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Hirofumi Uchida
Gregory F.Udell
Wako Watanabe

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ABSTRACT

Current theoretical and empirical research suggests that small banks have a comparative advantage in processing soft information and delivering relationship lending. The most comprehensive analysis of this view found using U.S. data that smaller SMEs borrow from smaller banks and smaller banks have stronger relationships with their borrowers (Berger, Miller, Petersen, Rajan, and Stein 2005) (BMPRS). We employ essentially the same methodology as BMPRS on a unique Japanese data set and obtained findings that are quite interesting from an international comparison point of view. We found like BMPRS that larger firms tend to borrow from larger banks. However, unlike BMPRS we did not find that this was because larger firms are more transparent. Together these results imply that large banks do not necessarily have a comparative advantage in extending transactions-based lending. We also found like BMPRS that smaller banks have strong relationships with their borrowers. However, we find that banking relationships in the U.S. and Japan are strong in somewhat different dimensions. Our paper clarifies these and other interesting similarities and differences between the U.S. and Japan.

Hirofumi Uchida
Wakayama University
Faculty of Economics
930 Sakaedani
Wakayama, JAPAN
uchida@eco.wakayama-u.ac.jp

Wako Watanabe
Graduate School of Economics and Management
Tohoku University
27-1 Kawauchi, Sencai
Miyagi, 980-8576 JAPAN
watanabe@econ.tohoku.ac.jp

Gregory F.Udell
Kelley School of Business
Indiana University
1309 East Tenth Street
Bloomington, IN 47405-1701
USA
gudell@indiana.edu

1. Introduction

There is a general perception in Japan that competition across different types of banks has intensified in the past two decades. It has been reported in the financial press that large banks have encroached on the markets that were once the domain of small banks such as Shinkin banks and credit cooperatives.[1] Large banks have created and introduced new loan products, such as loans collateralized by inventory, non-tangible assets, and accounts receivable, that have been specifically targeted to small- and medium-sized enterprises (SMEs).[2] At the same time the number of small banks in market has been contracting due to bank failures and consolidation.[3] As in other developed economies, these trends raise significant policy questions: Will small banks survive in the future in Japan? If they do not, will some markets become underserved?

Recent academic research suggests that small banks may have an advantage over large banks in providing credit to SMEs. Specifically, this research suggests that large banks and small banks may have different comparative advantages in utilizing different lending technologies. On the one hand, large banks are viewed as having a comparative advantage in underwriting SME loans using *transactions-based lending technologies* that rely on quantitative and transferable information referred to as *hard* information, since they can enjoy scale economies in evaluating such information. On the other hand, small banks are considered to have a comparative advantage in

[1] A recent article for example reports that the uncollateralized and non-guaranteed "bargain-sale loans" of large bank which aim to capture blue-chip SMEs are threatening regional financial institutions ("Ootegin Kousei de Shuueki Kibishiku (Large banks threaten small banks' profits)," the Nikkei Newspaper, January 20, 2004). Another article reports that in response to this, regional financial institutions are increasing uncollateralized loans to SMEs ("Chigin, Shinkin, Mutanpo Yuushi wo Kakudai (Regional banks and Shinkin banks are expanding uncollateralized loans)," the Nikkei Newspaper, August 2, 2005).

[2] See, for example, "Ginko yu-shi ni kawaridane tanpo: chu-sho torihikisaki kaitaku ni chie (unusual collateral for bank loans: beat brains to develop new SME customers)," (Nikkei Newspaper, January 23, 2006).

[3] Yamori (2005) reports the drastic decrease in the number of two types of cooperative banks in Japan: The number of Shinkin banks decreased from 462 in 1980 to 301 in 2005 and that of credit cooperatives decreased from 483 in 1980s to 179 in 2005.

underwriting SME loans utilizing the *relationship lending technology*, which relies primarily on qualitative non-transferable information referred to as *soft* information.[4] Stein (2002) shows that small banks with simple organizational structures have comparative advantages in producing soft information and thereby excel at providing relationship lending. A number of papers have found empirical evidence consistent with this theory particularly in the U.S. context (e.g., Cole, Goldberg and White 2004, Scott 2004, Berger, Miller, Petersen, Rajan and Stein 2005).

The primary aim of this paper is to investigate whether banks have these size-dependent advantages in Japan and, more broadly, what this implies for the future of small banks in the Japanese context. Our methodological approach borrows extensively from Berger, Miller, Petersen, Rajan, and Stein (2005) (hereafter BMPRS), who found that bank-SME relationships are stronger for smaller banks than for larger banks. Specifically, we apply the BMPRS's empirical methodology to investigate (1) whether smaller firms borrow from smaller banks and (2) whether strength of the bank-SME relationship differs by bank size, using a unique data set of Japanese SMEs. We are thus able to examine whether the findings of BMPRS and other U.S.-focused studies translate across country borders.

Our analysis, however, is not just a replication of BMPRS using a data set in Japan. Our data allow us to pursue the issue of bank size and bank-borrower relationships in more depth on one important dimension: information verifiability. Specifically, unlike data used in U.S. studies such as BMPRS, our data allow us to identify whether an SME has audited financial statements. Using this information, we decompose the effect of financial statement transparency from that of firm size in general. This decomposition is important, because the availability of audited financial statements determines whether an SME can receive loans based on *financial statement lending*,

[4] After the seminal works by Petersen and Rajan (1994) and Berger and Udell (1995), enormous effort has been exerted to investigate whether a strong relationship between a bank and an SME brings about benefits, such as a lower interest rate and greater credit availability. See Boot (2000), Ongena and Smith (2000), and Elyasiani and Goldberg (2004), for survey.

which is one of the most important transactions-based lending technologies. Our data on information verifiability allows us to extend the BMPRS analysis by investigating whether the importance of bank size and relationship strength depends on the availability of audited financial statements. That is, unlike BMPRS we can investigate whether bank size and relationship strength matter to potential financial statement borrowers and other borrowers.

By way of preview, we find interesting similarities and differences in SME lending practices in Japan compared with those in the U.S. As for the size correspondence between banks and borrowers, we find like BMPRS that larger firms are more likely to borrow from larger banks. Unlike BMPRS, however, our methodology allows us to analyze whether this is because large banks have comparative advantages in delivering financial statement lending. We find that they do not. Larger firms borrow from larger banks even when their financial statements are not audited. Thus, other size-related factors are likely to contribute to this size matching between banks and borrowers.

As for the strength of bank-borrower relationships, we find like BMPRS that small banks have stronger relationships with their SMEs. However, our analysis enables us to identify differences in small banks' "relationship building" between the U.S. and Japan. BMPRS found that the bank-firm relationships for small banks in the U.S. tend to i) have a longer duration, ii) reflect a shorter distance between borrower and lender, iii) be more personal (more face-to-face interaction), and be more exclusive (more likely to be associate with a sole lender). Our analysis in contrast shows that smaller banks in Japan do not have longer-term relationships with their borrowers -- although like in the U.S. we also find that smaller banks in Japan have wider business relationships with, have a shorter distance to, have more frequent contact with, and have a smaller number of co-lenders to, their borrowers than larger banks do. Thus, our findings on relationship building tend to reflect more similarity than difference, although on at least one dimension of relationship

building (relationship duration) the countries appear to differ significantly.

Overall, research findings (ours and the extant literature) on commercial lending in each of these two countries seem to fit into the broad framework that predicts a linkage between bank size and the deployment of different lending technologies. Our analysis, however, reveals some interesting similarities and differences across the two countries with respect to the nature and relevance of specific links, which suggests that SME lending practices may further differ in interesting ways across other countries. Our findings also have some practical implications. Specifically, they suggest that small banks in Japan may have a unique qualitative advantage over large banks – their ability to deliver soft information based relationship lending – even though in aggregate size their lending has been replaced quantitatively by larger banks.

Our paper makes two main contributions. First, by conducting a cross-country comparison of the largest and the second largest economies, we examine whether SME loan underwriting differs across these two countries. Our findings show some interesting differences, and they seem to indicate the possibility that important differences in the *financial institutions structures* and *lending infrastructures* across countries may affect the way in which banks lend to SMEs as suggested by Berger and Udell (2006).

Second, we offer a significant methodological improvement over other studies of SME credit including BMPRS in that we specifically consider the importance of the availability of verifiable information in the form of audited financial statements. As discussed above, this innovation permits a more penetrating interpretation of our results and also suggests the avenues for further research.

There are three companion papers that are closely related to this study. In this paper we investigate whether the complexity of banking organizations matter in determining the strength of bank-firm relationships. According to the theory of relationship lending, the strength of the

relationship ultimately determines the availability and price of credit, i.e., the benefits of the relationship. Here we do not focus on the benefits of relationship lending. We address this issue using the same data set in a companion paper, Kano, Uchida, Udell, and Watanabe (2006).

Uchida, Udell, and Yamori (2006a), another companion paper, investigates the use of different lending technologies in Japan. Using a detailed data set obtained from an SME survey in three prefectures in Japan, they find that Japanese banks do not use different lending technologies, e.g. financial statement lending and relationship lending, as distinctively as banks in other countries as Berger and Udell (2006) suggested. Rather, their findings imply that Japanese banks seem to take a synthetic approach in screening borrowers. That is, irrespective of their size, Japanese banks almost always focus on the information contained in borrower's financial statements, and they also put (less) emphasis on the strong relationship with the borrower and the value of borrower's tangible assets that are pledged as collateral. Our results obtained in this paper are quite consistent with these findings.

