

# **Loans to Japanese Borrowers**

by

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## **Loans to Japanese Borrowers**

### **Abstract**

This paper examines the characteristics of loans to Japanese borrowers using a relatively unexplored, contract-specific data set. I find that Japanese banks charge less on loans to Japanese borrowers than do foreign banks, holding constant many of the risk characteristics of the borrower. Moreover, Japanese banks vary pricing less across these risks than do foreign banks, suggesting that Japanese banks tend not to distinguish good risks from bad. Taken together, the results suggest that problems at Japanese banks stem from the behavior of the banks themselves, not simply from poor economic conditions. I also document a significant shortening in the maturity structure of Japanese loans in the late 1990s.

Japanese banks and their borrowers have been the focus of numerous empirical studies. Researchers have studied the costs and benefits of relationship banking within the Japanese banking system (Aoki and Patrick, 1994; Hoshi, Kashyap, and Scharfstein, 1990, 1991; Gibson, 1995, 1997; Weinstein and Yafeh, 1998; Kang and Stulz, 2000), the role of Japanese banks in corporate governance (Kang and Shivdasani, 1995, 1997; Morck and Nakamura, 2000; Dinç, 2000; Hoshi and Kashyap, 2001), and the impact of deregulation and the subsequent crisis on the functioning of the financial system (Bayoumi, 1999; Yamori and Murakami, 1999; Hoshi and Kashyap, 1999; Hoshi and Patrick, 2000; Spiegel and Yamori, 2003; Brewer, Genay, Hunter, and Kauffman, 2003). Despite the knowledge gained from these papers, there is scant empirical evidence on the characteristics of loan contracts between Japanese firms and their banks. This paper incorporates relatively unexplored, contract-specific data on bank loans to large borrowers to help fill this gap. Specifically, I examine how the pricing and terms of loans to Japanese borrowers vary as a function of borrower and bank characteristics.

Roughly two decades have past since Japan began deregulating its financial sector. The period since then has been tumultuous for both banks and their borrowers. During the 1980s, large, high-quality firms migrated from banks to capital markets, forcing banks to lend to a wider scope of customers. Much of the new lending went to small firms and to the real estate sector, substantially increasing banks' credit exposure (Hoshi and Kashyap, 1999). Bank earnings declined through the beginning of the period and then fell precipitously after the collapse of the Japanese asset price "bubble" around 1990. Today, Japanese banks continue to be plagued by severe asset-quality problems and low profitability. Non-financial firms have fared no better. In recent times, firms have experienced lower growth, profitability, and productivity than their peers in other developed countries. Bankruptcy rates are currently at a near all-time high, with large, listed firms failing at rates unseen in post-war Japan.

Observers have offered several explanations for why Japanese banks have performed so poorly. Some believe that the large NPL "overhang" left from collapsing prices in the early

1990s has handicapped Japanese banks' ability to make profitable loans. Others assert that Japan's sluggish economy lacks profitable investment opportunities, with falling prices and zero nominal interest rates compounding the difficulty of earning sufficient returns on investments. Still others argue that Japanese banks are unprofitable because they do not exploit profitable lending opportunities, either because managers lack the skills required for proper risk evaluation, or because they pursue goals other than profit maximization.

The data collected for this paper can help distinguish between these competing arguments. The contract-specific information provides a means for inferring the lending practices of Japanese banks. More importantly, the data include loans to Japanese borrowers from foreign (i.e., non-Japanese) banks, the characteristics of which can be used to benchmark the pricing of Japanese bank loans. If banks cannot make profitable loans in Japan because of weak macroeconomic conditions, then both Japanese and foreign bank loans should appear similarly unprofitable. But if profitable lending opportunities do exist in Japan and domestic banks fail to exploit these opportunities, then one might expect to observe profit-oriented foreign banks earning more on Japanese loans than do Japanese banks.

The data are derived from an archive of over 120,000 syndicated loan deals from around the globe. Each record in the archive includes information on the borrower, the terms of the loan, and the banks arranging and participating in the loan. The data set includes 874 loans to Japanese borrowers over the period 1980 to 2001, with the bulk of the observations coming from the last three years of the sample.

Though highly detailed in nature, there are several reasons why syndicated loans might not represent the typical loan to a Japanese business. First, the Japanese syndicated loan market constitutes a relatively small portion of total lending in Japan. The ratio of new syndicated loans to total commercial and industrial loans outstanding amounted to 3% in Japan in 2001, compared with 114% in the United States. Second, data on loans to syndicated borrowers – which tend to be relatively large – are likely to differ from the small and medium-sized loans that represent a

growing share of the business at Japanese banks. Third, the rapidly evolving market – and the methods for collecting data from the market -- implies that interpreting time series patterns in syndicated lending can be hazardous. For instance, the larger quantity and improved accuracy of observations in the latter years of the database likely reflects both improvements in disclosure that have led to better sampling, and changes in the global structure of bank lending. A separate goal of this paper is to recognize some of the pitfalls that result from using these detailed, yet imperfect data.

The paper begins by comparing loan characteristics of Japanese borrowers to the average borrower in four other developed countries: France, Germany, the United Kingdom, and the United States. I show that loan spreads for Japanese borrowers are substantially lower, on average, than for borrowers with similar characteristics from the other developed countries, hinting that Japanese loans may be underpriced. More directly, I document a significant difference in the way that Japanese and foreign banks price loans to *Japanese borrowers*. Japanese lenders charge a median loan spread that is 25 to 50 basis points lower than foreign lenders, even after controlling for a variety of loan and borrower characteristics. Moreover, Japanese banks vary their pricing less across borrowers than foreign banks, suggesting that they are unable to distinguish good risks from bad. Taken together, our pricing results do not support the argument that Japanese banks suffer simply because of poor economic conditions. Instead, the findings suggest that the problems at Japanese banks stem from the behavior of the banks themselves.

I also find that the maturity structure of loans to Japanese borrowers changed significantly in 1998, a year in which Japanese regulators imposed stricter disclosure standards on banks. Starting in that year, the median maturity of loans to Japanese borrowers shortened to 12 months, compared with an average maturity of 72 months for loans originated during the years 1980-1997. No similar decline occurred among borrowers in the benchmark countries. I argue

that the change in maturity structure likely reflects the combined effects of an increase in the popularity of loan commitments in Japan and a shift in the perceived risk of Japanese borrowers.

The rest of the paper proceeds as follows. Section 2 provides some background information and reviews related literature. Section 3 provides an overview of the Loanware database. Section 4 contains summary comparisons of Japanese borrowers to borrowers from the four other developed nations and then moves on to compare the pricing characteristics of domestic and foreign bank loans to Japanese borrowers. Section 5 uses cross-sectional regressions to further investigate the pricing differences between Japanese and foreign banks. The section also conducts a more detailed examination of the decline in loan maturity observed during the late 1990s. Section 6 concludes.

