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# **The Effects of Bank Relations on Stock Repurchases: Evidence from Japan**

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## **The Effects of Bank Relations on Stock Repurchases: Evidence from Japan**

### **Abstract**

This paper examines the effects that bank relations have on stock repurchases in Japan. Similar to U.S. evidence, we find that stock repurchase announcements in Japan have positive announcement period returns. Announcement returns are positively related to equity ownership by main banks, but are negatively related to nonbank debt ratios. In contrast, bank debt ratios do not have such a negative relation. Announcement returns are also negatively related to future growth opportunities, suggesting that repurchase announcements are greeted more positively by investors when repurchasing firms have lower growth opportunities. We also find that firms with high leverage are less likely to repurchase stocks, whereas firms with high equity ownership by main banks are more likely to do so. Overall, these results are consistent with the views that banks, particularly main banks, are effective monitors of agency costs and financial distress risk, and that their presence as dual stakeholders are value-enhancing.

## 1. Introduction

In Japan, a bank can be an important lender and/or significant equityholder of firms. In this paper, we examine the effects that bank relations have on stock repurchases. Although previous research has not addressed this issue, there are several reasons why bank relations are likely to be important for firms' stock repurchase decisions. First, stable bank–firm relationships and the existence of on-going intermediary functions enable banks to be effective monitors of agency problems among managers, shareholders, and debtholders of their client firms (e.g., Fama, 1985; Sharpe, 1990; Diamond, 1984, 1991). Second, when banks are also significant equityholders of their client firms, they are likely to have strong incentives to monitor these firms in order to facilitate corporate policies such as stock repurchases that enhance shareholder wealth. Diamond (1984) contends that firms that maintain close bank relations through equity ownership have less need for other types of monitors as compared to firms without close bank ties.

Furthermore, stock repurchases decrease financial slack and increase the leverage ratio as a result of the reduction in outstanding equity, which can potentially increase the firm's financial distress risk (Dann, 1981; Maxwell and Stephens, 2003). Banks as large debtholders have great concerns about firms' financial distress risk as bank loans usually represent low-priority fixed pay-off contracts in firms' financial structures (Fama, 1985). To reduce financial distress risk, banks as informed creditors have both the incentive and the ability to provide their client firms with important monitoring and other intermediary functions. When banks are also large equityholders, they may have even greater incentives to monitor their client firms, as equityholders also bear the cost of financial distress risk as with debtholders (Opler and Titman, 1994). Thus, banks as large shareholders should have strong incentives to moderate the adverse effect that stock repurchases can have on equityholders.

To study the effect that bank relations have on stock repurchases, we identify 793 Japanese share repurchases between 1995 and 2000 as our sample. We first examine abnormal returns surrounding stock repurchase announcements. The 3-day mean and median abnormal announcement returns are a statistically significant 2.2% and 1.5%, respectively. In tests examining the cross-sectional variation of

announcement returns, we find that most firm-specific variables that have been posited to explain repurchase announcement returns for U.S. firms are not significantly related to announcement returns in Japan. However, we find higher announcement returns when the firm's main bank holds a larger equity stake in repurchasing firms, whereas equity ownership by other large shareholders does not have any discernable effect on announcement returns. These results are consistent with the view that main banks, as significant equityholders, are involved in or are supportive of value-enhancing policies such as stock repurchases. Large nonbank shareholders, however, may be interested in some other benefits rather than maximizing share value (Lichtenberg and Pushner, 1994; Pushner, 1995); such shareholders may hold a large equity stake to maintain business relationships with their firms or to obtain control benefits from them. In this case, their presence as large shareholders is not likely to have a positive effect on repurchase announcement returns.

In focusing on the firm's financial structure, we find a statistically significant negative relation between a firm's nonbank debt ratio and announcement returns. In contrast, we find little negative relation between a firm's main bank loan ratios and announcement returns. These findings suggest that while high levels of diffused debt (i.e., nonbank debt) have an adverse impact on the shareholder wealth effect of a repurchase announcement, possibly due to an increase in financial distress risk arising from stock repurchases, high levels of concentrated debt in a firms' capital structure (i.e., main bank and other bank debt) do not. This latter finding supports the view that banks mitigate market's concerns related to financial distress risk when firms repurchase stock.

To further establish that a negative relation between a firm's nonbank debt ratio and announcement returns is related to concerns pertaining to financial distress risk, we examine whether the adverse effect of an increase in the nonbank debt ratio on share value is more severe when firms face higher financial distress risk. We find that the negative relation between the nonbank debt ratio and announcement returns is more pronounced when firms repurchase a larger percentage of shares, when they have higher levels of firm-specific risk, when they have negative operating earnings, and when they have higher debt-to-equity ratios. For firms with more fixed assets or higher operating earnings over their

interest expenditures, the negative relation between the nonbank debt ratio and announcement returns is mitigated. Therefore, it appears that financial distress risk is an important factor that affects share value during stock repurchase announcements. More importantly, we find that high levels of bank debt do not adversely affect share values even when these firms have high financial distress risk. To the extent that banks are active and effective monitors of firms' default risk, the results suggest that investors are less concerned about the high financial distress risk of repurchasing firms if these firms have larger bank debt in their capital structure.

We also find that firms with low Tobin's  $q$  have higher repurchase announcement returns. This result suggests the market reacts positively when firms with low future growth opportunities conduct stock repurchases (e.g., see Dittmar, 2000; Grullon and Michaely, 2004). As an alternative measure of firm's future investment opportunities, we calculate the change in fixed assets from the year prior to the repurchase to two years thereafter, normalized by total assets in the year before the repurchase. We find that this change in fixed assets measure is also negatively related to announcement returns. Low growth firms are also indicative of firms with high agency problems, especially when these firms also have high free cash (Lang, Stulz, and Walkling, 1991; Opler and Titman, 1993). To see if banks are viewed by the market as monitors of repurchasing firms' agency costs, we conduct additional tests on the interaction of Tobin's  $q$  and free cash. We find that firms with low Tobin's  $q$  and high free cash, but without high main bank loans, other bank loans, or equity owned by a main bank, realize higher repurchase announcement returns. If repurchases are a means of controlling agency conflicts by reducing free cash, then their value in minimizing agency costs should be greatest in firms without a strong monitor. While a strong monitor may be better able to force a firm to disgorge excess cash, conditional on the payout, the value effect should be higher for those high agency firms that are more likely to waste the cash if not paid out (i.e. firms without a strong main bank). Thus, our results indirectly suggest that the market views banks, particularly main banks, as informed monitors of the repurchasing firms' agency costs.

Finally, to better identify the determinants of the repurchase decision in Japan, we perform a Tobit regression analysis using both firms that repurchase stocks and firms that do not repurchase stocks.

We find that firms with higher levels of bank debt and nonbank debt are less likely to repurchase stocks. These results suggest that to protect their debt claims both banks and other debtholders prefer firms to avoid leverage-increasing repurchase programs when their debt claims are already high. Also important, we find that when firms have main banks as significant equityholders, they are more likely to repurchase stocks. Therefore, although main banks as large creditors may prefer client firms to refrain from conducting stock repurchases, main banks as large equityholders are likely to encourage stock repurchases. Consistent with this view, we find that the dummy variable that takes a value of one if the bank serves as the largest debtholder as well as the largest equity holder has an insignificant coefficient, suggesting that when main banks are both the largest creditor and largest equityholder, they neither encourage nor discourage stock repurchases. These results clearly show the different motives that main banks face when they are significant creditors and/or significant equityholders. However, we find that large shareholders other than the main bank are less likely to encourage repurchases. This finding is consistent with our earlier conjecture that large nonbank shareholders may not actively influence managers to engage in value-enhancing corporate actions. We also find that firms with lower Tobin's  $q$  and lower future growth in fixed assets are more likely to conduct stock repurchases, again suggesting that Japanese firms engage in stock repurchases when they expect a deterioration in future investment.

The remainder of our paper proceeds as follows. The next section provides background information on Japanese stock repurchases, discusses our data, and presents summary statistics. Section 3 presents evidence on announcement returns, their cross-sectional analyses, and determinants of the stock repurchase decision. Section 4 concludes.

## **2. Overview of the Japanese share repurchase program and data**

### *2.1 The Japanese share repurchase program*

Under the Japanese Commercial Code, share repurchases were first allowed in Japan in October 1994. The first repurchase announcement took place one year later, on October 18, 1995, by Amway Japan. Similar to the U.S., Japanese firms do not have to buyback shares after the announcement of a

share repurchase program. However, if a firm fails to buyback 50 percent of its target repurchase amount by the end of its authorization period, which is usually for one year, then it has to provide an explanation to the Ministry of Finance. Once shares are repurchased, they must be retired unless they are being used to cover stock option grants.<sup>1</sup> In April 2001, however, the Commercial Code was modified to allow firms to own treasury stocks. With this modification, Japanese firms are no longer required to state the purpose of their repurchases.

Originally, stock repurchases were treated as dividend payments, and all shareholders of the repurchasing firm, regardless of their decisions to participate in the repurchase, had to pay an income tax proportional to their equity holdings in the firm. This tax rule was repealed in November 1995. During our sample period, capital gains and dividends were taxed at a maximum of 26 percent and 35 percent, respectively. Given this difference in tax treatments, we will examine whether repurchases serve as substitutes for dividend payouts later in the paper.

Repurchasing firms were also originally required to alter their corporate articles to set a maximum amount of shares that they could seek in a repurchase. The decision to alter their corporate article had to be made by the board of directors and subsequently be approved at a shareholders' meeting. In June 1997, the Commercial Code was revised to allow firms to conduct stock repurchases without a shareholder vote. This revision in the Code gave firms more flexibility to conduct repurchases. Finally, repurchasing firms originally had to use an earnings surplus to conduct repurchases, but in March 1998, they were allowed to use any surplus capital to repurchase their shares, regardless of their operating performance. Japanese firms are not allowed to repurchase stock with new debt.

## 2.2 Data

Our sample consists of stock repurchase announcements made by nonfinancial Japanese firms that are listed on either the First or Second Section of the Tokyo Stock Exchange (TSE). Stock repurchase announcement dates and other relevant information are obtained from daily issues of the *Nihon Keizai*

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<sup>1</sup> For each stock option granted, firms were allowed to own treasury stocks to cover those options for up to 10 years.