Uchida, Udell, and Yamori (2006b) is also closely related to the present study. Using the same data set as that of Uchida, Udell, and Yamori (2006a), they focus on the information production/accumulation process by loan officers. Their analysis is more detailed in the sense that they focus on the role of loan officers, but is similar to the second stage of our analysis here. They find results that are consistent with those in the present study, e.g. the irrelevance of relationship length.

The remainder of this paper is composed as follows. In the next section, we briefly explain some institutional background and dynamics of the banking industry in Japan. In Section 3, we introduce the data and methodology. Section 4 presents the results and their interpretations. The final section concludes the paper with policy implications.

2. Institutional background

The financial services industry in Japan has been segregated since World War II. Within the commercial banking industry, one form of segregation has affected the delivery of large business loans and loans to SMEs. On the one hand, Shinkin banks and credit cooperatives, which are both cooperative banks, are mandated by law to confine their commercial lending to SMEs. On the other hand, regional banks and city banks, which are larger and operate under a different set of regulations (the Banking Act), have historically focused on larger businesses, although they had not been prohibited from conducting business with SMEs.[5]

The primary motivation for this segregation appears to have been to promote expertise from specialization and to limit competition in order to guarantee profits and to secure the safety and soundness of the financial sector as a whole. Due to this segregation, practitioners sometimes refer to the existence of a "banking ladder" from a firms' point of view, which begins with a small credit cooperative, progresses to a Shinkin bank, then to a second-tier regional bank, to a regional bank, and finally reaches one of the largest city banks. As firms grow, they step up this banking ladder and gain in reputation. Practitioners sometimes use the term "*sotsugyo* (graduate)" in describing when a firm transfers from a lower-ladder bank to an upper-ladder bank.[6]

This once clear segregation appears to be collapsing today, however. As we mentioned in the introduction, there is an abundance of anecdotal evidence that indicates that the customer base of different types of banks began to overlap. In the 1980s, well-performing large and established

[5] Until 1989, another type of bank, the Sogo banks (mutual banks), also existed and operated SME lending. In 1989, all but one Sogo banks transformed their types and became banks under the Banking Act. These banks, which are called second-tier regional banks, are included in our analysis in the category of regional banks.

[6] In principle, Shinkin banks and credit cooperatives are allowed to lend to their members only, which also contributes for SMEs to *sotsugyo*. To become a member of a Shinkin bank, a firm has to have employees smaller than 300 persons or has capitalization smaller than 900 million yen. Credit cooperatives have tighter restrictions so that further small firms can only qualify them.

firms stopped relying on commercial banks for fund-raising and turned to the capital markets.[7] Large banks who lost their large business customers turned their focus in response to "blue-chip" SMEs and individuals. As a result, commercial banks (especially large banks) dramatically increased their loans to SMEs and individuals during this period (see Hoshi and Kashyap 2001, Chapter 8). There are a lot of recent newspaper articles that report that larger banks have targeted and attracted smaller borrowers that used to be the customers of small credit cooperatives or Shinkin banks.[8] The introduction of new loan products appears to have been part of this large bank strategy of targeting SMEs.

Despite these reports of large bank entry into the SME market, recent data show that the duration of the relationship between SMEs and banks in Japan is still so long that firms rarely experience a change in main banks.[9] One possible reconciliation of these seemingly inconsistent pieces of evidence is that the role of small banks as the main bank is still irreplaceable and large banks have not become primary lenders to SMEs. Instead, large banks have become secondary lenders – or what practitioners call "*jun-mein* (quasi-main)" or "*hi-mein* (non-main)" banks. Thus, although large banks have quantitatively increased their SME lending, this does not necessarily mean that they have qualitatively superseded small banks and deprived of their role as "true" main banks.

In summary, anecdotal evidence gives us a mixed view about the future of small banks in Japan. To shed some light on these issues, we now turn to our formal empirical analysis of the role of small banks.

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[7] Financial liberalization and the development of the capital market also contributed to this flight from bank loans. See Hoshi and Kashyap (2001, chapter 7).

[8] Interviews with bankers from small banks support this view.

[9] As shown below, the average duration is 32.2 years in our data set. See SME Agency (2002, 2003, 2004) as well for a long relationship in Japan.

3. Data and Methodology

3.1 Data

The SME data used in this paper comes from the 2002 Survey of the Financial Environment (SFE) which was conducted by the SME Agency of the Government of Japan in November 2002. It contains detailed information about the SMEs' qualitative characteristics, their financial statements, and their relationships with the main bank. The main bank is identified by a question in the survey which directly asks the firm to identify its main bank. Since the responding firms included large corporations, we confined our sample to SMEs only.[10]

We link the SFE survey data to data on the SMEs' main banks using two different sources. For SMEs whose main banks are city and regional banks, we obtain data on their banks from the Nikkei NEEDS Company (Bank) Data File (Nihon Keizai Shimbun, Inc.). For SMEs whose main banks are Shinkin banks we obtain data on their banks from the Financial Statement of Shinkin Banks (Kin-yu Tosho Consultant Corporation). Due to the small number of observations, we excluded sample firms for which the main bank is neither a city, regional, nor Shinkin bank.

3.2 Variables and methodology

3.2.1 Determinants of bank size

Hypothesis and main variables

Our methodology here borrows extensively from BMPRS. In our first set of tests we ask: "What size of bank do SMEs choose to borrow from?" This is an analysis on the determinants of bank size. If, as Stein (2002) predicts, small banks have comparative advantages in producing soft

[10] In accordance with the Small and Medium Enterprise Basic Law in Japan, SMEs are defined here as enterprises with 300 or fewer regular employees (100 or fewer in Wholesale and Services, 50 or fewer in Retail and Food) or a capital stock of 300 million yen or less (100 million yen or less in Wholesale, 50 million yen or less in Retail, Food and Services).

information and large banks have comparative advantages in lending based on hard information, opaque firms would borrow from small banks and transparent firms would go to large banks.[11] We will thus test the following hypothesis: *Transparent firms borrow from large banks and opaque firms borrow from small banks*.

The dependent variable in our regressions is bank size as measured by the natural logarithm of bank assets, log(BTASSET). The main independent variable is the dummy variable AUDIT, which equals one if an SME has audited financial statements. This variable indicates whether there is hard information about the firm's performance and condition.

Hard information contained in audited financial statements would make the firm transparent and enable the bank to underwrite loans utilizing the financial statement lending technology (Berger and Udell 2006). Thus, our first hypothesis predicts that AUDIT should have a significantly positive effect on log(BTASSET). That is, SMEs that have audited financial statements should choose larger banks that have a comparative advantage in providing financial statement lending because these loans are based on hard information.

There is, however, empirical evidence that is inconsistent with this prediction. Uchida, Udell, and Yamori (2006a) report that Japanese banks do not distinctively use different lending technologies, and rather take a synthesized approach in screening borrowers by taking into account different factors all together. Judging from this finding, information from auditing may or may not be used irrespective of bank size, and thus AUDIT makes no difference in the determination of bank size. Our data set, through the use of AUDIT, allows us to directly test which story is more plausible.

[11] Subsequent research has suggested that the mapping implicit in Stein (2002) and other theoretical work between hard information and large firm lending may be overly simplistic. Some transactions-based (i.e., hard information-based) technologies may be well-suited for opaque borrowers such as factoring, leasing and small business credit scoring (Berger and Udell 2006). For a discussion of this in the Japanese context see Uchida, Udell and Yamori (2006a). In our analysis we focus on one type of hard information: audited financial statements.

It is worthwhile noting that BMPRS do not have information on whether the firm's financial statements are audited. One of their proxies for hard information is firm asset size. Their justification for this proxy is based on a presumption that large firms are more likely to have verifiable information than small firms are. We do not have to rely on this assumption because our variable AUDIT directly and precisely captures the availability of the hard information associated with financial statement lending. For comparability with BMPRS and to control for hard information which is unrelated to financial statement lending, we include as an independent variable log(ASSET), the natural logarithm of the firm's asset, together with AUDIT.

In addition to firm size, BMPRS also uses a dummy variable called *Records*, which represents the existence of any sources of financial information, to proxy hard information. This is, however, not a very good proxy for the quality (informativeness) of financial information: it does not contain information about whether this information is in the form of financial statements, whether the financial statements (if they exist) were constructed by the entrepreneur, whether they were constructed based on GAAP, or whether they were constructed by an independent CPA without verification (i.e., without audit) – much less whether it was verified by the third party in the form of an audit. Information about the existence of verifiable information with respect to the firm's condition and performance in the form of an audit (represented by AUDIT) is critical. Without this information, BMPRS cannot distinguish between relationship lending and financial statement lending.

Control variables

We also use a variety of different control variables. From the firm's financial statements we use the current ratio, CURRENT, the capital asset ratio, CAPRATIO, and the pretax profit margin, PPMARGIN. FAGE is the age of the firm; EMPLOYEE is the number of employees; LISTED is

a dummy variable which takes a value of one if the firm is listed; and a dummy variable OWNER takes a value of one if the entrepreneur of the firm owns more than half shares of the firm.

We also use PROPERTY, BUILDING, MACHINERY, VEHICLE, TOOL, and LAND, which represent the fraction of these tangible assets to total assets. These variables represent the potential to pledge fixed assets as collateral. Opaque or not, small firms with a high fraction of these assets may not have to rely on small banks, since large banks may be able to easily lend based on hard information about the values of these assets as collateral. Within the paradigm of lending technologies a la Berger and Udell (2006), banks could use alternative transactions-based lending technologies that are associated with these types of assets, i.e., leasing, equipment lending and real estate-based lending. As indicated above, however, Japanese banks that take a synthesized approach in screening may not put much emphasis on collateral value (Uchida, Udell, and Yamori 2006a). By use of these variables, we can test which hypothesis is more plausible, which is also our contribution over BMPRS.

