



Discretionary accounting and the behavior of Japanese banks under financial duress

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Abstract

This paper investigates utilization of discretionary accounting practices in the context of international bank regulation under the Basle Accord. Specifically, we explore implications of earnings management as a means of regulatory-capital arbitrage by Japanese banks during a period of financial duress, 1989–1996. Using a sample of 607 pooled time series and cross-sectional observations, we find evidence that Japanese banks' lending was capital constrained, and that banks set gains on securities sales and loan-loss provisions in such a way as to smooth reported income and replenish regulatory capital. Our results support the hypothesis that the form of earnings management examined may have been instrumental in enabling some Japanese banks to comply with international capital regulation. We contend that this behavior is otherwise inexplicable on the basis of significant informational, tax or economic motivations. © 2003 Elsevier Science B.V. All rights reserved.

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1. Introduction

The ingenuity of banks in circumventing capital regulation has focused increasing attention on some important inadequacies of the Basle Accord. This agreement, instituted in 1988 under the auspices of the Bank for International Settlements (BIS), attempted to harmonize the international regulation of bank capital. It established

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contract-equivalent standards that are explicit, stated in accounting terms, and observable. The standards are comprised of a set of rules for calculating ratios of capital to risk-weighted assets. A number of papers have taken accounting measures of capital at face value in addressing the influence of capital on bank lending. Most find that loan growth is significantly positively influenced by bank capital. Jackson (1999), reviews the related literature and concludes: “On balance, it seems reasonable to conclude that banks attempt to respond in the least costly way to binding capital constraints” (p. 19).²

Motivation for this study lies in the possibility that banks have found ways to exploit the divergence between true economic capital, which represents a bank’s capacity to absorb unexpected losses, and capital as it is measured under Basle. Consistent with Kane’s (1977, 1988) description of “regulatory dialectic”, in which regulation is followed by avoidance behavior on the part of regulated firms, responses to capital regulation may involve manipulation of either capital or risk-weighted assets (Jones and John, 1998). Such exploitation has been referred to as “regulatory-capital arbitrage”. So far, regulatory attention to such behavior has been directed mainly at manipulation of the denominator, through such activities as securitization (Jackson, 1999).

Our concern is with behavior potentially related to manipulation of the numerator of the regulatory-capital ratio. A similar concern was expressed earlier in an analysis of the Basle Accord by Cooke (1991), which contended that banks in various countries used national discretion afforded in the definition of capital to undermine the original intent of international “capital convergence”. The Basle standard is based on two sources of capital which insulate depositors from adverse developments: “core”, or Tier 1 capital, which is defined in a consistent manner for all countries, and “supplementary”, or Tier 2 capital, which contains what are sometimes referred to as “carve-outs”, or “leeway” elements, that at least one of the signatory countries considered to be part of bank capital prior to the agreement (Wagster, 1996). A recent proposal for revising the capital-adequacy provisions under Basle addresses difficulties in measuring asset risk, but changes in the definition of the numerators of the capital standards have, so far, been excluded from proposed revisions (Basle Committee on Banking Supervision, 1999).

We empirically examine the behavior of Japanese banks, from 1989 to 1996. During this period, market values of Japanese banks’ assets declined dramatically.³ Japanese banks were also hamstrung by the Basle Accord, which, under conditions of deteriorating asset quality, threatened to curtail their access to international markets. The threat was significant as well as immediate, insofar as exclusion from inter-

² Domestic and US lending by Japanese banks, in particular, are the subjects of studies by Peek and Rosengren (1997) and Shrieves and Dahl (2000). Both conclude that the impact of a dramatic decline in Japanese equity values in 1989–1990 on bank equity contributed to reduced lending by Japanese banks.

³ To put the magnitude of the crisis in perspective, it is often compared to the savings-and-loan debacle in the United States in the late 1980s, which resulted in a bailout valued at about 3% of US gross domestic product. Analysts have estimated the current financial crisis in Japan to be as much as 20% of gross domestic product (Wall Street Journal, August 27, 1998).

national banking business constitutes a disproportionate cost of not meeting the Basle guidelines (Marsh and Jean-Paul, 1996). We examine the hypothesis that many banks reacted by engaging in discretionary accounting practices that constitute earnings management. Our results provide direct evidence that relationships among contemporaneous changes in bank lending, security gains, and provisions for loan losses are, for the most part, consistent with either of two possible objectives of earnings management, namely, income smoothing and regulatory-capital arbitrage. We also find evidence that higher tax burdens were a cost borne by Japanese banks in achieving goals with respect to earnings management.