*Shimbun*, which is equivalent to the *Wall Street Journal* for Japan. For each day from October 18, 1995 to December 31, 2000, we look at the “Repurchase Announcements” section of the *Nihon Keizai Shimbun* to identify stock repurchase announcements.<sup>2</sup> For each announcement, we record the number of shares or the yen amount sought, the type of repurchase, and the purpose of the repurchase. Initially, we identify 1,219 repurchase announcements. Of these repurchase announcements, 1,176 are open-market repurchases, and 43 are fixed-price tender offers.<sup>3</sup> We eliminate the fixed-priced tender offer announcements from our sample due to its small sample size and because prior research finds that the information content of fixed-price tender offers is different from open-market repurchases (Comment and Jarrell, 1991; Dann, 1981; Vermaelen, 1984; Bagwell, 1991). For example, a fixed priced tender offer is sometimes viewed as a takeover deterrence (Bagwell, 1991).

During our sample period, only two purposes are given for repurchases: to cover stock option grants and to retire stock. During this period, Japanese firms were not allowed to own their own shares as treasury stocks except for covering stock option grants. We eliminate all 197 repurchases whose purpose is to cover stock options, as this motive does not directly or immediately alter the firm’s capital structure. From the remaining 979 open-market repurchases, we eliminate another 186 observations due to either insufficient financial statements data or stock returns data, leaving us with a final sample of 793 stock repurchases. A total of 220 different firms repurchased stock during our sample period, which represents over 20 percent of the firms listed on the TSE. Among these 220 firms, 29 firms conducted a repurchase only once, while 99 firms engaged in two repurchases, and 92 firms engaged in three or more repurchases.

Table 1 breaks down the frequency distribution of our stock repurchase sample by industry and by year. As shown in this table, share repurchase activity increased dramatically in 1998. We suspect that the revisions to the Commercial Code that took place between 1995 and 1998 led to the increase in

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<sup>2</sup> We end the sample period in 2000 because *Kigyō Keiretsu Soran*, which is the main data source on firms’ bank loans and ownership structure, stopped publishing in 1999.

<sup>3</sup> Other forms of repurchases, such as Dutch auction tender offers, are not allowed under the Japanese Commercial Code.

repurchase activity in 1998. A breakdown of the sample by industry shows that most of the repurchasing firms are in manufacturing (564 firms), wholesales and retail (122 firms), construction (42 firms), and transportation and communication (33 firms).

[Insert Table 1 Here]

We obtain financial statements and daily stock returns data from the PACAP–Japan database. Data on the firms’ loans from their main bank and other banks, equity ownership by the top 10 largest shareholders, and equity ownership by the main bank and other banks, are collected from various issues of *Kigyō Keiretsu Soran*, a comprehensive guide to Japanese firms published by Toyo Keizai. Following Hoshi, Kashyap, and Scharfstein (1990) and Aoki, Patrick, and Sheard (1994), we define the main bank as the firm’s largest lender.

Table 2 reports summary statistics of firm-specific characteristics for our repurchasing firms for the fiscal year prior to the repurchase announcement (Panel A) and for repurchase-specific characteristics, along with statistics on the firms’ dividend payouts (Panel B). All variables summarized in Table 2 are employed in our subsequent empirical tests. In observing the bank variables, which are the focus of our paper, we see that the average main bank debt ratio is 2.7%. This number is similar to that reported in previous papers that find main banks are the most important creditors to their firms (e.g., see Kang, Shivdasani, and Yamada, 2000). The standard deviation is 3.4%, revealing that the variation of main bank debt is large relative to its mean. The quartile statistics also show a large variation in main bank debt (i.e., the 1<sup>st</sup> and 3<sup>rd</sup> quartile observations are 0.0% and 4.4%, respectively). The mean equity ownership held by main banks is 2.9%, but the median is 4.1%. As with the main bank debt ratio, the summary statistics for equity ownership by main banks show a high degree of variability. At first glance, these ownership statistics for main banks may seem modest, but for firms that have a main bank as its largest creditor, the main bank is almost always the largest shareholder (540 cases out of 548 firms). These 540 cases account for 68% of our sample. Therefore, the main bank, as the firm’s largest shareholder and largest debtholder, should be able to exercise significant influence over these firms.

[Insert Table 2 Here]

### 3. Empirical results

#### 3.1. Abnormal returns surrounding repurchase announcements

For each repurchase announcement, we calculate daily abnormal returns (ARs) using a standard event-study methodology. We obtain market model estimates by using 200 trading days of returns data, beginning 220 days before and ending 21 days before the stock repurchase announcement. Our benchmark market return is the PACAP equally-weighted market return.<sup>4</sup> Daily ARs are accumulated to obtain a cumulative abnormal return (CAR) from Day  $-t$  before the repurchase announcement to Day  $+t$  after the repurchase announcement. Panels A and B of Table 3 show ARs and CARs, respectively. We report  $p$ -values from a  $t$ -test and a Wilcoxon  $Z$ -test to test whether the mean and median ARs, respectively, are significantly different from zero.

[Insert Table 3 Here]

Table 3, Panel A, shows that both mean and median ARs are positive and statistically significant on Days  $-1$ ,  $0$ , and  $+1$ . The largest abnormal return is on Day  $0$  with a mean of  $1.2\%$  and a median of  $0.7\%$ , both of which are statistically significant at the  $1\%$  level. Panel B shows that all CARs that include the announcement day are positive and statistically significant at the  $1\%$  level. For example, the mean  $CAR(-1,1)$  and  $CAR(-5,5)$  are  $2.2\%$  and  $2.5\%$ , respectively, both of which are significant at the  $1\%$  level. The positive abnormal returns surrounding Japanese stock repurchase announcements are consistent with U.S. evidence.<sup>5</sup>

To show whether the effects of bank debt and equity ownership by main banks on announcement returns are different from those of nonbank debt and equity ownership by other large shareholders, in Panel A of Table 4, we report mean and median  $CARs(-1,1)$  according to quartiles based on the repurchasing firms' debt ratios (total debt, main bank debt, other bank debt, and nonbank debt) and ownership distributions (equity ownership by the top ten largest shareholders, equity ownership by main

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<sup>4</sup> Using a value-weighted return yields identical results.

<sup>5</sup> See, for example, Vermaelen (1981), Comment and Jarrell (1991), Stephens and Weisbach (1998), and Grullon and Michaely (2004). These papers document positive abnormal returns surrounding stock repurchase announcements in the U.S.

banks, and equity ownership by the top ten largest shareholders excluding main banks). The Q1 (Q4) subsample contains repurchase announcement returns by firms with the highest (lowest) debt ratios and the highest (lowest) equity ownership. We conduct  $t$ -tests for the differences in mean returns between Q1 and Q4 subsamples and Wilcoxon  $Z$ -tests for the differences in median returns between Q1 and Q4 subsamples.

[Insert Table 4 Here]

Table 4 shows little difference in mean and median CARs(-1,1) between firms with the highest and lowest total debt ratios and those between firms with the highest and lowest other bank debt ratios. However, firms with the highest main bank debt ratio have higher mean announcement returns (2.7%) than firms with the lowest main bank debt ratio (1.5%). In contrast, firms with the highest nonbank debt ratio have lower mean announcement returns (1.3%) than firms with the lowest nonbank debt ratio (2.8%). These latter results are consistent with the view that when a repurchase announcement is made by a firm with a relatively high level of nonbank debt (i.e., firms with relatively high financial distress risk), it is greeted less positively by investors. In contrast, the presence of informed creditors such as main banks mitigates the adverse effect of high leverage, and thus the market views firms with relatively high main bank debt as having an active monitor of financial distress risk. This interpretation is corroborated by CAR results classified by different levels of main bank ownership. Repurchasing firms that have more of their equity held by main banks have higher mean announcement returns than firms that do not have significant main bank equity ownership (2.6% versus 1.4%). We do not find such patterns for equity ownership by other large shareholders.

In Panel B of Table 4, we construct a 4x4 sort on the main bank debt ratio and (independently) on main bank equity ownership and report mean and median CARs in each portfolio. The first row shows that among firms with the highest main bank loan ratios (Q1 subsample), those with high main bank equity ownership (Q1 and Q2 subsamples) show statistically significant positive mean CARs (2.8% and 3.2%, respectively), while those with low main bank equity ownership (Q3 and Q4 subsamples) do not experience statistically significant mean positive CARs. These results suggest a high main bank loan

ratio, by itself, does not generate positive CARs unless main banks hold large equity ownership in their client firms. The first column further shows the importance of main bank equity ownership in explaining CARs. It shows that firms with the highest main bank equity ownership (Q1 subsample) experience statistically significant mean positive CARs regardless of the size of the main bank loan ratio. The median CARs show the similar patterns.<sup>6</sup>

### *3.1.1. Cross-sectional regression analysis on announcement returns*

In order to identify the source of the positive announcement returns surrounding repurchase announcements, we present estimates from multiple regressions using  $CAR(-1,1)$  as the dependent variable. As key explanatory variables, we include financial structure and equity ownership variables in our regression model. Firms with high leverage have higher financial distress risk. However, if high bank debt is indicative of bank monitoring, then firms with higher bank debt are expected to suffer less from financial distress risk. In addition to a firm's leverage ratio, several other factors can have an effect on its financial distress risk. For example, total risk, the proportion of fixed assets in a firm's asset structure, and the firm's earnings to interest ratio can affect the extent of the firm's financial distress risk. Therefore, we include the standard deviation of daily stock returns during the year prior to the repurchase announcement,<sup>7</sup> a ratio of fixed assets to total assets, and a ratio of operating earnings to interest expenditures, as additional variables in the regression model.

For other explanatory variables, we include variables that proxy for the free cash flow and signaling motivations of stock repurchases. Previous research shows that reducing the agency problem associated with free cash flows and signaling undervaluation of equity are two important factors that explain why U.S. firms conduct stock repurchases. For example, Easterbrook (1984) and Jensen (1986) contend that stock repurchases represent a means for firms to distribute their excess cash to shareholders.