Entrepreneur characteristics are captured by a dummy variable GENDER, which takes a value of one if the entrepreneur is male, a dummy variable HOUSING, which takes a value of one if the entrepreneur has his/her own house, a dummy variable EDUCATION, which takes a value of one if the entrepreneur graduated from a college, university, or graduate school, and AGE, which represents the entrepreneur's age. We also use seven industry dummies, CONSTRUCT, TRANSPORT, WHOLESALE, RETAIL, REALESTATE, SERVICE, and OTHER, and eight regional dummies, HOKKAIDO, KITAKANTO, CHUBU, KANSAI, CHUGOKU, SHIKOKU, and KYUSHU. The default is a manufacturing firm in Tokyo area.

Finally, three variables are used to control for the market structure of banks. First, BRANCH is the number of branch offices of city, regional, and Shinkin banks in each prefecture. We also use REGBRATIO and SHINBRATIO, which are the ratios of the number of branch offices of

regional banks and Shinkin banks, respectively, to BRANCH. These two variables are to control for the difference in size distribution of banks by prefecture. A larger REGBRATIO implies greater access to middle-sized banks, while a larger SHINBRATIO means greater availability of small banks. These variables take the same value for those SMEs in the same prefecture.[12]

3.2.2 Strength of bank relationships

Hypothesis and dependent variables

We then investigate whether bank size matters in determining the strength of the bank-SME relationship. Following BMPRS, we regress bank size as well as our control variables on proxies for strength. The fundamental hypothesis we test is: *smaller banks establish stronger relationships with SMEs than large banks do*.

As proxies for the strength of the bank-SME relationships, we take the following five alternative variables which are available from the SFE survey: (1) LENGTH, the length of the relationship between the firm and its main bank; (2) SCOPE, the variable representing the scope of relationships which is constructed by the principal component analysis using the information about the existence or non-existence of five particular transactions between the firm and the main bank; (3) DISTANCE, a variable representing the physical distance between the firm and the bank branch; (4) CONTACT, a variable representing the frequency of contact between the firm and a loan officer of the main bank; and (5) NOBK, the number of banks that the firm is borrowing from.[13] The data appendix contains detailed description of how we constructed these variables.[14]

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[12] The data of these variables are taken from *Fainansu Ja-naru* (Finance Journal).

[13] Alternative to NOBK, we also tried a dummy variable, EXCLUSIVE, which takes a value of one if the main bank is the sole lender to the firm. It produced very poor results with few significant independent variables, and is thus not reported.

[14] We do not use Trade Credit Paid Late as a dependent variable in our analysis as BMPRS did for two reasons. First, a comparable variable is not available from the survey data. Second, because our focus in this paper is on the determinants of the strength of banking relationships, we do not examine the

Using these five variables, we test our second hypothesis in five different ways. That is, we test whether smaller banks are likely to (1) have longer SME relationships (a higher value of LENTGH), (2) have relationships with more scope (a higher value of SCOPE), (3) be located closer to their SMEs (a smaller value of DISTANCE), (4) contact their SMEs more frequently (a larger value of CONTACT), (5) lend more exclusively (a smaller value of NOBK). The five regressions are run by OLS.

It is interesting to note that CONTACT is not available in BMPRS. This variable is particularly important because soft information may be obtained through direct contact between loan officers and entrepreneurs and frequent contact likely increases the chance of obtaining important soft information. LENGTH and SCOPE also represent the strength of relationships but they are more indirect measures compared with CONTACT. NOBK can also be considered as an indirect measure of the relationship strength. As explained above, however, the main bank is rarely changed in spite of the drastic changes in loan shares to SMEs by bank type. It may therefore be the case that only the main bank matters in relationship building. If that is the case, NOBK is a poor proxy.

Finally, our ability to use CONTACT makes DISTANCE less important, because frequent visits from afar would imply a strong relationship, while infrequent visits from a nearby bank would imply a weak relationship. However, these two variables may move in tandem. For purposes of comparison with BMPRS, we use DISTANCE as well.

Main independent variables

The main independent variable in this analysis is bank size. As before, we take a natural logarithm of the variable and use log(BTASSET). A finding of a negative coefficient on

benefits of strong relationships, which is the focus of a companion paper (Kano, Uchida, Udell, and Watanabe 2006).

log(BTASSET) in the LENGTH, SCOPE, or CONTACT regressions, or a positive coefficient in the DISTANCE or NOBK regressions would be consistent with the theoretical argument that small banks have an advantage in relationship lending.

In addition, we use AUDIT as an independent variable. As noted above this variable is used to isolate firms that may not have to rely on strong relationships with banks, i.e., financial statement borrowers. That is, if banks use alternatives to the relationship lending technology that do not rely on soft information, one of the most important would likely be *financial statement lending.* This suggests that relationships would be stronger for borrowers other than financial statement borrowers, which implies a negative coefficient on AUDIT.

IV estimation and control variables

In addition to the estimation by OLS, following BMPRS, we also estimate the five strength regressions using instrumental variables (IV). As BMPRS indicate, there may be variables which affect both the strength variables (the dependent variables) and bank size (the main independent variable). To control for such effects, we estimate the strength regressions with the bank-size determination regression (Section 3.2.1) taken as its first stage.

Among the first-stage independent variables, we consider REGBRATIO and SHINBRATIO as instruments, i.e. REGBRATIO and SHINRATIO do not appear in the right-hand side of the strength (the second stage) regressions. This is because these variables represent differences in geographical distribution of branch offices of banks of different sizes. They should influence BTASSET, but would not seem to directly affect the strength variables. The other independent variables of the first stage regression are used as controls in the second stage.

3.3 Summary statistics

Descriptive statistics are shown in Table 1. Firms in our sample are on average 59.1 years old, have assets of 2,696 million yen, and employ 75 people. An average firm is therefore a medium-sized firm. For comparison, BMPRS report that in their U.S. data set, an average firm is 14.8 years old, and has assets of 3.003 million dollars (368 million yen). This implies that our sample firms are much older and almost seven times larger in size than those in BMPRS.

Another size difference between our data set and that of BMPRS can be found with respect to bank size. In our data set of Japan, the smallest bank has assets of 42.8 billion yen, and the average asset size of all the banks is 19.6 trillion yen. These numbers are much larger than those of the U.S. banks in the data set of BMPRS. The mean asset size of their smallest quintile banks is 0.163 billion dollars (20.0 billion yen), and that of the whole sample is 8.883 billion (1.1 trillion yen).

Turning to the relationship strength variables, an average relationship between a sample firm and its main bank is 32.2 years. This is far longer than that in the U.S. U.S. firms in the data set of BMPRS have on average relationship of 8.7 years with their banks. The average firm in our data set borrows from 3 banks, is located 6 kilometers (about 3.75 miles) from its main bank's branch office, and meets with its main bank's contact person every 46 days. In the BMPRS's U.S. data set, an average firm is located 26.05 miles (42 kilometers) from its bank branch. This large difference likely reflects the geographic difference between the two countries. This should be kept in mind when we compare the results of DISTANCE across countries.

Table 2 presents means of some important variables by subsamples decomposed by bank size. We can first note that the larger the bank size, the larger the firm size. This is consistent with what BMPRS report for the U.S. SMEs in their Table 1.

We can also observe several interesting characteristics of the strength of the bank-firm relationship in Japan. First, as bank size increases, the length of the relationship between the firm

and the bank becomes longer. This is exactly the opposite to what BMPRS report for U.S. SMEs (their Table 1). Existing studies would interpret this as a stronger bank-firm relationship for a *larger* firm. However, Kano, Uchida, Udell, and Watanabe (2006) find that a longer relationship may not necessarily be beneficial in Japan. Table 2 also shows no systematic relationship between the level of SCOPE and bank size, which is also inconsistent with the implication of existing studies but *is* consistent with the finding in Kano, Uchida, Udell, and Watanabe (2006).

Second, the number of lending banks increases as the firm's main bank becomes larger. This seems to be consistent with the implication of existing theory. BMPRS report that in the U.S. the larger the bank size, the less likely the bank is an exclusive lender. This may imply that both in Japan and in the U.S. firms try to increase the number of lending banks to avoid the hold-up problem which they would otherwise suffer from a large single lender.

Third, as the lending bank becomes larger, the bank tends to be located farther from and tends to have less frequent contact with its borrowers. These statistics may imply that large banks have weaker relationships with their borrowers than small banks, as existing theory predicts. Similar pattern (only with respect to distance) is also observed in BMPRS.

Finally, we see no systematic relationship between bank size and AUDIT. That is, likelihood of having audited financial statements does not appear to be associated with bank size. This may imply that the financial statement transparency does not matter in the choice of bank size.

In summary, consistent with existing theories and BMPRS, we have observed (1) a correspondence between an SME's size and the size of its main bank, and (2) a negative relationship between bank size and relationship strength in terms of NOBK, DISTANCE, and CONTACT. On the other hand, we have also observed (3) a discrepancy between the prediction of existing theories and our summary statistics when we focus on LENGTH and SCOPE. However, the observations thus far are based solely on univariate analysis. We thus move on to

the regression analysis in the next section.

4. Regression results

4.1 Determinants of Bank Size

The results for the bank size determination regression are shown in Table 3. With respect to the key dependent variable, AUDIT is not significantly different from zero. This insignificance indicates that having audited financial statements does not matter in determining the size of a bank from which a firm borrows. This implies that banks do not have any size-related comparative advantages or disadvantages in extending financial statement lending. This finding is important because it refutes the conventional prediction that large banks are better at financial statement lending.