## **2. Background and Related Literature**

To provide some historical perspective on the profitability of Japanese banks, the top panel of Figure 1 decomposes Japanese bank profits into three components: core earnings (net interest revenue plus net earnings from fees on lending and deposit-related activities), net gains on securities holdings and sales, and loan loss expenses from provisions and direct charge-offs. The bottom panel of Figure 1 provides a similar decomposition for U.S. banks. Core earnings have been low at Japanese banks for more than 20 years, never rising much above 0.5 percent of assets. By contrast, core earnings for banks in the United States have grown steadily from more than one percent in the early 1980s to above 2 percent today. Though not shown, European banks were likewise profitable over the decade of the 1990s.<sup>1</sup>

Why are Japanese banks so unprofitable? The extant literature has come up with varying answers to this question. Koo (2003) argues that the primary cause of poor bank profitability is the corporate debt overhang left by the collapse of the Japanese asset pricing bubble. He draws a parallel between problems at Japanese banks today and U.S. banks' problems after the Latin

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<sup>1</sup> Banks in France, Germany, and the U.K., had average core earnings of 0.5% in 1990 and 0.8% in 1999 (*OECD Bank Profitability, 2002*).

American debt crisis of the early 1980s. Sugiura (2002) attributes the low profitability at banks to a slumping economy, general price deflation, a greater burden of debt repayments, and an inability of small companies to restructure.

But these explanations fall short of accounting for persistently low core earnings among Japanese banks throughout the 1980s – before the collapse of asset prices in the early 1990s, and during a period in which the Japanese economy was strong. In fact, Hoshi and Kashyap (1999) point out that a secular decline in Japanese bank core profits began in the 1950s. They show that macroeconomic variables cannot account for this decline and that fluctuations in the Japanese economy explain little of the variation in bank profits over the last 40 years. Instead, Hoshi and Kashyap document a negative relation between bank profitability after deregulation and a bank's reliance on traditional sources of income (such as interest on loans) before deregulation. They also find that banks fare more poorly after deregulation if they relied heavily on customers that could easily shift to bond financing after the onset of deregulation. Overall, Hoshi and Kashyap conclude that Japanese banks have not adapted well to competitive changes spawned by deregulation.

Japanese banks may be slow to adapt because the incentives of bank managers are not properly aligned with profit maximization. Japanese banks often establish close ties with their customers. While these relationships can reduce information asymmetries and lead to more efficient financing, they can also work to bind banks and their customers to protect each other at all costs. The relationships are often solidified through so-called “stable-shareholding” agreements whereby banks, borrowing firms, and their affiliates cross hold equity shares. These arrangements act as explicit barriers to takeovers, making it difficult to oust poor managers at banks and their client firms. Banks and affiliated financial institutions, such as life insurance companies, also formulate “double-gearing” arrangements in which banks supply subordinated loans to the institution in exchange for a capital investment in the bank. Fukao (2003) argues that

double-gearing between banks and life insurance companies has contributed to the weakening condition at both types of institutions.

One particular manifestation of the close ties between banks and their customers is the practice of “evergreening” – that is, continually rolling over or refinancing – loans to poorly performing borrowers. There are several reasons why banks may continue to evergreen loans to unprofitable borrowers. First, bank managers may be sensitive to the negative impact that a loan denial would have on the borrower and decide to forego the unpleasant consequences. Second, close borrowers may threaten the bank with retaliation if cut off, either by selling their current equity stake in the bank, or by refusing to provide capital support to the bank in the future.<sup>2</sup> Third, by refinancing weak borrowers, banks do not have to classify the borrowers as “non-performing,” thereby avoiding the credit costs associated with increased loan loss provisions. Fourth, government authorities might pressure banks to continue lending to unprofitable borrowers to prevent a credit crunch, or because borrowers exert political pressure on authorities.

Peek and Rosengren (2002) study the allocation of credit to a large panel of Japanese firms during the 1990s. They find that main banks are more likely to offer additional loans to borrowers that are deteriorating than to otherwise similar borrowers that are healthy. A similar relation holds for borrowers that are members of the same keiretsu as the bank. Borrowers are not accorded the same benefits from non-bank lenders, or when they are not members of a keiretsu. Peek and Rosengren argue that this behavior is consistent with the evergreening of loans to banks’ closest customers.

Evergreening could put a drag on economic growth if it favors unprofitable borrowers at the expense of healthy borrowers with valuable growth opportunities. Caballero, Hoshi, and Kashyap (2003) argue that evergreening could have a negative impact on economic growth even when financing is not rationed to healthy borrowers. They reason that evergreening keeps alive

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<sup>2</sup> Dvorak (2002) uses the relationship between Ashikaga Bank and its local customers to highlight the practice of keeping a borrower financed so that the borrower can, in turn, provide capital for the bank.

firms that would normally be killed off by competitive pressures. Such “zombie” firms could drive down the profit potential of healthy firms by offering below-cost prices in product and labor markets. In other words, evergreening can prevent creative destruction and promote unfair competition in the real sector.

Overall, the papers discussed above focus on the relation between bank profitability and economic growth in Japan. These papers tend to point to distorted incentives created by close relationships and the practice of evergreening as the culprits for low bank profitability. However, to date, none of the studies directly investigates the practices that propagate the low profitability. The contract-specific information utilized in this paper allows me to conduct just such an investigation. In the next section, I introduce the source of the contract-specific data.

### **3. Overview of Syndicated Loan Sample**

The sample of syndicated loans comes from Loanware, a global database that tracks loan contracts on medium and large-sized borrowers. Dealogic, a company owned jointly by *Euromoney* Publishers and Compusoft Software, maintains the Loanware database. A typical record in Loanware includes the borrower’s name, industry, nationality, and a variety of credit ratings; the loan type, amount, maturity, purpose, pricing and fee information, whether or not the loan is secured with collateral, the identity of bank(s) arranging the loan, and the identity of non-arranger banks participating in the loan. Records are created for each “tranche”, or part of a loan, and any one loan deal, or “facility” in Loanware parlance, can contain multiple tranches.<sup>3</sup> Loanware’s sources include Securities and Exchange Commission filings (for U.S. loans), company annual reports, and public news releases. But most of the loan information comes directly from the banks arranging the loan deals. These banks compete for positioning in *Euromoney* “league tables” and therefore have a strong incentive to document as many deals as

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<sup>3</sup> The Dealogic terminology differs from that of its competitor, Loan Pricing Corporation, which maintains the Dealscan database. In Dealscan, a “facility” refers to an individual component of the loan (i.e., a Loanware “tranche”), not the entire loan deal.

possible.<sup>4</sup> Loanware contains some traditional bilateral and “club” deals, but syndicated loans clearly dominate the database.

Table 1 reports the annual distribution of the 874 loans to Japanese borrowers on Loanware from 1980 through 2001. For comparison purposes, the table also reports a similar distribution for borrowers across France, Germany, the United Kingdom, and the United States, and for the entire Loanware universe. U.S. borrowers dominate the database with 68,134 loans, accounting for over half of all Loanware observations. U.K. borrowers are also well represented with 8,367 loans, comprising about 7% of the total universe. With the exception of the years 2000 and 2001, Japan has the fewest syndicated borrowers of the five countries, but Japan is roughly equivalent to Germany, which contributed 881 observations. The fact that Japan and Germany have large banking systems yet contribute relatively few observations to the data set probably reflects the countries’ historical reliance on bilateral loan relationships.