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<sup>6</sup> Because we sort the sample firms by main bank equity ownership and by main bank loans independently of each other, there are cases where some portfolios have zero observations. For example, we do not observe any cases in which firms belong to the subsample of lowest main bank loans as well as belong to the subsample of highest main bank equity ownership.

<sup>7</sup> If we replace the standard deviation of past stock returns with the standard deviation of ROE for the three years prior to the repurchase, the results remain qualitatively the same.

Paying out excess cash limits managers' scope for discretionary spending, thereby decreasing the agency problem associated with free cash flows.<sup>8</sup> Vermaelen (1981), on the other hand, shows that when there is high information asymmetry between managers and outside investors, firms repurchase their stocks to signal to the market that their stocks are undervalued.

In our regression model, to control for the free cash flow explanation for stock repurchases, we use the ratio of free cash flow (operating earnings + depreciation - capital expenditures) to total assets<sup>9</sup> and the ratio of cash holding (cash + marketable securities) to total assets as explanatory variables. If firms with higher free cash flow engage in stock repurchases, such repurchases are likely to be greeted more favorably by investors. Thus, the free cash flow variable is posited to be positively associated with announcement returns. To the extent that cash holding proxies for the extent of the firm's free cash flow (Dittmar, 2000; Grullon and Michaely, 2004), the cash holding variable is also expected to be positively related to announcements returns.

To control for the signaling explanation for stock repurchases, we use past one-year market-adjusted excess returns,<sup>10</sup> firm size, and the fraction of shares sought in the repurchase as proxy variables. If a firm's stock market performance is relatively poor compared to other firms and the firm believes that it is suffering from mispricing, then it may decide to conduct a stock repurchase to signal to the market its undervaluation (Comment and Jarrell, 1991; Dittmar, 2000). Thus, past excess returns is posited to be negatively related to announcement returns. Firm size (log of total assets) may also serve as a signaling variable. Smaller firms are likely to have greater information asymmetry, so smaller firms that conduct repurchases might realize higher announcement returns than larger firms (see Vermaelen (1981) and

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<sup>8</sup> Bartov (1991) and Vafeas and Joy (1995) find results that support the signaling hypothesis and the free cash flow hypothesis, respectively. Stephens and Weisbach (1998) and Dittmar (2000) provide empirical support for both arguments. Most recently, Grullon and Michaely (2004) find results that support the free cash flow hypothesis. See Dittmar (2000) for other hypotheses that have been put forth in the literature that explain why firms conduct stock repurchases.

<sup>9</sup> We also experiment with alternative measures of free cash flow, such as operating income plus depreciation and net income plus depreciation. We find that these alternative measures yield qualitatively similar results to those reported in the paper. Following Fenn and Liang (2001), our free cash flow measure subtracts capital expenditures because they are outlays necessary to undertake positive net present value investments.

<sup>10</sup> We also conduct tests using raw returns and shorter return windows, such as 60 days prior to the repurchase. The results from these alternative tests are qualitatively similar to those reported in the paper.

Dittmar (2000) for a similar argument). Finally, with respect to the fraction of shares sought, larger repurchases may represent either a positive signal of undervaluation (Comment and Jarrell, 1991) or a large distribution of free cash, thus a positive relation is posited between the fraction of shares sought and announcement returns.

We also include a dummy variable that equals to 1 if the repurchasing firm belongs to a keiretsu. A keiretsu is a diverse group of firms interlinked through an extensive network of product–market and financial relationships, which is solidified through corporate cross-shareholdings (Nakatani, 1984; Prowse, 1990; Flath, 1993; Berglöf and Perotti, 1994; Kang and Shivdasani, 1995; Dewenter, Novaes, and Pettway, 2001). Because the keiretsu is a unique feature of the Japanese corporate finance environment and because keiretsu firms may participate in stock repurchases by their affiliated firms, we might see a keiretsu effect on our repurchase announcement returns. For example, because the close relationships among keiretsu firms can reduce information asymmetry and costs of financial distress for member firms, the keiretsu affiliation may have a positive effect on announcement returns.

We use Tobin's  $q$  as another explanatory variable in our regression model. For firms that have low future investment opportunities, the distribution of cash may potentially represent positive NPV decisions, so stock repurchases are good news for these firms' shareholders (Grullon and Michaely, 2004).

The regression model also includes year and industry dummies as additional control variables.<sup>11</sup> Because some firms conduct more than one repurchase during our sample period, the standard errors reported in our regression results are clustered by firm. Table 5 presents the regression results.<sup>12</sup>

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<sup>11</sup> For industry dummy variables, we use a 2-digit industry classification. In tests not reported here, we also experiment with 3- and 4-digit industry classifications and obtain results that are qualitatively similar to those reported in the paper.

<sup>12</sup> Because firms that have chosen to repurchase shares are not random samples, the estimated coefficients in Table 5 may be subject to sample selection bias (e.g., see Babenko, 2009; Li and McNally, 2007; Eckbo, Maksimovic and Williams, 1990; Li and Prabhala, 2007; Holmen and Nivorozhkin, 2008). To address this sample-selection issue, we employ a two-stage Heckman (1979) procedure, where we first estimate an inverse Mills ratio ( $\lambda$ ) using a Probit regression on a sample of repurchasing firms and nonrepurchasing firms, and then we include this estimate in our regressions of announcement returns. Untabulated tests show an insignificant coefficient on the inverse Mills ratio, while the signs and the magnitudes of coefficients on other explanatory variables are preserved. The

[Insert Table 5 Here]

We find that many independent variables that are successful to explain repurchase announcement returns in the U.S. do not explain repurchase announcement returns in Japan. The insignificance of the coefficients on the cash holding and free cash flow variables and the insignificance of the coefficients on the past year stock return and shares sought variables suggest that agency cost and signaling explanations play a much smaller role in Japanese stock repurchases than they do for U.S. repurchases. However, Kang and Stulz (1996) and Dewenter and Warther (1998) argue that Japanese firms enjoy reduced agency costs compared to U.S. firms mostly due to the presence of bank monitors in Japan. This argument suggests that using free cash flow variables alone to identify firms with agency costs may be insufficient to draw meaningful results in studies of Japanese firms. We conduct a more thorough investigation of this issue later in the paper (i.e., Table 8), where we identify firms with high agency costs as those with high free cash flow, low investment opportunities, and low bank monitoring.

The coefficient on the nonbank debt ratio is negative and statistically significant, but the coefficients on the main bank loan and other bank loan ratios are statistically insignificant. These results are consistent with those in Table 4. The results suggest the market is less concerned with the adverse effect of leverage related to borrowings from banks, as bank monitoring mitigates concerns related to financial distress risk. In contrast, because diffuse lenders have few incentives to monitor financial distress risk and the managerial behavior of repurchasing firms, the market reacts less positively to repurchase announcements by firms with higher nonbank debt ratios. The adverse effect of nonbank debt on announcement returns is also economically large. A one-standard deviation increase in the nonbank debt ratio decreases  $CARs(-1, 1)$  by 0.98%. Given that mean and median  $CARs(-1, 1)$  are 2.2% and 1.5% respectively, a one-standard deviation increase in the nonbank debt ratio can potentially cut observed mean and median announcement returns in half.<sup>13</sup>

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insignificance of the inverse Mills ratio suggests that OLS regressions that do not correct for sample-selection bias provide unbiased estimates, so we opt to report such OLS regression results in Table 5.

<sup>13</sup> As an alternative test of an effect of financial structure on announcement returns, we replace fiscal year-end debt ratios before the repurchase year (i.e.,  $t = -1$ ) with fiscal year-end debt ratios after the repurchase (i.e.,  $t = 1$ ). Again,



Main banks who serve as the largest creditors may want firms to maintain financial slack to safeguard their credit claims, thus they might have a strong incentive to discourage stock repurchases.<sup>14</sup> However, as large shareholders, main banks have financial incentives to maximize their equity value. Note that when investors hold both debt and equity, as Japanese banks do, they are like the fixed-fraction investors analyzed in Admati and Pfleiderer (1994), that is, investors who hold a fixed fraction of all the firm's securities and receive a fixed fraction of all of its payouts. Admati and Pfleiderer (1994) point out that if firms only have such investors, and if management cares about maximizing shareholder wealth, then these firms will always invest in positive net present value (NPV) projects. This is because such investors hold debt as well as equity, so any loss incurred to any one type of security from investing in a positive NPV project is offset by the gain that is accrued to the other type of security. As such, main banks as fixed-fraction investors have strong incentives to encourage and facilitate positive NPV stock repurchases. If main banks play the role of fixed-fraction investors as described in Admati and Pfleiderer (1994), the main bank's presence in repurchasing firms has the potential to send a positive signal to the market that the stock repurchase is a positive NPV project, where it is value-enhancing for equityholders while it does not increase firms' financial distress risk. Supporting this argument and consistent with univariate findings in Table 4, we find that the coefficient on equity ownership by main banks is positive and significant.<sup>15</sup> Thus, the market views the main bank that holds dual claims in its client firm's debt and equity as a credible monitor of the firm's financial distress risk and as a value-maximizing informed investor.

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we find that only the coefficient on the nonbank debt ratio is negative and significant. For brevity, these results are not reported in a table.

<sup>14</sup> We discuss this issue further in Section 3.2.

<sup>15</sup> It may not be the concentration of ownership by main banks that matters, but simply whether the main bank is one of large shareholders. Consistent with this interpretation, we find that a dummy variable that equals 1 if the main bank is also one of a firm's top ten shareholders is positively related to repurchase announcement returns. We thank a referee for pointing this out.

