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The Choice between Public and Private Debt by Japanese Firms

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Abstract

The purpose of this paper is to investigate the choice of corporate financing between public and private debt. Focusing on the drastic change of financing pattern during the period of financial liberalization from the mid 1980s to the mid 2000s, this paper examines what factors determine the demand for public and private debt. We find that the growth opportunity and default risk of the issuing firm are the main determinants of the debt choice in this period.

1. Introduction

The purpose of this paper is to investigate the choice of corporate financing between public and private debt. Here we define bank borrowings as private debt, and corporate bonds as public debt.¹ Focusing on the drastic change in financing pattern during the period of financial liberalization from the mid 1980s to the mid 2000s, this paper examines what factors determine the demand for public and private debt.

First, using the Financial Statements Statistics of Corporations by Industry, we overview the corporate financing pattern of Japanese firms (excluding those in the financial sector) focusing on bond and bank borrowings.² Figure 1 shows the ratio of the bond outstanding to total asset for both of the large and small firms. A large firm is one with net worth more than one billion yen, and a small firm is one with net worth less than 1 billion yen. For large firms, the bond outstanding grew rapidly from 1985 to 1990. The ratio was around 5 percent in the early 1980s, but increased to around 10% in the 1990s. In 2005, it decreased again to 7%, because larger firms decreased the debt financing as a whole in this period.

On the other hand, the ratio of bonds to total assets is much lower for small firms. For example, the average ratio of bonds to total assets from 1990 to 2000 was 9.8% for large firm, but only 0.2% for small firms. These numbers show that bonds have been used mainly by large firms in Japan. However, it should be noted that the bond issuing by small firms has been increasing on a relative basis after 2001: the ratio of bonds to total assets was 0.27% in the 2000, but increased to 0.80% in 2005.

¹ Many studies about debt choice, such as Houston and James (1996), define debt based on the public information and borrowings from many anonymous lenders as public debt, while they define debt based not only on public information but private information and borrowings from a small number of lenders as private debt.

² Table 1 of Arikawa and Miyajima (2005) shows the capital structure of Japanese firms from the late 1980s to 2000.

Figure 1. The Ratio of Bond to Total Asset

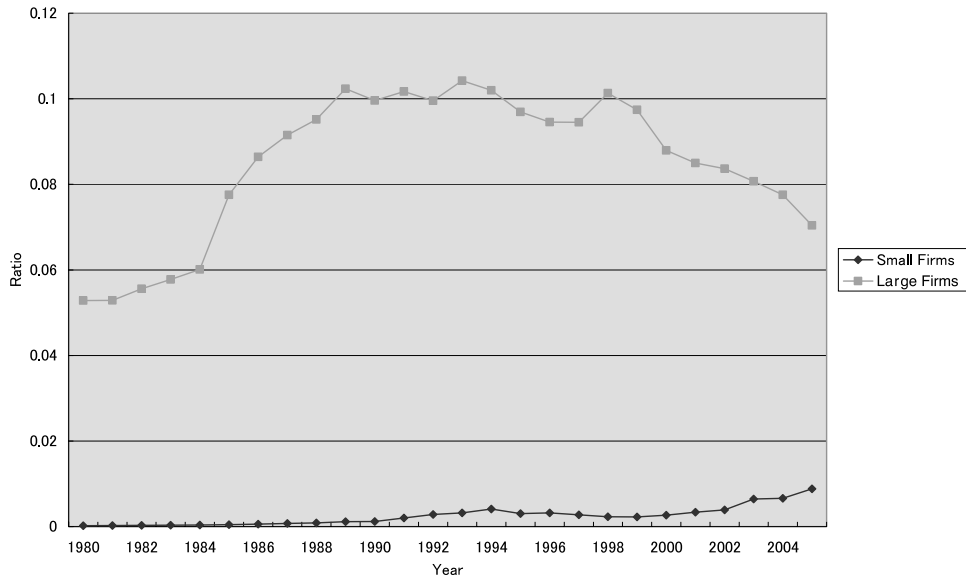
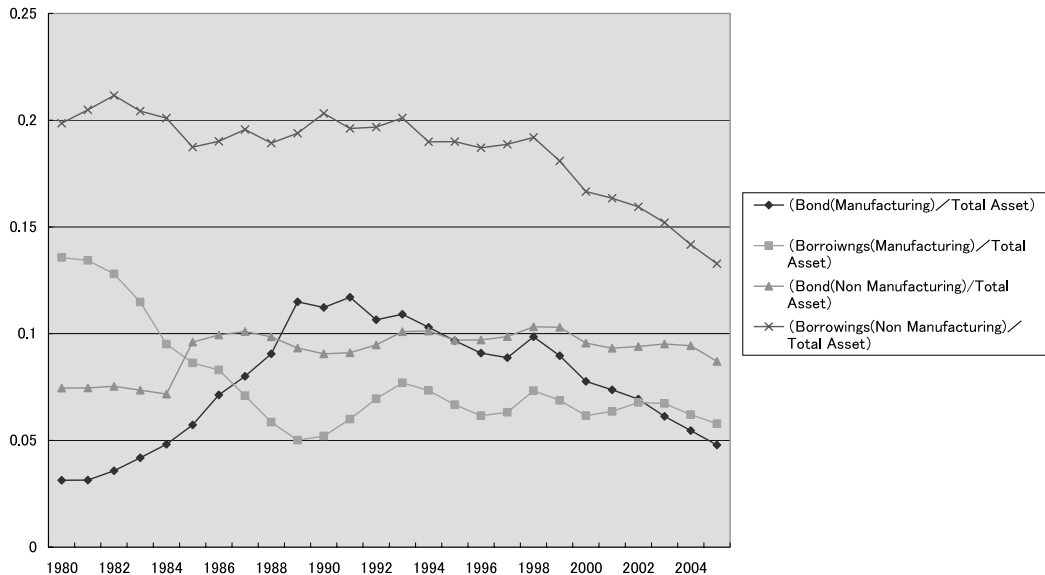


