

Earnings Management During Distinct Phases of Capital Demand: Evidence from Japanese Banks*

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First Draft: October 2002

* The views expressed herein are those of the authors and do not necessarily reflect those of the Office of Federal Housing Enterprise Oversight or of FleetBoston Financial.

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Abstract

Shrieves and Dahl (2002) find that Japanese banks used security gains and loan loss provisions to manage earnings, which helped capital-constrained banks to replenish regulatory capital in order to increase or at least maintain their lending portfolio during the 1988-1996 period of capital constraint. Given that Japanese banks have endured three distinct periods of capital demands during the 1980s and 1990s, this paper extends the Shrieves and Dahl study to investigate what factors may have determined the Japanese banks' lending and earnings management decisions before 1990 when Japan's economy rapidly expanded and its banks did not face the BIS regulatory capital requirement as well as after 1995 when banks faced more intense capital constraint and banking crisis. Using bank balance sheet data of 78 Japanese banks, we find evidence of banks using gains from sale of securities as a means to manage earnings throughout all three periods, which is consistent with the findings of Shrieves and Dahl. However, due to mounting non-performing loans during the recent period of acute banking crisis, banks overall may have been restrained from using loan loss provisions to smooth income. Moreover, we are not quite certain if Japanese banks actually used gains and provisions to replenish regulatory capital during the financial distress period; instead, our results seem to indicate that banks significantly reduced their lending position during this period.

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1. Introduction

Bank managers have discretionary actions to adjust the timing and size of transactions and accruals in their financial reports. They have three main incentives to recognize and record certain financial transactions during a particular time to: (i) disseminate positive earnings information and managerial performance to investors; (ii) defer tax payment on earned income; and (iii) achieve regulatory capital requirements. To achieve these three goals, bank managers have discretion to engage in seven capital-raising options: security gains and losses, loan loss provisions, loan charge-offs, capital notes, common stocks, preferred stocks, and dividends. Overwhelming evidence has been documented to indicate that: first, banks tend to understate loan loss provisions, overstate realized gains on sales of securities, and increase dividend earnings, while conveying positive earnings information to investors; second, banks tend to increase their loan loss provisions and reduce their realized security gains, while deferring tax payments in the face of high core earnings; and third, banks that are close to meeting capital requirements tend to overstate loan loss provisions, understate loan write-offs, and recognize abnormal gains on securities portfolios.¹

The above studies on bank managers' goals in relation to capital raising options, however, have focused on U.S. banks. For Japanese banks in particular, Genay (1998) examines the relationship between the performance of Japanese banks and their financial characteristics during the 1991-1997 period, and unexpectedly finds that Japanese banks

¹ For example, see Greenwalt and Sinkey (1988), McNichols and Wilson (1988), Moyer (1990), Scholes, Wilson, and Wolfson (1990), Wahlen (1994), Beatty, Chamberlain, and Magliolo (1995), Collins, Shackelford, and Wahlen (1995), Beaver and Engel (1996), and Kim and Kross (1998). However, Healy and Wahlen's (1998) review of the earning management literature indicate that if there is to be a more informed debate about the implications of earnings management for standard setting, we need additional evidence on which accounting standards are used to manage earnings, the frequency of earnings management, as well as their effect on earnings and resource allocation. In addition, most studies thus far do not attempt to provide evidence on whether earnings management is widespread or infrequent.

increase their loan loss provisions when their core earnings as well as the returns on the stock market are high. The author concludes that this puzzling finding may be attributed to income smoothing by these banks. Recently, Shrieves and Dahl (2002) study the discretionary accounting practices of Japanese banks under financial constraint in trying to meet the Basle Accord guidelines. During their study period, 1989-1996, they find that: (i) surplus regulatory capital plays a significantly positive role in the Japanese banks' lending decision; (ii) Japanese banks' non-discretionary income is significantly and positively related to loan loss provisions and is negatively related to security gains, while loan loss provisions and security gains are complement to one another; and (iii) last period's dividend, rather than beginning of period surplus capital, dictates banks' dividend policy. Shrieves and Dahl (2002) conclude that Japanese banks used security gains and loan loss provisions for income smoothing, and, capital-constrained banks, in particular, used earnings management to replenish regulatory capital during this period of financial duress, which is in support the regulatory-capital arbitrage hypothesis.

Shrieves and Dahl focus on the time period (1989-1996) in which Japanese banks experienced deterioration in macroeconomic conditions, dramatic decline in the market values of their assets, and regulatory capital constraints by the Basle Accord. In the past, however, the Japanese banking system has evolved into three distinct phases: (i) high-growth era, (ii) dramatic decline in the market value of assets, and (iii) further deterioration of balance sheet with the banking crisis deepening. Since banks' vulnerability to changes in economic environment as well as structural changes in the financial system can lead to changes in banks' investment and financial decisions, questions arise as to what factors may have determined the Japanese banks' lending and earnings management decisions before 1990 in the absence of the BIS regulatory capital requirement, but in the face of high economic growth, escalating stock market, rising banks' assets and profits? Furthermore, what factors may have determined these banks' lending and earnings management decisions after 1995 in the face of more intense

banking crisis as accumulations of non-performing loans deteriorated further the balance sheet of Japanese banks? Did Japanese banks behave differently during the period of economic growth in the latter part of the 1980s and the period of extreme capital demand in the second half of the 1990s?

Shrieves and Dahl (2002) provide an excellent framework to examine earnings management practices over the three unique phases of capital demand by Japanese banks. Specifically, we analyze the role of loan loss provision and realized gains from securities portfolios on earnings management practices of 78 Japanese banks over a 15-year period (1985-1999). We break down our analysis into three unique time periods the Japanese banking sector faced: (1) high growth era (1985-1989); (2) the implementation of the Basle Accord and dramatic decline in the market value of assets (1990-1994); and (3) the further deterioration of balance sheets of Japanese banks and much more severe capital constraint experienced by the Japanese banks (1995-1999). To the best of our knowledge, this is the first such study to contrast cross-sectional data to focus on earnings management by the Japanese banking system. For a broad sample of Japanese banks, we follow the empirical methodology of Shrieves and Dahl (2002) and estimate a simultaneous equation model of investment and financial decisions, which explicitly incorporates the endogeneity of accounting discretion with respect to security gains and loan loss provisions.

We find similar as well as different patterns of earnings management practices between the three periods. With regard to using gains from sale of securities as a vehicle to engage in earnings management, Japanese banks realized gains from securities to offset the adverse impact of loan loss provisions on income in order to smooth income throughout all three periods. However, the propensity of using gains to smooth income is smaller for banks with negative nondiscretionary during the financial distress as well as the more intense banking crisis periods.

With regard to using loan loss provisions, we find that Japanese banks used loan loss provisions as a means to manage earnings only during the high-growth period. During the

financial distress, only banks with negative nondiscretionary earnings were motivated to increase their provisions-to-assets when their return on investment increased. During the latter period of more intense capital constraint and banking crisis, only banks with negative nondiscretionary income used provisions as a means to smooth income, while overall Japanese banks actually increase their provisions-to-assets in the face of declining return on investment. We conclude that this behavior is consistent with the fact that during the period of mounting non-performing loans and more intense banking crisis, banks were pressured to increase their share of provision-to-asset, and thereby were restrained from using provisions as a means to smooth income. One surprise finding is that despite the accumulation of bad loans, banks with negative nondiscretionary earnings continue to use provisions to smooth income, indicating that these banks continue to engage in income smoothing by understating their provisions relative to assets in the face of declining return on investment despite rising non-performing loans.