Our results indicate that Japanese banks, within the bounds of their “main-bank” system of stable shareholdings, used earnings management to accommodate financial duress while continuing to satisfy their accounting-based requirements under Basle. We conclude that the observed empirical regularities relating to security gains and loan-loss provisions were not powerfully motivated by tax considerations, economic considerations of securities portfolio rebalancing (insofar as the securities sales were quickly reversed, presumably to preserve the stable cross-shareholding arrangements), or by informational considerations (unrealized capital gains were already identifiable on bank financial statements).

The paper is organized as follows. Section 2 describes the earnings management hypotheses regarding income smoothing and regulatory-capital arbitrage. Section 3 describes our data and the simultaneous-equations methodology by which we model the determination of managerial decisions with respect to lending, securities gains, loan-loss provisions and dividends. Section 4 presents descriptive statistics and results. In Section 5, we undertake supplementary analyses of the effective tax rates on securities gains and loan-loss provisions. Section 6 concludes.

2. Earnings management and accounting discretion in Japanese banks

Earnings management stems from managers’ discretion over the timing of certain elements of income and expense. A number of prior empirical studies of earnings management among financial institutions in the US focus on loan-loss reserves as the discretionary element (Greenawalt and Sinkey, 1988; McNichols and Wilson, 1988; Wahlen, 1994). Other studies also include security gains/losses as a discretionary component of income (Beatty et al., 1995; Collins et al., 1995; Moyer, 1990; Scholes et al., 1990). We follow these studies in emphasizing the importance of these elements of income as means of managing earnings for Japanese banks. For our purposes, other components of income are defined as nondiscretionary.⁴ The focus is on the period since 1989, which has witnessed dramatic changes in the Japanese economy and in regulation of international banking. Two motivations for earnings management involving security gains and loan-loss provisions are acknowledged. We

⁴ Beatty et al. (1995) and Collins et al. (1995) use similar logic in defining nondiscretionary income for US banks.

refer to these motivations as the income smoothing and regulatory-capital arbitrage hypotheses.

2.1. Income smoothing

Income smoothing has been hypothesized to lower the present value of tax obligations (Smith and Stultz, 1985); convey private information to investors about current and prospective performance (Beaver et al., 1989; Scholes et al., 1990); and to lower the firm's cost of capital by reducing variability in income (Trueman and Titman, 1988). Income smoothing suggests that banks will use their discretion over loan-loss provisions to cause provisions to vary directly with both nondiscretionary income and security gains.⁵ Using similar logic, income smoothing will motivate banks to cause security gains to vary inversely with nondiscretionary income, and directly with increases in provisions.

2.2. Regulatory-capital arbitrage

Banks are capital constrained if lending is an increasing function of internally generated funds due to a wedge between the costs of internally and externally generated equity capital. Such a wedge might exist due to asymmetric information about the value of bank assets (Myers and Majluf, 1984), or to transaction costs of external financing. Since achieving regulatory-capital targets may require relatively expensive additional external funding in support of increased lending, banks will presumably choose a regulatory-capital strategy that minimizes combined funding and regulatory costs (Kane, 1977). Banks do not wait until they are below the regulatory standard before they begin managing capital as suggested by the regulatory-capital arbitrage hypothesis, but rather, when there is a significant probability that they will fall short of the standard in the near future. Capital-constrained banks may improve their regulatory-capital ratio and their ability to absorb unexpected losses, without resort to external financing by reducing either lending or dividends. To the extent that such actions reduce the risk of insolvency, they do not constitute regulatory-capital arbitrage (Jackson, 1999, discusses securitization as a form of regulatory-capital arbitrage). Alternatively, banks may use discretionary accounting to achieve regulatory-capital targets. To the extent that such behavior increases regulatory capital without a corresponding reduction in risk of insolvency, it constitutes regulatory-capital arbitrage.

Under Basle, Tier 1, or "core" capital, consists of equity, some preferred stock, and disclosed reserves, while Tier 2, or "supplementary" capital, consists of loan-loss reserves, hybrid debt-capital instruments (including subordinated debt), undisclosed

⁵ Recently, the Securities and Exchange Commission (SEC) took steps against SunTrust Bank, forcing it to reduce a loan-loss reserve that it had already announced. The SEC has warned US banks against utilizing excess provisions to build a "fund" against which lower future provisioning may be used to smooth reported income (The Financial Times, November 25, 1998). Genay (1998), provides evidence on Japanese banks' use of provisions to smooth income.