Figure 2 shows a comparison of the proportion of bond outstanding for large firms between the manufacturing and non-manufacturing sector. It shows that the ratio for manufacturing decreased consistently from 1999, while that for non-manufacturing has not changed so much since the late 1980s. Thus, the decrease in the ratio of bonds outstanding was mainly caused by the manufacturing sector. On the other hand, the amount of borrowing from financial institution is much higher for non-manufacturing firms than the manufacturing firms, though the number decreased from 2000 along with the decline of total debt.

Figure 2. Debt Composition by Industry



To examine the relative importance of bonds to other financial resources, we show the ratio of bonds outstanding to the sum of bonds and bank borrowings in Figure 3. We see that, after increasing drastically from 1985, the ratio for large firms has remained around 40 percent since 1990. While the ratio of debt to total assets decreased from 2000, the ratio of bonds to total debt remained unchanged. This may suggest that large Japanese firms set a target for the ratio of bonds to borrowing. On the other hand, the ratio of bond to total debt for small size firms was only 0.4% in 2005, suggesting again that the bond is a financial instrument that is only used by larger firms even in the 2000s.

Figure 3. The Ratio of Bond to the Sum of Bond and Borrowings

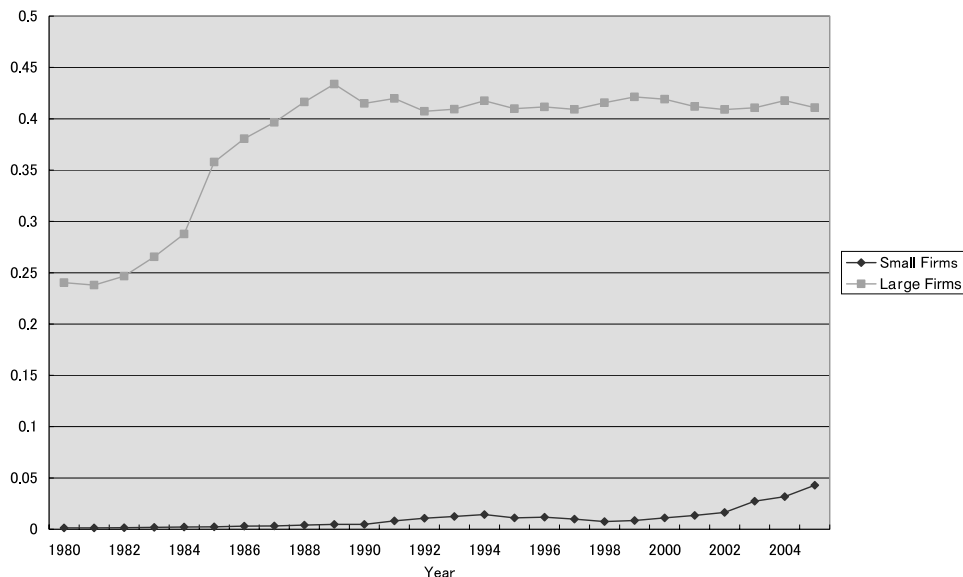
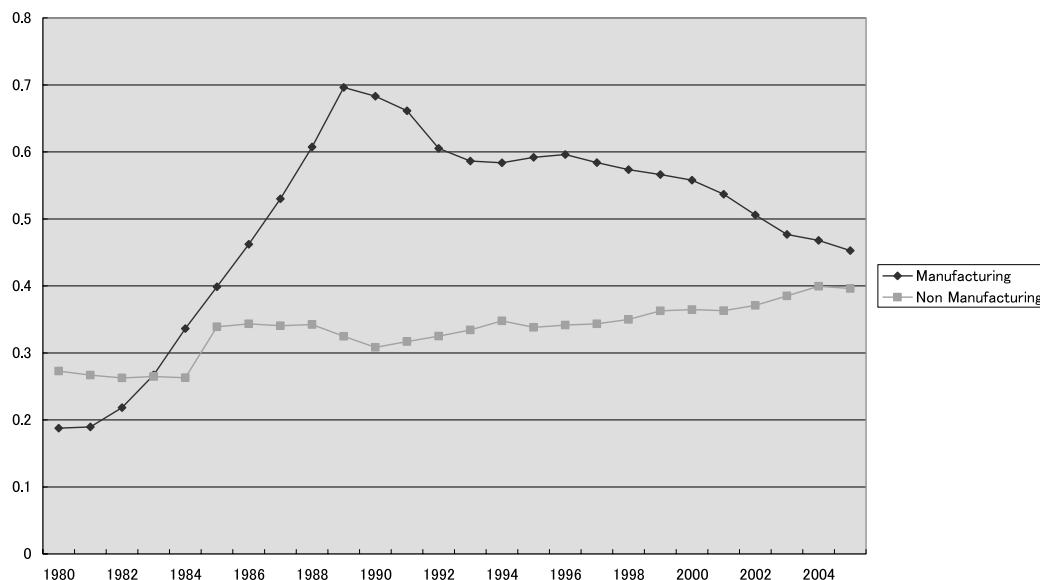