The coefficient on equity ownership held by other large shareholders is not significantly related to announcement returns.<sup>16</sup> Why would bank equity owners care about maximizing share value while other large equity owners do not? In Japan, main banks are often the explicit delegated monitors of firms (Aoki, Patrick, and Sheard, 1994; Sheard, 1989). Hoshi, Kashyap, and Scharfstein (1990) also argue that the main bank performs the role of an insurer, because implicit long-term contracts with the firm can create incentives to provide necessary assistance when its client firms are in financial trouble. These arguments suggest that main banks have strong incentives to monitor firms' financial distress risk and one way for main banks to realize returns for their monitoring efforts is to become large shareholders (Prowse, 1992). In contrast, Prowse (1992) shows that other large shareholders in Japan do not serve as monitors and so these shareholders may simply hold equity stakes to free-ride on main bank's monitoring. Alternatively, large nonbank shareholders may be more interested in some other benefits rather than maximizing share value (Lichtenberg and Pushner, 1994; Pushner, 1995). For example, large nonbank shareholders may own equity to maintain business relationships with their firms or to obtain control benefits from them. To the extent that this motivation for equity holdings is not detrimental to share value, their presence is not likely to engender either a negative or a positive market reaction when a firm announces a stock repurchase.

The coefficient on the keiretsu dummy variable is positive, as expected, but it is not statistically significant. This finding suggests that keiretsu membership does not play any significant role in firms' repurchase decisions.<sup>17</sup> Alternatively, the distinction between keiretsu and non-keiretsu firms may have blurred in recent years (Kim and Nofsinger, 2005), so a keiretsu affiliation has a less important effect during our sample period.

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<sup>16</sup> An alternative explanation for our positive abnormal returns surrounding repurchases is that repurchases lead to an increase in equity value simply by transferring value from debt holders to equity holders (Maxwell and Stephens, 2003). To the extent that this behavior is more likely among non-bank shareholders, our finding that the presence of other large shareholders is not engendering a positive market reaction surrounding repurchases can rule out this alternative explanation.

<sup>17</sup> Although the main bank relation is an important component of the keiretsu network, firms outside keiretsu groups also maintain ties to a main bank (Horiuchi, Packer, and Fukuda, 1988; Sheard, 1994). For example, in our sample of repurchasing firms, over one-third of the firms have a main bank but do not belong to a keiretsu. Thus, the lack of statistical significance on the keiretsu dummy variable does not undermine our findings related to the importance of the main bank relation.

Finally, we find that Tobin's  $q$  is negatively related to announcement returns. This result is consistent with that of Grullon and Michaely (2004) who find that U.S. firms with low future investment opportunities (i.e., low Tobin's  $q$ ) have larger announcement returns. As an alternative test of this explanation, in Model (2) we replace Tobin's  $q$  with the change in fixed assets from the year prior to the repurchase to two years thereafter, normalized by total assets in the year before the repurchase.<sup>18</sup> We again find that this variable is negatively and significantly related to announcement returns, suggesting that firms with fewer future investment opportunities experience positive returns when they use excess cash to repurchase stock.

We conduct an additional set of regression tests on announcement returns. Table 5 showed that announcement returns for repurchasing firms are negatively associated with their nonbank debt ratio. This finding suggests that repurchasing firms with high nonbank debt ratios have less positive market reactions possibly due to a potential increase in financial distress risk. However, a more direct test of this argument would be to examine if firms with higher nonbank debt *and* higher financial distress risk are the ones with lower announcement returns. In Table 6, we report regression results where we use interaction terms between debt ratios and proxy measures for financial distress risk to demonstrate that announcement returns are indeed lower for firms with higher debt ratios that are also perceived to have higher financial distress risk. To measure the extent of a firm's financial distress risk, we create seven dummy variables, each equal to 1 if (a) the firm size measured by total assets is above the sample median (high size dummy), (b) the percentage of shares sought is above the sample median (high percentage of shares sought dummy), (c) the standard deviation of daily returns for an one-year period prior to the repurchase announcement date is above the sample median (high standard deviation dummy), (d) the fixed assets ratio is above the sample median (high fixed assets dummy), (e) the earnings over interest ratio is above the sample median (high EBIT to interest dummy), (f) the operating income is negative (negative EBIT

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<sup>18</sup> Due to potential endogeneity problem, we also try the change in fixed assets from three years before the repurchase to the year before the repurchase, and find similar results to those reported in the table.

dummy), and (g) the total debt-to-equity ratio is above the sample median (high total debt to total equity dummy).

[Insert Table 6 Here]

Model (1) of Table 6 shows that the coefficient on the interaction term between the nonbank debt ratio and the high size dummy is insignificant. Because smaller firms have less debt capacity and are riskier in general, we would expect that small firms with a high level of debt (particularly nonbank debt) have less positive announcement returns; however, our results do not support this view.

In Model (2), however, we find that the coefficient on the interaction term between the nonbank debt ratio and the high percentage of shares sought dummy is negative and significant. It appears that the market disfavors firms that repurchase a large amount of outstanding equity when the firm already has a high nonbank debt ratio. This result suggests that concerns related to financial distress risk are an important determinant of repurchase announcement returns in Japan.

Model (3) provides corroborating evidence. The interaction term between the nonbank debt ratio and the high standard deviation dummy is negative and significant, indicating that repurchases by firms with high nonbank debt and high total risk are also viewed less positively by the market. When firms are unable to generate stable and certain cash flows to cover interest and principle payments on their debt, then debt renegotiations may have to occur, a task that is more difficult for public debt than it is for private bank debt. Note also that the coefficients on nonbank debt are no longer statistically significant in Models (2) and (3), indicating that the negative impact of nonbank debt on announcement returns in Table 5 is largely due to risky firms with high nonbank debt that repurchase a relatively large amount of outstanding equity.

In Models (4) and (5) of Table 6, we see that the coefficient on the interaction term between the nonbank debt ratio with the high fixed assets dummy (Model (4)) and the interaction term between the nonbank debt ratio with the high earnings to interest dummy (Model (5)) are both positive and significant. We would expect that a high level of collateralizable assets and a high earnings to interest ratio mitigate the negative effect the firm's leverage has on its announcement returns, as a high level of collateralizable

assets and a high earnings to interest ratio increase a firm's debt capacity and lower financial distress risk, and, indeed, we see results that support these claims. Note that the magnitudes of the regression coefficients on the interaction terms largely offset the magnitudes of the regression coefficients on the nonbank debt ratios.

Model (6) shows that firms with negative operating earnings and with high levels of nonbank loans (and also high levels of other bank loans) have lower announcement returns. Finally, Model (7) shows that when a firm has a high debt to equity ratio in general, the market reacts more negatively when the firm's debt composition consists of high nonbank debt.

Overall, the results in Table 6 suggest that the consequential increase in financial distress risk is a concern when highly levered firms with greater financial distress risk repurchase stocks. However, the adverse effect of high leverage is mitigated when firms have greater collateralizable assets and higher earnings to interest ratios. These results, however, are primarily restricted to the firm's nonbank debt. We do not find such results for main bank debt. Thus, the market does not seem to be concerned with the firm's main bank debt ratio despite the overall increase in the debt ratio that stock repurchases cause. This finding is consistent with the view that banks, especially main banks, are able to mitigate some of the distortions to optimal financing decisions induced by financial distress risk.

While our findings that bank debt does not affect market reactions are consistent with the hypothesis that banks are effective monitors of financial distress risk, we recognize that these findings are also consistent with the following alternative hypothesis (ease of renegotiation hypothesis): If the repurchasing firm subsequently enters financial distress, it is much more likely to be able to renegotiate concentrated bank debt than widely held debt. Thus, the market is less likely to be concerned with a firm's high bank debt than its high nonbank debt. To distinguish between the monitoring hypothesis and this ease of renegotiation hypothesis, we conduct a Probit regression, where the dependent variable is equal to one if the bank loan ratio increases from year -1 to year +1, and zero otherwise. We use three variables as our key explanatory variables that measure the extent of a firm's financial distress: coverage ratio (EBIT/interest), risk (standard deviation of daily stock returns), and leverage (high debt to equity

dummy that is equal to one if the firm has a debt-to-equity ratio above the sample median, and zero otherwise). These results are reported in Table 7.

[Insert Table 7 Here]

We find that main banks and other banks do not increase their lending to firms with low coverage ratios, high risk, and high leverage. These results are consistent with the view that banks are monitoring financial distress risk (i.e., they are less likely to lend to risky firms). In contrast, an ease of renegotiation hypothesis predicts opposite coefficient signs on these variables.

We conduct one final test on announcement returns. Firms with low investment opportunities and high free cash flows are indicative of firms with high agency problems. If the market views main banks and/or other concentrated owners as monitors of repurchasing firm's agency problems, we would expect repurchase announcements by firms with high agency problems *and without* strong monitors to be greeted more positively by the market. To identify firms with high agency problems, we create a high free cash flow dummy variable that is equal to one if a firm's free cash flow (operating earnings plus depreciation minus capital expenditures) is above the sample's bottom quartile and interact it with the inverse of Tobin's q. We use the inverse of Tobin's q, so the larger the interaction term, the higher is the firm's agency cost. Lang, Stulz, and Walkling (1991) and Opler and Titman (1993) also identify firms with high free cash flow and low Tobin's q as firms with high agency problems. We then interact this agency cost variable with a dummy variable that indicates firms without a strong monitor. Specifically, we use four such dummy variables to identify firms without a strong monitor. Dummy 1 is equal to one if the ratio of main bank loans to total assets is below the sample's top quartile (low main bank loan dummy). Dummy 2 is equal to one if the ratio of other bank loans to total assets is below the sample's top quartile (low other bank loan dummy). Dummy 3 is equal to one when a firm does not have a main bank as a large shareholder (no main bank equity ownership dummy). Dummy 4 is equal to one if equity ownership by top 10 shareholders excluding the main bank is below the sample's top quartile (low non-main bank equity ownership dummy). If repurchases are a means of controlling agency conflicts, then their value in minimizing agency costs should be greater in firms without a strong monitor. Therefore, we expect our

interaction terms to be positively related to announcement returns. Because a firm has to satisfy three criteria (i.e., we are interacting three variables) to be identified as a high agency cost firm without a strong monitor, we use a three-quarters cutoff when we create our free cash flow dummy and dummy variables for the existence of a strong monitor. These liberal definitions increase a firm's chance of meeting all three criteria. Using median cutoffs for dummy variables yields similar results but weaker statistical significance. Results are reported in Table 8.