reserves and revaluation reserves. Elements of Tier 2 capital are eligible only up to 100% of Tier 1 capital. Under Japanese law, loan-loss provisions fall into three categories: general provisions, specific provisions, and provisions for certain international loans. All three categories of provisions reduce Tier 1 capital via their impact on earnings. General provisions will increase Tier 2 capital.⁶ The sale of securities with gains will improve Tier 1 capital via net income. Since Japan utilizes its national discretion to allow 45% of the market values of securities not reflected on the balance sheet to be counted in Tier 2 capital, realization of gains may also result in reduction of Tier 2 capital (subject to the limitations on Tier 2). Since Japan taxes corporate capital gains at about 50% (during the period of our study), the realization of gains will deplete Tier 2 capital by about the same amount as it improves Tier 1 capital (unless the bank already had a surplus of eligible components of Tier 2).

2.2.1. *Discretionary loan-loss provisions*

Discretion over loan-loss provisions gives a bank the option of understating its provisions in relation to actual anticipated loan losses, thereby resulting in higher Tier 1 regulatory capital.⁷ Over the period since 1990, and notwithstanding the fact that banks exercise some discretion in setting loan-loss provisions, loan-loss experiences and/or regulatory pressure have resulted in significant increases in provisions by Japanese banks. Our data (presented later) indicate a ten-fold increase from 1989 to 1996. These provisions reduced Tier 1 capital, and possibly resulted in a “regulatory surplus” of the components of Tier 2 capital. These observations suggest that, to the extent that Japanese banks have fallen short of their regulatory-capital targets during the period, it has been due to the adverse impact of the nondiscretionary component of loan-loss provisions on Tier 1 capital. Even so, the preponderance of opinion (e.g., Dawkins, 1994) on the subject of Japanese banks’ provisions holds that they significantly understated the extent of problem loans.⁸ Our analysis examines whether the relationships between provisions and other variables reflects a pattern consistent with regulatory-capital arbitrage.

An increase in loan-loss provisions, like depreciation expense, affects cash flow only via its impact on income taxes; to the extent it reduces taxes, it is a source of

⁶ Since general provisions are included as a component of Tier 2 capital, and deducted from risk-weighted assets, an increase in general provisions may actually increase the BIS total capital ratio, especially if the increase in Tier 2 capital is larger than the decrease in Tier 1 capital due to income taxes. But the limited deductibility of general provisions under Japanese tax law raises doubts about their potential value in generating tax shields (Federation of Bankers Associations of Japan, 1994). We address this issue in Section 5 by estimating average tax rates on provisions as well as on security gains.

⁷ In contrast, the announcement in May of 1987 by major US bank holding companies of significant increases in loan-loss-provisions for less-developed countries’ debt was interpreted as a credible signal of future actions to reduce the risk of insolvency (Musumeci and Sinkey, 1990). Under the regulatory framework at that time, the increase in provisions did not result in a significant decline in regulatory Tier 1 capital, which included loan-loss provisions.

⁸ Brewer et al. (1999, p. 3) discuss discretion with respect to provisions in the context of several bank failures in Japan after 1995. They conclude that “the bad loans and valuation losses previously disclosed by the banks had been significantly understated and concealed the extent of the banks’ problems.”

funds. Therefore, while provisions may reduce Tier 1 capital, the pure cash-flow implications are positive.

2.2.2. Discretionary security gains

Another element of discretion is the timing of security gains and losses. Unlike the US, Japan allows banks to invest in equity securities of nonbank firms, and in 1990, they directly owned 25.2% of all the equity in Japanese companies (Kester, 1992). For the period of this study, equity investments are carried at lower of cost or market, and Japan utilizes its national discretion under the Basle Accord to allow 45% of the market values of securities not already reflected on the balance sheet to be counted as a component of Tier 2 capital.⁹ These unrealized, or “latent” gains, are reported in banks’ financial statements, so the actual realization of the gains does not convey new information to investors regarding the value of the banks’ equity portfolio.

Aggregate banking statistics for the years 1989 to 1996 give insight into the potential impact of banks’ equity sales on the system of stable cross-shareholdings, which represent an important structural feature of the Japanese corporate control system. Unrealized (latent) gains on securities for Japanese banks declined more than 75%, from 54 trillion yen in 1989 to 13 trillion yen in 1996. Over the same period, investment in securities remained relatively constant, at about 131 trillion yen, but investment in corporate equities actually increased from 31 trillion yen in 1989 to 46 trillion yen in 1996 (data from Nihon Kezai Shimbun Inc.). Japanese banks apparently sold corporate equities at prices above book values, cashing in the latent gains in the process. The fact that banks’ investment in equities over the period increased substantially suggests that banks at least partially offset the equity sales by purchasing (or repurchasing) equities at prevailing prices, increasing the book value of their equity investments.¹⁰ By engaging in the sale and repurchase of equity securities with capital gains, a bank will improve its Tier 1 capital level without reducing risk of insolvency.