Figure 4 shows a comparison of the ratio of bonds outstanding to total debt (bond plus borrowings) between the manufacturing and non-manufacturing sectors. We find that, for the manufacturing sector, the bond ratio dramatically increased from 19% in 1980 to 69% in 1989. In Section 3, we examine the reason for this rapid increase. In the 1990s, the ratio decreased, and in 2005 was approximately 45%, almost the same level as in 1986. For the non-manufacturing sector, it started increasing in the 1980s and the trend continues. That figure was about 40% in 2005, just 5% below that for the manufacturing sector.

Since the 1980s, the choice between bond and borrowing by Japanese firms has been characterized by the following:

- 1) Most of the bond issuing is by large firms with net worth above 1 billion yen.
- 2) Manufacturing firms shifted their financing method from bank borrowing to bonds in the late 1980s, but decreased bond issuing in the 1990s. By 2005, the proportion of bonds outstanding to total debt had fallen back to the level of 1986.
- 3) Non-manufacturing firms increased their bonds outstanding in the late 1980s, and the ratio continued to increase until the 2000s.

Figure 4. The Ratio of Bond Outstanding to Total Asset by Industry

In the following section, we investigate the choice of corporate financing between public and private debt from the late 1980s to 2004 using firm level data. The structure of this paper is as follows. In Section 2, we provide a review of theoretical work on the debt choice. In Section 3, we examine the factors that affected the debt choice of Japanese firms in the 1980s. In Section 4, we investigate whether the complete deregulation of the bond market in the late 1990s affected the debt choice of Japanese firms. We conclude in Section 5.