[Insert Table 8 Here]

We find that firms with high agency problems and with (i) low main bank debt (Model (1)), (ii) low other bank debt (Model (2)), and (iii) no main banks as large shareholders (Model (3)) have more positive repurchase announcement returns.<sup>19</sup> These findings are consistent with the view that if the market views banks as monitors of repurchasing firm's agency problems, and if repurchases are also a means of controlling agency conflicts, then their value in minimizing agency costs should be greater in firms without a strong monitor. Model (4) shows that the absence of large nonbank shareholders in high agency cost firms does not have any statistically discernable effects on repurchase announcement returns.

### *3.2. Determinants of the stock repurchase decision*

In this section, we examine determinants of the firm's repurchase decision using a Tobit regression. Following Dittmar (2000), who uses both repurchasing and nonrepurchasing firms as her study sample, we also use all repurchasing and nonrepurchasing firms listed on the Tokyo Stock Exchange from 1998 to 2000 for which we have complete data.<sup>20</sup> We run a Tobit regression on the combined sample, where the dependent variable is the yen value of the shares sought in the repurchase

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<sup>19</sup> As we discussed in a previous section, when it comes to the main bank as an important equityholder, what matters is whether the main bank is one of the large shareholders, not its concentrated ownership in a firm. Consistent with this view, we find that the coefficient on an interaction term that uses a main bank equity ownership dummy based on a three-quarters cutoff is not statistically significant.

<sup>20</sup> We exclude sample years 1995-1997 from the Tobit analysis because very few firms repurchased stocks during those early years when repurchases were first allowed. When firms from 1995-1997 are included in the regression, the results are similar to our reported results.

divided by the firm's market value of equity.<sup>21</sup> For nonrepurchasing firms, the dependent variable is set to zero. Because we are using panel data, we again cluster standard errors by firm in our regression tests.

The explanatory variables we use in the Tobit regression are the same as those used in Table 5, but with two exceptions. First, following Dittmar (2000), we make a necessary adjustment to the past excess returns variable. In the CAR model, we estimated the past excess returns from day -205 to day -5. However, because nonrepurchasers do not have an "event day" per se, we use sample firms' past calendar-year excess returns in the Tobit model. Second, we include the payout ratio (dividends paid / net income) as an additional explanatory variable. If repurchases serve as a payout policy that substitutes for dividends, perhaps because of either their lower tax burdens or their greater flexibility in payout (Jagannathan, Stephens, and Weisbach, 2000; Grullon and Michaely, 2002), then the payout ratio is expected to be negatively related to the percentage of shares sought.

From our perspective, the key explanatory variables of interest are the debt ratios and equity ownership by main banks. If stock repurchases increase financial distress risk, firms with more debt are less likely to repurchase stocks. That is, we expect a negative relation between the firm's debt ratios and the percentage of shares sought in the repurchase. However, if a main bank plays an important monitoring role as an informed intermediary and is a large shareholder, then it might have strong incentives to influence the firm to engage actively in value-enhancing repurchasing activities. Thus, we expect firms with more equity held by main banks to be more willing to repurchase stock.

[Insert Table 9 Here]

Tobit regression results are reported in Table 9.<sup>22</sup> We see that cash holdings are not significant in Models (1) and (2). The free cash flow variable is negatively related to the percentage of shares sought in

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<sup>21</sup> The yen value of shares sought is calculated as total shares sought multiplied by the firm's stock price three days prior to the repurchase announcement day.

<sup>22</sup> We include fixed effects (year and industry dummies) in our Tobit regression. Greene (2004a, 2004b) points out that using fixed effects in limited dependent variable models induces a bias in coefficient estimates. To examine if a possible estimation bias exists in our Tobit regression, we estimate Tobit models without fixed effects for the entire panel. We also estimate our Tobit model by year, by industry, and by both. Overall, we find that our reported results stay intact. We also conduct a similar series of diagnostic tests on our earlier Probit results in Table 7 and find little evidence on estimation bias. We acknowledge a referee for pointing this issue out to us.



both models. Thus, consistent with our previous findings on announcement returns, the desire to distribute free cash does not seem to motivate stock repurchases in Japan. Past excess returns, however, is negatively and significantly related to the percentage of shares sought, suggesting that firms experiencing a decline in stock returns are more likely to repurchase stock. This result is consistent with a signaling motivation for repurchases. The signal, however, does not seem to be credible in conveying undervaluation because the results from the announcement return analysis in the previous section show a positive association between announcement returns and past excess returns. We find that firm size is positively associated with the percentage of shares sought. Dittmar (2000) also finds the same result for U.S. firms. To the extent that smaller firms have greater information asymmetry, the signaling hypothesis predicts that smaller firms are more likely to repurchase stock. Overall, therefore, our results lend only limited support for a signaling explanation of repurchases.

The payout ratio is not significantly related to the percentage of shares sought in Models (1) and (2). The standard deviation of daily returns for a one year period prior to the repurchase is negatively related to the percentage of shares sought in Model (2). In contrast, Jagannathan, Stephens, and Weisbach (2000) find that U.S. firms with volatile earnings prefer conducting repurchases to paying out dividends. Jagannathan, Stephens, and Weisbach (2000) and Grullon and Michaely (2002) also find that U.S. firms use repurchases as a substitute for dividends, as repurchases represent flexible payouts whereas sticky dividends do not. Our finding of an insignificant relation between the payout ratio and the percentage of shares sought for Japanese firms, however, is not surprising given that Dewenter and Warther (1998) find that Japanese firms do not adhere to strict dividend payouts from year to year.

Most important, we find that firms with high debt ratios—regardless of whether it is main bank debt, other bank debt, or nonbank debt—are less likely to conduct a stock repurchase. This result suggests that an increase in financial distress risk associated with an increase in leverage ratios discourages highly levered firms from conducting stock repurchases. The result also suggests that both banks and other creditors are safeguarding their claims. That is, to protect their debt claims, both banks and other debtholders prefer firms to maintain financial slack and not to increase their leverage ratios when their

debt claims are large. However, our results show that the negative propensity to repurchase stock is strongest for main bank debt (the regression coefficient on this variable is, respectively, -0.279 and -0.252 in Models (1) and (2)) and weakest for nonbank debt (the regression coefficient on this variable is, respectively, -0.173 and -0.143 in Models (1) and (2)), indicating that main banks are more active in monitoring firms' financial distress risk than are diffuse creditors. Aoki (1990) argues that the main bank plays the role of a manager of a loan consortium in obtaining financing for its client firms. Hoshi, Kashyap, and Scharfstein (1990) also argue that the main bank performs the role of an insurer when its client firms are in financial trouble. These arguments suggest that main banks have greater concerns about firms' financial distress risk than other banks, and thus allow firms to repurchase stocks only when stock repurchases potentially represent positive NPV events, and do not increase firms' financial distress risk.<sup>23</sup>

We also find, in Models (1) and (2), the coefficients on equity ownership by main banks are positive and significant. Thus, main banks as large equityholders influence firms to conduct repurchases that enhance their equity values. This result also shows the different motive that main banks face when they are large equityholders, as opposed to when they are large creditors. To further examine this difference in motive that the main bank faces, in Models (3) and (4), we include a dummy variable that equals to one if the main bank is both a firm's largest creditor and its largest equityholder. We find that the coefficient on this dummy is insignificant, suggesting that the main bank as both the largest creditor and the largest equityholder neither encourages nor discourages stock repurchases. Thus, main banks that serve as both the largest creditors and the largest shareholders seem to face a trade-off between enhancing their equity value and endangering their credit claims. When firms with main banks conduct stock repurchases, we can infer that they do so because the trade-off in these circumstances results in a net benefit to the main bank. The event study results corroborate this conjecture, as equity ownership by main banks is positively related to repurchase announcement returns while bank debt is not significantly related to repurchase announcement returns. We also find that coefficients on equity ownership by the top ten

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<sup>23</sup> Nakatani (1984), Weinstein and Yafeh (1998), and Kang and Liu (2007) also show that banks encourage client firms to adopt policies to safeguard their client firms' debt claims.

largest shareholders excluding main banks are negative and significant. If stock repurchases are value-enhancing decisions, this result may be consistent with Lichtenberg and Pushner (1994) and Pushner (1995), who show that nonfinancial institutional shareholders in Japan do not actively pursue efforts to enhance share value.<sup>24</sup> Finally, we find that Tobin's  $q$  and the subsequent change in fixed assets are significantly and negatively related to shares sought. These results suggest that firms that expect deterioration in future investment opportunities are more likely to conduct stock repurchases.

#### **4. Summary and conclusions**

Using a sample of 793 stock repurchases in Japan, this paper examines the effects that bank relations have on stock repurchases. We find positive and statistically significant abnormal returns surrounding the announcement of Japanese stock repurchases, consistent with prior U.S. findings. In cross-sectional analysis, however, we find that typical agency cost and signaling variables that have been posited to explain repurchase announcement returns for U.S. firms do not explain repurchase announcement returns for Japanese firms. Instead, we find that repurchase announcement returns for Japanese firms are negatively related to their nonbank debt ratios. This result suggests that the market is concerned about financial distress risk when high nonbank debt firms repurchase stock. We do not find such a negative relation between a firm's bank debt ratio and announcement returns. Thus, the market appears to be less concerned with financial distress risk when the firm has a high level of bank debt, indicating that investors perceive large bank lenders to be effective monitors of financial risk. We also find higher announcement returns when a main bank holds a larger equity stake in repurchasing firms. All of these results are consistent with the view that the presence of informed claimholders such as main banks as both debtholders and equity blockholders (i.e., as fixed-fraction investors) represent important

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<sup>24</sup> Lichtenberg and Pushner (1994) and Pushner (1995) argue that Japanese firms with large equity ownership by nonfinancial (i.e., corporate) shareholders tend to be insulated from external discipline such as bank monitoring. This lack of monitoring may not encourage managers to always pursue value maximizing actions. Consistent with this view, our results indicate that managers of Japanese firms with large equity ownership by nonfinancial shareholders have few incentives to engage in stock repurchases. This does not mean, however, that these shareholders actively seek to destroy share value. Our earlier regression results for repurchase announcement returns show that the presence of large nonfinancial shareholders does not engender a negative market reaction.

monitors for their client firms and also active facilitators of shareholder value-enhancing financing policies.