If the proceeds from the sale of securities are immediately reinvested, then the impact on bank funding is the tax implication of the transaction. The offsetting sale and repurchase of securities achieves a “mark-to-market” on the affected portion of the

⁹ Japan’s Ministry of Finance did not require banks to use mark-to-market accounting for trading-account securities and securities held for sale until fiscal 1997. In December 1997, as part of a political package for easing the credit crunch, the Ministry of Finance revised its banking regulations that had previously required valuation of nontrading marketable securities at the lower of cost or market to valuation using the cost method. By 2001, Japanese banks will be required to use mark-to-market accounting for their equity investments.

¹⁰ Further support is found in Zielinski and Holloway (1991, pp. 186–187) who state that, during 1990, “in order to avoid disturbing their stable shareholdings, the banks repurchased most of the shares they had sold”. Shrieves (2000), finds, in a broad sample of Keiretsu affiliated firms, that the fractional shareholdings of the firms’ “main” banks’ did not change between 1988 and 1996. Inoue (2000) reports increases in percentage cross-shareholdings by Japanese banks in five of the eight years from 1989–1996, before declining in each year from 1997–1999. Sheard (1994) discusses how shares are bought and sold in the context of stable shareholding arrangements.

securities portfolio, albeit with potentially undesirable tax consequences that reduce available cash. Therefore, the pure cash-flow implications of discretionary security gains are negative. (A numerical example illustrating the accounting performance implications of provisions and security gains is available upon request.)

2.2.3. Empirical implications of regulatory-capital-arbitrage behavior

If banks are capital-constrained, then their lending decisions will vary directly with internal generation of funds. This conclusion is unrelated to capital regulation, and rests upon the premise that the cost of funds is a decreasing function of internally generated funds due to a wedge between the costs of internally and externally generated equity capital. The strategies for regulatory-capital arbitrage discussed above do not increase internal funding, rather, they decrease it, due to their tax consequences. If regulatory capital is unimportant, they have correspondingly negative implications for investing in loans. However, if banks face regulatory costs that are decreasing in regulatory capital, and if improving regulatory capital via external funding is relatively costly, then discretionary provisions and discretionary security gains may be used instead, and will have positive implications for bank lending.

The foregoing discussion leads to several empirical implications. If banks are capital constrained, then lending will be positively related to internal funds generation. Absent regulatory-capital arbitrage, cash-flow considerations imply that lending will be inversely related to security gains, and positively related to loan-loss provisions. The regulatory-capital arbitrage hypothesis has four implications. First, if shortage of Tier 1 capital is a pressing regulatory concern, then lending at capital-constrained banks should respond positively to beginning-of-period regulatory capital and contemporaneous increases in security gains, and inversely to contemporaneous changes in provisions. Second, to the extent that security gains and provisions have discretionary components, security gains will respond directly, and provisions inversely, to changes in lending. Third, security gains will be complementary to provisions, since gains result in an offset to the reduction in Tier 1 capital (and possible increases in Tier 2) which results from the nondiscretionary component of provisions. Finally, since nondiscretionary earnings improve Tier 1 capital, security gains will be inversely related to nondiscretionary earnings, and provisions, positively related.

2.3. Tax incentives and consequences

Banks' securities gains are fully taxable in Japan, thus strengthening tax incentives to "time" security gains to achieve minimum present value of taxes. Objectives of reduced earnings volatility or regulatory-capital compliance come at a significant cost if they result in tax liabilities that would otherwise be avoided or postponed indefinitely. Banks would minimize the tax penalty from security gains when taxable income is negative, and, to the extent that provisions are tax deductible, the greatest tax benefit from provisions is when taxable income is positive. A complete analysis of earnings management by Japanese banks must assess the related tax motivations or tax consequences. We address tax issues in Section 5.

2.4. *Confounding of hypotheses*

The hypotheses of income smoothing and regulatory-capital arbitrage have identical implications for the direction of empirical relationships among nondiscretionary earnings, security gains, and loan-loss provisions. The realization of gains from securities sales to offset the impact of the provisions on income will almost surely result in favorable implications for regulatory Tier 1 capital, and perhaps for total regulatory capital, even if that is not the primary objective. Therefore, in describing and interpreting our results, some of our conclusions are stated in terms of support, or lack thereof, for both hypotheses. However, for banks with low regulatory capital, the regulatory-capital-arbitrage hypothesis takes on greater motivational potential, and has additional implications for relationships between gains and lending and between provisions and lending, which we attempt to capture in our model. To this end, our methodology accommodates possible nonlinearities in the relationships between regulatory-capital levels and incentives relating to loan-loss provisions and security gains.