2. Previous literature on debt choice

This section gives a review of theoretical and empirical studies on the choice between public and private debt. We argue that among the many factors that affect the choice between public and private debt, the advantage of monitoring for private debt is one of the most important. Given the informational asymmetry problem between borrowers and lenders, information production is needed for avoiding the adverse selection problem or to prevent moral hazard behavior by borrowers. Since the number of creditors are relatively large for public bonds, monitoring activities become more inefficient due to the duplication of monitoring by a large number of lenders and the reduced incentive for monitoring (the free rider problem) (Diamond, 1984). As a result, bank borrowing is advantageous in terms of mitigating the free rider problem because of the concentrated ownership of debt (Fama, 1985).

By emphasizing the capability of the banking sector to mitigate agency costs from asymmetric information, Diamond (1991) shows that newer firms without an established reputation borrow from banks, while more successful firms tend to issue bonds. On average, newer and smaller firms face greater risks in terms of future profitability. Therefore, the problem of asymmetric information is more serious, and that is the reason why smaller or newer firms depend more heavily on bank borrowing to mitigate the problem. Following this idea, empirical studies on debt choice such as Petersen and Rajan (1994) find that a close relationship with banks makes it possible for small U.S. firms to borrow at lower cost.

Furthermore, bank borrowings are advantageous in that they provide flexibility for renegotiations on loan contracts. In fact, Graham and Harvey (2001) report that many CEOs consider the flexibility of contracts to be one of the most important factors when comparing financing measures. From this point of view, Thakor and Wilson (1995) and Bolton and Freixas (2000) discuss another benefit of bank borrowing. Because of its concentrated ownership, the banking sector can make efficient decisions on whether to liquidate or bail out a firm in financial distress by renegotiating with borrowers the terms of the debt contract. Since the ownership of public bonds is dispersed among bondholders, they cannot so efficiently bail out financially distressed firms.

Although bank borrowing has benefits for borrowers, there are offsetting costs that prevent firms from borrowing exclusively from banks. One approach to explaining the cost of bank borrowing suggested by Sharpe (1990) and Rajan (1992) is based on the observation that while a bank can reduce agency problems, the firm-specific information acquired by a bank may create a hold-up problem. Rajan (1992), for example, argues that the informational rents extracted ex post by banks distort the firm's investment by reducing the entrepreneur's returns from successful projects. Following this idea, Houston and James (1996) find that U.S. firms facing a serious hold-up problem tend to limit the use of bank debt. Weinstein and Yafeh (1998) also verify that the capital cost of a firm with close ties to a bank is higher than that of a firm without a bank relationship, using a large sample of Japanese firms.

Empirical studies on the choice of corporate financing between public and private debt based on Japanese firms since the 1980s have been done by Hoshi, Kashyap, and Sharfstein (1993), Anderson and Makhija (1999), Hori and Osano (2002) and Shirasu and Xu (2007). Hoshi, Kashyap, and Sharfstein (1993) and Anderson and Makhija (1999) empirically analyze the choice between public debt (debt based on public information) and private debt (debt based on private information) for the period of financial deregulation in the 1980s in Japan. Based on the monitoring hypothesis, Hoshi et al. (1993) argue that a rise in Tobin's q decreases bank borrowing when a firm is a member of a keiretsu. Considering the benefit of reducing agency costs through the acceptance of strict monitoring by banks, Anderson and Makhija (1999) report that the choice of public debt is negatively correlated with growth opportunities, while the keiretsu relationship does not have any effect on debt choice. Hori and Osano (2002) and Shirasu and Xu (2007) investigate the choice between public debt and private debt for the period of post-financial deregulation in the late 1990s. Similar to the result of Hoshi et al. (1993) on the 1980s, both papers empirically determine that firms with higher growth prospects tend to choose bond issuing rather than bank borrowings in this period.