We do not know, however, the mechanism working behind this size-irrelevance. It may be because there are no scale economies associated with extending financial statement lending. The findings in Uchida, Udell, and Yamori (2006a), however, imply that the finding just reflects non-specialization of banks in distinct lending technologies in Japan depending on their size or type.

In spite of the irrelevance of AUDIT, we obtain a positive and statistically significant coefficient for log(ASSET). Even after controlling for financial statement transparency, larger firms are more likely to borrow from larger banks. The result is consistent with that of BMPRS in the U.S. context. However, the interpretation is different, since we have AUDIT as an independent variable which BMPRS did not have. Even after controlling for transparency in terms of auditing, we find an independent size effect.

This may reflect size-related firm transparency (transparency from sources other than auditing). However, it also seems likely to be driven by many factors that are unrelated to firm transparency

such as legal lending limit/portfolio diversification considerations and large firm product considerations. Because BMPRS cannot disentangle the firm size effect from the transparency/audit effect, they could not draw this inference. We can also observe in Table 3 that listed firms are also more likely to borrow from large banks. This could also be interpreted as an indication that more transparency is associated with firms who borrow from larger banks, although this may be capturing some nontransparency-driven factors related to listing.

Finally, firms with a higher proportion of fixed assets (MACHINERY, VEHICLE and LAND) tend to choose smaller banks. The results on these fixed asset coefficients are slightly surprising. Some research has argued that fixed asset lending (e.g., real-estate based lending and equipment based lending) should be viewed as separate lending technologies when these loans are primarily underwritten based on the appraised value of the assets (Berger and Udell 2006). Given that these are transactions-based lending technologies, we would have expected them to be more frequently associated with larger banks a la Stein (2002).

However, it is difficult to draw strong conclusions here because these assets might not be used in the underwriting process or they were used only as a secondary source of repayment (back-up collateral) in a loan that was primarily underwritten using the relationship lending technology. To support this view, Uchida, Udell, and Yamori (2006a) demonstrate that pledging collateral is of secondary importance in the screening process in Japan, although SMEs are required to pledge collateral quite frequently.[15]

4.2 Strength of bank relationships

The results on the strength of the bank-SME relationship are shown in Table 4 through Table 8. These tables reflect regressions with differing dependent variables used as a proxy for the

[15] See Ono and Uesugi (2006) as well.

relationship strength.

LENGTH regression

Table 4 shows the regression with the length of the bank-borrower relationship, LENGTH, as the dependent variable. Both in the OLS and in the IV regressions, we can see that LENGTH is not associated with bank asset size (BTASSET), or AUDIT. This result on bank asset size is strikingly different from that in BMPRS and can be interpreted as inconsistent with theoretical predictions and empirical evidence that smaller banks have a comparative advantage in processing soft information and delivering relationship lending (e.g., Stein 2002, Carter, McNulty and Verbrugge 2004, Scott 2004, Liberti and Mian 2006).

Taking into account some existing evidence in Japan, however, this interpretation may not be appropriate. This result might just reflect some idiosyncratic differences between Japan and the U.S. that may dilute LENGTH as a proxy for relationship strength in the Japanese context. As shown in Section 3.3, banking relationships in Japan for example appear to be dramatically longer than in the U.S. and, as we have noted in Table 2, LENGTH seems to *increase* with bank size if we focus on their simple correlation. This suggests the possibility that frictions or other factors in the Japanese context might discourage switching banks that are unrelated to the production of soft information.[16] Thus, LENGTH may not simply be a good proxy for the strength of the banking relationship in Japan.[17].

SCOPE regression

Table 5 shows the regression with the scope of the bank-borrower relationship, SCOPE, as the

[16] These differences or frictions could fall under the broad rubric of differences in the social environment. For a brief summary of the literature in this area see Berger and Udell (2006).
[17] Uchida, Udell, and Yamori (2006b) also obtain evidence that supports this view.

dependent variable. In contrast to the case of the LENGTH regression, both the OLS and the IV results show that bank size is negatively associated with the strength of the banking relationship in terms of its scope. Smaller banks have a wider scope of relationships with their borrowers. Although we cannot compare this result across countries since BMPRS do not have a corresponding dependent variable, the results are consistent with predictions from existing theories.

In the IV regression, we also find that AUDIT is significant in determining SCOPE. This result might imply that financial statement transparency contributes to strengthening bank-firm relationships. However, the Durbin-Wu-Hausman test reveals that log(BTASSET) is not endogenous in this specification. Also, the IV estimation may not be reliable, since the Hansen's J test (the bottom of the table) implies that the instruments are not exogenous (only in this regression). Given the inconsistency of this result with our other findings that consistently and robustly show the insignificance of AUDIT, it may not be appropriate to place much weight on this finding.

DISTANCE and CONTACT regressions

When distance is used as our measure of strength we find evidence that bank size matters. It matters in a way that is consistent with BMPRS and theoretical and empirical findings that small banks have a comparative advantage in relationship lending. Specifically, the OLS results in Table 6 show that a smaller bank tends to be located closer to its SMEs (the coefficient of log(BTASSET)). As in the other regressions, however, AUDIT has no impact on DISTANCE.

The coefficient of log(BTASSET) is insignificant in the IV estimation. This is in contrast with the results in BMPRS in which IV estimations consistently produced stronger significance (with the same signs) for bank size than the OLS did in all the strength regressions. Here, however, the Durbin-Wu-Hausman test result indicates that log(BTASSET) is not endogenous and the OLS estimates are consistent. Therefore we focus on the OLS results.

Table 7 reports the results of our regression that uses frequency of contact as our measure of strength. The results show that a smaller bank has more frequent contact with its borrowers, which is consistent with the U.S. result.[18] Arguably the frequency of contact is the better proxy for relationship strength than distance to the extent that the production of soft information comes from personal interaction with the borrower. However, both the DISTANCE results and CONTACT results are consistent with each other. Small banks try to establish stronger relationships with nearby borrowers by having frequent contact.

We should note here that DISTANCE and CONTACT do not depend on firms' transparency in terms of audited financial statements. Whether a firm has its financial statements audited or not makes its relationship with the main bank neither stronger nor weaker in terms of location and frequency of contact. This implies that at least in Japan, having audited financial statements does not discourage the use of relationship lending, so that financial statement lending and relationship lending are not substitutes to each other. This confirms the finding of Uchida, Udell, and Yamori (2006a).

NOBK regression

Finally, in our last regression we use the number of banks (NOBK) as our measure of strength. In this regression (Table 8), log(BTASSET) is significant while AUDIT is insignificant.[19] Turning first to the log(BTASSET) variable, the positive and significant coefficient is consistent with the findings in BMPRS and, again, more generally supports theoretical and empirical work that indicates that small banks should have stronger relationships with their borrowers given their ability

[18] As in the case of DISTANCE, although log(BTASSET) is insignificant in the IV result, the Durbin-Wu-Hausman test reveals that the variable is not likely to be endogenous, so that the OLS results are reliable.

[19] Again, the IV estimation produced insignificant coefficient, but the Durbin-Wu-Hausman test indicates that log(BTASSET) is not endogenous.

to process soft information. However, we can go further by investigating whether this result is independent of the firms' transparency. Here the coefficient on AUDIT indicates that it is independent because having audited financial statements does not affect the number of banks used by borrowers.

4.3 Discussion

Recent theoretical and empirical work has drawn some clear distinctions between relationship lending and transactions-based lending. A key distinction in the literature focuses on the comparative advantages and disadvantages of large and small banks. On balance this literature argues that larger banks because of their scale have an advantage in delivering transactions-based lending to SMEs because this type of lending involves processing hard information. This literature also argues that small banks have an advantage in processing soft information because soft information depreciates as it is passed through the hierarchical structure of large banks.

In the only comprehensive test of the link between bank size and SME banking relationships, BMPRS found evidence that seems to be consistent with this view in the U.S. context. Specifically, they found evidence that (1) larger firms, which they consider to be relatively more transparent, are more likely to borrow from larger banks and (2) smaller banks are more likely to have stronger relationships with their borrowers. Moreover, their findings on the latter issue were quite robust to different specifications. BMPRS interpret the former result as evidence that more transparent firms migrate to larger banks, which have comparative advantages in transactions-based lending, while they interpret the latter result as evidence that small banks have comparative advantages in extending relationship lending.

We address these same issues in our analysis using a unique Japanese data set. We make two important points. First, we demonstrate that the size correspondence between banks and SMEs

may not imply large banks having comparative advantages in extending transactions-based lending. Second, we demonstrate that small banks tend to have stronger relationships with their borrowers, but the nature of relationship building is likely to be somewhat different in Japan and in the U.S.

As for the first point, we find, as BMPRS, that larger firms were more likely to borrow from larger banks. However, our interpretation is different since we have other key independent variables that can distinguish between two forms of transactions-based lending. We have a dummy variable for whether the SME has audited financial statements, which makes the SME both more transparent and enables it to obtain financial statement lending. We also have variables that measure the firms' ability to pledge tangible assets as collateral, which should facilitate another form of transactions-based lending: fixed-asset lending.

Our results indicate that these variables do not have an effect on the borrower's choice of bank size – inconsistent with predictions from the theoretical literature. Therefore, it is not likely that larger firms borrow from larger banks because their banks are better at extending transactions-based lending.[20] Rather, it may be that bank size matters for other reasons, e.g. bank portfolio diversification (small banks avoid large commercial loans because they lead to undiversified loan portfolios) or a legal lending limit considerations.[21]

Our analysis thus makes an important point that the BMPRS size-match result may not necessarily imply that transparent firms tend to borrow from large banks. Nevertheless, their interpretation (that it does) is still consistent with their results. That is, it may be the case that in the U.S., firm size does reflect firm transparency, and that large banks use their comparative advantage in transactions-based lending to finance these firms. Under this latter interpretation, we

[20] Evidence that is supportive of this interpretation is that Japanese banks may not use lending technologies as distinctively as banks in the U.S. in a manner Berger and Udell (2006) described (Uchida, Udell, and Yamori (2006a)). Insignificant impact of auditing on the strength of bank-borrower relationships, a finding from our analysis of the second stage, also supports this interpretation.