Table 1 also reports the annual proportion of loans to Japanese borrowers made by foreign banks. I define a loan to be from a foreign bank if all of the arranging banks, which tend to take the largest stake in the loan, are headquartered outside of Japan. If any of the arranging banks is Japanese, I label the loan to be from a Japanese bank. In the early part of the sample, foreign lenders arrange nearly all of the loans. Apparently, Japanese banks were reluctant during this period to divulge information on their bilateral bank relationships. Japanese-led loans begin to be reported in 1988 and constitute at least half of the sample thereafter.<sup>5</sup>

With some insight into the nature of the Loanware sample, I now turn to comparing the loan contract characteristics of Japanese borrowers to the characteristics of contracts to borrowers in the benchmark countries, France, Germany, the U.K., and the U.S.

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<sup>4</sup> Much of the information for loans from the 1980s and early 1990s predates the popularity of league tables. For this period, Dealogic relies on loan information extracted from issues of *Euromoney* and *Euroweek*. For that reason, the pre-1990s data should be treated with extra caution.

<sup>5</sup> The Japanese-led loan records fail to identify most of their borrowers by name until after 1997, suggesting banks provided information conditional on borrower anonymity. After 1997, this practice ceases and all

## 4. Loan Characteristics of Japanese Borrowers

### 4.1 Comparison to loans in benchmark countries

Table 2 provides an annual comparison of Japanese borrowers to borrowers in France, Germany, the United Kingdom, and the United States, referred to collectively as “benchmark borrowers” using five separate characteristics related to the loan contract or the borrower.

Because not all borrower records contain complete information for every characteristic, the bottom of Table 2 lists the number of observations and percentage of all records available for each characteristic over the sample period.

The first characteristic is the median value of the borrower’s current (as of September 2002) Moody’s long-term debt rating, measured across all borrowers with ratings information. The current Moody’s rating provides us with a uniform measure of credit risk, though it has at least two drawbacks. First, only those firms that are large and informationally transparent enough to issue public debt are rated.<sup>6</sup> The bottom of the table shows that only 32.3% of the Japanese observations and 21.5% of the benchmark observations contain Moody’s ratings information. The unrated borrowers are likely to be smaller and more informationally opaque than the rated borrowers. Second, the current rating may not reflect the riskiness of the borrower at the time the loan was originated, particularly for loan agreements in the 1980s. Unfortunately, Loanware has only scant information on the rating of a borrower at the time of the loan. Therefore, I rely on the current rating and assume that persistence in the quality of the borrower makes the current rating informative about past credit risk.

The second characteristic is the median amount of the loan tranche, measured in millions of U.S. dollars.<sup>7</sup> The loan provides a proxy for the size of the borrower obtaining the loan, as larger borrowers are more likely to obtain larger loans. Because size is a measure of credit risk,

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borrowers are identified by name. At that point in time, Dealogic began requiring that borrowers be identified as a condition for having loan deals count toward a bank’s league table score.

<sup>6</sup> Moody’s does provide *bank debt* credit ratings for firms with no public debt, but the frequency of such ratings is small.

smaller-sized loans should typically be riskier loans. However, the relative size of loans can vary for reasons other than risk – for example, the purpose of the loan could influence its size – so one should be cautious about making inferences based only on the loan amount. One advantage to using loan amount as a proxy for riskiness is that nearly all of our observations contain loan amount information.

The third characteristic is the median term or maturity of the loan, measured in years from the signing date. Like the loan amount, the maturity can provide a signal of the riskiness of the loan, as riskier borrowers are likely to get shorter-maturity loans (see Flannery, 1994). But maturity will also be related to the type of the loan. Holding other borrower characteristics constant, loan commitments are typically of a shorter maturity than term loans. Maturity could also be related to the propensity to evergreen, since keeping the term short enables the bank to roll over a loan more easily.

The fourth characteristic is the proportion of sample loans that are recorded as being secured with collateral. The interpretation of collateral as a risk variable is especially ambiguous. On one hand, holding other risk characteristics constant, the presence of collateral should lower the riskiness of the loan. Theories even suggest that low-risk borrowers might pledge collateral to distinguish themselves from high-risk borrowers.<sup>8</sup> On the other hand, banks are more likely to require collateral from riskier borrowers. Empirical evidence on the use of collateral suggests that the latter effect tends to dominate.<sup>9</sup> But the type and purpose of the loan, and the ease with which the underlying assets can be evaluated and seized in case of bankruptcy, will also influence whether or not collateral is pledged.

In addition to its ambiguous interpretation as a risk variable, there is an acute sampling problem with the collateral variable. Loanware records a “yes” in the collateral field of a loan record if the information source for the loan mentions explicitly that the loan is secured with

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<sup>7</sup> All loans are converted to U.S. dollars using the exchange rate on the signing date of the loan agreement.

<sup>8</sup> For example, see Besanko and Thakor (1987).

collateral, otherwise the field is left blank. Therefore, Loanware does not distinguish between a loan agreement that is unsecured and a loan that is missing information about the security status of the loan. For the statistics in Table 2, I count all blank fields to mean “unsecured,” therefore the estimates understate the true proportion of loans that are secured.<sup>10</sup> However, the collateral data can still be informative for comparison if recording errors do not vary systematically across borrower nationality.

The final characteristic is a median measure of loan price, termed the “loan premium.” For the cross-country comparisons, I define the loan premium to be the interest spread on loans priced off the London interbank offer rate (LIBOR), the most common benchmark for pricing syndicated loans. The loan premium includes the interest charged on the drawn portions of the loan, plus utility and facility fees. Thus, the loan premium reflects both interest and non-interest sources of revenue. Some loans are priced off benchmarks other than LIBOR.<sup>11</sup> Other records contain no pricing information at all. Across the Japanese borrowers, 19.5% contain LIBOR pricing information, compared with 55.8% of the benchmark borrowers.

The bottom of Table 2 summarizes the five characteristics by calculating the average median value across the entire 22 years of the sample, and across the subsample spanning the period 1990 to 2001. Given the uneven sampling methods used in the 1980s, I focus much of the attention on the 1990 to 2001 data. I calculate the average Moody’s ratings by first converting annual median ratings to an integer using a linear scale (i.e., Aaa = 1, Aa1 = 2, . . . , C = 21). The average numerical values are calculated, rounded to the nearest integer, and reconverted to the corresponding Moody’s credit rating. For averages that are halfway between two ratings, I report the ratings that straddle the average.

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<sup>9</sup> See Berger and Udell (1990), Strahan (1999), and Booth and Booth (2002).

<sup>10</sup> For example, Carey, Post, and Sharpe (1998) estimate that 70% of U.S. Dealscan bank loans are secured. By comparison, for loans originating in 2001, Loanware implies that only 29% of U.S. borrowers were secured.

<sup>11</sup> For example, Japanese borrowers also receive loans priced off the Tokyo interbank offer rate (TIBOR). I incorporate TIBOR-priced loan in some of the later analysis.