We also identify the determinants of the repurchase decision using a Tobit model. Again, we find weak support for U.S. explanations for repurchase decisions. Instead, we find that debt ratios are negatively and significantly associated with the percentage of shares sought. However, when a bank is a large shareholder of the firm, the firm is more likely to repurchase a large percentage of shares. These results, together with the findings of the announcement returns, suggest that firms with close ties to banks are able to overcome the concerns related to financial distress risk arising from stock repurchases while pursuing value-enhancing repurchases. Overall, the results in our paper show the importance and benefits of bank relations in stock repurchase decisions in Japan.

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**Table 1**  
**Distribution of repurchases by industry and by year**

The sample consists of 793 stock repurchase announcements made by Japanese nonfinancial firms listed on the Tokyo Stock Exchange from 1995 to 2000. The repurchase announcement date is obtained from the “Repurchase Announcements” section in the *Nihon Keizai Shimbun*, which is equivalent to the *Wall Street Journal* in Japan.

By industry	By year						Total
	1995	1996	1997	1998	1999	2000	
Agriculture, fishery and mining	0	0	0	0	1	2	3
Construction	0	1	0	25	4	12	42
Manufacturing	1	4	18	309	108	124	564
Wholesales and retail	0	1	3	66	21	31	122
Real estate	0	0	0	3	1	4	8
Transportation and communication	0	0	2	17	7	7	33
Electric power and gas	0	0	0	2	0	2	4
Services	0	0	1	16	0	0	17
<b>Total</b>	<b>1</b>	<b>6</b>	<b>24</b>	<b>438</b>	<b>142</b>	<b>182</b>	<b>793</b>

**Table 2**  
**Sample characteristics**

The sample consists of 793 stock repurchase announcements made by Japanese nonfinancial firms listed on the Tokyo Stock Exchange from 1995 to 2000. The repurchase announcement date is obtained from the “Repurchase Announcements” section in the *Nihon Keizai Shimbun*, which is equivalent to the *Wall Street Journal* in Japan. All financial statements data are measured at the fiscal year-end that immediately precedes the repurchase announcement date. Free cash flow is measured by operating earnings plus depreciation minus capital expenditures. Past 1 year excess return is a buy-and-hold return from 205 days to 5 days before the repurchase announcement, net of an equally-weighted market return. Past 1 calendar-year excess return is the equally-weighted market adjusted return for the prior calendar year. EBIT/interest is the ratio of operating income to interest expenditures. Tobin’s q is the ratio of the market value of equity plus the book value of debt to the book value of total assets. Fixed assets (-1, 2) is the change in fixed assets from the year before the repurchase to two years thereafter.

Variables	Mean	Median	Stdev	Q1	Q3
Panel A: Firm characteristics					
Total assets (in billions)	296.034	97.008	814.843	52.903	224.717
Cash and marketable securities / total assets	0.175	0.152	0.106	0.098	0.227
Free cash flow / total assets	0.061	0.060	0.032	0.040	0.080
Past 1 year returns	-0.077	-0.093	0.313	-0.239	0.055
Past 1 calendar year returns	-0.125	-0.173	0.356	-0.368	0.054
Standard deviation of 1 yr daily stock return	0.029	0.029	0.007	0.024	0.033
Fixed assets / total assets	0.280	0.259	0.144	0.186	0.348
EBIT / interest	62.111	6.467	617.875	2.550	20.593
Tobin's q	1.085	0.976	0.631	0.837	1.141
Fixed assets (-1,2) / total assets (-1)	0.001	-0.004	0.066	-0.027	0.016
Main bank loan to total assets ratio	0.027	0.014	0.034	0.000	0.044
Other bank debt to total assets ratio	0.097	0.062	0.114	0.004	0.145
Nonbank debt to total assets ratio	0.353	0.354	0.139	0.253	0.455
% equity owned by top10 owners	41.939	39.484	10.908	34.456	47.787
% equity owned by main bank	2.937	4.096	2.153	0.000	4.828
% equity owned by top10 owners excluding main bank	39.002	36.485	11.391	31.225	44.758
Panel B: Repurchase characteristics					
% shares sought	5.267	2.986	5.965	1.180	9.757
Value of repurchase (in millions of yen)	7.624	1.498	21.716	0.456	4.755
Value of repurchase / market value of equity	5.584	3.342	5.915	1.200	9.186
Total yen dividend (in thousands of yen)	29.251	7.925	105.868	4.029	18.547
Payout ratio (dividend / net income)	0.007	0.005	0.014	0.003	0.008

**Table 3**  
**Daily abnormal returns (AR) and cumulative abnormal returns (CAR) around repurchase announcement dates**

The sample consists of 793 stock repurchase announcements made by Japanese nonfinancial firms listed on the Tokyo Stock Exchange (TSE) from 1995 to 2000. The repurchase announcement date is obtained from the “Repurchase Announcements” section in the *Nihon Keizai Shimbun*, which is equivalent to the *Wall Street Journal* in Japan. We compute abnormal daily returns using the market model. We estimate the market model by using 200 trading days of return data ending 21 days before the repurchase announcement. We use PACAP equally weighted market returns as the benchmark. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: ARs around the announcement day				
Day	Mean	<i>p</i> -value	Median	<i>p</i> -value
-10	-0.0003	0.762	-0.001	0.625
-9	-0.002*	0.097	-0.001**	0.023
-8	-0.001	0.612	-0.001	0.193
-7	-0.001	0.257	-0.001	0.133
-6	-0.002*	0.085	-0.002**	0.036
-5	-0.002*	0.051	-0.001**	0.046
-4	-0.0004	0.709	-0.001*	0.083
-3	0.001	0.486	-0.0004	0.700
-2	0.003***	0.006	-0.001	0.483
-1	0.005***	0.001	0.001**	0.041
0	0.012***	0.000	0.007***	0.000
1	0.005***	0.000	0.001**	0.017
2	-0.001	0.457	-0.002**	0.049
3	0.002**	0.049	-0.0001	0.535
4	-0.0002	0.862	-0.001	0.193
5	0.0004	0.680	-0.001	0.944
6	0.0003	0.743	-0.001	0.831
7	-0.001	0.565	-0.0004	0.321
8	0.001	0.182	-0.001	0.986
9	0.001	0.612	-0.002	0.301
10	-0.001	0.359	-0.001*	0.093
Panel B: CARs around the announcement day (AD)				
Event window	Mean	<i>p</i> -value	Median	<i>p</i> -value
(AD -10, AD -2)	-0.004	0.191	-0.005**	0.037
(AD -1, AD 0)	0.017***	0.000	0.012***	0.000
(AD -1, AD 1)	0.022***	0.000	0.015***	0.000
(AD -5, AD 1)	0.023***	0.000	0.017***	0.000
(AD -5, AD 5)	0.025***	0.000	0.014***	0.000
(AD -10, AD 10)	0.020***	0.000	0.012***	0.000
(AD 0, AD 5)	0.018***	0.000	0.010***	0.000
(AD 1, AD 10)	0.007**	0.011	0.0001	0.202

**Table 4**  
**Cumulative abnormal returns (-1, 1) for Japanese repurchasing firms categorized by financial structure and ownership distribution**

The sample consists of 793 stock repurchase announcements made by Japanese nonfinancial firms listed on the Tokyo Stock Exchange (TSE) from 1995 to 2000. The repurchase announcement date is obtained from the “Repurchase Announcements” section in the *Nihon Keizai Shimbun*, which is equivalent to the *Wall Street Journal* in Japan. We compute abnormal daily returns from the day before the repurchase announcement to the day after the announcement using the market model, CAR(-1,1). We estimate the market model by using 200 trading days of return data ending 21 days before the repurchase announcement. We use PACAP equally weighted market returns as the benchmark. In Panel A, the sample is divided into quartiles based on the repurchasing firms’ debt ratios and equity ownership. The subsample with the highest debt ratio or highest equity ownership is Subsample (A) and the subsample with the lowest debt ratio or lowest equity ownership is Subsample (D). The sample size is in parentheses. The test-of-difference columns report *p*-values for the test of equality of means and *p*-values for the test of equality of medians. In Panel B, we construct a 4x4 sort on the main bank debt ratio and main bank equity ownership and report mean and median (in brackets) CARs in each portfolio. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Mean and median CARs(-1,1) by debt ratio and equity ownership												
Variables	Q1 - highest (A)		Q2 (B)		Q3 (C)		Q4 - lowest (D)		Test of difference (A) - (D)			
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Dif. mean	<i>t</i> -test	Dif. median	Z-test
Total debt ratio	0.020*** (n = 198)	0.010***	0.023*** (n = 198)	0.013***	0.022*** (n = 199)	0.018***	0.024*** (n = 198)	0.016***	-0.004	0.535	-0.006	0.154
Main bank loan ratio	0.027*** (n = 199)	0.014***	0.025*** (n = 198)	0.014***	0.024*** (n = 151)	0.018***	0.015*** (n = 245)	0.011***	0.012	0.064*	0.003	0.162
Other bank debt ratio	0.026*** (n = 198)	0.009***	0.025*** (n = 199)	0.019***	0.020*** (n = 198)	0.016***	0.018*** (n = 198)	0.014***	0.008	0.258	-0.005	0.482
Nonbank debt ratio	0.013*** (n = 198)	0.010***	0.026*** (n = 200)	0.019***	0.022*** (n = 198)	0.016***	0.028*** (n = 197)	0.014***	-0.015	0.026**	-0.004	0.088*
% equity owned by top10 owners	0.019*** (n = 198)	0.014***	0.028*** (n = 199)	0.020***	0.020*** (n = 197)	0.015***	0.022*** (n = 199)	0.013***	-0.003	0.666	0.001	0.487
% equity owned by main bank	0.026*** (n = 199)	0.017***	0.024*** (n = 198)	0.016***	0.029*** (n = 143)	0.019***	0.014*** (n = 253)	0.011***	0.012	0.031**	0.006	0.034**
% equity owned by top10 owners excluding main bank	0.020*** (n = 197)	0.013***	0.021*** (n = 200)	0.017***	0.024*** (n = 198)	0.016***	0.024*** (n = 198)	0.013***	-0.004	0.600	0.000	0.435