James (1987) and Kaneko and Watanabe (2005) investigate the difference between public and private debt using the event-study method. James (1987) examines the announcement effect of stock returns on public and private debt issuing using data from 1974 to 1983. They find that the CAR for the announcement of new bank borrowing contracts is 2% in significance, but find no significant results for the announcement of public debt issues. Kaneko and Watanabe (2005) compare the announcement effect of a commitment line contract with a bank to a Commercial Paper (CP) issue or straight bond issue, using Japanese data. For both AAR and CAR, they find no significant results for CPs or straight bonds, but find positive and significant results for bank borrowing. Furthermore, they demonstrate that the announcement effect of a contracting commitment line is larger if the firm has few internal funds or a low bond rating. This suggests that it is more important for a firm with a high default risk to have flexibility in loan contract renegotiations.

3. Reason for the increase in bonds outstanding in the late 1980s

In this section, we analyze the reasons for the increase in bond issuing by large Japanese firms in the late 1980s.³

To investigate the bond market in the 1980s, we have to consider the regulation of the bond market. As explained by Hoshi and Kasyap (2001), until 1996, Japanese firms had to meet bond issuance criteria to issue corporate bonds. It was in 1979 that the issuance of unsecured bonds was permitted for the first time, based on the introduction of an accounting index and profitability index criteria. In 1979, only two firms were able to issue unsecured bonds. Thereafter, deregulation was implemented in phases, leading to a gradual increase in the number of firms eligible to issue bonds, both unsecured and secured. The relaxation of bond issuing criteria was one of the conditions, in addition to other favorable macroeconomic factors, that made it possible for Japanese firms to raise money through equity-related bonds in both the domestic or foreign markets. It is worth emphasizing that although the number of the firms raising equity-related bonds in the domestic market increased to approximately five hundred at the end of 1989, the number of firms with full financial options was still limited compared to all listed companies. In fact, the number of firms eligible to issue unsecured convertible bonds listed on the TSE 1st Section from 1985 to 1989 was 145. Although Diamond (1991) argues that in theory, both firms with relatively high profitability and those with low profitability depend more on bond issuing, it was very difficult for relatively risky firms in Japan to find financial resources outside of bank borrowing in the 1980s.

The number of firms issuing CBs (unsecured or secured) is relatively higher in the manufacturing industry than in non-manufacturing.⁴ This is consistent with the fact that the manufacturing firms increase their bond issuing as is shown in section 1. Especially, the proportion of firms eligible to issue bonds in electronics industry and automobile industry is relatively higher.

Using this sample, we investigate the choice between bond and borrowings focusing on the effects of growth opportunity. We use the ratio of unsecured bonds outstanding to the sum of bank borrowing and bonds outstanding at the end of 1989 as a dependent variable. The ratio of unsecured bonds to the sum of bank borrowing and bonds, which was 48 percent in 1984, increased to 63 percent at the end of 1989.⁵ As for explanatory variables, we select Tobin's q as the proxy for growth opportunity, following Hoshi et al., (1993).⁶ We expect that a firm with a higher Tobin's q will have a larger incentive to avoid the hold-up problem by choosing bonds rather than bank borrowing. Higher amounts of total leverage represent a greater likelihood of financial distress. To examine this effect on debt choice, we mainly use the debt-asset ratio as a proxy for default risk. In addition, we introduce the standard deviation of the ratio of operating profit to sales for the past ten years as another proxy of risk, assuming that a manager may evaluate the business risk as a proxy for default risk. Furthermore, following Hoshi et al. (1993), we include the ratio of holding securities and land to total assets as a proxy for collateral.⁷ The data for independent variables are taken from the financial data at

³ This section is based on Miyajima and Arikawa (1999), Miyajima and Arikawa (2000) and Arikawa and Miyajima (2005).

⁴ See the detail in the Table 1 of Miyajima and Arikawa (1999).

⁵ See the detail in Table 2 of Miyajima and Arikawa (2000).

⁶ The accuracy of our q is inferior to the one used by Hoshi et al. (1993), in that we do not estimate the market value of tangible assets except land and security holdings.

⁷ We also add the log of total asset to control for size.

the end of 1984.