The sample of Japanese borrowers appears to be less risky than the sample of rated benchmark borrowers. The average median Moody's rating for Japanese borrowers over the entire sample period is Baa1, compared with an average between Baa2 and Baa3 for the benchmark countries. Note that Baa3 is the lowest rating a firm can receive and still be considered "investment grade." The relative difference in risks between borrowers in Japan and the benchmark countries holds for most years in sample. For instance, the median benchmark borrowers over the years 1990-2001 are rated "junk" while the median Japanese borrower is still rated investment grade. Japanese loans also tend to be larger, on average, than loans in the other countries and tend to have an average maturity that is slightly longer than the benchmark loans. The lower risk of the Japanese borrowers could suggest that the pool of Japanese borrowers is less risky than non-Japanese borrowers, or that banks in the syndicated loan market are more selective when lending to Japanese borrowers. The fact that a substantially higher proportion of the sample of Japanese borrowers is rated suggests that banks require higher standards for the Japanese borrowers receiving syndicated loans.<sup>12</sup>

The average loan maturity for Japanese borrowers of nearly six years during the 1990s masks a large drop in maturity at the end of the sample period. Specifically, beginning in 1998, the median maturity falls to one year. In fact, the prevalence of one-year maturities is so high in these years that nearly *half of the entire sample* (47%) of Japanese loans has a maturity of one year. No such decline occurs in the maturity of loans to benchmark borrowers.

There are at least three potential explanations for this large change in maturity. First, loan commitments became much more popular in Japan in the late 1990s and loan commitments tend to be of shorter maturity than term loans. The proportion of Japanese loans made under commitment averaged 63% of all syndicated loans during the period from 1998 to 2001, compare

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<sup>12</sup> A series of regressions (not reported) supports the idea that some of the observed differences in loan price are due to risk, and others are due to differences in the lending behavior of Japanese banks. I find that prices on foreign bank loans to Japanese borrowers are not statistically different from loans to benchmark

with 32% of the total for the period from 1980 to 1997.<sup>13</sup> The high proportion of loans made under commitment during the 1998-2001 period compares with an average of 44% of loans in the benchmark countries during the same period. But the median maturity of loans made under commitment in the benchmark countries from 1998 to 2001 is 2 years, equivalent to the median maturity among benchmark borrowers earlier in the sample. Moreover, 26% of Japanese non-commitment loans during the 1998-2001 period also had a maturity of one year or less. Therefore, while the increase in the popularity of loan commitments probably contributed to the decline in average maturity in the late 1990s, it cannot completely explain the incidence of one-year maturities.<sup>14</sup>

Second, the short-maturity loans could signal an increase in the practice of evergreening after the Financial Reconstruction Law (FRL) of 1998 greatly expanded the disclosure obligations of Japanese banks. In particular, the FRL required banks to classify loans according to asset quality and set aside a specific proportion of loan loss reserves against the value of nonperforming loans, net of any collateral.<sup>15</sup> Under the FRL, loans that are “restructured” to a borrower experiencing difficulties are also to be classified as nonperforming, but in practice very few loans are classified as restructured. Therefore, by offering loans with one year of maturity

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countries once I control for other loan characteristics. However, loan prices on domestic bank loans to Japanese borrowers remain significantly lower than the prices on the benchmark loans.

<sup>13</sup> A change in the Japanese commercial code (the Interest Rate Declaration Law) made commitment lending explicitly legal in Japan in 1999, sparking much of the growth in the popularity of the loan commitments.

<sup>14</sup> A similar explanation relates to Basel Accord rules regarding the risk weighting of loan commitments. These rules exempt the undrawn portion of loan commitments with maturities less than one from capital charges. That is, the undrawn portion of the commitment receives a zero-weight in calculating risk-weighted assets. Because Japanese banks have been capital-constrained since the late 1990s (see Fukao, 2003), one could argue that they have a stronger incentive when offering loan commitments to exploit the Basel rule that maximizes their reported risk-weighted capital.

<sup>15</sup> There are actually two borrower classifications described under the FRL. Banks are obliged to report classified loans, as described above, on an unconsolidated basis. Banks can also volunteer to report “risk management loans,” which may be consolidated, and can include credits other than loans. The two reporting methods, however, produce numbers of similar magnitude. Banks must set aside reserves equivalent to 15% of the net book value (book value – collateral value or specific reserves) of “needs attention” loans, 70% of the net value of “risk” loans, and 100% of the net value of “unrecoverable” loans. For more information on disclosure requirements, see Bank of Japan (2000) and Financial Services Agency (2001).

(or less), banks could evergreen loans to keep them “performing” and avoid costly additions to loan loss reserves.

Third, the change in maturity structure could reflect a shift in how banks perceive, and react to, the credit risk of Japanese borrowers. Following the nationalization of three large Japanese banks and a series of capital injections into most other large banks between 1997 and 1999, banks could have become more cautious about entering into long-term contracts with their borrowers. By shortening the maturity of their loans, banks reduce their credit exposure to weak borrowers. Moreover, a shorter maturity keeps borrowers on a “short leash,” improving the monitoring ability of the banks (Flannery, 1994).

At the end of section 5, I explore more deeply these three explanations by estimating the relation between maturity and a set of variables meant to proxy for the risk and performance of the borrower.

Japanese loans are also much less likely to be secured with collateral than benchmark loans. This feature of the sample is surprising given that aggregate statistics indicate that collateral lending is about as popular in Japan as the United States.<sup>16</sup> One potential explanation for the finding might be that Japanese banks rely on buildings and land for collateral, whereas the collateral backing the types of loans in Loanware – inventory, receivables, etc. – is uncommon in Japan. Another possibility is that Japanese banks underreport the security status of loans to Loanware relative to other banks. However, discussions with the Dealogic representatives that manage Loanware have uncovered no reason why reporting from Japanese banks would be different.

Finally, the loan premium charged on Japanese loans tends to be much smaller, on average, than the premium charged on benchmark loans. For example, over the 1990-2001

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<sup>16</sup>Collateral backed an average 34% of Japanese loans outstanding during the period 1990-2001 (Deposits and Loans Market, Bank of Japan, <http://ww2.boj.or.jp/en/dlong/stat/data/cdab1080.txt>). Over the same period, collateral backed 41% of U. S. C&I loans (Survey of Terms of Business Lending, Federal Reserve Statistical Release, <http://www.federalreserve.gov/releases/e2/>).

period, the average Japanese loan premium of 80 basis points is *less than half* the 164 basis point benchmark loan premium. The difference in the amounts charged on loans could be due to differences in risk. The average benchmark Moody's credit rating of Ba1 is two notches lower than the average Japanese rating of Baa2, and the benchmark loans are smaller and more likely to be secured, which could indicate that the loans made to benchmark borrowers are riskier. On the other hand, the variation in loan prices could also reflect differences in *how* loans are priced in Japan after controlling for borrower riskiness. For example, banks may keep prices low on loans to weak borrowers.