Panel B: Mean and median CARs(-1, 1) by main bank loan ratio and equity ownership by main bank

Main bank loan ratio	Equity ownership by main bank			
	Q1 - highest	Q2	Q3	Q4 - lowest
Q1 - highest	0.028*** [0.016***] (n = 89)	0.032*** [0.013***] (n = 74)	0.016 [0.014] (n = 34)	-0.004 [-0.004] (n = 2)
Q2	0.025*** [0.015***] (n = 71)	0.017** [0.013**] (n = 76)	0.039*** [0.022***] (n = 51)	N/A [N/A] (n = 0)
Q3	0.026*** [0.018***] (n = 39)	0.021*** [0.020***] (n = 48)	0.029*** [0.021***] (n = 58)	-0.012 [-0.039] (n = 6)
Q4 - lowest	N/A [N/A] (n = 0)	N/A [N/A] (n = 0)	N/A [N/A] (n = 0)	0.015*** [0.011***] (n = 245)

**Table 5**  
**Ordinary least squares regressions of cumulative abnormal returns (-1, 1)**

The sample consists of 793 stock repurchase announcements made by Japanese nonfinancial firms listed on the Tokyo Stock Exchange (TSE) from 1995 to 2000. The repurchase announcement date is obtained from the “Repurchase Announcements” section in the *Nihon Keizai Shinbun*, which is equivalent to the *Wall Street Journal* in Japan. We estimate the market model by using 200 trading days of return data ending 21 days before the repurchase announcement. We use PACAP equally weighted market returns as the benchmark. Free cash flow is measured by operating earnings plus depreciation minus capital expenditures. Past 1 year excess return is a buy-and-hold return from day -205 to day -5, net of an equally-weighted market return. EBIT/interest is the ratio of operating income to interest expenditures. A *keiretsu* firm is a firm that belongs to one of the six *keiretsu* groups. Tobin’s q is the ratio of the market value of equity plus the book value of debt to the book value of total assets. Fixed assets (-1, 2) is the change in fixed assets from the year before the repurchase to two years thereafter. The number in parentheses denotes the standard error clustered by firm. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Independent variables	(1)	(2)
Intercept	0.035 (0.036)	0.045 (0.036)
Cash and marketable securities / total assets	-0.008 (0.024)	-0.005 (0.024)
Free cash flow / total assets	-0.013 (0.097)	-0.100 (0.084)
Past 1 year excess return	0.013 (0.013)	0.015 (0.013)
log (total assets in 000s)	-0.326 (2.338)	-2.124 (2.281)
% shares sought	0.054 (0.042)	0.040 (0.049)
Standard deviation of 1 yr daily stock return	0.564 (0.519)	0.467 (0.479)
Fixed assets / total assets	0.007 (0.023)	0.009 (0.022)
EBIT / interest	0.000 (0.000)	0.000 (0.000)
Main bank loan to total assets ratio	-0.071 (0.118)	-0.059 (0.120)
Other bank debt to total assets ratio	-0.015 (0.038)	0.001 (0.037)
Nonbank debt to total assets ratio	-0.082*** (0.024)	-0.064** (0.025)
% equity owned by main bank	0.240* (0.133)	0.237* (0.134)
% equity owned by top10 owners excluding main bank	-0.001 (0.023)	-0.003 (0.023)
Keiretsu dummy	0.006 (0.006)	0.007 (0.006)
Tobin's q	-0.007** (0.003)	
Fixed assets (-1,2) / total assets (-1)		-0.119** (0.047)
Year dummies	yes	yes
Industry dummies	yes	yes
Adjusted R-squared	0.053	0.063
No. of observations	793	793

**Table 6**  
**Ordinary least squares regressions of cumulative abnormal returns (-1, 1) on interaction terms**  
**between debt ratios and proxies for financial distress risk**

The sample consists of 793 stock repurchase announcements made by Japanese nonfinancial firms listed on the Tokyo Stock Exchange (TSE) from 1995 to 2000. The repurchase announcement date is obtained from the “Repurchase Announcements” section in the *Nihon Keizai Shimbun*, which is equivalent to the *Wall Street Journal* in Japan. We estimate the market model by using 200 trading days of return data ending 21 days before the repurchase announcement. We use PACAP equally weighted market returns as the benchmark. Free cash flow is measured by operating earnings plus depreciation minus capital expenditures. Past 1 year excess return is a buy-and-hold return from day -205 to day -5, net of an equally-weighted market return. EBIT/interest is the ratio of operating income to interest expenditures. Fixed assets (-1, 2) is the change in fixed assets from the year before the repurchase to two years thereafter. The high size dummy equals 1 if total assets are above the sample median. The high percentage of shares sought dummy equals 1 if the percentage of shares sought is above the sample median. The high standard deviation dummy equals 1 if the standard deviation of daily returns for a 1-year period prior to the repurchase announcement date is above the sample median. The high fixed assets dummy equals 1 if the fixed assets ratio is above the sample median. The high EBIT to interest dummy equals 1 if EBIT/interest is above the sample median. A keiretsu firm is a firm that belongs to one of the six keiretsu groups. The number in parentheses denotes the standard error clustered by firm. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Intercept	0.029 (0.025)	0.023 (0.039)	0.043 (0.033)	0.048 (0.035)	0.056 (0.040)	0.029 (0.036)	0.026 (0.040)
Cash and marketable securities / total assets	-0.007 (0.024)	-0.009 (0.025)	-0.002 (0.024)	-0.013 (0.024)	-0.005 (0.024)	0.003 (0.024)	-0.000 (0.026)
Free cash flow / total assets	-0.011 (0.096)	0.048 (0.102)	-0.001 (0.101)	0.013 (0.090)	0.065 (0.103)	0.029 (0.107)	-0.028 (0.105)
Past 1 year returns	0.012 (0.014)	0.013 (0.014)	0.013 (0.013)	0.013 (0.013)	0.013 (0.013)	0.014 (0.013)	0.013 (0.013)
log (total assets in 000s)		-1.277 (2.457)	-1.139 (2.400)	-0.498 (2.289)	-0.367 (2.372)	0.055 (0.042)	0.058 (0.042)
% shares sought	0.053 (0.043)		0.054 (0.044)	0.060 (0.041)	0.058 (0.041)	-0.765 (2.303)	-0.309 (2.340)
Standard deviation of 1 yr daily stock return	0.589 (0.523)	0.664 (0.548)		0.611 (0.509)	0.519 (0.519)	0.620 (0.508)	0.702 (0.533)
Fixed assets / total assets	0.008 (0.024)	0.002 (0.024)	0.008 (0.023)		0.000 (0.024)	0.007 (0.024)	0.003 (0.024)
EBIT / interest	-0.001 (0.002)	0.0003 (0.001)	-0.001 (0.001)	-0.001 (0.002)			-0.0003 (0.001)
Main bank loan to total assets ratio: a	-0.061 (0.144)	-0.044 (0.126)	-0.113 (0.108)	-0.137 (0.186)	-0.043 (0.131)	-0.059 (0.122)	-0.345 (0.177)
Other bank loan to total assets ratio: b	-0.029 (0.054)	-0.034 (0.042)	-0.017 (0.033)	0.008 (0.067)	-0.041 (0.043)	0.000 (0.038)	0.064 (0.105)
Nonbank debt to total assets ratio: c	-0.081** (0.031)	-0.036 (0.029)	-0.040 (0.026)	-0.111*** (0.032)	-0.116*** (0.034)	-0.067*** (0.025)	-0.064** (0.032)
% equity owned by main bank	0.238* (0.134)	0.269** (0.130)	0.243* (0.132)	0.232* (0.131)	0.260* (0.134)	0.208 (0.132)	0.206 (0.136)
% equity owned by top10 owners excluding main bank	0.001 (0.023)	-0.002 (0.023)	-0.003 (0.023)	0.000 (0.023)	-0.004 (0.023)	-0.010 (0.023)	-0.003 (0.023)
Keiretsu dummy	0.006 (0.006)	0.005 (0.006)	0.007 (0.006)	0.008 (0.006)	0.005 (0.006)	0.006 (0.006)	0.006 (0.006)
Tobin's q	-0.007** (0.003)	-0.008** (0.003)	-0.007** (0.003)	-0.007** (0.003)	-0.007** (0.003)	-0.007** (0.003)	-0.007** (0.003)

High size dummy: d	0.001 (0.015)						
High percentage of shares sought dummy: e		0.028 (0.017)					
High standard deviation dummy: f			0.022 (0.014)				
High fixed assets dummy: g				-0.023 (0.016)			
High EBIT to interest dummy: h					-0.029* (0.017)		
Negative EBIT dummy: i						0.072*** (0.018)	
High total debt to total equity dummy: j							0.049** (0.024)
a*d	0.033 (0.223)						
b*d	0.013 (0.069)						
c*d	-0.007 (0.039)						
a*e		-0.089 (0.225)					
b*e		0.072 (0.051)					
c*e		-0.060* (0.035)					
a*f			0.093 (0.178)				
b*f			0.013 (0.050)				
c*f			-0.066* (0.035)				
a*g				0.113 (0.210)			
b*g				-0.044 (0.074)			
c*g				0.072* (0.040)			
a*h					-0.337 (0.224)		
b*h					0.072 (0.095)		
c*h					0.062* (0.037)		
a*i						0.371 (0.343)	
b*i						-0.328* (0.188)	
c*i						-0.179*** (0.064)	
a*j							0.287 (0.206)
b*j							-0.134 (0.117)
c*j							-0.094* (0.048)
Year dummies	yes	yes	yes	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes	yes	yes	yes
Adjusted R-squared	0.053	0.064	0.058	0.058	0.062	0.066	0.063
No. of observations	793	793	793	793	793	793	793