The two-limit Tobit model is used for the estimation method, as the independent variables are truncated at both zero and one. As shown in Table 4 in Miyajima and Arikawa (1999), the coefficient of the ratio of debt to total assets is significantly negative. This means that a firm uses a greater ratio of bonds compared to bank borrowings when the default risk is lower. For manufacturing firms, we find that the coefficient of security holdings is significantly positive, while the coefficient of land holdings is significantly negative. This means, in the manufacturing sector, that firms with more liquid assets tend to choose bonds, while those with more assets that can be used as collateral tend to use those assets to borrow from the banking sector. The finding of a positive relationship for the amount of land and bank borrowing is consistent with the results of Shirasu and Xu (2007) who investigate the same debt choice problem using data from the 1990s. The coefficient of firm size is significantly positive. This means that larger firms tend to use bonds rather than bank borrowing based on the higher reputations.

The coefficient of Tobin's q as a proxy for future growth opportunity is significantly positive. This result does not change even when we add the log of total assets as a proxy for firm size, an industry dummy, or when we limit the sample to the manufacturing sector. This result shows that firms with larger growth opportunity tend to choose bonds rather than bank borrowings. These results are consistent with Hoshi et al. (1993), though they contradict the results of Anderson and Makhija (1999). Shirasu and Xu (2007) point out that the analysis by Anderson and Makhija (1999) have a problem in terms of how they deal with the effect of regulation on the debt choice in the 1980s.

4. Public debt versus private debt after the deregulation

In this section, we investigate the factors that affected the debt choice of a firm from 1996 to 2004, a time during which regulations in the bond market were abolished. Regulations on bond issuing, such as bond issuance criteria, may prevent firms from obtaining the optimal ratio of bond to bank borrowing. Furthermore, as suggested by Hori and Osano (2002) and Shirasu and Xu (2007), we cannot reject the possibility that an increase in the stock price will affect the firm's choice of financing measures, since most of the bonds issued in the 1980s were convertible bonds and warrant bonds. Therefore, in this section, we perform the same analysis as the previous section using the data after 1996, under which the regulations in the bond market were completely abolished, and the number of issues of straight bonds increased.⁸

We select a sample of firms listed on the TSE 1st Section from 1996 to 2004 excluding financial institutions and public utilities. The source for all of the financial data in this paper is NIKKEI NEEDS and AMSUS. Here, we construct the panel data.

The dependent variable in the following multivariate analysis is again defined as the ratio of bonds outstanding to the sum of bank borrowing and bonds.⁹ For the independent variables, we use almost the same variables as in the previous section. First, we select Tobin's q as the proxy for the firm's growth prospects. Here, we use Tobin's q with a one-year lag and three

⁸ Hori and Osano (2002) investigate the debt choice problem using a more rigorous estimation method, though they use the sample only in 1998.

⁹ As pointed out by Shirasu and Xu (2007), the composition of new debt raised in each year and debt outstanding is different. Therefore, we have to admit that the choice between public and private debt done in the past might have affected the dependent variable even if we use data after 1996.

year average interchangeably. High total leverage may represent a greater likelihood of financial distress. To examine this effect, we use the debt-asset ratio as the proxy for the default risk. Furthermore, we add the log of total assets as a proxy for firm size, the ratio of fixed assets to total assets as the proxy for collateralizable assets, and the standard deviation of the stock price for the past 36 months as a proxy for firm risk. The descriptive statistics of the dependent and independent variables are shown in Table 1 and Table 2. We find that both the ratio of bonds to the sum of bonds and bank borrowings and the ratio of bonds to total assets decreased consistently since 1996. This is consistent with the results shown in Figure 1.

Table 1 Debt Composition from 1996 to 2004

	Bond/(Bond+Long-Term Loan)		Bond/Total Asset	
	Average	Std.dev	Average	Std.dev
1996	0.503	0.414	0.074	0.088
1997	0.283	0.373	0.035	0.065
1998	0.282	0.361	0.039	0.069
1999	0.274	0.357	0.037	0.067
2000	0.270	0.358	0.031	0.059
2001	0.244	0.348	0.028	0.055
2002	0.240	0.340	0.027	0.054
2003	0.233	0.329	0.027	0.054
2004	0.227	0.323	0.027	0.058