3. Methodology and data

3.1. *Model specification*

Our analysis of discretionary accounting choice by Japanese banks employs a simultaneous model with four equations: Lending, securities gains, provisions for loan losses, and dividends. It is based on the assumption that Japanese banks periodically and simultaneously adjust these variables to achieve their objectives. The equations for lending, securities gains, and provisions for loan losses offer empirical evidence of the extent to which Japanese banks used discretionary accounting to maintain accounting-based regulatory-capital standards and to smooth reported earnings, while the equations for lending and dividends reflect, respectively, the potentially related issues of investment and financing activities. Their specifications are based partly on earlier studies of earnings management by banks in the United States (Beatty et al., 1995; Collins et al., 1995; Greenawalt and Sinkey, 1988; McNichols and Wilson, 1988; Moyer, 1990; Scholes et al., 1990; Wahlen, 1994).

3.1.1. *Bank lending*

The lending decision is represented by the year-on-year change in total loans, normalized by beginning-of-year assets (dLOANS). The change in lending is modeled as a linear function of individual bank attributes, the other endogenous variables, and of the average percentage change in industrial production (INDPROD) over the current and prior years, which controls for exogenous changes in loan demand.

One bank attribute potentially influencing lending decisions is bank size, measured as the natural log of lagged bank assets (ASSETS₋₁). Size distinguishes possible changes in the relative roles of large and small banks over the sample period. This may be important if banks of different size serve customers with different loan

demands. Loans to small companies at Japanese banks, for instance, grew more quickly than loans to larger companies in the 1990s (Federation of Japanese Bankers Associations of Japan, 1994).

Two additional bank attributes are portfolio composition and bank type. Portfolio composition, as reflected in the lag of the loan-to-assets ratio ($LNASS_{-1}$), is included to account for possible maintenance of bank-specific target loan-to-assets levels. If stable targets exist, then the coefficient of $LNASS_{-1}$ will be negative. We use a dummy to distinguish bank type (REG), equal to unity for regional banks and zero for city banks. It isolates the different roles for city and regional banks by allowing different intercepts for the two bank types.

Non-discretionary income is defined as reported earnings before taxes, extraordinary items, security gains, and loan-loss provisions. The ratio of nondiscretionary income to total assets is a measure of a bank's return on total investment, and is referred to hereafter as ROI. To accommodate potential asymmetries in the influence of bank earnings, we use the interaction of ROI with a binary variable, NEG, which is zero if a bank's nondiscretionary income is positive, unity otherwise. The interaction term is equal to ROI if ROI is negative, zero otherwise. If banks are capital constrained, changes in lending should be positively related to ROI, because it represents internally generated funding (pre-tax), and because it represents a major component of the change in regulatory capital.

If banks are capital-constrained, then given beginning-of-period regulatory capital and nondiscretionary earnings (ROI), changes in lending should be inversely related to dividends, net of stock issuance (NETDIV), which have an unambiguous negative impact on both internal funding and Tier 1 regulatory capital. As indicated in the previous section, the impacts of securities gains (GAINS) and loan-loss provisions (PROV) on total regulatory capital are complex, since each affects Tier 1 and Tier 2 capital in opposite directions. However, if Tier 1 regulatory capital is the critical regulatory constraint, then under the regulatory-capital-arbitrage hypothesis, lending should be directly related to security gains, and inversely related to provisions. As a qualification of the interpretation of the coefficient for provisions, we note that provisions may be an indicator of loan quality in the market served by the bank, also implying a negative relationship with lending.

We use the beginning-of-period surplus of the bank's regulatory-capital ratio over that required under the regulatory standard to capture the influence of regulatory capital on bank lending.¹¹ To reflect possible nonlinearities in the relationship, banks are divided into quartiles based on the magnitude of their surplus during each year. Three regulatory-capital variables are created $BISLO_{-1}$ is the BIS capital surplus for banks in the lowest quartile, and zero for banks in the three higher quartiles. Similarly, $BISHI_{-1}$ is the surplus for banks in the highest quartile, and zero for banks