#### *4.2 Comparing Japanese bank loans and foreign bank loans to Japanese borrowers*

To gain more insight into Japanese bank lending, I now compare the contract characteristics of loans from domestic (i.e., Japanese) banks to Japanese borrowers with loans from foreign (i.e., non-Japanese) banks to Japanese borrowers, while controlling for the riskiness of the borrower. As mentioned earlier, I identify a loan as originating from a “domestic” lender if at least one of the arranging banks is headquartered in Japan. Otherwise, I label the lender as “foreign.” Of the 874 loans to Japanese borrowers, 593 loans are from Japanese banks and 281 from foreign banks.

The top panel of Table 3 compares the riskiness of borrowers from Japanese banks with that of borrowers from foreign banks over the period 1990 to 2001.<sup>17</sup> In making the comparison, I augment the loan contract characteristics from Table 2 with stock price information gathered from Datastream on the subset of Japanese borrowers that are exchange listed, yielding a measure of borrower size (market value of equity) and volatility (weekly standard deviation in stock returns) that do not depend on features of the loan contract. For the results to follow, I also include borrowers rated by Standard & Poor's. This nets 16 additional Japanese borrowers with credit ratings. For borrowers with both a Moody's and S&P rating, I average the two ratings and round down to the riskier credit rating.

Two notable patterns emerge from the risk comparisons. First, Japanese banks appear to lend to a riskier group of borrowers than do foreign banks. Borrowers from Japanese banks are less likely to be listed on a stock exchange or to have issued rated debt than borrowers from foreign banks. Moreover, among the set of borrowers that are exchange listed or rated by Moody's, borrowers from Japanese banks have a smaller market value of equity, higher stock market volatility, and are rated one notch riskier than borrowers from foreign banks. Second, the standard deviations of the risk measures that Japanese banks lend to a wider range of risks than do the foreign banks. For example, the standard deviation of borrower size in the domestic bank group (\$20,922 million) is twice that of the foreign bank group (\$9,967 million).

The bottom portion of Table 3 compares the loan prices charged by Japanese banks to the prices charged by foreign banks using loan premium and two additional measures that incorporate additional non-interest fees associated with the loan. "Drawn spread" equals the loan premium plus participation and underwriting fees, expressed as a percentage of the loan amount, and measures the LIBOR spread earned by a bank that receives all possible fees associated with originating and managing a loan that is completely drawn down by the borrower. "Undrawn return" equals the sum of upfront fees, facility fees (which are paid annually on the total amount of a loan), and commitment fees (which are paid on the undrawn portion of a loan) expressed as a percentage of the loan amount. Undrawn return estimates the return a bank would earn on the undrawn portion of a loan commitment.

Although Japanese banks lend to a riskier pool of borrowers, they earn a mean drawn spread of 68 basis points on the drawn portion of the loan, well below the 109 basis points earned by foreign banks. Similarly, the mean return on the undrawn portion is lower for Japanese banks. Moreover, while the standard deviations in the top panel of Table 3 suggest that Japanese banks lend to a wider variety of risks than do foreign banks, the standard deviations in the lower panel indicate that they tend to vary their pricing less across their risks than do foreign banks. This is

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<sup>17</sup> The results for the entire period are similar.

hard to reconcile with the notion that Japanese banks are charging appropriate risk premia on their loans.

In the next section, I confirm these general patterns with regressions of loan spreads on a broad set of control variables, including the ones just discussed. I then use a similar cross-sectional framework to investigate the curious drop in Japanese loan contract maturities that began in 1998.

## **5. Cross-sectional regressions**

### *5.1 Loan spread regressions*

I now consider a set of reduced form regressions to better control for variation in risk across the loan contracts of Japanese borrowers. The regressions are reduced form because I employ control variables that are unlikely to be influenced by the contract terms themselves. I group the control variables into three categories: exogenous loan variables, borrower performance variables, and borrower credit risk variables.

The *exogenous loan variables* are characteristics of the loan that could help explain variation in loan price and maturity, but are determined independently of the contract terms. I distinguish these variables from endogenous loan variables, such as the loan amount and whether or not the loan is secured, that are set simultaneously with price and maturity. The first exogenous loan variable is a dummy variable indicating whether or not the loan is made under commitment, defined to be all loan tranches labeled by Loanware as a “line of credit,” “revolver,” “mix of facilities,” or “revolving/term.” The liquid nature of a loan commitment instrument suggests that its contract terms may differ from traditional “term loans.” James and Smith (2000), Kashyap, Rajan and Stein (2002), and Gatev and Strahan (2002) argue that part of what makes a bank special is its ability to provide liquid loans in the form of loan commitments. The second loan variable is a dummy variable set equal to one when a loan is denominated in yen. I include this variable to control for the possibility spreads that low nominal yields in Japan “squeeze” loan spreads to be lower on yen-denominated loans. I also include two dummy

variables related to the purpose of the loan. One variable takes the value of one if the loan is to finance an acquisition or a Leveraged buyout (LBO), the other equals one when the loan refinances existing debt, or is used as part of a recapitalization. Booth and Booth (2002) find that U.S. syndicated loan spreads tend to be higher on loans that finance a takeover or LBO, and lower on refinancings and recapitalizations. Loanware is the source for all four of these variables.

Given that Japanese banks may have incentive to alter loan agreements to facilitate the evergreening of loans, the *borrower performance variables* proxy for the quality of the borrower. The variables include three dummies that identify whether the borrower is in the retail, real estate, or construction sector. These sectors are commonly recognized in Japan as the weakest and most reliant on continued bank support. The other variable is the one-year change in the equity price of the borrower over the calendar year prior to the signing of the loan. I adopt this variable because large declines in stock price could signal that a borrower is distressed. The industry dummies are from Loanware. The equity price data are from Datastream.

The *borrower risk variables* include the exogenous measures of risk from Table 3: the market value of equity, weekly stock return volatility, and the current credit rating of the borrower (converted to its integer representation). The equity volatility returns are calculated using weekly data for three years ending in the year prior to the signing date, and the market value of equity use the last trading day in the year prior to the signing date. The

In addition to the exogenous characteristics discussed above, the regressions include two additional dummy variables. The first is a foreign bank dummy that it equals one when a foreign bank arranges a loan and zero when a domestic bank leads the loan. The second is a time dummy that takes the value of one if a loan observation is from the four-year period 1998 to 2001.

Table 4 presents the results from ordinary least squares (OLS) regressions of the loan spread on the exogenous characteristics for various cuts of the sample. I continue to restrict the sample to the more reliable 1990-2001 sample, although regressions that include the 1980-89 data produce results that are quite similar. I also exclude the real estate dummy from all loan price

specifications because no firm from the industry survives the cuts required for the regressions. The first three columns use the LIBOR-based drawn spread as the dependent variable and become increasingly restrictive with the sample as equity and ratings variables are added. Columns (4) and (5) expand the number of observations by including loans priced off the Tokyo interbank offer rate (TIBOR). Lack of variation across observations forces me to exclude the construction industry variable from specifications that only include borrowers that are both publicly traded and rated by Moody's and S&P (columns (3) and (5)).

The paucity of pricing information on Japanese loans restricts the regressions to between 64 and 186 observations – a small fraction of the original 874 loans. Nonetheless, the regressions in columns (1) through (5) confirm the pricing patterns in Table 3. Foreign banks earn a drawn spread that is 25 to 52 basis points higher than Japanese banks, holding other controlling factors constant.