Moreover, we find that lending activities of Japanese banks differed significantly during the three periods. We are not certain that during the banking crisis period Japanese banks actually used loan loss provisions and security gains to replenish regulatory capital in order to increase or at least maintain their lending portfolio as hypothesized under the regulatory capital-arbitrage hypothesis. Our findings for the capital-to-assets ratios being significantly negative imply that the increased capital-to-assets ratios of Japanese banks were aimed to improve the regulatory capital requirement following the introduction of the Basle Accord resulted in a decline in loan growth. Hence, it seems that Japanese banks lowered their lending position as they improve their capital position during the period of intense capital constraint.

The rest of the paper is organized as follows. The next section describes (i) the earnings management hypothesis regarding income smoothing and regulatory capital management; and (ii) the evolution of the Japanese banks from 1985 to the present. Section 3 presents the data and the simultaneous-equation methodology that is used to model the determinants of lending,

securities gains, loan loss provisions and dividends. Section 4 presents descriptive statistics and the empirical results. Finally, Section 5 provides some concluding remarks.

2. Earnings Management and the Japanese Banking System

In this section, we provide a brief sketch of earnings management incentives and options, and the three evolutionary phases of the Japanese banking system.

2.1. Earnings Management

Bank managers have discretionary actions to adjust the timing and size of transactions and accruals in their financial reports. They have three main incentives in recognizing and recording certain financial transactions to: (i) achieve regulatory capital requirements; (ii) defer tax payment on earned income; and (iii) disseminate enhanced earnings information to investors. To achieve these three goals, bank managers have discretion to engage in seven capital-raising options: security gains and losses, loan loss provisions, loan charge-offs, capital notes, common stocks, preferred stocks, and dividends.

Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either to influence contractual outcomes that depend on reported accounting numbers, or to convey private information to stakeholders about the underlying economic performance of the company. This lends itself to two important questions: (i) what motivates earnings management, and (ii) how do managers use earnings management.

Many motivations for earnings management have been examined in the literature. They include: (i) realization of earnings thresholds [Burgstahler and Dichev (1997) and Degeorge, Patel, and Zeckhauser (1999)]; (ii) initial public offerings and seasoned equity offerings [Rangan (1998) and Teoh, et al. (1998a, 1998b)]; (iii) income smoothing [Greenwalt and Sinkey (1988) and Beaver and Engel (1996)]; (iv) regulatory capital planning [Scholes, Wilson, and Wolfson (1990), Kim and Kross (1998), and Shreives and Dahl (2002)]; (v) book-tax reporting differences

[Mills and Newberry (2001) and Phillips, Pincus, and Rego (2002)]; (vi) debt covenants restraints [DeFond and Jiambalvo (1994)]; (vii) bonus plans and compensation [DeAngelo (1986) and Pourciau (1993), Gaver, et al. (1995), and Holthausen et al. (1995)]; (viii) alteration of risk perceptions and earnings information to investors [Bhattacharya, et al. (2002), Barth, et al. (1999)]; (ix) government investigation [Bonner, et al. (1998)]; (x) management of bad debts [McNichols and Wilson (1988)], etc. Managers can exercise judgment to influence financial reporting in several ways. For instance, expected life and salvage values of long-term assets, obligations for pension benefits and other post employment benefits, deferred taxes, security gains/losses, and losses from bad debts and asset impairments are all subject to managerial judgment. In addition, managers can also choose acceptable methods of reporting the same economic transactions, such as the straight line or accelerated depreciation methods. Managers can also decide how to structure corporate transactions. For example, lease contracts can be structured so that lease obligations are on- or off-balance sheet and equity investments can be structured to avoid consolidation.

2.2. The Evolution of the Japanese Banking System

Table 1 gives summary statistics of the macroeconomic and the financial characteristics endured by Japanese banks across three unique time periods: 1985-1989, 1990-1994, and 1995-1999. As can be seen in Panel 1, domestic production as measured by industrial production (INDPROD) increased on average at the rate of 4.5 percent during the 1985-1989 period, which contrasts with negative growth rates of -0.62 percent and 0.54 percent in the 1990-1994 and 1995-1999 periods, respectively. The stock market index (STOCKS) increased on average 26.9 percent during the 1985-1989 period as compared to the index declining on average 7.9 percent and 6.3 percent during the 1990-1994 and 1995-1999 periods. The land price index (LAND) declined from a 5.7 percent annual growth rate in the high-growth period to a -2.4 and -3.9 percent annual growth rate during the last two periods, respectively. Meanwhile, average growth in stock prices of Japanese banks (STOCKS_BANK) rose at the rate of 20.4

percent during the economic and stock market upswings, and then declined on average 10.6 and 7.1 percent during the two latter periods, respectively.

Likewise, since the introduction of the 1988 Capital Basle Accord, the banking sector also experienced significant changes with respect to their business operations as well as their risk management practices. Panels 2 and 3 of Table 1 present the financial characteristics of large city banks and smaller regional banks, respectively.

City banks' income on average fell sharply, exhibiting negative net income during the most recent period. Average return on investment (ROI) deteriorated from 0.341 percent during the 1985-1989 period to 0.00 percent and 0.04 percent during the latter two periods, respectively. Similar trends are observed for regional banks.

Over these same periods, the change in lending activities as a percent of total assets (dLOANS) for the city banks on average declined from 6.97 percent during the 1985-1989 period to only 1.73 and 0.51 percent during the 1990-1994 and 1995-1999 periods. Furthermore, loan loss provisions as a percent of total assets increased from an average of 0.04 percent in the first period to about 0.09 and 0.72 percent in the second and third periods, respectively. Finally, average gains from sales of securities as a share of total assets decreased from 0.27 percent of total assets during the high-growth period to 0.25 percent during the financial distress period, but then sharply increased to 0.45 percent during the period of more intense capital constraint and operating losses.² Equally important, net dividends dropped slightly from 0.054 percent in the first period to 0.048 percent and 0.040 percent during the latter two trouble periods. Similar trends are again observed for the regional banks.

[Insert Table 1]

² Gains from sales of securities on average were higher in the latter two periods despite the decline in the market value of overall equities of the banks, as measured by decline in stock market index. This inconsistent observation is due to the fact that equity investment capitals were held at below cost or market value, and then were sold and repurchase back at the market value, Japanese banks increased their latent gains of security sales, increased the book value of their equity investments, and thereby increased their Tier 1 Capital.

The descriptive statistics in Table 1 confirm that the Japanese economy and financial markets have gone through three distinct phases of capital demand. Hence, an examination of the differing behaviors of Japanese banks in the three phases is warranted. Brief discussions of the three periods are in order to provide institutional settings in which Japanese banks operated. **High-Growth Era (1985-1989):** Japanese banks expanded rigorously during the 1980's. The main factors include strong macroeconomic performance, booming stock market, low domestic interest rates, relatively strong yen, and vibrant real estate market. In July 1988, *The Banker* had the following quote, "In a year which was the worst-ever for many US and European banks, Japan's banks turned in higher profits, increased their capital, and took in a larger share of world lending and capital-market business" (p. 109).