[21] See footnote 6 as well.

would conclude that the observed differences between Japan and the U.S. may be the consequence of differences in financial institutions structure and lending infrastructure between the two countries. However, without information on audited financial statements BMPRS cannot distinguish between these two interpretations, i.e., they cannot distinguish whether the large firms' preference for large banks stems from transparency (the demand side) or other factors (the supply side). Our analysis, however, enables us to make such a distinction.

The second point that our analysis makes is a confirmation of the finding in other studies that small banks have a comparative advantage in extending relationship lending. However, our results suggest that the nature of relationship building may differ across countries. Although the length of the bank-borrower relationship has generally been considered the most powerful proxy for relationship strength, it does not seem to offer such a proxy in Japan where the duration of relationships is quite long for all types of banks. On the other hand, our results for other proxies of relationship strength work in a manner consistent with the results found elsewhere. That is, our results indicate that small banks tend to have stronger relationships with their borrowers in terms of the scope of relationship, the distance from the borrower, the frequency of contact, and the exclusivity of lenders. Our results, together with results from other studies, imply that the small banks' advantage in extending relationship lending is likely to be universal, although the nature of relationship building may differ across countries.

On balance, the findings in this paper and in BMPRS on SME lending in the two largest economies in the world suggest that lending patterns in both countries seem to fit into the broad framework found in the literature that predicts a linkage between bank size and the deployment of different lending technologies. However, in addition to similarities in SME lending in Japan and the U.S., our results also revealed some interesting differences with respect to specific linkages. In general our results suggest that in Japan as well as in the U.S. small banks have a comparative

advantage in relationship lending (although the mode of relationship building may be somewhat different). However, our results suggest the possibility that large banks do not have an advantage in deploying transactions-based lending to transparent borrowers. Whether this is an idiosyncratic feature of Japanese SME lending, or whether this result is universal, is beyond the scope of our analysis. However, data limitations in the extant literature on the U.S. and elsewhere (e.g., BMPRS) do not rule out the possibility that this result is universal.

The determinants of these observed and potential differences across countries likely stem from differences in the financial institutions structures and lending infrastructures across countries which in turn affect the relative efficacies of different lending technologies. Thus, the relative deployment of different lending technologies across Japan and the U.S., and the nature of the lending technologies themselves, may be quite different, as suggested by Berger and Udell (2006) and Uchida, Udell, and Yamori (2006a).

The social environment could also be substantially different in Japan and the U.S.[22] In particular, if the level of social capital and trust is higher in Japan than in the U.S., this may affect the writing and enforcement of financial contracts. The importance of social capital in explaining regional or cross-country differences in financial contracting has been demonstrated in related contexts (Stulz and Williamson 2003, Guiso, Sapienza, and Zingales 2004). Geographic conditions could also make it less costly in Japan to conduct relationship lending, which in turn would lead to less emphasis on relationship length. This is clearly speculation on our part, however. More research on this topic, both in Japan and in other countries, is certainly needed.

5. Conclusion

[22] Berger and Udell (2006) consider the social environment to be part of the overall lending infrastructure.

In this paper we investigated the link between bank size and banking relationships in the Japanese SME commercial loan market. Our methodological approach is very similar to Berger, Miller, Petersen, Rajan, and Stein (2005) (BMPRS). This allows us to shed light on potential similarities and differences between commercial lending practices in the two largest commercial markets in the world. Our unique Japanese data set also allowed us to investigate some issues that BMPRS were unable to address because of limitations in their data.

Our results reveal both similarities and differences in SME lending practice across the two countries. We found like BMPRS that larger firms tend to borrow from larger banks, but unlike BMPRS for the U.S., we do not find that it is because larger firms are more transparent. This implies that large banks do not necessarily have a comparative advantage in extending transactions-based lending, at least in Japan. We also found like BMPRS that smaller banks have stronger relationships with their borrowers. But there were some interesting differences in the nature of relationship building across these two countries. Our findings of both similarities and differences in SME lending between the U.S. and Japan clarifies the nature of the linkages between size and lending technologies in these two countries, and suggests the need for further studies in other countries.

Our results also suggest some policy implications. The blurring wall between different types of banks now facilitates inter-type competition among Japanese banks in a manner that seems to be unfavorable to small banks. The results obtained in this paper imply, however, that small banks have a comparative advantage in relationship lending and in establishing strong relationships with their borrowers. We also found an association between bank size and firm size although this association is not likely due to the transparency of large firms, but rather other factors that may drive customer differentiation between large banks and small banks. These suggest that it may be important that the small bank sector of the industry survive in the future.

However, we cannot conclude that the future is necessarily bright for small banks in Japan. Large banks in Japan have been increasing their lending to small firms. This may imply that although the comparative advantage of small banks in providing relationship lending to small borrowers may not change, large banks may nevertheless displace small banks quantitatively. Further research is clearly needed to identify the trade-offs associated with this potential shift.

Data Appendix: Construction of proxies for the strength of bank-SME relationships

1. LENGTH

This variable represents how many years the firm and its main bank have transactional relationships. The relevant question in the SFE survey considers the existence of not lending relationship only but broader relationships.

2. SCOPE

This variable is the first principal component of the principal component analysis over five dummy variables representing the existence or non-existence of a particular transaction between the firm and the main bank. The five dummy variables are created based on the following five questions: (i) whether the SME has a checking account at the main bank, (ii) whether the SME settles notes payables at the main bank, (iii) whether the SME has recently purchased stock in its main bank, (iv) whether the SME has obtained some information services from the main bank, and (v) whether the SME has time deposits at the main bank.

3. DISTANCE

Since the original question in the SFE survey only gives us multi-nominal information, we constructed DISTANCE as follows: It takes a value of 0.25 if the firm answered that the distance is no

greater than 500m, 0.75 if the distance is greater than 500m and no greater than 1km, 5.5 if it is greater than 1km and no greater than 10km, 20 if it is greater than 10km and no greater than 30km, 40 if it is greater than 30km and no greater than 50km, and 75 if it is greater than 50km.

4. CONTACT

The original question in the SFE survey only asks firms to choose from nine categorical options. We thus constructed CONTACT as follows: It takes a value of 365 if the frequency of contact between the firm and the loan officer of the main bank is answered once a day, 52 if the frequency is once a week, 26 if it is once in two weeks, 12 if it is once a month, 6 if it is once in two months, 4 if it is once in three months, 2 if it is once in a half year, 1 if it is once a year, and 0 if no contact has been made in the past one year.

5. NOBK

NOBK is the number of lender institutions including non-banks that a respondent firm borrows from.

References

A.N. Berger, N.H. Miller, M.A. Petersen, R.G. Rajan, and J.C. Stein. Does function follow organizational form? Evidence from the lending practices of large and small banks. Journal of Financial Economics, Vol. 76, pp. 237–269, 2005.

A.N. Berger and G.F. Udell. Relationship lending and lines of credit in small firm finance. Journal of Business, Vol. 68, pp. 351–381, 1995.

A.N. Berger and G.F. Udell. A more complete conceptual framework for SME finance. Journal of Banking and Finance, Vol. 30, pp. 2945–2966, 2006.

A.W.A. Boot. Relationship Banking: What Do We Know? Journal of Financial Intermediation, Vol.

9, pp. 7-25, 2000.

D.A. Carter,, J.E. McNulty, and J.A. Verbrugge. Do Small Banks Have an Advantage in Lending? An Examination of Risk-Adjusted Yields on Business Loans at Large and Small Banks. Journal of Financial Services Research, Vol. 25, pp. 233-52, 2004.

R.A. Cole, L.G. Goldberg, and L.J. White. Cookie-Cutter Versus Character: The Micro Structure of Small-Business Lending by Large and Small Banks. Journal of Financial and Quantitative Analysis, Vol.39, pp. 227-52, 2004.

E. Elyasiani and L.G. Goldberg. Relationship lending: A survey of the literature. Journal of Economics and Business, Vol. 56, pp. 315-330, 2004.

L. Guiso, Sapienza, P., Zingales, L. Does local financial development matter? Quarterly Journal of Economics, Vol. 119, pp. 929-969, 2004.

T. Hoshi and A. Kashyap. *Corporate Financing and Governance in Japan*. MIT Press, 2001.

M. Kano, H. Uchida, G.F. Udell, and W. Watanabe. Information Verifiability, Bank Organization, Bank Competition and Bank-Borrower Relationships. RIETI discussion paper 06-E-003, the Research Institute of Economy, Trade, and Industry, 2006.

J. Liberti and A. Mian. Estimating the Effect of Hierarchies on Information Use. London Business School working paper, 2006.

S. Ongena and D.C. Smith. Bank relationships: A review. In P.T. Harker and S.A. Zenios, editors, Performance of Financial Institutions. Cambridge University Press, 2000.

A. Ono and I. Uesugi. The Role of Collateral and Personal Guarantees in Relationship Lending: Evidence from Japan's Small Business Loan Market. RIETI Discussion Paper Series 05-E-027, the Research Institute of Economy, Trade, and Industry, 2006.

M.A. Petersen and R.G. Rajan. The benefits of lending relationships: evidence from small business data. Journal of Finance, Vol. 49, pp. 3–37, 1994.