Consistent with risk-pricing behavior, smaller firms and firms with lower credit ratings (i.e., higher values of the integer representation of the credit rating) pay more on their loans. For instance, the credit rating estimate in column (3) implies that every ratings notch downward adds 11 basis points to the cost of the loan. Holding all else constant, banks also charge anywhere from 5 to 50 basis points less for loan commitments than for term loans, depending on the sample investigated. Spread differences between loan commitments and term loans are at their most narrow among borrowers that are both publicly-traded and rated, implying that the largest pricing differences exist among privately-held firms, which tend to be smaller, riskier, and more informationally opaque.

There is also some evidence that poorly performing borrowers can be charged lower rates than healthier borrowers, a sign that Japanese banks are helping to keep zombie firms alive. First, firms in the retail industry appear to be charged a lower loan spread than firms in other industries. However, upon further breakdown of the sample into foreign and domestic banks (columns (6) and (7)), we find that the negative estimate on the retail industry variable is due to foreign banks, not

Japanese banks. Second, the positive and marginally significant estimate associated with one-year equity price changes suggests that banks charge lower spreads on firms with falling stock prices. While this result is intriguing, it is not statistically significant in the other specifications.

The last two columns of Table 4 split the sample by lender nationality using the combination LIBOR-TIBOR loan spread as the dependent variable. Consistent with the notion that loan pricing by Japanese banks is relatively insensitive to variation in borrower risk, the control variables (column (6)) explain only a small portion, 4.6%, of the variation in drawn spreads earned by domestic banks. By contrast, the variables in column (7) explain 36.2% of the variation in drawn spreads earned by foreign banks.

### *5.2 Loan maturity regressions*

In section 4, I presented three potential explanations for the anomalous decline in Japanese borrower loan maturities that began in 1998: (1) a sharp rise in the proportion of loans made under commitment in the late 1990s, (2) an increase in evergreening behavior after loan disclosure requirements were expanded, and (3) a general increase in the perceived riskiness of Japanese borrowers. I now extend the cross-sectional regression framework to loan maturity to provide some insight into the viability of these explanations.

Table 5 presents the results from OLS regressions of loan maturity, measured in years, on the exogenous characteristics. The main results from the table can be summarized as follows. First, loan commitments have a significantly shorter maturity than term loans. The estimates imply that the maturity on loan commitments can be from six months to three years shorter than term loans, holding all other variables constant. Thus, loan commitments are associated with shorter-term maturities and lower interest rate spreads (Table 4). Strahan (1999) and Booth and Booth (2002) document a similar result. Second, none of the borrower performance variables (the three “weak” industry indicators and the one-year change in equity price) are statistically significant. Third – and somewhat surprisingly – foreign banks offer shorter maturity loans than domestic banks, holding other variables constant. In fact, a comparison between the time dummy

estimates in columns (4) and (5) shows that foreign banks are responsible for much of the reduction in loan maturities during the 1998-2001 period. The point estimates suggest that foreign bank loan maturities fell by six months more than domestic bank loan securities during that period. This finding could point to an increased wariness by banks to lend long to Japanese borrowers after the peak crisis years 1997-1999.

Overall, the abrupt fall in loan maturities that began in 1998 appears to be driven by two factors. First, Japanese firms greatly increased their use of loan commitments in the late 1990s and loan commitments have shorter maturities. Second, banks – especially foreign banks – shifted the maturity structure of their loans to Japanese borrowers, perhaps due to general changes in the perception of risk profile of Japanese borrowers. Because much of the decline in loan maturities appears to originate from for foreign banks, and because borrower performance does not appear to be related to maturity, our results are not consistent with the idea that banks shortened maturities to facilitate evergreening as disclosure requirements became stricter.

## **6. Conclusion**

I document a significant difference in the way that Japanese loans are priced and, in particular, show that Japanese banks underprice loans to their domestic borrowers compared with the pricing by foreign banks. Japanese lenders charge a median loan spread that is 25 to 52 basis points lower than foreign lenders, after controlling for a variety of loan and borrower characteristics. In fact, Japanese borrowers from foreign banks are *less risky*, on average, than Japanese borrowers from Japanese banks, but are willing to pay higher loan prices from foreign banks. Moreover, Japanese banks vary their pricing less across borrowers than foreign banks and appear less sensitive to observable measures of risk, suggesting that they do not distinguish good risks from bad. Taken together, the pricing results do not support the argument that Japanese banks suffer simply because of poor economic conditions.

If foreign banks price loans competitively, then the observed differences in spreads are consistent with at least two possibilities. One is that foreign banks may be offering additional

services, or Japanese banks may be receiving additional compensation, that is unobserved.

Another is that Japanese banks may be mispricing their loans. Importantly, evidence that Japanese banks vary their pricing less across a more dispersed set of risky borrowers seems to support the mispricing view.

If Japanese banks are unprofitable because they misprice loans, then one is prompted to ask how such a practice could persist for so long. At least part of the answer relates to the absence of regulatory or market disciplining mechanisms within the Japanese banking sector. Historically, regulatory authorities have been unwilling to impose punitive costs on owners or managers of poorly performing Japanese banks. Government capital injections from several years ago, for example, extended the lives of weak banks without imposing meaningful conditions for restructuring. Today, infighting among regulators has frustrated efforts to clamp down on banks. Meanwhile, controlling shareholders of Japanese banks appear not to be deterred by persistent low profits. As part of “stable shareholding” agreements, these investors – primarily insurance companies and other financial institutions – protect banks from takeovers, in return for similar protection from banks, and for low-cost loans. Finally, full deposit insurance coverage of most bank accounts helps weak banks to continue to have access to ample deposit funds.

Finally, I document a shift in the maturity structure of Japanese loans in 1998, a year in which Japanese regulators imposed stricter disclosure standards on banks. Starting in that year, the median maturity of Japanese bank loans shortened to 12 months, compared with an average maturity of 72 months for loans originated during the years 1980-1997. No similar decline occurred among borrowers in the benchmark countries. I argue that the change in maturity structure likely reflects two factors. First, borrowers greatly increased their use of loan commitments beginning in 1998, shortly before Japanese law codified the legality of offering loan commitments, and loan commitments have a shorter maturity than term loans. Second, banks – particularly foreign banks – appear to have reacted to increases in the perceived risk of Japanese borrowers by shortening the maturity of their loans.