Moreover, it was not difficult for firms to obtain equity financing during this period as Japanese firms heavily relied on bank financing due to a well-established, relationship-based lending, known as *Keiretsu* financing. This relationship helped both the banks and the firms in several ways. For the firms, this special relationship helped overcome adverse selection and mitigate moral hazard problems. For the banks in particular, this unique relationship helped moderate conflicts between equity and debt holders, and decrease duplication of monitoring by different lenders.³

As a result of a very strong economic growth and thereby demand for credit, the banking sector grew vibrantly with respect to assets, lending, and profits during the 1980's. Subsequently, there are many reasons why banks may want to smooth their earnings. One reason for such behavior is that banks may attempt to reduce their income tax burden by smoothing out profits over time. Banks may also want to produce a constant income stream in order to gain confidence from the public and/or investors. Moreover, in the absence of the Basle Accord during this period, regulatory capital did not constrain overall bank capital, thus banks

³ For further discussion on this issue, refer to Hoshi and Kashyap (2001, pp. 191-195).

may be able to finance their lending activities during this prosperous period without having to reduce their provisions, increase realized gains, or reduce their dividend earnings. Banks can easily maintain growth in lending activities and stable dividend policy for investors.

Because provisioning for loan losses and realization of gains from sale of security can significantly enhance balance sheet, and can reduce the volatility of profits, banks may attempt to reduce their income tax burden by smoothing out profits over time. In addition, banks may also want to produce a constant income stream in order to gain confidence from the public and/or investors. Thus, it can be expected that banks may reduce their realization on gains from sales of securities and increase their loan loss provisions as well as dividends in order to smooth their earnings during this period of prosperity, financial growth, and high profits.

Furthermore, if regulatory-capital is not a pressing matter such that banks are not constrained by the BIS regulatory capital requirement during the 1980's, then according to the capital arbitrage hypothesis tested by Shrieves and Dahl (2002), banks are able to finance their lending activities during this prosperous period without having to reduce their provisions, increase realized gains from sale of securities, reduce their dividend earnings. Instead, banks may focus on maintaining stable dividend policy. Thus, it may be expected that loan loss provisions and gains from sales of securities may have, respectively, positive and negative impact on bank lending.

On the other hand, because macroeconomic developments and stock market performances affect risk provisions and earnings, there are two potential bank behaviors. First, banks may behave procyclically, e.g., banks would reduce provisions during economic growth and upswings. This is rational if banks, generally faced with very little non-performing loans during the good times, are willing to reduce the level of provisioning, particularly when they are faced with a significant amount of market pressure to achieve high profits. Hence, there may be a potential inverse relationship between economic growth and loan loss provisions for Japanese banks during this high growth period. However, banks may behave anticyclically, e.g., they may

not reduce and/or may even increase risk provisioning during high-growth periods. The reason is that banks may anticipate that if the economy is cyclical, then the expansionary period would generally be followed by economic downswings and so they must prepare themselves for the fact that their debtors may have difficulties to repaying back their loans.

Financial Duress Era (1990-1994): The Japanese banking system was losing ground as a source of finance for large corporations. In the early 1990's, the financial deregulation had opened up the way for large Japanese corporations to obtain alternative financing options to bank borrowing.⁴ As a result, Japanese banks were forced to shift their customer base from large established firms that belonged to a *Keiretsu* (an industrial group centered around a main bank) to small and mid-size firms.⁵ The problem is that the banks did not have intimate knowledge of these new customers. Presumably to compensate for the lack of information, the banks often required collateral for these loans. Land was used as the preferable choice of collateral primarily because the nominal value of land did not fall at all throughout the postwar period, at least not until after 1991. So when the land price began tumbling in 1992, the collateral lost its value and many loans to these small to medium size firms became non-performing. As a result, the fall in land price eroded the asset quality and hence the capital base of the banks' balance sheet, and thus significantly contributed to the bad loan problems.

At the same time, the Nikkei 225 Index declined by 50 percent between 1990 and 1994. In turn, because Japanese banks held hefty portions of common stocks in their portfolio, there

⁴ As discussed by Ito and Sasaki (1998), Ueda (1998), Cargill (1999), and Hoshi and Kashyap (1999), between 1983 and 1989 the Japanese bond market blossomed, permitting many internationally known companies to tap the public debt market for the first time.

⁵ Alternatively, Japanese banks could have increased their holding of government bonds. However, during the same period the Japanese government was in the middle of "administrative reform" to limit the growth of government expenditure and eliminate budget deficit.

was a significant decline in their capital.⁶ Overall, the collapse of the stock and land prices forced the banks to accumulate non-performing loans and suffer losses in the value of their own securities holdings.⁷

Subsequently, the banks' now-weaker capital reserve position may have adversely impacted its lending position. In addition, the enforcement of BIS regulatory capital requirements became effective in 1993. If capital constrains bank lending, then is expected that lending will vary positively with capital ratios. However through discretionary accounting practices, some banks could maintain or increase their lending position and still meet capital reserve requirements. Specifically, regulatory capital-constrained banks had an incentive to improve on their regulatory capital demand by increasing equity and net income. According to Shrieves and Dahl's capital-arbitrage hypothesis, banks could increase their equity position and thereby increase or at least maintain their lending activities by reducing dividend and increasing discretionary components of income (e.g., increase realized security gains and reduce loan loss provisions).

Further Deterioration of Banks' Financial Condition and Banking Crisis Era (1995-1999):

The Japanese banking industry has traditionally been one of the most heavily regulated industries and this factor cannot be ignored.⁸ Specifically, banks with publicly traded equity shares must comply with sometimes-conflicting regulations. On the one hand, the external regulator since 1989 (the Basle Accord) requires these banks to disclose their financial statements so that investors may have full information. On the other hand, the Ministry of

⁶ According to Fukao (2001), a 10 percent decline in stock price index wipes out 20 percent of the net capital because the market value of stocks held by banks is about twice as much as their net capital.

⁷ Moreover, this was in tandem with the overall decline in the Japanese economy. Between 1990 and 1994 the average growth rate was 1.5 percent compared to 5.5 percent for the previous four years. Moreover, monetary policy tools were also ineffective even though the Bank of Japan reduced the discount rate seven times in a period of three years from 6% to 1.75%. All these macroeconomic events further led to the bank loan problems.

⁸ The Japanese banking system has been going through a very gradual deregulation process that started in the early 1980's and has taken around 25 years for its completion [Hoshi and Kashyap (2001)].

Finance, the internal regulator, has traditionally favored secrecy, more limited disclosure of the true financial conditions and accounting practices that attempted to paper over financial difficulties. Since the deregulation of the Japanese banking industry, however, the regulators have required greater disclosure. These disclosures have made it easier to determine the true value of bank loan portfolio. Furthermore, deregulation has also led to a loss of much of the banks' protection from competition, both domestic and international. Consequently, banks faced competition across their traditional business lines. This led the banks to diversify their loan portfolio.

