMLOAN1 is the p value. 3. Firms took out only a single application and those that do not percieve the largest lender as their main bank are excluded from both subsamples. 4. The regressions are run using the maximum likelihood estimation where the likelihood for DMLOAN1 taking a value of 1 is estimated using the probit model whose independent variables consist of all the exogenous variables in the second-stage equation for SHORTRATE and LNLOANS2, FINANCINGCOST3, LNSALES, SETTLE2, SALARY2 and PERSONAL2 as excluded instrumental variables. 7. In addition, 7 region dummies (dummies for Hokkaido, Tohoku, Chubu, Kinki, Chugoku, Shikoku and Kyushu) and 5 industry dummies (dummies for construction, manufacturing, communication and transportation, wholesale and retail, real estate industries) are included to control for a firm's demography. Kanto and "other" (financial and insurance and any other uncategorized firms) are base region and industry, respectively. The estimated coefficients of these dummy variables and the constant term are omitted from the table.

	Firms that answer that they will apply for a loan to their main bank in case of a temporary liquidity shortage.			Firms that answer that they will apply for a loan to their main bank or ask their main bank to postpone repayments in case of a temporary liquidity shortage.		
	Coef.	Std. Err.		Coef.	Std. Err.	
DMLOAN1	0.564	0.196	***	0.513	0.200	***
LNSHORTLOAN1	-0.131	0.030	***	-0.131	0.029	***
SCORE	-0.057	0.005	***	-0.057	0.005	***
LNTASSET	0.004	0.033		0.005	0.031	
OWNER	-0.024	0.062		-0.016	0.060	
COLLATERAL1	0.011	0.072		0.012	0.070	
PRIVATESECURITY1	0.105	0.070		0.100	0.068	
FINANCINGCOST1	0.005	0.125		0.008	0.119	
FINANCINGCOST2	0.317	0.101	***	0.293	0.099	***
LNLOANS1	0.058	0.024	**	0.051	0.023	**
SETTLE1	-0.006	0.126		-0.047	0.120	
SALARY1	0.018	0.069		0.043	0.066	
PERSONAL1	0.054	0.063		0.054	0.061	
HI	0.296	0.264		0.362	0.257	
N	570			600		
Log likelihood	-784.48			-830.04		
LR test for endogeneity of DMLOAN1 (p-value)	3.94 (0.047)			3.44 (0.064)		

Table 7: Regression results from subsamples sorted by various attributes (sample of firms that applied to multiple banks and perceive the largest lender as their "main bank")

(Notes) 1. ***, **, and * show significance at the 1 percent, 5 percent, and 10 percent levels, respectively. 2. The regressions are run using the maximum likelihood estimation, where the likelihood for DMLOAN1 taking a value of 1 is estimated using the probit model, whose independent variables consist of all the exogenous variables in the second stage equation for SHORTRATE and LNLOANS2, FINANCINGCOST3, LNSALES, SETTLE2, SALARY2, and PERSONAL2 as excluded instrumental variables. The estimated coefficients of DMLOAN1 in each subsample regression are reported. The set of explanatory variables is identical to those in Tables 3-6 except that the Kyushu and Chugoku regions are treated as one region in (8) and (9). 3. Subsample (3) consists of firms whose largest lender is a regional bank. The other subsamples are constructed by splitting the dataset by the sample median of the number of branches of the primary bank (1,2), of the logarithm of total assets of firms (4,5), of the length of lending relationship with the largest lender (6,7), and of the Herfindahl Index of branch numbers in the telephone area-code area where a firm is located (8,9). Medians are 145 branches, 7.48 (1.8 million JPY), 37 years, and 0.174. 4. Firms took out only a single application and those that do not perceive the largest lender as their main bank were excluded from each subsample.

	Est. coef. of DMLOAN1	S.E.		N	Log likelihood	LR test for endogeneity of DMLOAN1 (P-Value)
(1) Small banks	0.873	0.171	***	339	-500.80	13.49 (0.000)
(2) Large banks	0.014	0.439		351	-410.54	0.32 (0.570)
(3) Regional banks	0.807	0.188	***	426	-606.37	4.15 (0.042)
(4) Small firms	0.393	0.248	***	345	-520.37	1.39 (0.239)
(5) Large firms	0.788	0.134	***	345	-410.89	14.1 (0.000)
(6) Shorter relation	0.459	0.269	*	302	-425.24	2.36 (0.125)
(7) Longer relation	-0.065	0.196		305	-410.81	0.56 (0.454)
(8) Competitive market	0.982	0.132	***	344	-456.17	22.76 (0.000)
(9) Concentrated market	0.172	0.215		346	-471.66	0.11 (0.736)

Table A1: First-stage probit results for Table 3

(Notes) 1. ***, **, and * show significance at the 1 percent, 5 percent, and 10 percent levels, respectively. 2. The first-stage probit model and the second-stage linear equation whose results are reported in Table 2 are estimated simultaneously by the maximum likelihood method. 3. Both Panel A and Panel B report the results for the sample of firms that perceive their primary lender as their main bank. 4. In addition, 7 region dummies (dummies for Hokkaido, Tohoku, Chubu, Kinki, Chugoku, Shikoku and Kyushu) and 5 industry dummies (dummies for construction, manufacturing, communication and transportation, wholesale and retail, real estate industries) are included to control for a firm's demography. Kanto and "other" (financial and insurance and any other uncategorized firms) are base region and industry, respectively. The estimated coefficients of these dummy variables and the constant term are omitted from the table.

Variable	The first-stage probit for Panel A of Table 3			The first-stage probit for Panel B of Table 3		
	Marginal effect	Std. Err.		Marginal effect	Std. Err.	
LNSHORTLOAN1	0.000	0.018		0.007	0.019	
SCORE	0.001	0.003		0.001	0.004	
LNTASSET	-0.015	0.023		-0.029	0.025	
OWNER	0.051	0.035		0.051	0.039	
COLLATERAL1	0.059	0.043		0.073	0.046	
PRIVATESECURITY1	-0.034	0.043		-0.064	0.047	
FINANCINGCOST1	-0.007	0.074		0.001	0.081	
FINANCINGCOST2	-0.279	0.058	***	-0.240	0.063	**
LNLOANS1	0.008	0.014		0.013	0.016	
SETTLE1	0.097	0.053	*	0.106	0.063	*
SALARY1	0.026	0.038		0.025	0.043	
PERSONAL1	0.042	0.043		0.031	0.045	
HI	-0.149	0.180		-0.259	0.209	
LNLOANS2	-0.054	0.010	***	-0.049	0.010	
FINANCINGCOST3	0.021	0.082		0.134	0.107	
LNSALES	-0.057	0.027	**	-0.059	0.029	**
BIS	-0.008	0.007		-0.010	0.007	
SETTLE2	-0.197	0.039	***	-0.238	0.041	***
SALARY2	-0.105	0.038	***	-0.100	0.043	**
PERSONAL2	-0.136	0.048	***	-0.123	0.055	**
N	992			873		