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**Table 1. Characteristics of Loanware Sample for Borrowers from Japan, France, Germany, U.K., and U.S., 1980-2001**

Year	Japanese borrowers:		Number of loans from:				Number of all Loanware loans
	Number of loans	Proportion arranged by foreign bank	France	Germany	U.K.	U.S.	
1980	5	1.00	16	17	35	59	1,120
1981	7	1.00	22	13	35	133	1,552
1982	9	1.00	38	4	41	139	1,665
1983	11	1.00	30	12	37	134	1,243
1984	10	0.80	32	19	88	255	1,789
1985	3	1.00	26	8	146	270	1,533
1986	10	0.70	40	25	194	271	1,501
1987	6	0.83	61	18	333	736	2,209
1988	11	0.55	82	8	515	1,293	3,186
1989	11	0.45	53	30	576	2,268	4,436
1990	14	0.36	56	24	481	3,132	5,409
1991	3	0.00	43	14	365	3,653	5,891
1992	15	0.60	49	29	405	4,947	7,229
1993	18	0.28	45	26	465	4,394	6,919
1994	17	0.35	59	36	682	5,009	8,062
1995	23	0.35	84	57	585	5,289	8,859
1996	51	0.29	74	55	432	6,584	10,267
1997	41	0.49	103	60	474	7,287	11,492
1998	28	0.89	56	42	388	4,946	10,067
1999	76	0.50	272	123	714	7,977	9,126
2000	173	0.27	241	107	727	5,277	9,065
2001	332	0.11	244	154	649	4,081	7,786
Total	874	0.58	1,726	881	8,367	68,134	120,406

**Table 2. Comparing Loans to Japanese Borrowers with Loans to Borrowers in Benchmark Countries.**

Year	Median Moody's rating of borrower		Median loan amount (millions of \$)		Median maturity (years)		Proportion of loans that are secured		Median loan premium (b.p. over LIBOR)	
	Japanese	French, German, U.K, U.S.	Japanese	French, German, U.K, U.S.	Japanese	French, German, U.K, U.S.	Japanese	French, German, U.K, U.S.	Japanese	French, German, U.K, U.S.
1980	Baa2	Baa1	106	45	8	5	0.40	0.03	--	63
1981	A2	Baa1	10	75	5	5	0.00	0.02	50	55
1982	A3	A2	30	65	3	7	0.33	0.01	88	55
1983	Baa1	Baa1	24	70	4	5	0.00	0.06	50	59
1984	Baa2	Baa1	40	75	4	5	0.10	0.05	80	55
1985	Baa1	A3	25	90	2	5	0.00	0.03	125	34
1986	A3	A2	46	91	4	5	0.00	0.02	100	34
1987	Baa1	Baa1	90	100	4	5	0.00	0.07	75	36
1988	Baa3	Baa2	100	100	4	5	0.18	0.08	50	75
1989	A3	Baa3	74	46	1	5	0.00	0.09	25	150
1990	A2	Baa3	150	31	5	4	0.00	0.10	38	125
1991	A2	Baa2	500	24	9	3	0.33	0.26	--	143
1992	Baa3	Baa2	74	25	12	4	0.00	0.35	40	150
1993	Baa3	Baa3	100	40	12	3	0.11	0.38	50	150
1994	Baa3	Baa3	39	45	10	4	0.06	0.35	138	150
1995	Baa3	Baa3	59	52	7	5	0.00	0.34	48	150
1996	A3	Ba1	17	50	6	4	0.06	0.37	113	165
1997	Baa1	Ba3	33	60	6	4	0.15	0.36	150	161
1998	Baa1	B1	120	63	1	5	0.21	0.38	70	175
1999	Baa2	Ba3	139	73	1	4	0.18	0.39	88	200
2000	Baa1	Ba2	113	100	1	3	0.06	0.30	70	200
2001	Baa2	Baa3	47	100	1	3	0.02	0.27	72	200
Average (1980-2001)	Baa1	Baa3	88.01	64.53	4.94	4.44	0.10	0.20	75.84	117.45
Average (1990-2001)	Baa2	Ba1	115.94	55.24	5.92	3.81	0.10	0.32	79.48	164.06
Available Observations (% of total)	283 (32.3)	16,984 (21.5)	870 (99.5)	78,433 (99.1)	813 (93.0)	62,782 (79.4)	874 (100.0)	79,108 (100.0)	170 (19.5)	44,127 (55.8)

**Table 3. Comparing Loans to Japanese Borrowers from Domestic and Foreign Banks, 1990-2001.**

<b>Borrower Risk Measures</b>	Domestic Banks	Foreign Banks
Public Securities Issuance		
Proportion exchange listed	0.15	0.51
Proportion rated by Moody's or S&P	0.24	0.47
Market Value of Equity (millions of \$)		
Mean	7,027	7,333
Median	1,869	4,252
Standard deviation	20,922	9,967
Weekly Stock Return Volatility (std dev)		
Mean	0.07	0.05
Median	0.06	0.05
Standard deviation	0.03	0.02
Credit Rating		
Mean	Baa2	Baa1
Median	Baa2	Baa1
Standard deviation	2.9 notches	2.4 Notches
Loan Amount (millions \$)		
Mean	295	255
Median	51	114
Standard deviation	843	444
Loan Maturity (years)		
Mean	3.3	3.3
Median	1.0	2.0
Standard deviation	3.5	3.5
<b>Loan Price Characteristics</b>		
Loan Premium (b.p. over LIBOR)		
Mean	68	98
Median	48	75
Standard deviation	49	72
Drawn Spread (b.p. over LIBOR)		
Mean	68	109
Median	48	85
Standard deviation	49	79
Undrawn Return (b.p.)		
Mean	21	34
Median	18	18
Standard deviation	18	64

**Table 4. Loan Spread Regressions: Japanese borrowers, 1990-2001**

Variable	(1) All available borrowers y = drawn LIBOR spread	(2) Borrowers with equity information, y = drawn LIBOR spread	(3) Borrowers with equity and ratings information, y = drawn LIBOR spread	(4) Borrowers with equity information, y = LIBOR or TIBOR drawn spread	(5) Borrowers with equity and ratings information, y = LIBOR or TIBOR drawn spread	(6) Borrowers from domestic banks with equity information, y = LIBOR or TIBOR drawn spread	(6) Borrowers from foreign banks with equity information, y = LIBOR or TIBOR drawn spread
Constant	76.446*** (18.894)	327.459*** (54.480)	43.635 (77.385)	222.322*** (33.959)	76.652 (68.150)	140.897*** (49.489)	305.365*** (53.595)
Loan Commitment	-50.080*** (13.957)	-30.645*** (11.561)	-5.713 (14.004)	-24.562*** (7.802)	-5.300 (9.338)	-1.526 (10.868)	-48.552*** (10.970)
Yen-denominated	6.061 (12.772)	-12.001 (11.595)	-8.467 (12.079)	-0.667 (10.428)	-11.636 (10.302)	2.697 (19.425)	0.255 (12.918)
Purpose acq/LBO	47.892* (24.523)	-0.235 (21.875)	21.749 (21.720)	-4.811 (19.654)	26.494 (19.619)	52.898* (32.021)	-32.384 (33.881)
Purpose refinancing	-12.742 (13.582)	-13.598 (11.009)	-23.826** (10.525)	0.018 (8.261)	-17.147** (8.427)	22.938* (13.367)	-3.469 (10.759)
Industry retail	-27.059 (34.851)	-59.617** (24.999)	-47.477* (27.256)	-29.947** (14.656)	-58.860*** (20.439)	-12.170 (19.310)	-37.312* (21.249)
Industry construction	20.869 (30.942)	8.957 (21.573)		-7.603 (16.176)		-22.825 (26.875)	11.134 (20.861)
One year change in equity price (b.p.)		0.467 (0.741)	1.618* (0.901)	0.050 (0.367)	0.827 (0.639)	0.244 (0.410)	-0.930 (0.734)
Equity volatility (b.p.)		0.111 (0.344)	0.406 (0.366)	-0.111 (0.105)	0.228 (0.318)	0.018 (0.188)	0.032 (0.336)
Ln(market value of equity)		-16.862*** (3.852)	-5.540 (4.618)	-8.452*** (2.249)	-5.929 (4.182)	-7.826*** (2.797)	-12.425*** (3.647)
Credit rating			11.031*** (3.043)		7.736*** (2.268)		
Foreign bank	51.952*** (16.534)	30.759** (13.542)	25.236* (14.175)	30.884*** (7.823)	33.167*** (8.225)		
Year = 1998-2001	6.381 (14.573)	-10.799 (14.476)	5.510 (17.786)	-22.077* (11.956)	8.201 (17.134)	19.447 (24.135)	-10.409 (15.465)
Adj. R-squared	0.186	0.370	0.316	0.227	0.348	0.046	0.362
Number of Observations	138	105	64	186	93	84	102