Data: Firms listed on TSE 1st Section

Table 2 Descriptive Statistics of the Sample Firm from 1996 to 2004

	Average	Median	Std.dev
Bond/(Bond+Long-term Borrowing)	0.284	0	0.366
Bond/Total Asset	0.035	0	0.065
Borrowing from Main Bank/Total Asset	0.046	0.027	0.063
Tobin's q	1.211	1.059	0.566
Debt/Total Asset	0.537	0.540	0.225
Size	11.491	11.284	1.281
Fixed Asset /Total Asset	0.656	0.530	0.757
Risk	11.579	10.659	5.245
Cross Shareholding (%)	11.817	10.690	9.027

Size: log of total asset, Risk: 36 month average of stock return volatility

Sample: Firms listed on TSE 1st Section

Sample Period: From 1996 to 2004

The regression results are shown in Table 3. A two-limit Tobit model is used for the estimation method as independent variables are truncated at both zero and one. In column (I) to (IV), we use the ratio of bonds outstanding to the sum of bonds and bank borrowings as a dependent variable. Here, we perform a panel regression to control for the firm specific effect. We find that the coefficient of Tobin's q is significantly positive. A firm with greater growth opportunity depends more on bond issues than on bank borrowings, and this is the same result that we find in the 1980s. No matter whether there are regulations on the bond market or not, firms with greater growth opportunity tend to use bonds as a corporate financing measure. We find similar results when we use the market-to-book ratio instead of Tobin's q, or the three-year average of Tobin's q. These results are consistent with previous research such as Shirasu

and Xu (2007), who use the sample from 1993 to 1997, or Hori and Osano (2002), who use the sample in 1998.

On the other hand, the debt ratio is significantly negative. A firm with a higher default risk depends more on bank borrowings. This means that the necessity for renegotiating debt contracts is one of the key factors influencing debt choice in the 1990s. Furthermore, we find that the coefficient of firm size is significantly positive, and that of the standard deviation of stock price significantly negative. These results suggest that firms with higher risk depend more heavily on bank borrowings.¹⁰

The greater bargaining power of the bank over the borrowing firm is the reason for the hold-up problem. To avoid this hold-up problem, a borrowing firm tries to borrow not from only one bank but from many banks simultaneously. To the contrary, a firm with a higher default risk prefers a smaller number of lenders, as this makes it less costly to renegotiate the loan contract since the lenders face a default risk. To confirm this hypothesis, we perform a similar regression analysis using the ratio of borrowing from the main bank to total assets as the dependent variable.¹¹ We assume here that a firm with higher main bank borrowings is more likely to face hold-up problems but faces a smaller number of lenders when renegotiating the loan contract.

Table 3 Debt choice after the complete deregulation (1996-2004)

Model	I		II		III		IV		V
Tobin's q	0.039		0.030						-0.012
	0.014	***	0.014	**					0.002
Market to Book Ratio					0.039				
					0.014	***			
Average q for three years							0.037		
							0.018	**	
Debt/Total Asset	-1.692		-1.621		-1.653		-1.603		0.230
	0.070	***	0.078	***	0.073	***	0.071	***	0.006
Fixed Asset/Total Asset	-0.029		-0.015		-0.029		-0.016		0.002
	0.019		0.018		0.019		0.018		0.001
Size	0.139		0.135		0.139		0.139		-0.014
	0.011	***	0.011	***	0.011	***	0.012	***	0.001
Risk	-0.006		-0.006		-0.006		-0.006		0.003
	0.002	***	0.002	***	0.002	***	0.002	***	0.000
Industrial Dummy	no		yes		yes		no		yes
Year Dummy	yes		yes		yes		yes		yes
Constant	-0.27		-0.48		-0.27		-0.35		0.08
	0.13	**	0.20	***	0.13	**	0.14	***	0.02
NOB	11676		11676		11676		10895		4425

***, ** and * denote coefficients significant at the 1, 5, and 10 percent levels, respectively.

Size: log of total asset, Risk: 36 month average of stock return volatility

Dependent variable is (Bond/Total Asset) From column I to column IV

Dependent variable is (Borrowing from Main Bank/Total Asset) in column V.

¹⁰ We find no significant results concerning the ratio of fixed assets to total assets, although Shirasu and Xu (2007) find it to be significant.