The deregulation brought about a frenzy of activity among the banks (large and small), depositors, and firms. Basically, the banks lost both their largest firms (borrowers) and their depositors to the equity markets. This was in part because of the bad loans problem and their ability to smooth (postpone) these losses with earning management tools. Further, the government had to bail out a number of these banks using public funds. For instance, the government had as much as 30 trillion yen in public funds to help failed or severely undercapitalized banks. This coupled with the implementation of the Basle Accord has forced the banks to adopt better accounting practices and restricted earning management activities. However, as pointed out in Hoshi and Kashyap (2001), in spite of the long tradition of holding company shares, the banks started to sell some of these shares to realize profits and prop up their balance sheets.⁹

During this period, the Japanese banks endured a further deterioration of their balance sheet and intensifying banking crisis.¹⁰ In particular, banks faced extended economic stagnation, mounting bad loans, as well as the implementation of the BIS regulatory capital

⁹ Since most of these share holding were decades old and thus had a very low base price compared even to their post-peak current market price.

¹⁰ For example, in March 1999, 15 large banks applied for a capital injection and received 7.45 trillion Yens of public funds.

requirement, and weak relatively capital reserve position that continue to adversely impact their lending position. Equally important, because a significant portion of their loans used land as collateral, Japanese banks should engage in prudent risk management practices by increasing their loan loss provisions to reflect the mounting bad loans as well as the decline of the collateral value of the loans.

As for their incentives to managing earnings, we may witness a more intense pattern of income smoothing during period in which banks face drastic increase in loan losses and operating losses that are more severe than the other two periods. For example, the ratio of bad loans to total loans increased to 6 to 6.5 percent in the last period from 3 percent or less during the most of the second period. Net operating losses (defined as the difference between gross profits and loan losses) peaked at $-\text{¥}8.3$ and $-\text{¥}7.9$ trillion in 1998 and 1997 from positive profits of $\text{¥}2.5$ trillion each in 1991 and 1992.¹¹ Therefore, it is an interesting empirical question whether Shrieves and Dahl's capital-arbitrage hypothesis can be supported in the rapidly deteriorating economic environment as evidenced by a banking crisis in Japan in the last period.

3. Data and Methodology

3.1. Data

We compile a large data set, with annual income statements and balance sheet data for 78 Japanese banks over the 15-year study period, 1985-1999. Our source of the bank-level variables is the Pacific-Basin Capital Market Research Center (PACAP) Database-Japan which is jointly created and maintained by the University of Hawaii and University of Rhode Island in collaboration with the Daiwa Institute of Research and the Toyo Keizai Inc.

¹¹ Refer to Fukao (2001).

3.2. Methodology

Following Shrieves and Dahl (2002), we estimate a simultaneous equation model to analyze the discretionary accounting practices of Japanese banks on four financing decision variables: lending, securities gains, loan loss provision, and dividend earnings. This model assumes that Japanese banks periodically and simultaneously adjust their financing decision variables to achieve their objective of income smoothing and/or capital arbitrage. Specifically, securities gains and loan loss provision offers empirical evidence of the extent to which Japanese banks use discretionary accounting to smooth reported earnings, while the equations for lending and dividends represents the issues of, respectively, investment and financial activities.¹² These four financing decisions are functions of financial bank attributes as well as other exogenous variable as follows. Please refer to the appendix for definitions of each variable.

$$\begin{aligned} dLOANS_{it} = & \alpha_0 + \alpha_1 REG_{it} + \alpha_2 ASSETS_{it-1} + \alpha_3 LNASS_{it-1} + \alpha_4 INDPROD_{it} \\ & + \alpha_5 CAPLO_{it-1} + \alpha_6 CAPMID_{it-1} + \alpha_7 CAPHI_{it-1} + \alpha_8 ROI_{it} + \alpha_9 (ROI * NEG)_{it} \\ & + \alpha_{10} GAINSS_{it} + \alpha_{11} PROV_{it} + \alpha_{12} NETDIV_{it} + \varepsilon_{it} \end{aligned} \quad (1)$$

$$\begin{aligned} GAINS_{it} = & \beta_0 + \beta_1 REG_{it} + \beta_2 ASSETS_{it-1} + \beta_3 LNASS_{it-1} + \beta_4 STOCK_{it} + \beta_5 PRIME_{it} \\ & + \beta_6 CAPLO_{it-1} + \beta_7 CAPMID_{it-1} + \beta_8 CAPHI_{it-1} + \beta_9 ROI_{it} + \beta_{10} (ROI * NEG)_{it} \\ & + \beta_{11} dLOANS_{it} + \beta_{12} PROV_{it} + \beta_{13} NETDIV_{it} + \xi_{it} \end{aligned} \quad (2)$$

$$\begin{aligned} PROV_{it} = & \delta_0 + \delta_1 REG_{it} + \delta_2 ASSETS_{it-1} + \delta_3 RSRVRAT_{it-1} + \delta_4 LAND_{it} \\ & + \delta_5 CAPLO_{it-1} + \delta_6 CAPMID_{it-1} + \delta_7 CAPHI_{it-1} + \delta_8 ROI_{it} + \delta_9 (ROI * NEG)_{it} \\ & + \delta_{10} dLOANS_{it} + \delta_{11} GAINS_{it} + \delta_{12} NETDIV_{it} + \psi_{it} \end{aligned} \quad (3)$$

$$\begin{aligned} NETDIV_{it} = & \gamma_0 + \gamma_1 REG_{it} + \gamma_2 ASSETS_{it-1} + \gamma_3 NETDIV_{it-1} + \gamma_4 CAPLO_{it-1} + \gamma_5 CAPMID_{it-1} \\ & + \gamma_6 CAPHI_{it-1} + \gamma_7 ROI_{it} + \gamma_8 (ROI * NEG)_{it} + \gamma_9 dLOANS_{it} + \gamma_{10} GAINS_{it} \\ & + \gamma_{11} NETDIV_{it} + \omega_{it} \end{aligned} \quad (4)$$

Since our focus is on income smoothing and capital arbitrage behavior, we summarize in Table 2 below the expected signs of key coefficients in each equation. In the lending (dLOANS) equation, if regulatory capital constrains bank lending, then we expect: (i) the three capital-to-

¹² Several other studies have used a similar model specification, like Greenawalt and Sinkey (1988) and Moyer (1990). However, our specification is based on the work by Shrieves and Dahl (2002), where they also model a simultaneous model with four equations.

assets ratios (CAPLO, CAPMID, CAPHI), return on investment (ROI), and gains/losses on sale of securities (GAINS) to be positively related to dLOANS; and (ii) loan loss provisions (PROV) and net dividend payouts (NETDIV) to be negatively related to dLOANS. In the equation for gains/losses on sale of securities (GAINS) equation, if income smoothing and capital arbitrage behavior exists, we expect: (i) lending (dLOANS), loan loss provisions (PROV), as well as net dividend payouts (NETDIV) to be directly related to GAINS; (ii) the three capital-to-assets (CAPLO, CAPMID, CAPHI) and the return on investment (ROI) to be negatively related to GAINS. Likewise if income smoothing and capital arbitrage behaviors exist, then: (i) the three capital-to-assets ratios (CAPLO, CAPMID, CAPHI), the return on investment (ROI) and gains/losses from sale of securities (GAINS) should positively impact loan loss provisions (PROV); (ii) lending (dLOANS) as well as net dividend payouts (NETDIV) should be inversely related to PROV. And finally, CAPLO, CAPMID, CAPHI, ROI, and GAINS (dLOANS and PROV) should positively (negatively) net dividend payouts (NETDIV).