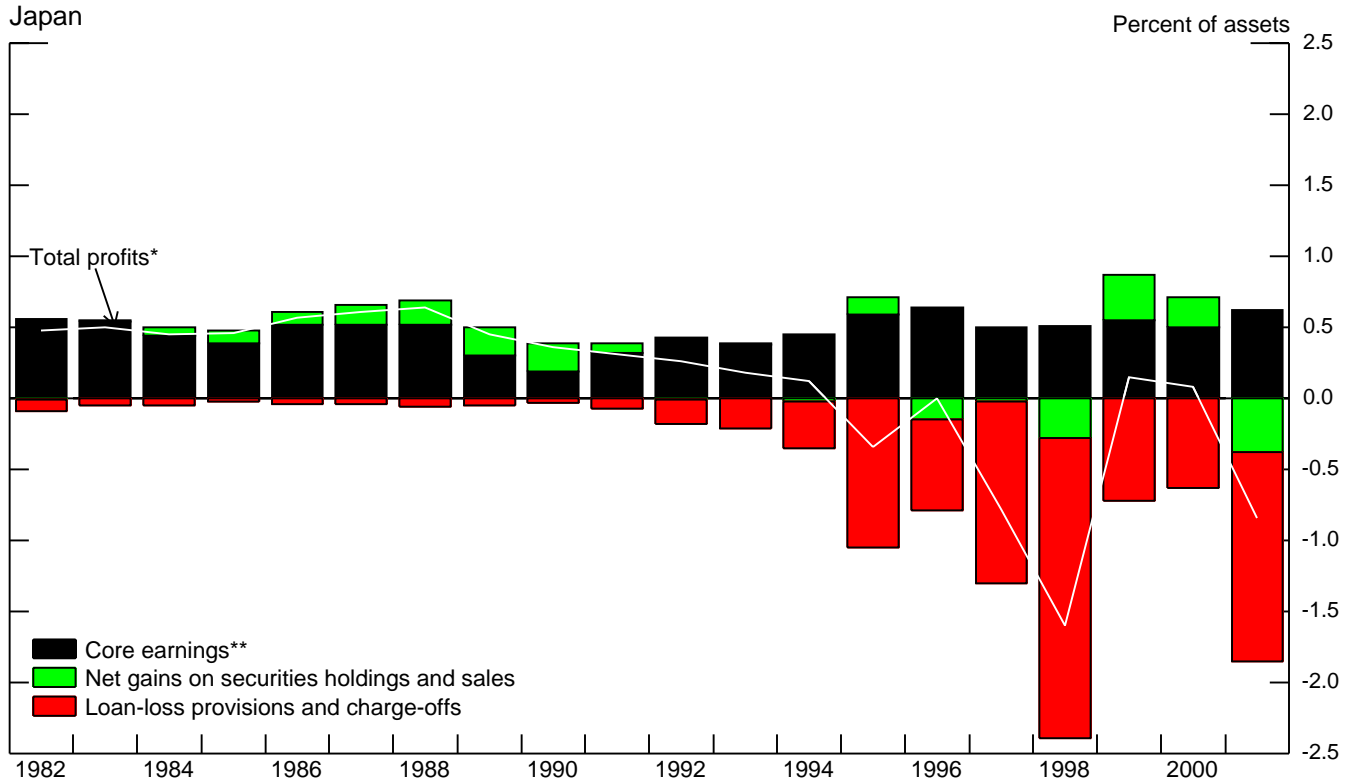
\*\*\*significant at a 1% level, \*\*significant at 5% level, \*significant at at 10% level.

**Table 5. Loan Maturity Regressions: Japanese borrowers, 1990-2001**

Variable	(1) All borrowers	(2) All borrowers with equity information	(3) All borrowers with equity and ratings information	(4) Borrowers from domestic banks with equity information	(5) Borrowers from foreign banks with equity information
Constant	9.231*** (0.312)	6.358*** (1.261)	4.354 (3.625)	7.336*** (2.655)	3.701*** (1.233)
Loan Commitment	-3.225*** (0.206)	-1.025*** (0.291)	-0.491 (0.497)	-1.523** (0.587)	-0.565** (0.252)
Yen-denominated	-2.119*** (0.290)	-0.341 (0.387)	0.057 (0.548)	-0.229 (1.042)	-0.075 (0.297)
Purpose acq/LBO	-2.015*** (0.548)	0.708 (0.730)	0.200 (1.044)	1.552 (1.718)	-0.728 (0.779)
Purpose refinancing	-0.144 (0.262)	0.153 (0.307)	0.101 (0.448)	0.435 (0.717)	-0.321 (0.247)
Industry retail	-0.009 (0.373)	0.390 (0.544)	0.190 (1.087)	0.231 (1.036)	0.344 (0.489)
Industry real estate	-0.132 (0.724)	-0.707 (1.785)		-0.299 (2.455)	
Industry construction	-0.535 (0.405)	0.498 (0.601)		0.527 (1.227)	0.090 (0.480)
One year change in equity price (%)		4.039 (13.632)	11.954 (33.996)	2.915 (22.025)	10.452 (16.879)
Equity volatility (%)		-4.412 (6.187)	0.178 (16.905)	-9.610 (10.221)	7.530 (7.718)
Ln(market value of equity)		-0.131 (0.084)	0.062 (0.222)	-0.197 (0.150)	-0.035 (0.084)
Credit rating			-0.016 (0.121)		
Foreign bank	-1.223*** (0.227)	-0.628** (0.291)	-0.422 (0.437)		
Year =1998-2001	-2.482*** (0.266)	-1.522*** (0.444)	-3.121*** (0.911)	-1.241 (1.295)	-1.705*** (0.361)
Adj. R-squared	0.503	0.224	0.207	0.127	0.394
Number of Observations	749	186	93	84	102

\*\*\*significant at a 1% level, \*\*significant at 5% level, \*significant at at 10% level.

**Figure 1: Components of Bank Profitability**



\*Before extraordinary items and taxes.

\*\*Net interest revenue and net earnings from fees on lending and deposit-related activities.