¹¹ Using the Japan Company Handbook, we first identify the "main bank" of each firm by selecting the top bank in its trading bank list, and define it as the main bank if that bank is the largest lender among the banks lending to the firm.

The results are shown in column (V) of Table 3.¹² The ratio of borrowing from the main bank to total assets is positively related to default risk and stock price volatility. In other words, firms with higher risk depend more on main banks as sources of financing. We also find that smaller firms borrow more from their main bank. These results mean that firms with higher risks tend to depend on the main bank in order to gain higher flexibility for loan contracts.

On the other hand, we find that the coefficient of Tobin's q is significantly negative.¹³ While firms with lower growth opportunity tend to depend more heavily on their main bank, firms with higher growth opportunity relies less on the main bank in order to avoid the hold-up problem.

5. Conclusion

In this paper, we investigated the choice of corporate financing between public and private debt, using data from the late 1980s to 2004. We find that the theoretical hypothesis about the choice of corporate financing is supported empirically.

First, we examined the firm's decision between bond and bank borrowing in the late 1980s, a period in which the number of bond issues increased rapidly. We find that the growth opportunity of the issuing firm is the main determinant of the debt choice. Firms with low growth opportunity mainly depended on bank borrowing in the face of the risk of hold-up problems. In the 1980s, Japanese firms gained broader choices for financing resources thanks to the financial deregulation, but only firms with high growth opportunity and low default risk were able to use these newly introduced financing methods. By contrast, riskier firms continued to rely on bank borrowings.

We also investigated the debt choice behavior of Japanese firms using data after 1996, a period in which the bond market in Japan was completely deregulated. We found a positive relation between the ratio of bonds to total assets and Tobin's q . The firm with higher growth opportunity depend on bond issuing more, and this result is same as the one in the 1980s. This means that firms with higher growth opportunity relies more heavily on bond issuing, regardless of the degree of regulation in the bond market.

On the other hand, the coefficient of the debt ratio is significantly negative, suggesting that firms consider the necessity of renegotiating debt contracts when they decide the ratio of bank borrowing and bond issuance. We also found that the ratio of main bank dependence is higher if a firm is riskier, smaller in size, and lower in future profitability. These results suggest again that firms consider the necessity of renegotiating debt contracts when they decide the ratio of bank borrowing. In other words, firms with higher default risk try to have more flexibility on loan contract by concentrating on main bank borrowing, while firms with higher growth opportunity reduce their dependence on the main bank to avoid hold-up problems.

The results above have the following implications. After World War II, due to the strict bond market regulations, Japanese firms had no alternatives to bank borrowing for corporate financing measures. This regulation imparted great bargaining power to the banking sector over borrowing firms, and guaranteed monopolistic rents to banks.

The situation changed significantly after the financial deregulation in the 1980s. Firms

¹² Here, we use data from 1996 to 2000 as the sample because we do not have data concerning main banks after 2001.

¹³ We find similar results when using market to book ratio instead of using Tobin's q .

with higher growth opportunity and lower default risk depend more on public debts such as bonds, while those with lower growth opportunity and higher default risk remain dependent on bank borrowings. Looking from the banking sector, safer or profitable borrowers reduced their dependence, while riskier ones remained dependent on it.

Here, banks have no problem if they demand higher interest rates from riskier firms, or decide to bail out borrowing firms based on future profitability. But in the 1990s, many Japanese banks, with an insufficient capital base, helped insolvent borrowers with little hope of recovery through interest concessions and partial debt forgiveness to deal with loan losses (Peek and Rosengren, 2005, Hoshi, 2006). The result was the emergence of “Zombie firms.” Consequently, as pointed out by Hoshi (2006), zombie firms became dependent on the main bank, leading to a decrease in macroeconomic productivity because such firms did not exit from the market.

Recently, many Asian countries have tried to develop a bond market. The results in this paper suggest that policymakers have to consider the effects on existing financing measures of the introduction of new methods. In the Japanese case, the deregulation of the bond market resulted in an increase of loans to riskier firms, and policymakers should have considered the strengthening of corporate governance in the banking sector along with the deregulation of the bond market.

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