[Insert Table 2]

4. Empirical Results

Table 3 presents empirical results of each financial decision variable for each of the three periods: expansionary period (1985-1989); financial duress period (1990-1994); and acute banking crisis period (1995-1999) to compare and contrast Japanese banks' decisions in lending, gains from sales of securities, loan loss provisions, and net dividend across the three periods of economic growth, financial growth as well as profitability and capital demands of banks. Below we discuss and compare our key findings for each of the four equations.

[Insert Table 3]

4.1. Bank Lending

The first equation in Table 3 shows the empirical results for various factors that determine bank decisions on lending (dLOANS). First, non-discretionary income as a percent of

asset (ROI) is significant and positively related to lending only during the period in which Japanese banks experienced further deterioration of balance sheets and severe capital constraint, which implies that lending activities are relatively hindered by the decline of the return on investment during this most recent period. On the other hand, the decline in ROI actually stimulated lending activities of banks with negative nondiscretionary income during the financial duress period. Second, provision for loan losses as a percent of assets have an inverse relationship with banks' loan growth only during the high-growth period but not during the periods of financial duress and the banking crisis.

Capital ratios for all of the three subsets (CAPLO, CAPMID, CAPHI) are significant but surprisingly negative in determining bank-lending activities during financial duress period, suggesting that the lack of regulatory capital did not constrain bank lending. The implication of this finding is that with the introduction of the Basle Accord, any increase in banks' capital-to-assets ratios could have been aimed to improve the capital requirement rather than to expand loan portfolio. Our results reinforce and at the same time contradict those of Shrieves and Dahl's as follows: (i) our negative and significant results for CAPMID and CAPHI concur Shrieves and Dahl's negative (although statistically insignificant) estimates, suggesting that lending of banks in the middle and high quartile capital ratios are not constrained by the lack of regulatory capital. Our negative and significant estimate of CAPLO contradicts their positive but insignificant estimate. Hence, our finding indicates that even lending of banks in the lower quartile capital ratios is not constrained by the lack of regulatory capital. Finally, while the relationship between capital and lending is positive during the banking crisis period for all three levels of capital ratios, suggesting that bank lending is constrained by the lack of regulatory capital during this period of severe banking crisis and capital constrained, the estimated coefficients are statistically insignificant.

Other interesting results in the lending behavior of Japanese banks is the finding that lending growth is significantly stimulated by the high demand for loans (measured by the growth

of industrial production) as well as increasing beginning of the period assets only during the expansionary period, suggesting that any accumulation of assets during in the 1990s did not significantly increase lending portfolio of Japanese banks during the capital constrained and banking crisis periods. Also worthy of note is that the average lending activities for the smaller regional banks are higher than lending activities of the larger city banks only during this boom period, while lending activities of city banks are not significantly different from those of regional banks during the two financial distress and acute banking crisis periods.

4.2. Security Gains

The second equation in Table 3 illustrates the important determinants of bank decisions to realize gains from sales of securities during the high-growth, financial distress, and banking crisis periods. First note that, equity-to-assets ratios (CAPLO, CAPMID, CAPHI) are positively significant, suggesting that banks are not regulatory capital constrained during the boom period. While net dividends have significantly negative impact on gains during the high-growth period, any increase in dividend payouts raises the propensity of banks to realize gains on sale of securities increases during the two capital-constrained periods. More importantly, empirical evidence of banks using gains as a means to smooth income prevails throughout all three periods, which is consistent with Shrieves and Dahl's finding for the financial duress period. While the degree of using gains to smooth income is stronger for banks with negative nondiscretionary income earnings during the high-growth period, it is weaker during the latter two periods of capital constraint. Moreover, loan loss provisions is significantly positive throughout all three periods, suggesting that any increase in provisions that results in reducing income prompts banks to increase gains from sale of securities.

Other interesting findings include: (i) average gains from sales of security are smaller for regional banks as compared to city banks during the most recent period in which banks face more severe balance sheet problems; (ii) stock market index significantly and negatively affects security gains during the high-growth period, suggesting that the Japanese banks did not sell

their equities to realize gains when the stock market return was performing relatively well during the expansionary period; and (iii) prime-lending rate is significantly negative during this boom period but is significantly positive during the financial duress period.

4.3. Loan Loss Provision

The third equation in Table 3 shows the determinants of banks decisions on loan loss provisions (PROV) for each of the three periods. We find that security gains are positively related to provisions throughout the three periods, suggesting banks used gains from sale of securities to offset the negative impact of provisions on income. In general, income-smoothing behavior with respect to loan loss provisions is found only during the high-growth period as the nondiscretionary income is positively and significantly related to provisions only during this period. Unlike Shrikes and Dahl, we find that during the period of financial duress, overall Japanese banks did not use loan loss provisions to smooth income; however, banks with negative nondiscretionary income display some degree of income-smoothing behavior by increasing provisions-to-assets in response to an increase in ROI during this period of capital constraint. More interestingly, during the latter period of more intense banking crisis and capital constraint, banks increase loan loss provisions (instead of decrease as maintained under the income smoothing and capital-arbitrage hypothesis) in the face of declining nondiscretionary income. This finding suggests that mounting non-performing loans as well as rigorous regulatory capital requirement during this most recent period may have restricted banks from using loan loss provisions to engage in income-smoothing and capital-arbitrage behavior. On the other hand, some degree of income smoothing and capital-arbitrage behaviors by means of loan loss provisions do persist for banks with negative nondiscretionary during this most recent period of intense capital constraint period.

In addition, we find that across the three periods banks with higher loan loss reserves at the beginning of the period tend to set higher levels of provision, which is not consistent with prudent risk management since we expect banks to increase their provisions in the face of loan

loss reserves depletion. Moreover, since land price index is a measure of risk characteristics of the banks' loan portfolio, there is a significantly negative relationship between land price index (LAND) and provision-to-assets (PROV) during both the high-growth and financial distress period. However, despite the fact that banks have enormously increased their loan loss provisions during the most recent period of mounting bad loans, banks may have understated these provisions relative to loan portfolio risks as measured by the declining land price index.

Furthermore, the finding that higher dividend payouts reduces banks' propensity to provision for loan losses suggests that while banks continue to put emphasis on conveying positive earnings information to investors, prudent risk management may have been compromised. However, it is possible that the slight reduction of net dividend payouts on average during the most recent period in which banks face capital constraint and severe bad loans allowed banks to slightly increase their loan loss provisions in the face of accumulating bad loans. Furthermore, equity-to-assets ratios (CAPLO, CAPMID, CAOPHI) are significantly and negatively related to provisions only during the high-growth, suggesting that since investments were not constrained by the BIS regulatory capital requirement during the high-growth period, banks may have understated their loan loss provisions. On the other hand, the relationship between equity-to-assets ratio and loan loss provisions is significantly positive during the period of increasing non-performing loans, suggesting that any increase in the capital relative to assets are used to increase their provisioning position. Finally, regional banks have on average higher loan loss provisions as compared to city banks only during the 1995-1999 period, suggesting the possibilities that regional banks (i) may have higher shares of non-performing loans relative to the regional banks during this period of mounting bad debts and severe banking crisis; and/or (ii) they were relatively more prudent in managing their risks.