¹¹ Our source of data on regulatory capital did not provide Tier 1 and Tier 2 capital separately, only total regulatory capital. We do not regard this as a serious problem, since the various hypotheses regarding the influence of Tier 1 capital are manifested in terms of the unambiguous relationship between GAINS, PROV, NETDIV and Tier 1 or Tier 2 capital. Reestimation of the four-equation model using the (lag) equity-to-assets ratio instead of the BIS variable leads to similar conclusions.

in the three lower quartiles. $BISMID_{-1}$ is the surplus for banks in the middle two quartiles, and zero for banks in the first and fourth quartiles. In addition to standard *t*-tests on the three BIS coefficients, we also test for significance of differences in the coefficients on the lowest and highest quartiles. If a lack of regulatory capital constrains bank lending, we expect a positive relationship between surplus regulatory capital and lending. Our specification of capital levels accommodates differences in the influence of regulatory capital over the spectrum of capital levels. Eq. (1) models the relationship between dLOANS and the explanatory variables:¹²

$$\begin{aligned} dLOANS = & a_0 + a_1REG + a_2ASSETS_{-1} + a_3LNASS_{-1} + a_4INDPROD \\ & + a_5BISLO_{-1} + a_6BISMID_{-1} + a_7BISHI_{-1} + a_8ROI \\ & + a_9(ROI * NEG) + a_{10}GAINS + a_{11}PROV + a_{12}NETDIV. \end{aligned} \quad (1)$$

3.1.2. Security gains

The equation for security gains (GAINS) is intended to capture the potential for using security gains to meet objectives of bank managers with regard to smoothing income, minimizing tax liabilities, and maintaining regulatory capital. Of principal interest is whether security gains are inversely related to nondiscretionary income and whether security gains and loan-loss provisions complement one another. Both the income smoothing and regulatory-capital arbitrage hypotheses suggest that banks will use gains on the sale of securities to cushion the impact of lower nondiscretionary income or higher provisions. NETDIV is expected to be directly related to security gains, since higher gains (lower losses) may be necessary to achieve the earnings necessary to support higher dividends and replenish Tier 1 capital depleted by dividends.

Given that earnings management involves potential tax incentives which may be influenced by a bank's tax status, an interaction term, (ROI * NEG), is used to distinguish between years in which the bank's nondiscretionary income is positive and those in which it is negative. The interaction term also accommodates possible asymmetries in earnings management strategies which relate to managerial compensation (Healy, 1985; McNichols and Wilson, 1988) or managerial turnover (Murphy and Zimmerman, 1993), both of which may create incentives for managers to "take a bath" when earnings levels are extraordinarily low.

As in Eq. (1), we use three variables to capture possible nonlinearities in the relationship between security gains and regulatory capital. Recall that the rules for defining total regulatory capital, coupled with Japan's tax code, imply that low *total* regulatory capital will not necessarily motivate realization of capital gains on security sales, since the sale of securities with unrealized gains will deplete Tier 2 capital by about the same amount as it improves Tier 1 capital. However, if low regulatory capital has been the result of the adverse impact of increases in loan-loss provisions on Tier 1 capital, we would expect an inverse relationship between security gains and beginning of period capital for capital-constrained banks.

¹² Individual bank and time subscripts are omitted from all equations for notational convenience.

In modeling GAINS, we also include the average stock return (STOCK) and prime rate changes (PRIME) over the prior and current periods. If security transactions are carried out merely as a periodic portfolio rebalancing activity, then GAINS should be positively related to stock market performance, and negatively related to changes in the prime lending rate. Alternatively, in light of the potential for banks to use their access to latent gains as means of “window dressing”, we acknowledge that the opposite could also be true: that securities transactions may be associated with asset depreciation. This might be the case if banks want to improve reported earnings in the face of adverse economic conditions. Such arguments imply that GAINS be positively related to the prime lending rate and negatively related to stock market performance.

The final bank attribute is the lagged loan-to-assets ratio (LNASS₋₁). It represents the extent of inventory of nonloan assets that the bank may sell. As the ratio increases, there are fewer options for generating gains or losses, so a nonpositive relationship to GAINS is expected. Eq. (2) expresses the GAINS variable as a linear function of the explanatory variables:

$$\begin{aligned} \text{GAINS} = & b_0 + b_1\text{REG} + b_2\text{ASSETS}_{-1} + b_3\text{LNASS}_{-1} + b_4\text{STOCK} \\ & + b_5\text{PRIME} + b_6\text{BISLO}_{-1} + b_7\text{BISMID}_{-1} + b_8\text{BISHI}_{-1} \\ & + b_9\text{ROI} + b_{10}(\text{ROI} * \text{NEG}) + b_{11}\text{dLOANS} + b_{12}\text{PROV} \\ & + b_{13}\text{NETDIV}. \end{aligned} \quad (2)$$