**Table 7**  
**Probit regression estimates of the likelihood of an increase in bank loans**

The sample consists of 711 stock repurchase announcements made by Japanese nonfinancial firms listed on the Tokyo Stock Exchange (TSE) from 1995 to 2000. The repurchase announcement date is obtained from the “Repurchase Announcements” section in the *Nihon Keizai Shimbun*, which is equivalent to the *Wall Street Journal* in Japan. The dependent variable is equal to one if a firm’s bank loans increase from year -1 to year +1, where year 0 is the repurchase announcement year; otherwise the dependent variable is set to zero. EBIT/interest is the ratio of operating income to interest expenditures. The high debt to equity dummy is equal to one if debt to equity ratio is above the sample median, and zero otherwise. Free cash flow is measured by operating earnings plus depreciation minus capital expenditures. Past calendar-year excess return is the equally-weighted market adjusted return for the prior calendar year. A keiretsu firm is a firm that belongs to one of the six keiretsu groups. Tobin’s q is the ratio of the market value of equity plus the book value of debt to the book value of total assets. The number in parentheses denotes the standard error clustered by firm. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Independent variables	Dependent variable = 1 if main bank loans increase	Dependent variable = 1 if other bank loans increase
Intercept	3.477*** (0.950)	3.974*** (0.894)
EBIT/interest	3.430* (2.143)	4.650** (2.366)
Standard deviation of 1 yr daily stock return	-27.646*** (9.642)	-48.732*** (9.596)
High debt to equity dummy	-0.250* (0.137)	-0.465*** (0.131)
Cash and marketable securities / total assets	0.034 (0.738)	0.281 (0.718)
Free cash flow / total assets	-0.921 (2.342)	2.594 (2.270)
Past calendar-year excess return	-0.107 (0.216)	-0.154 (0.204)
Log (total assets in 000s)	-27.640 (60.936)	-97.335* (57.131)
% shares sought	-3.511*** (0.838)	-3.657*** (0.821)
Payout ratio (dividend / net income)	0.084 (0.057)	0.159** (0.068)
Fixed assets / total assets	0.293 (0.480)	-1.227*** (0.449)
% equity owned by main bank	-31.819*** (4.308)	-15.468*** (3.328)
% equity owned by top10 owners excluding main bank	-0.578 (0.575)	0.295 (0.550)
Keiretsu dummy	-0.057 (0.131)	-0.089 (0.125)
Tobin's q	-0.104 (0.141)	-0.047 (0.142)
Year dummies	yes	yes
Industry dummies	yes	yes
Log likelihood	-303.241	-330.166
No. of observations	711	711

**Table 8**  
**Ordinary least squares regressions of cumulative abnormal returns (-1, 1) on interaction terms**  
**between bank debt ratios (equity ownership) and proxy for agency costs**

The sample consists of 793 stock repurchase announcements made by Japanese nonfinancial firms listed on the Tokyo Stock Exchange (TSE) from 1995 to 2000. The repurchase announcement date is obtained from the “Repurchase Announcements” section in the *Nihon Keizai Shimbun*, which is equivalent to the *Wall Street Journal* in Japan. We estimate the market model by using 200 trading days of return data ending 21 days before the repurchase announcement. We use PACAP equally weighted market returns as the benchmark. The high free cash flow dummy equals 1 if a firm’s free cash (operating earnings plus depreciation minus capital expenditures) is above the sample’s bottom quartile. Past 1 year excess return is a buy-and-hold return from day -205 to day -5, net of an equally-weighted market return. EBIT/interest is the ratio of operating income to interest expenditures. The low main bank loan dummy equals 1 if the ratio of main bank loans to total assets is below the sample’s top quartile. The low other bank loan dummy equals 1 if the ratio of other bank loans to total assets is below the sample’s top quartile. The no main bank equity ownership dummy equals 1 if equity ownership by main banks is zero. The low non-main bank equity ownership dummy equals 1 if equity ownership by top 10 shareholders excluding the main bank is below the sample’s top quartile. 1/Tobin’s q is the inverse of Tobin’s q, which is the ratio of the market value of equity plus the book value of debt to the book value of total assets. A keiretsu firm is a firm that belongs to one of the six keiretsu groups. The number in parentheses denotes the standard error clustered by firm. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Independent variables	(1)	(2)	(3)	(4)
Intercept	-0.014 (0.039)	-0.016 (0.039)	-0.009 (0.037)	-0.017 (0.039)
Cash and marketable securities / total assets	-0.004 (0.024)	-0.004 (0.024)	-0.003 (0.023)	-0.006 (0.024)
High free cash flow dummy: a	-0.020* (0.010)	-0.018* (0.009)	-0.012 (0.008)	-0.005 (0.009)
Past 1 year excess return	0.015 (0.013)	0.016 (0.013)	0.016 (0.013)	0.016 (0.013)
log (total assets in 000s)	1.043 (2.520)	1.151 (2.548)	0.770 (2.392)	0.796 (2.504)
% shares sought	0.051 (0.042)	0.048 (0.042)	0.055 (0.042)	0.053 (0.041)
Standard deviation of 1 yr daily stock return	0.528 (0.508)	0.481 (0.500)	0.445 (0.514)	0.457 (0.498)
Fixed assets / total assets	0.011 (0.022)	0.010 (0.022)	0.016 (0.022)	0.010 (0.022)
EBIT / interest	-0.0001 (0.002)	-0.0001 (0.002)	-0.0003 (0.001)	-0.0003 (0.002)
Low main bank loan dummy: b	-0.009 (0.007)	-0.006 (0.007)	0.018 (0.012)	-0.006 (0.007)
Low other bank loan dummy: c	0.003 (0.006)	-0.0004 (0.007)	0.012 (0.008)	0.003 (0.007)
Nonbank debt to total assets ratio	-0.056** (0.026)	-0.053** (0.026)	-0.064** (0.025)	-0.055** (0.026)
No main bank equity ownership dummy: d	-0.002 (0.006)	-0.002 (0.006)	-0.039*** (0.013)	-0.003 (0.006)
Low non-main bank equity ownership dummy: e	0.003 (0.006)	0.003 (0.006)	0.003 (0.007)	0.002 (0.006)
Keiretsu dummy	0.006 (0.006)	0.006 (0.006)	0.006 (0.006)	0.007 (0.006)
1 / Tobin’s q: f	0.018** (0.009)	0.020** (0.009)	-0.019** (0.009)	0.023*** (0.009)
a*b*f	0.022* (0.012)			
a*c*f		0.020* (0.012)		
a*d*f			0.021* (0.012)	

a*e*f				0.001 (0.013)
Year dummies	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes
Adjusted <i>R</i> -squared	0.058	0.058	0.062	0.055
No. of observations	793	793	793	793

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**Table 9**  
**Tobit regressions of the percentage of share sought on explanatory variables**

The sample consists of all Tokyo Stock Exchange-listed nonfinancial firms with complete data—both that announce and do not announce stock repurchases—from 1998 to 2000. The repurchase announcement date is obtained from the “Repurchase Announcements” section in the *Nihon Keizai Shimbun*, which is equivalent to the *Wall Street Journal* in Japan. The dependent variable is the yen value of the shares sought in the repurchase divided by the firm’s market value of equity. If the firm is a nonrepurchaser, the dependent variable is set to zero. Free cash flow is measured by operating earnings plus depreciation minus capital expenditures. Past calendar-year excess return is the equally-weighted market adjusted return for the prior calendar year. EBIT/interest is the ratio of operating income to interest expenditures. Fixed assets (-1, 2) is the change in fixed assets from the year before the repurchase to two years thereafter. A dummy variable for largest lender and largest equityholder equals 1 if a firm’s main bank is both its largest creditor and largest equityholder. A keiretsu firm is a firm that belongs to one of the six keiretsu groups. The number in parentheses denotes the standard error clustered by firm. \*\*\*, \*\*, and \* denote significance at the 1%, 5%, and 10% levels, respectively.

Independent variables	(1)	(2)	(3)	(4)
Intercept	-0.019 (0.035)	-0.018 (0.035)	-0.032 (0.034)	-0.028 (0.034)
Cash and marketable securities / total assets	-0.013 (0.026)	-0.008 (0.026)	-0.006 (0.026)	-0.001 (0.026)
Free cash flow / total assets	-0.135* (0.084)	-0.256*** (0.078)	-0.0140* (0.084)	-0.259*** (0.078)
Past calendar-year excess return	-0.014** (0.007)	-0.020*** (0.007)	-0.016** (0.007)	-0.022*** (0.007)
log (total assets in 000s)	10.011*** (2.316)	7.738*** (2.272)	11.406*** (2.249)	8.981*** (2.203)
Payout ratio (dividend / net income)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Standard deviation of 1 yr daily stock return	-0.519 (0.328)	-0.659*** (0.238)	-0.697** (0.324)	-0.813** (0.324)
Fixed assets / total assets	0.020 (0.021)	0.033* (0.021)	0.031 (0.021)	0.042** (0.020)
EBIT / interest	-0.003 (0.004)	-0.004 (0.004)	-0.004 (0.004)	-0.004 (0.004)
Main bank loan to total assets ratio	-0.279*** (0.081)	-0.252*** (0.080)		
Other bank loan to total assets ratio	-0.181*** (0.029)	-0.154*** (0.027)	-0.221*** (0.027)	-0.190*** (0.025)
Nonbank debt to total assets ratio	-0.173*** (0.022)	-0.143*** (0.020)	-0.157*** (0.022)	-0.129*** (0.020)
% equity owned by main bank	0.335** (0.136)	0.339*** (0.136)		
Main bank is largest lender and largest equityholder dummy			0.000 (0.006)	0.001 (0.006)
% equity owned by top10 owners excluding main bank	-0.134*** (0.020)	-0.135*** (0.021)	-0.146*** (0.020)	-0.148*** (0.020)
Keiretsu dummy	0.004 (0.005)	0.005 (0.005)	0.005 (0.005)	0.006 (0.005)

Tobin's q	-0.013*** (0.004)		-0.013*** (0.004)	
Fixed assets (-1,2) / total assets (-1)		-0.124*** (0.031)		-0.130*** (0.031)
Year dummies	yes	yes	yes	yes
Industry dummies	yes	yes	yes	yes
Log likelihood	-114.678	-111.342	-122.972	-118.432
No. of observations	3276	3276	3276	3276