4.4. Net Dividends

The final equation in Table 3 examines the factors that explain banks' decisions on dividend payouts (NETDIV) during three periods. First, note that the coefficients on capital-to-

assets ratio (CAPLO, CAPMID, CAPHI) have significant and positive impact on net dividend decisions of Japanese banks during the financial distress and the more severe capital constraint periods, suggesting that the build up of equity capital as a share of assets enabled firms to maintain stable dividend payouts. Moreover, any increase in bank lending is partially financed by lowering dividend payments to investors since the growth in bank loans has an inverse impact on net dividend, although statistically significant only during the financial duress period.

Another notable observation is that bank decisions on dividend payments is positively and significantly determined by last period's cash dividend (NETDIV_{t-1}), implying that these banks aim to achieve stable growth of dividend earnings for their investors during all three periods. Furthermore, any increase in gains from sale of securities prompts banks to increase dividend payouts throughout all three periods, while any increase in loan loss provisions induces banks to reduce dividend payouts only during the most recent period in which banks face severe financial constraint. Net dividends are significantly and positively determined by non-discretionary income during the high-growth period. These results suggests that Japanese banks on average were less likely to pay dividends in the face of declining nondiscretionary earnings and increasing provisions during both the financial distress and acute capital constraint periods, unless they can realize gains from sale of securities. However, the relationship between ROI and NETDIV is significantly negative during the financial distress period, with those banks that endure negative non-discretionary income (ROI*NEG) increasing significantly their net dividend payouts in the face of higher ROI during this same period. Thus, while banks on average maintained growth in net dividend payouts in the face of declining ROI during the financial duress period, banks with negative nondiscretionary income may have been required to reduce dividend. Regional bank dummy (REG) is positive and significant during both of the trouble periods, indicating that dividend payments during these two periods are on average higher for the smaller regional banks relative to the larger city banks that maintain their main bank relationship to the *Keiretsu* firms.

4.5. Specification Tests

We have conducted three formal tests for the 2SLS model. The first test examines whether the parameters from OLS and 2SLS methods are equal, as they would be in the absence of simultaneity or model misspecification. Hausman's (1978) specification test rejects the hypothesis of equivalence of the parameters in each of the four equations. These results support the assumption of endogeneity in lending, security gains, loan loss provision, and net dividends. Furthermore the results also indicate that OLS estimation may entail simultaneous equation bias.

The second test for model misspecification consists of regressions of the residuals from each equation in the 2SLS model on all the instruments and computing tests of the hypothesis that the coefficients in each equation are jointly zero. The results show that none of the tests were significant even at the 10% level. The third test compares the 2SLS coefficients with those for 3SLS estimation. Our tests reject equality of the 2SLS and 3SLS parameter estimates for each of the four equations.

We also conduct some sensitivity analysis of the results to determine robustness. The most critical test includes a year dummy in each of the four equations. This test would control for omitted factors in a fixed effects model in the sense that it implicitly assumes that the dummy variables capture the influence of omitted variables, which are common to each year, but different across years.

5. Conclusion

This paper analyze the allocation of loan loss provision and realized gains from securities portfolios as means for earnings management practices by 78 Japanese banks over a 15 year-period (1985-1999). Specifically, we break down our analysis into three distinct periods that characterize the evolution of the Japanese banking system: (i) high-growth era for

Japanese banks (1985-1989); (ii) the financial duress period (1990-1994); and (iii) the further deterioration of bank balance sheet and banking crisis period (1995-1999).

With regard to income smoothing behavior of Japanese banks, gains from sale of securities were used as a means to smooth income throughout all three periods. This finding suggests that Japanese banks realized gains from sale of securities in order to offset the adverse impact of loan loss provisions on income in order to smooth income throughout all three periods; however, the propensity of using gains to smooth income is larger [smaller] for banks with negative nondiscretionary income during the high-growth period [the latter two capital constraint periods]. Our findings are consistent with those of Shrieves and Dahl during their study period characterized by financial duress.

However, we find that Japanese banks used loan loss provisions to manage earnings only during the high-growth period. During the financial distress, we find that only banks with negative nondiscretionary earnings increased provisions-to-assets with any increase on ROI. During the most recent period of more intense capital constraint and banking crisis, however, our empirical results suggest that while banks with negative nondiscretionary income used provisions as a means to smooth income, overall Japanese banks actually increased their provisions-to-assets in the face of declining return on investment. This finding implies that during this period of rising non-performing loans and more intense banking crisis, banks were understandably forced to increase their share of provision-to-asset, and thereby were restrained from using provisions as a means to smooth income. Thus, it appears that the accumulation of capital-to-assets ratio significantly improved the provisioning positions of banks, which suggests that banks may have been restricted by the accumulation of non-performing loans in addition to being regulatory capital constraint. The surprise finding is that despite mounting bad loans, however, banks with negative nondiscretionary earnings continue to use provisions to smooth income, indicating that these banks engaged in income smoothing by understating their

provisions-to-assets (despite rising non-performing loans) in the face of declining return on investment.

We find that loan growth of Japanese banks has been significantly impacted by different factors during the three periods. During the high-growth (1985-1989) period, the three factors contributing significantly to the growth of Japanese banks' loan portfolio were: (i) high economic growth (hence high demand for loans); (ii) banks' objective to maintain a steady loan-to-assets ratio; and (iii) banks' rising assets. On the other hand, while contracting macro-economic conditions significantly depressed overall lending activities of Japanese banks during the 1990-1994 period, the decline in the return on investment of banks enduring negative nondiscretionary earnings significantly helped improve their loan portfolio. Furthermore, during the more intense capital constraint period (1995-1999), overall bank lending was significantly hindered by the decline of the return on investment. More importantly, we are not certain that during the financial distress period Japanese banks actually used loan loss provisions and security gains to replenish regulatory capital under the regulatory capital-arbitrage hypothesis. Our findings of the significantly negative coefficients for the capital-to-assets ratios imply that the increased capital-to-assets ratios of Japanese banks aimed to improve the capital requirement following the introduction of the Basle Accord resulted in a decline in loan growth. Hence, it seems that Japanese banks lowered their lending position as they improve their capital position during the financial duress period.

Moreover, we find that Japanese banks did not significantly account for additional risk-taking activities, e.g., increase their provisions when their loan portfolio increased during the high growth period. We also find that the banks were not completely prudent in managing risk because our results indicate that they (i) reduced their provisions-to-assets when loan loss reserve depletes during all three periods; (ii) understated their loan loss provisions when the collateral value of their loans significantly declined during the more severe banking crisis period.

Finally, we also find that current dividend policy is significantly guided by last period's dividend payouts throughout the three periods, indicating that Japanese banks give great importance to stable growth dividend earnings for investors. Higher capital equity prompts banks to increase dividend payouts during the latter two contractionary periods. Furthermore, to achieve higher dividend payouts, banks increased gains from sale of securities during the 1995-1999 period in which stock market deteriorated significantly. However, dividend payouts were significantly deterred by any increases in banks' lending activities during the financial distress period, while it was necessary for banks to understate their loss provisions in order to maintain stable dividend payout growth during the more severe banking crisis period.