3.1.3. Loan-loss provisions

Like gains on securities transactions, discretion in provisions may be used to achieve either income smoothing, tax, or regulatory-capital objectives. The two non-discretionary income level variables, ROI and ROI * NEG, along with security gains (GAINS), and net dividends (NETDIV), influence PROV if income smoothing or regulatory-capital arbitrage are factors motivating loan-loss provisions. As with the estimation of security gains and losses, including the dual measures of nondiscretionary earnings allows evaluation of potential asymmetries in banks’ motivation for smoothing. Both income smoothing and Tier 1 capital considerations motivate for a positive relationship between PROV and ROI and between PROV and GAINS, and an inverse relationship between PROV and NETDIV.

To the extent that accounting and regulatory concepts are relevant to provisions, we would expect provisions to be a decreasing function of the value of loan collateral, and an increasing function of borrowers’ ability to service their financial obligations. Since a large fraction of Japanese bank lending is collateralized with real estate, we include the average of the current and past years’ rates of change in the land price index (LAND) as a measure of current value of loan collateral.¹³ The average of current and prior years’ levels of liabilities in companies filing for

¹³ Although both buildings and land may be used as collateral, no reliable index of building values was found, and, in any event, building values and land values are likely to be positively correlated.

bankruptcy (BKRPT) is used as a metric for borrowers' ability to service financial obligations.

Bank size (ASSETS₋₁), the three surplus total BIS capital ratios (BISLO₋₁, BISMID₋₁, BISHI₋₁), and the bank's lagged loan-loss reserves-to-assets ratio (RSRVRAT₋₁) are also included as explanatory variables. Banks constrained by a lack of Tier 1 capital will be less inclined to take provisions, so a positive relationship between regulatory capital and provisions would be expected for banks so constrained. The coefficient of RSRVRAT₋₁ should be negative if banks adjust provisions to achieve bank-specific target reserves-to-assets levels.

The variable dLOANS may positively influence PROV for two reasons. First, as the change in lending as a fraction of total assets increases, provisions as a percentage of assets should also increase. Second, if increases in lending involve lowering credit standards, the impact of changes on lending will be even greater. Under regulatory-capital arbitrage, however, there will be an inverse relationship between dLOANS and PROV, since increased lending creates a demand in the bank for more Tier 1 capital.

The model for estimation of loan-loss provisions is given in Eq. (3):

$$\begin{aligned} \text{PROV} = & c_0 + c_1\text{REG} + c_2\text{ASSETS}_{-1} + c_3\text{RSRVRAT}_{-1} + c_4\text{BKRPT} \\ & + c_5\text{LAND} + c_6\text{BISLO}_{-1} + c_7\text{BISMED}_{-1} + c_8\text{BISHI}_{-1} \\ & + c_9\text{ROI} + c_{10}(\text{ROI} * \text{NEG}) + c_{11}\text{dLOANS} + c_{12}\text{GAINS} \\ & + c_{13}\text{NETDIV}. \end{aligned} \quad (3)$$

3.1.4. Net dividends

The final equation is for NETDIV. Japanese companies normally set their dividends at a fixed percentage of their share's par value (Zielinski and Holloway, 1991) and do not often change this amount. However, some changes in cash dividends are observed (Dai-Ichi Kangyo Bank increased its dividend from Y8.5 in 1991 to Y9.0 in 1992 before dropping it back to Y8.5 in 1993). Even with a constant cash dividend and no new equity issues, however, NETDIV may vary due to share repurchases or sales of treasury stock.

We conjecture that such changes depend upon both profitability and regulatory-capital considerations, and therefore net dividends should be positively related to nondiscretionary income (ROI) and security gains (GAINS), and negatively related to provisions (PROV). Concerns over capital levels should also make net dividends positively related to beginning-of-period surplus regulatory capital for capital-constrained banks (BISLO₋₁, BISMID₋₁, BISHI₋₁). If maintaining a stable dividend is important, then current and prior period dividends (NETDIV₋₁) should be positively related. Additionally, bank size (ASSETS₋₁) and the regional bank dummy variable (REG) are included to allow for their potential influences on dividend policy. The resulting model of dividend determination is given in Eq. (4):

$$\begin{aligned} \text{NETDIV} = & d_0 + d_1\text{REG} + d_2\text{ASSETS}_{-1} + d_3\text{NETDIV}_{-1} + d_4\text{BISLO}_{-1} \\ & + d_5\text{BISMED}_{-1} + d_6\text{BISHI}_{-1} + d_7\text{ROI} + d_8(\text{ROI} * \text{NEG}) \\ & + d_9\text{dLOANS} + d_{10}\text{GAINS} + d_{11}\text{PROV}. \end{aligned} \quad (4)$$