The Small and Medium Enterprise Agency of the Government of Japan. 2002 White Paper on Small and Medium Enterprises in Japan. 2002.

The Small and Medium Enterprise Agency of the Government of Japan. 2003 White Paper on Small and Medium Enterprises in Japan. 2003.

The Small and Medium Enterprise Agency of the Government of Japan. 2004 White Paper on Small and Medium Enterprises in Japan. 2004.

J.A. Scott. Small business and value of community financial institutions. Journal of Financial Services Research, Vol. 25, pp. 207-230, 2004.

J.C. Stein. Information production and capital allocation: decentralized versus hierarchical firms. Journal of Finance, Vol. LVII, pp. 1891–1921, 2002.

R.M. Stulz and R. Williamson. Culture, openness and finance. Journal of Financial Economics, Vol. 70, pp. 313-349, 2003.

H. Uchida, G. Udell and N. Yamori. SME financing and the choice of lending technology, RIETI Discussion Paper Series 06-E-025, the Research Institute of Economy, Trade, and Industry, 2006a.

H. Uchida, G. Udell and N. Yamori. Loan officers and relationship lending, RIETI Discussion Paper Series 06-E-031, the Research Institute of Economy, Trade, and Industry, 2006b.

N. Yamori. Shinyou Kinko wa Saihen ni Dou Torikumu Bekika (How should Shinkin banks tackle consolidations?). Shinkin Central Bank Monthly, Vol.4, pp. 2-20, 2005.

Table 1: Descriptive statistics

	N	Mean	Std. Dev.	Min	Max
BTASSET (million yen)	1863	19,600,000	32,100,000	42,824	102,000,000
ASSET (thousand yen)	1863	2,696,387	5,356,132	2,337	74,900,000
LENGTH (year)	1863	31.953	15.668	1	99
SCOPE	1863	0.005	1.269	-4.450	1.625
NOBK	1863	3.055	3.792	0	99
DISTANCE	1794	6.077	9.336	0.250	75
CONTACT	1813	46.458	84.674	0	365
AUDIT	1863	0.580	0.494	0	1
CURRENT	1863	1.744	6.936	0.078	290.959
CAPRATIO	1863	0.253	0.293	-4.761	0.969
PPMARGIN	1863	0.009	0.089	-1.513	1.452
BUILDING	1863	0.106	0.118	-0.025	0.892
MACHINERY	1863	0.050	0.098	-0.046	0.775
VEHICLE	1863	0.009	0.034	-0.004	0.545
TOOL	1863	0.009	0.021	0.000	0.504
LAND	1863	0.135	0.128	0.000	0.842
FAGE (year)	1863	46.953	25.742	3	378
EMPLOYEE (person)	1863	75.149	180.641	2	4709
LISTED	1863	0.018	0.134	0	1
OWNER	1863	0.449	0.498	0	1
GENDER	1863	0.982	0.132	0	1
HOUSING	1863	0.893	0.310	0	1
EDUCATION	1863	0.609	0.488	0	1
AGE (year)	1863	59.110	9.441	29	95
CONSTRUCT	1863	0.224	0.417	0	1
TRANSPORT	1863	0.026	0.160	0	1
WHOLESALE	1863	0.158	0.365	0	1
RETAIL	1863	0.059	0.235	0	1
REALESTATE	1863	0.028	0.166	0	1
SERVICE	1863	0.074	0.261	0	1
OTHER	1863	0.060	0.238	0	1
HOKKAIDO	1863	0.084	0.277	0	1
TOHOKU	1863	0.131	0.337	0	1
KITAKANTO	1863	0.034	0.181	0	1
CHUBU	1863	0.229	0.420	0	1
KANSAI	1863	0.144	0.351	0	1
CHUGOKU	1863	0.079	0.270	0	1
SHIKOKU	1863	0.052	0.222	0	1
KYUSHU	1863	0.077	0.266	0	1

Table 2: Mean of important variables by bank size

Bank asset-size class (in Japanese yen)	< 1 trillion yen		1 - 5 trillion yen		5-10 trillion yen		10 trllion +	
Variables	mean	# of obs.	mean	# of obs.	mean	# of obs.	mean	# of obs.
LENGTH (year)	28.459	283	32.059	759	32.644	340	33.351	481
SCOPE	-0.042	283	0.106	759	0.008	340	-0.130	481
NOBK	2.007	283	2.747	759	3.053	340	4.160	481
DISTANCE (kilometer)	4.880	274	5.666	733	5.294	317	7.942	470
CONTACT (days/year)	60.477	277	50.056	738	45.485	324	33.331	474
BTASSET (million yen)	491,945	283	2,780,385	759	5,970,119	340	66,900,000	481
ASSET (thousand yen)	1,259,390	283	2,328,040	759	2,689,793	340	4,127,756	481
FAGE (year)	40.290	283	45.382	759	50.103	340	51.127	481
EMPLOYEE (person)	33.498	283	57.312	759	69.391	340	131.869	481
LISTED	0.000	283	0.001	759	0.009	340	0.062	481
OWNER	0.587	283	0.491	759	0.459	340	0.295	481
GENDER	0.975	283	0.975	759	0.991	340	0.992	481
HOUSING	0.922	283	0.900	759	0.876	340	0.875	481
EDUCATION	0.417	283	0.559	759	0.629	340	0.788	481
AGE (year)	57.982	283	58.895	759	59.059	340	60.150	481
AUDIT	0.534	283	0.581	759	0.615	340	0.580	481

Table 3. Bank choice
(Dependent variable = log(BTASSET))

		Coefficient		Robust standard error	P-value
Intercept	Intercept	15.6011	***	1.3002	0.000
Main independent variables	AUDIT	0.1001		0.0614	0.103
	log(ASSET)	0.1288	***	0.0257	0.000
Market structure	BRANCH	0.0004	*	0.0002	0.083
	REGBRATIO	-3.1309	**	1.4026	0.026
	SHINBRATIO	-1.0949		1.4180	0.440
Firm's financial numbers	CURRENT	-0.0008		0.0016	0.639
	CAPRATIO	0.3475	***	0.1252	0.006
	PPMARGIN	0.0742		0.3868	0.848
Firm's characteristics	BUILDING	-0.2441		0.2650	0.357
	MACHINERY	-0.7149	**	0.3249	0.028
	VEHICLE	-1.7938	*	1.0870	0.099
	TOOL	-1.5940		1.3283	0.230
	LAND	-0.7270	***	0.2572	0.005
	FAGE	0.0006		0.0022	0.784
	FAGE2	0.0000		0.0000	0.398
	EMPLOYEE	0.0003		0.0002	0.145
	LISTED	0.5046	**	0.1950	0.010
	OWNER	-0.2187	***	0.0654	0.001
Entrepreneur's characteristics	GENDER	0.2630		0.2277	0.248
	HOUSING	-0.0872		0.0959	0.363
	EDUCATION	0.3452	***	0.0680	0.000
	AGE	0.0060	*	0.0033	0.069
Industry dummies	CONSTRUCT	-0.0980		0.0843	0.245
	TRANSPORT	0.3750	*	0.2061	0.069
	WHOLESALE	0.0540		0.0959	0.574
	RETAIL	0.1164		0.1299	0.370
	REALESTATE	-0.3353	*	0.1964	0.088
	SERVICE	-0.0010		0.1254	0.993
	OTHER	0.2115	*	0.1235	0.087
Regional dummies	HOKKAIDO	-1.0413	***	0.3659	0.004
	TOHOKU	-0.4336		0.2815	0.124
	KITAKANTO	0.5002	*	0.2948	0.090
	CHUBU	-0.1333		0.2694	0.621
	KANSAI	0.6717	***	0.1516	0.000
	CHUGOKU	-0.0466		0.2835	0.870
	SHIKOKU	0.4227		0.2757	0.125
	KYUSYU	-0.0393		0.2938	0.894
Number of observation		1863			
F-value		42.8100			
Prob (F value)		0.0000			
R-squared		0.4513			

Note: ***, **, or * means that the coefficient is statistically significant at 1%, 5%, or 10% level.

Table 4. Determinants of relationship closeness
(Dependent variable = LENGTH)