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Table 1: Summary Statistics
(Percent of assets, unless noted otherwise)

	1985-1989				1990-1994				1995-1999			
	Mean	Std Dev	Min	Max	Mean	Std Dev	Min	Max	Mean	Std Dev	Min	Max
Panel 1: Macroeconomy												
STOCKS (% change)	0.2690	0.0453	0.1979	0.3193	-0.0786	0.0974	-0.2047	0.0922	-0.0632	0.0777	-0.1378	0.0475
STOCKS_BANK (% change)	0.2044	0.3138	-0.8635	1.9512	-0.1036	0.1639	-0.8927	0.5773	-0.0712	0.1911	-0.5729	0.4458
LAND (% change)	0.0570	0.0280	0.0271	0.0999	-0.0239	0.0230	-0.0554	0.0000	-0.0391	0.0035	-0.0436	-0.0348
PRIME (Difference)	-0.3667	0.7544	-1.3750	0.6667	-0.2833	1.4566	-1.9375	2.2292	-0.3125	0.3216	-0.7292	0.0000
INDPROD (% change)	0.0451	0.0327	-0.0024	0.0972	-0.0062	0.0373	-0.0613	0.0405	0.0054	0.0453	-0.0719	0.0408
Panel 2: City Banks												
dLOANS	0.06970	0.03328	-0.01021	0.20707	0.01725	0.05126	-0.07621	0.57721	0.00510	0.03478	-0.15080	0.24560
GAINS	0.00271	0.00183	0.00001	0.01076	0.00251	0.00266	-0.00065	0.01398	0.00449	0.00398	-0.00297	0.02328
PROV	0.00039	0.00038	0.00000	0.00299	0.00092	0.00126	0.00001	0.01328	0.00715	0.00651	0.00040	0.03494
NETDIV	0.000544	0.000191	0.000000	0.000932	0.000487	0.000108	0.000000	0.000891	0.000401	0.000000	0.000000	0.000867
ASSETS (Yen, mills.)	8,947,715	13,380,316	1,114,668	66,590,841	11,642,080	16,563,218	1,626,591	62,573,290	11,553,512	16,722,010	1,765,391	81,946,229
CASH (Yen, mills.)	1,565,823	3,033,244	29,313	16,659,051	1,451,275	2,566,001	41,257	13,211,206	798,290	1,617,127	28,535	12,247,709
INVSTMT (Yen, mills.)	1,268,918	1,482,329	170,499	7,066,349	1,698,712	1,927,945	231,978	7,115,320	1,864,066	2,299,413	215,689	10,880,048
LNASS	0.63117	0.08303	0.37442	0.77283	0.65828	0.07480	0.40527	0.79438	0.68894	0.06649	0.47983	0.80407
LLRESERVE (Yen, mills.)	34,711	53,726	3,660	300,786	65,470	109,774	4,324	691,420	200,161	298,055	6,114	1,599,066
RSRVRAT	0.00407	0.00143	0.00184	0.01033	0.00467	0.00236	0.00197	0.02025	0.01571	0.01049	0.00301	0.05799
TLIAB	8,708,941	13,056,497	1,080,497	64,841,050	11,223,165	16,022,632	1,567,273	60,749,304	11,154,672	16,198,273	1,729,937	80,081,537
CAP	0.03120	0.00700	0.01699	0.04934	0.03891	0.00625	0.02538	0.05744	0.03852	0.01043	0.01392	0.07942
NET_INCOME (Yen, mills.)	23,612	36,659	1,905	198,314	13,233	29,630	-335,498	135,531	-47,582	124,197	-900,575	53,995
NONDISC_INCOME (Yen, mills.)	22,219	33,386	-105,659	162,707	-1,133	60,211	-568,720	201,222	-30,531	111,295	-576,000	178,302
ROI	0.00341	0.00198	-0.00497	0.01092	0.00000	0.00313	-0.01199	0.00734	0.00038	0.00620	-0.05039	0.00977
Panel 3: Regional Banks												
dLOANS	0.07290	0.03897	-0.03089	0.20305	0.02438	0.03690	-0.15546	0.11447	0.02531	0.11826	-0.05767	1.00678
GAINS	0.00239	0.00134	-0.00009	0.00823	0.00243	0.00327	-0.00041	0.02020	0.00273	0.00251	-0.00056	0.00940
PROV	0.00053	0.00050	0.00000	0.00258	0.00088	0.00087	0.00002	0.00457	0.00860	0.01017	0.00026	0.05568
NETDIV	0.000391	0.000260	0.000000	0.000801	0.000467	0.000104	0.000000	0.000811	0.000357	0.000170	0.000000	0.000634
ASSETS (Yen, mills.)	1,190,974	312,554	582,651	2,030,612	1,591,327	375,787	926,037	2,526,541	1,756,805	605,226	936,704	5,398,154
CASH (Yen, mills.)	62,480	23,762	16,331	117,863	76,433	61,185	15,118	442,167	77,453	78,909	17,728	461,783
INVSTMT (Yen, mills.)	233,850	106,967	69,665	688,663	284,728	113,253	104,864	729,167	288,654	153,804	92,086	1,146,789
LNASS	0.68250	0.05632	0.48178	0.79609	0.71053	0.08754	0.38235	0.80132	0.74215	0.07437	0.47331	0.85484
LLRESERVE (Yen, mills.)	5,982	3,325	2,010	20,429	7,720	4,515	2,359	37,736	29,733	21,409	5,933	105,168
RSRVRAT	0.00506	0.00220	0.00186	0.01294	0.00493	0.00275	0.00191	0.02229	0.01801	0.01374	0.00378	0.06730
TLIAB	1,153,157	297,203	569,815	1,901,181	1,526,708	353,631	898,186	2,361,892	1,688,030	581,153	904,594	5,237,825
CAP	0.03069	0.00832	0.02045	0.07240	0.03972	0.01010	0.02820	0.07611	0.03833	0.01205	0.01187	0.08556
NET_INCOME (Yen, mills.)	2,842	1,336	870	7,493	817	17,140	-163,959	7,367	-5,953	18,341	-100,415	40,219
NONDISC_INCOME (Yen, mills.)	4,102	2,994	-3,777	13,622	1,373	18,627	-168,216	13,733	4,544	9,561	-30,026	43,438
ROI	0.00343	0.00199	0.00775	0.00079	0.00079	0.01105	-0.09937	0.00646	0.00000	0.00552	-0.02006	0.02881

Table 2: Expected Signs of Key Variables Under Income Smoothing and Capital Arbitrage

	dLOANS	GAINS	PROV	NETDIV	ROI	CAPLO	CAPMID	CAPHI
dLOANS	NA	+	-	-	+	+	+	+
GAINS	+	NA	+	+	-	-	-	-
PROV	-	+	NA	-	+	+	+	+
NETDIV	-	+	-	NA	+	+	+	+