		OLS			IV		
		Coefficient	Robust	P-value	Coefficient	Robust	P-value
Intercept	Intercept	-5.6140	4.6762	0.230	2.7754	25.3636	0.913
Main independent variables	AUDIT	0.0199	0.5604	0.972	0.0780	0.5801	0.893
	log(BTASSET)	-0.1867	0.2120	0.379	-0.8089	1.8441	0.661
Market structure	BRANCH	-0.0010	0.0008	0.174	-0.0005	0.0017	0.773
Firm's financial numbers	log(ASSET)	0.9750 ***	0.2344	0.000	1.0569 ***	0.3253	0.001
	CURRENT	-0.0977 ***	0.0182	0.000	-0.0982 ***	0.0185	0.000
	CAPRATIO	2.8799 ***	0.8157	0.000	3.0999 ***	1.0640	0.004
	PPMARGIN	-8.0105 ***	2.6824	0.003	-7.9330 ***	2.7932	0.005
Firm's characteristics	BUILDING	0.1189	2.3963	0.960	-0.0143	2.4232	0.995
	MACHINERY	-1.9411	2.4693	0.432	-2.3659	2.6990	0.381
	VEHICLE	-1.4188	8.0359	0.860	-2.4269	8.4516	0.774
	TOOL	-5.2261	13.7440	0.704	-6.1197	13.5276	0.651
	LAND	1.2202	2.1090	0.563	0.7806	2.4260	0.748
	FAGE	0.5762 ***	0.0604	0.000	0.5767 ***	0.0594	0.000
	FAGE2	-0.0017 ***	0.0005	0.000	-0.0017 ***	0.0005	0.000
	EMPLOYEE	0.0050 *	0.0026	0.052	0.0052 *	0.0027	0.051
	LISTED	3.2659	2.6847	0.224	3.5841	2.9124	0.218
	OWNER	-0.7182	0.5791	0.215	-0.8597	0.7127	0.228
Entrepreneur's characteristics	GENDER	1.3820	1.7493	0.430	1.5392	1.8170	0.397
	HOUSING	1.4786	0.9138	0.106	1.4187	0.9329	0.128
	EDUCATION	0.6644	0.6093	0.276	0.8764	0.9021	0.331
	AGE	0.1242 ***	0.0307	0.000	0.1280 ***	0.0325	0.000
Industry dummies	CONSTRUCT	-1.1519	0.7445	0.122	-1.2095	0.7723	0.117
	TRANSPORT	-0.8839	1.8032	0.624	-0.6385	1.9140	0.739
	WHOLESALE	0.7777	0.9029	0.389	0.8098	0.8944	0.365
	RETAIL	-0.5468	1.3592	0.688	-0.4513	1.3517	0.738
	REALESTATE	-1.3791	1.4359	0.337	-1.5978	1.5821	0.313
	SERVICE	-1.7058 *	1.0226	0.095	-1.7060 *	1.0167	0.093
	OTHER	-0.6322	1.0678	0.554	-0.4990	1.1050	0.652
Regional dummies	HOKKAIDO	-0.9252	1.3872	0.505	-1.7847	2.9673	0.548
	TOHOKU	2.6092 *	1.4221	0.067	1.9733	2.4519	0.421
	KITAKANTO	3.1204 *	1.6659	0.061	3.1978 **	1.6296	0.050
	CHUBU	2.3249 *	1.2387	0.061	2.0412	1.5779	0.196
	KANSAI	1.0493	1.1802	0.374	1.3613	1.4431	0.345
	CHUGOKU	2.3465	1.5218	0.123	2.0253	1.8683	0.278
	SHIKOKU	2.8812 *	1.6686	0.084	2.7552	1.7349	0.112
	KYUSYU	2.2801	1.5360	0.138	1.8290	2.1047	0.385
Number of observation		1863			1863		
R-squared		0.4599			NA		
Durbin-Wu-Hausman test P value					0.7350		
Hansen's J test statistic (P value)					0.0030	(0.95918)	

Note: ***, **, or * means that the coefficient is statistically significant at 1%, 5%, or 10% level. P value for the Durbin-Wu-Hausman test is that of the coefficient of the first stage residual.

Table 5. Determinants of relationship closeness
(Dependent variable = SCOPE)

		OLS			IV		
		Coefficient	Robust	P-value	Coefficient	Robust	P-value
Intercept	Intercept	-0.3745	0.4717	0.427	4.8461 *	2.8642	0.091
Main independent variables	AUDIT	0.0708	0.0566	0.211	0.1070 *	0.0633	0.091
	log(BTASSET)	-0.0715 ***	0.0215	0.001	-0.4587 **	0.2107	0.029
Market structure	BRANCH	0.0000	0.0001	0.588	0.0003	0.0002	0.123
Firm's financial numbers	log(ASSET)	0.1579 ***	0.0240	0.000	0.2089 ***	0.0396	0.000
	CURRENT	-0.0033	0.0054	0.539	-0.0037	0.0058	0.528
	CAPRATIO	-0.0762	0.1755	0.664	0.0607	0.1611	0.706
	PPMARGIN	0.5125 *	0.2846	0.072	0.5607	0.3563	0.116
Firm's characteristics	BUILDING	-0.6354 **	0.2727	0.020	-0.7183 **	0.2923	0.014
	MACHINERY	0.5042	0.3332	0.130	0.2399	0.3857	0.534
	VEHICLE	-0.0008	1.0153	0.999	-0.6280	1.0390	0.546
	TOOL	-1.7383	1.0732	0.105	-2.2943 **	1.1466	0.045
	LAND	0.5684 **	0.2432	0.020	0.2949	0.2944	0.317
	FAGE	0.0208 ***	0.0028	0.000	0.0211 ***	0.0027	0.000
	FAGE2	-0.0001 ***	0.0000	0.000	-0.0001 ***	0.0000	0.000
	EMPLOYEE	0.0003 **	0.0001	0.026	0.0004 **	0.0002	0.019
	LISTED	-0.5865 ***	0.2093	0.005	-0.3885	0.2443	0.112
	OWNER	0.0900	0.0583	0.123	0.0020	0.0777	0.980
Entrepreneur's characteristics	GENDER	-0.0684	0.2022	0.735	0.0294	0.2201	0.894
	HOUSING	0.0216	0.0848	0.799	-0.0157	0.0961	0.871
	EDUCATION	-0.1192 *	0.0633	0.060	0.0128	0.0986	0.897
	AGE	-0.0042	0.0030	0.163	-0.0019	0.0035	0.587
Industry dummies	CONSTRUCT	-0.0804	0.0773	0.299	-0.1162	0.0864	0.179
	TRANSPORT	-0.5685 **	0.2489	0.022	-0.4158	0.2849	0.144
	WHOLESALE	-0.0424	0.0823	0.607	-0.0224	0.0870	0.797
	RETAIL	-0.3471 ***	0.1082	0.001	-0.2877 **	0.1208	0.017
	REALESTATE	-0.7989 ***	0.1850	0.000	-0.9350 ***	0.2064	0.000
	SERVICE	-0.5978 ***	0.1393	0.000	-0.5979 ***	0.1426	0.000
	OTHER	-0.5347 ***	0.1493	0.000	-0.4518 ***	0.1597	0.005
Regional dummies	HOKKAIDO	0.1337	0.1432	0.351	-0.4013	0.3347	0.231
	TOHOKU	-0.0295	0.1479	0.842	-0.4252	0.2716	0.117
	KITAKANTO	-0.1772	0.2013	0.379	-0.1290	0.2059	0.531
	CHUBU	0.1290	0.1177	0.273	-0.0476	0.1657	0.774
	KANSAI	0.0918	0.1052	0.383	0.2860 *	0.1532	0.062
	CHUGOKU	0.0644	0.1479	0.663	-0.1355	0.1974	0.493
	SHIKOKU	0.0635	0.1581	0.688	-0.0149	0.1739	0.932
	KYUSYU	0.0936	0.1565	0.550	-0.1871	0.2338	0.423
Number of observation		1863			1863		
R-squared		0.1800			NA		
Durbin-Wu-Hausman test P value					0.0430		
Hansen's J test statistic (P value)					4.7780	(0.02883)	

Note: ***, **, or * means that the coefficient is statistically significant at 1%, 5%, or 10% level. P value for the Durbin-Wu-Hausman test is that of the coefficient of the first stage residual.

Table 6. Determinants of relationship closeness
(Dependent variable = DISTANCE)

		OLS			IV		
		Coefficient	Robust	P-value	Coefficient	Robust	P-value
Intercept	Intercept	1.2122	4.0077	0.762	-1.1111	26.0017	0.966
Main independent variables	AUDIT	0.4561	0.4207	0.278	0.4393	0.4882	0.368
	log(BTASSET)	0.6840 ***	0.2149	0.001	0.8567	1.8588	0.645
Market structure	BRANCH	-0.0021 ***	0.0007	0.004	-0.0023	0.0016	0.147
Firm's financial numbers	log(ASSET)	0.3682	0.2289	0.108	0.3454	0.2820	0.221
	CURRENT	0.1074 ***	0.0151	0.000	0.1075 ***	0.0147	0.000
	CAPRATIO	-0.7546	0.7202	0.295	-0.8157	0.9948	0.412
	PPMARGIN	-2.8857	3.2912	0.381	-2.9066	3.3030	0.379
Firm's characteristics	BUILDING	4.7390 *	2.8409	0.095	4.7774 *	2.8505	0.094
	MACHINERY	-0.5398	2.0651	0.794	-0.4175	2.3720	0.860
	VEHICLE	-0.7834	4.8910	0.873	-0.5058	5.9398	0.932
	TOOL	50.2665 ***	19.1553	0.009	50.5518 **	19.9403	0.011
	LAND	1.0389	1.5428	0.501	1.1563	2.0002	0.563
	FAGE	-0.0262 *	0.0157	0.094	-0.0264 *	0.0153	0.084
	FAGE2	0.0000	0.0001	0.680	0.0000	0.0001	0.718
	EMPLOYEE	0.0002	0.0012	0.859	0.0002	0.0014	0.912
	LISTED	4.1554	3.0909	0.179	4.0720	3.0136	0.177
	OWNER	-0.6829 *	0.3971	0.086	-0.6405	0.6495	0.324
Entrepreneur's characteristics	GENDER	-0.8929	1.2759	0.484	-0.9494	1.4335	0.508
	HOUSING	0.5785	0.6923	0.403	0.5952	0.7625	0.435
	EDUCATION	0.5726	0.4211	0.174	0.5134	0.8120	0.527
	AGE	-0.0602 ***	0.0204	0.003	-0.0613 **	0.0249	0.014
Industry dummies	CONSTRUCT	-2.4526 ***	0.5502	0.000	-2.4374 ***	0.6074	0.000
	TRANSPORT	-2.2203 *	1.1915	0.063	-2.2861 *	1.3003	0.079
	WHOLESALE	-3.0570 ***	0.5402	0.000	-3.0637 ***	0.5230	0.000
	RETAIL	-4.4501 ***	0.7809	0.000	-4.4774 ***	0.7823	0.000
	REALESTATE	-1.7299	1.9028	0.363	-1.6699	2.0598	0.418
	SERVICE	-3.0827 ***	0.7512	0.000	-3.0859 ***	0.7390	0.000
	OTHER	-2.5979 **	1.2221	0.034	-2.6326 **	1.2052	0.029
Regional dummies	HOKKAIDO	-0.8019	1.0456	0.443	-0.5564	2.9805	0.852
	TOHOKU	-2.1698	1.3459	0.107	-1.9879	2.5859	0.442
	KITAKANTO	0.1199	2.3284	0.959	0.1019	2.3020	0.965
	CHUBU	-1.4722	1.2545	0.241	-1.3863	1.6911	0.412
	KANSAI	-1.0205	1.0782	0.344	-1.0973	1.2654	0.386
	CHUGOKU	0.0458	1.5668	0.977	0.1416	2.0029	0.944
	SHIKOKU	-1.6182	1.7601	0.358	-1.5769	1.8928	0.405
	KYUSYU	-1.8107	1.3658	0.185	-1.6780	2.1473	0.435
Number of observation		1794			1794		
R-squared		0.0998			NA		
Durbin-Wu-Hausman test P value					0.9320		
Hansen's J test statistic (P value)					0.3800	(0.53757)	

Note: ***, **, or * means that the coefficient is statistically significant at 1%, 5%, or 10% level. P value for the Durbin-Wu-Hausman test is that of the coefficient of the first stage residual.