Table 3: 2SLS Model Estimation

Equations	Period: 1985-1989 (No. of Obs. = 376)			Period: 1990-1994 (No. of Obs. = 376)			Period: 1995-1999 (No. of Obs. = 352)		
	Coeff. Est.	t-stat	Adj. R2	Coeff. Est.	t-stat	Adj. R2	Coeff. Est.	t-stat	Adj. R2
dLOANS = Interceqt	-0.1088	-1.46	0.1090	0.1990	2.19 **	0.0629	0.0253	0.17	0.0439
REG	0.0158	2.97 ***		0.0007	0.09		0.0189	1.38	
ASSETS_t-1	0.0080	2.47 **		-0.0041	-1.04		-0.0028	-0.4	
LNASS_t-1	0.0987	2.23 **		-0.0915	-1.59		0.0106	0.12	
INDPROD	0.1751	3.12 ***		0.1921	2.51 ***		0.0174	0.11	
CAPLO_t-1	-1.1126	-1.37		-2.1824	-1.89 *		1.9881	1.02	
CAPMID_t-1	-0.6773	-1.17		-1.9892	-2.44 **		0.7982	0.57	
CAPHI_t-1	-0.3293	-0.74		-1.6819	-2.67 ***		0.5339	0.49	
ROI	0.7245	0.39		2.8774	1.38		4.7834	2.34 **	
ROI*NEG	-4.3884	-0.81		-3.9231	-2.08 **		-2.6729	-1.16	
GAINS	3.9971	1.47		-3.8802	-1.07		5.7442	1.08	
PROV	-23.6446	-2.79 ***		-7.0649	-1.34		-3.0528	-1.51	
NETDIV	4.7783	0.35		36.9272	0.85		-63.4373	-0.97	
GAINS = Interceqt	0.00767	2.51 ***	0.5143	0.01492	4.29 ***	0.5763	0.00861	1.11	0.3387
REG	-0.00026	-1.12		0.00029	0.91		-0.00123	-1.78 *	
ASSETS_t-1	0.00004	0.28		-0.00051	-3.13 ***		-0.00005	-0.16	
LNASS_t-1	-0.00857	-5.45 ***		-0.00957	-5.29 ***		-0.00916	-2.42 **	
STOCKS	-0.00757	-2.43 **		-0.00080	-0.47		0.00031	0.01	
PRIME	-0.00061	-3.36 ***		0.00030	2.67 ***		-0.00150	-0.25	
CAPLO_t-1	0.09260	2.94 ***		0.00532	0.11		-0.08504	-0.91	
CAPMID_t-1	0.06781	3.05 ***		-0.01290	-0.39		-0.07451	-1.13	
CAPHI_t-1	0.07448	4.35 ***		-0.00492	-0.19		-0.06048	-1.17	
ROI	-0.57197	-11.74 ***		-0.80979	-12.18 ***		-0.47023	-5.36 ***	
ROI*NEG	-0.70265	-3.39 ***		0.72455	9.8 ***		0.44909	3.98 **	
dLOANS	0.02180	3.26 ***		-0.01923	-1.38		0.00651	0.56	
PROV	1.36755	4.03 ***		1.01420	4.29 ***		0.34389	4.37 ***	
NETDIV	-1.56276	-2.93 ***		6.27138	3.95 ***		8.83698	4.43 ***	
PROV = Interceqt	-0.00093	-1.99 **	0.3323	-0.00089	-0.57	0.2074	0.01268	1.09	0.3552
REG	0.00006	1.07		-0.00002	-0.09		0.00326	2.54 ***	
TASSETS_t-1	0.00003	0.86		0.00006	0.7		-0.00010	-0.18	
RSVRAT_t-1	0.12735	8.92 ***		0.21843	3.96 ***		0.19178	2.09 **	
LAND	-0.00182	-2.11 **		-0.00688	-3.16 ***		0.34129	2.33 **	
CAPLO_t-1	-0.01763	-2.18 **		-0.00613	-0.21		0.33271	1.96 **	
CAPMID_t-1	-0.00732	-1.27		-0.00323	-0.16		0.27719	2.34 **	
CAPHI_t-1	-0.01014	-2.29 **		0.00366	0.24		0.27371	3.07 ***	
ROI	0.13021	8.29 ***		-0.00695	-0.15		-0.43392	-2.15 **	
ROI*NEG	-0.03209	-0.59		0.07623	1.66 *		0.70286	3.4 ***	
dLOANS	0.00139	1.04		0.01494	1.16		-0.00118	-0.05	
GAINS	0.14590	6.84 ***		0.16241	1.83 *		1.09800	3.11 ***	
NETDIV	-0.21954	-1.64 *		-0.90151	-0.88		-14.85640	-2.36 **	
NETDIV = Interceqt	0.00003	0.2	0.7429	0.00005	0.51	0.5683	0.00001	0.05	0.3323
REG	0.00000	0.12		0.00002	1.84 *		0.00009	2.45 ***	
ASSETS_t-1	0.00001	1.02		0.00000	0.49		0.00000	-0.22	
NETDIV_t-1	0.69175	21.91 ***		0.57240	14.39 ***		0.37347	3.44 ***	
CAPLO_t-1	-0.00411	-1.57		0.00500	2.79 ***		0.00860	1.65 *	
CAPMID_t-1	-0.00104	-0.56		0.00378	3.03 ***		0.00649	1.78 *	
CAPHI_t-1	-0.00057	-0.4		0.00366	3.87 ***		0.00590	2.12 **	
ROI	0.01135	2.05 **		-0.00507	-1.74 *		0.00844	1.61	
ROI*NEG	-0.00367	-0.21		0.01254	4.37 ***		-0.00098	-0.16	
dLOANS	-0.00051	-1.62		-0.00083	-2.09 **		-0.00050	-0.8	
GAINS	0.01513	1.92 *		0.00631	1.7 *		0.04620	5.89 ***	
PROV	-0.03952	-1.39		-0.00479	-0.59		-0.02290	-6.92 ***	

*** / ** / * Significant at the 99% / 95% / 90% Confidence Level, respectively.

Appendix

We follow Shrieves and Dahl (2002) for the definitions of all variables in the simultaneous equation system. The only deviation from their variables is our measure of capital ratios. Instead of using surplus regulatory capital ratios (BIS) as in Shrieves and Dahl's study, we use the overall equity capital ratios (CAP) because of the difficulty in measuring risk-weighted capital during the transition period, during which the banking regulator did not fully enforce the reported BIS ratios in Japan. We are comforted by Shrieves and Dahl's remarks that the use of CAP measures leads to similar conclusions. The endogenous and exogenous variables as well as bank characteristics are defined as follows.

Endogenous Variables:

dLOANS = one year change in total loans / beginning of year total assets

GAINS = gains/losses on sale of securities / beginning of year total assets

PROV = provision for loan loss / beginning of year total assets

NETDIV = cash dividends / beginning of year total assets

Banks Financial Characteristics:

REG = 1 for regional banks, and 0 for city banks

ASSETS_{t-1} = log of total assets (lag)

LNASS_{t-1} = total loans / total assets (lag)

RSRVRAT_{t-1} = loan loss reserves / total assets (lag)

CAP_{i,t-1} = equity capital / total assets (lag), where $i = LO, MID, \text{ and } HI$ for capital-to-assets in the lowest, middle, and highest quartile

ROI = non-discretionary earnings / total assets

NEG = 1 for banks with negative non-discretionary income, and 0 otherwise

Exogenous Variables:

STOCKS = two-year average percent change of the Tokyo Stock Exchange price index

PRIME = two-year average change in long-term prime lending rate

LAND = two-year average percent change the land price index

INDPROD = two-year percent change of the industrial production index