Table 7. Determinants of relationship closeness
(Dependent variable = CONTACT)

		OLS			IV		
		Coefficient	Robust	P-value	Coefficient	Robust	P-value
Intercept	Intercept	101.2450 ***	31.2730	0.001	55.1605	169.3204	0.745
Main independent variables	AUDIT	3.4950	3.9531	0.377	3.1955	4.0042	0.425
	log(BTASSET)	-8.0881 ***	1.5157	0.000	-4.6568	12.3465	0.706
Market structure	BRANCH	0.0084 *	0.0046	0.066	0.0055	0.0113	0.627
Firm's financial numbers	log(ASSET)	6.2805 ***	1.5770	0.000	5.8277 **	2.3528	0.013
	CURRENT	-0.0658	0.1504	0.662	-0.0637	0.1515	0.674
	CAPRATIO	-9.8301	6.3965	0.125	-10.9884	7.7113	0.154
	PPMARGIN	50.4672 *	26.3383	0.056	50.1115 **	25.6191	0.050
Firm's characteristics	BUILDING	-13.4065	14.3122	0.349	-12.7660	14.4279	0.376
	MACHINERY	-21.6190	18.3335	0.238	-19.3000	19.7803	0.329
	VEHICLE	47.5427	46.2228	0.304	53.2851	51.6870	0.303
	TOOL	99.9686	112.1123	0.373	105.5325	112.8596	0.350
	LAND	-2.2487	15.1290	0.882	0.1172	16.4911	0.994
	FAGE	0.3721 ***	0.1370	0.007	0.3684 ***	0.1353	0.006
	FAGE2	-0.0012 **	0.0006	0.033	-0.0012 **	0.0006	0.032
	EMPLOYEE	0.0172	0.0114	0.132	0.0161	0.0116	0.166
	LISTED	21.3597	17.7275	0.228	19.6061	18.8559	0.298
	OWNER	8.5670 **	4.2916	0.046	9.4011 *	5.6757	0.098
Entrepreneur's characteristics	GENDER	16.4178	11.1425	0.141	15.2585	11.8324	0.197
	HOUSING	6.3065	5.9344	0.288	6.5941	5.9430	0.267
	EDUCATION	-6.8592	4.3801	0.118	-8.0034	5.5715	0.151
	AGE	-0.3263	0.2124	0.125	-0.3461	0.2134	0.105
Industry dummies	CONSTRUCT	-10.0033 *	5.5466	0.071	-9.7248 *	5.6603	0.086
	TRANSPORT	-14.4045	11.7475	0.220	-15.7326	12.4527	0.206
	WHOLESALE	0.5879	6.8589	0.932	0.4294	6.8181	0.950
	RETAIL	-9.7874	9.0388	0.279	-10.3492	9.1694	0.259
	REALESTATE	-4.6120	13.3060	0.729	-3.4173	13.7317	0.803
	SERVICE	-17.7236 ***	6.2115	0.004	-17.8836 ***	6.0859	0.003
	OTHER	-17.3111 **	7.3062	0.018	-18.0192 **	7.6467	0.018
Regional dummies	HOKKAIDO	3.0288	8.2892	0.715	7.8654	19.4408	0.686
	TOHOKU	5.2207	8.4897	0.539	8.8295	15.2957	0.564
	KITAKANTO	-0.6916	10.0375	0.945	-1.0510	9.9919	0.916
	CHUBU	10.0815	6.9480	0.147	11.7247	9.5868	0.221
	KANSAI	1.5790	6.2673	0.801	-0.0341	7.8027	0.997
	CHUGOKU	32.0424 ***	11.4755	0.005	33.8975 **	13.5414	0.012
	SHIKOKU	30.7395 **	12.9926	0.018	31.5005 **	13.2709	0.018
	KYUSYU	8.7448	9.4954	0.357	11.3320	14.0741	0.421
Number of observation		1813			1813		
R-squared		0.0621			NA		
Durbin-Wu-Hausman test P value					0.7740		
Hansen's J test statistic (P value)					1.3120	(0.25207)	

Note: ***, **, or * means that the coefficient is statistically significant at 1%, 5%, or 10% level. P value for the Durbin-Wu-Hausman test is that of the coefficient of the first stage residual.

Table 8. Determinants of relationship closeness
(Dependent variable = NOBK)

		OLS				IV			
		Coefficient		Robust	P-value	Coefficient		Robust	P-value
Intercept	Intercept	-2.2091	*	1.3186	0.094	-3.1603		6.0354	0.601
Main independent variables	AUDIT	-0.0228		0.1798	0.899	-0.0293		0.1690	0.862
	log(BTASSET)	0.1852	***	0.0641	0.004	0.2558		0.4725	0.588
Market structure	BRANCH	0.0001		0.0002	0.782	0.0000		0.0005	0.996
Firm's financial numbers	log(ASSET)	0.2296	***	0.0705	0.001	0.2203	**	0.0927	0.017
	CURRENT	-0.0039		0.0041	0.340	-0.0038		0.0040	0.335
	CAPRATIO	-1.1734	***	0.3400	0.001	-1.1983	***	0.3716	0.001
	PPMARGIN	-0.1791		1.1457	0.876	-0.1879		1.1556	0.871
Firm's characteristics	BUILDING	-0.4686		0.7130	0.511	-0.4535		0.7178	0.527
	MACHINERY	1.0620		0.7302	0.146	1.1102		0.7869	0.158
	VEHICLE	-3.3090	**	1.4608	0.024	-3.1947	**	1.5911	0.045
	TOOL	5.8695		7.4711	0.432	5.9708		7.6834	0.437
	LAND	1.0279		0.8887	0.248	1.0778		0.8427	0.201
	FAGE	-0.0094	*	0.0055	0.088	-0.0094	*	0.0054	0.082
	FAGE2	0.0000	**	0.0000	0.014	0.0000	**	0.0000	0.015
	EMPLOYEE	0.0073	***	0.0021	0.000	0.0073	***	0.0021	0.000
	LISTED	0.6755		0.5774	0.242	0.6394		0.6358	0.315
	OWNER	-0.3521		0.2185	0.107	-0.3361		0.2508	0.180
Entrepreneur's characteristics	GENDER	-0.0450		0.3744	0.904	-0.0628		0.3827	0.870
	HOUSING	0.3100		0.2540	0.222	0.3168		0.2325	0.173
	EDUCATION	-0.1044		0.1769	0.555	-0.1284		0.2495	0.607
	AGE	0.0086		0.0079	0.279	0.0082		0.0089	0.362
Industry dummies	CONSTRUCT	0.1404		0.1602	0.381	0.1470		0.1724	0.394
	TRANSPORT	-1.0422	**	0.5010	0.038	-1.0700	**	0.4942	0.030
	WHOLESALE	0.6226	**	0.2436	0.011	0.6189	***	0.2321	0.008
	RETAIL	1.4271		0.8921	0.110	1.4162		0.9043	0.117
	REALESTATE	1.7346	***	0.4460	0.000	1.7594	***	0.4739	0.000
	SERVICE	0.2291		0.2636	0.385	0.2291		0.2626	0.383
	OTHER	0.9710	**	0.3894	0.013	0.9559	**	0.3871	0.014
Regional dummies	HOKKAIDO	0.1149		0.8121	0.887	0.2124		0.8132	0.794
	TOHOKU	-0.3911		0.4062	0.336	-0.3190		0.4285	0.457
	KITAKANTO	-0.7983	*	0.4734	0.092	-0.8071		0.4977	0.105
	CHUBU	-0.5786	*	0.3455	0.094	-0.5464	*	0.2886	0.058
	KANSAI	0.0082		0.3207	0.980	-0.0272		0.4671	0.954
	CHUGOKU	0.0100		0.4157	0.981	0.0464		0.3600	0.897
	SHIKOKU	0.2377		0.5031	0.637	0.2519		0.4651	0.588
	KYUSYU	0.1066		0.4464	0.811	0.1577		0.4251	0.711
Number of observation		1863				1863			
R-squared		0.2064				NA			
Durbin-Wu-Hausman test P value						0.8820			
Hansen's J test statistic (P value)						0.5100	(0.47535)		

Note: ***, **, or * means that the coefficient is statistically significant at 1%, 5%, or 10% level. P value for the Durbin-Wu-Hausman test is that of the coefficient of the first stage residual.