3.2. Data, sample, and descriptive statistics

Our sample period extends from 1989 to 1996. The beginning point represents a reasonable “baseline” because 1988 was the first year of implementation of the Basle Accord and because Japanese banks were relatively healthy as of year-end 1988 (Kim and Moreno, 1994, p. 32). We include city and regional banks. Long-term credit banks and trust banks are excluded to reduce heterogeneity, due to specialization in lending activities of these institutions (Tachibanaki and Taki, 1991; Federation of Bankers Associations of Japan, 1994). We also screen for possible outliers which might have resulted from bank mergers, which are likely to create temporary departures from typical values of many of the variables of interest, e.g., the year-on-year change in loans.¹⁴ The final sample consists of 607 pooled time series and cross-sectional observations. The number of banks varies by year, from a low of 67 to a high of 79.

Variables used in the analysis are listed in Table 1. The source of bank-specific data is *Worldscope*, which provides annual financial statements for Japanese banks. Because the statements are reported annually, as of March 31 (the end of the fiscal year in Japan), we index data from each calendar year to the year which precedes the publication of the financial statements (e.g., 1989 data are from the March 31, 1990 financial statements).

Table 2 gives variable means, by year. Panel A gives means for the macroeconomic conditions (recall that all macrovariables are two-year moving averages) and reflects a number of widely discussed facts regarding the poor condition of the Japanese economy: The significantly lower growth in industrial production after 1990, the precipitous decline in equity market values in 1990–1993, the dramatic reduction in interest rates, the increasing level of bankruptcy liabilities, and the recession in real estate continuing since 1992.

Panels B and C of Table 2 give means for the endogenous and predetermined bank variables, respectively. Note that the ratio of changes in loans to total assets declined substantially after 1989 until leveling off to below 2% per year after 1992. After a slight decline in 1990, loan reserves-to-assets have risen steadily from 0.35% of assets to 1.08% of assets in 1996, as provisions have increased rather dramatically while assets have stagnated.

Both GAINS and PROV increase after 1993, reaching their highest levels in 1995, and then declining somewhat in 1996. ROI, nondiscretionary earnings-to-assets, is highest in the first year, 1989, and lowest in 1996, but the extent of negative

¹⁴ Where applicable, consolidated financial data are used. Observations where the bank experienced a year-on-year change in assets or loans greater than 50% were eliminated, as well as observations involving the first year after a switch from a nonconsolidated to a consolidated accounting basis. Due to missing data on the BIS capital ratio, 168 observations were eliminated.

Table 1
Variable definitions

Endogenous variables:^a

- dLOANS = year-on-year change in total loans/beginning of year total assets
 GAINS = gains/losses on the sale of securities/beginning of year total assets
 PROV = provision for loan losses/beginning of year total assets
 NETDIV = (dividends less stock issuance)/beginning of year total assets

Exogenous and predetermined variables:

Measures of aggregate economic activity:^b

- INDPROD = two-year average percentage rate of change in the manufacturing index of industrial production
 STOCK = two-year average percentage rate of change in the Tokyo Stock Exchange (First Section) stock price index
 PRIME = the two-year average change in the long-term prime lending rate
 BKRPT = the two-year average of total liabilities of firms in bankruptcy
 LAND = two-year average of percentage change in the land price index

Predetermined bank characteristics:^c

- REG₋₁ = binary indicator equal to unity for regional banks; zero for city banks
 ASSETS₋₁ = natural log of bank total assets
 LNASS₋₁ = ratio of loans to assets
 RSRVRAT₋₁ = loan reserves/total assets
 BIS₋₁ = surplus regulatory capital^d
 ROI = ratio of bank nondiscretionary earnings to assets
 NEG = unity if nondiscretionary earnings is negative, zero otherwise

Notes to: Sources of data are as follows: Individual bank data from the Worldscope Global database; BIS ratios from Banker Magazine, various issues; prime lending rates from the Bank of Japan; stock index from the Tokyo Stock Exchange; Industrial production index and bankruptcy data from the Ministry of International Trade and Industry; land price index from the Japan Real Estate Institute.

^a The data on Japanese banks are on a consolidated basis with fiscal year-end at March 31.

^b Two-year averages are of the current and prior year.

^c A “-1” subscript denotes that the variable is measured with one period lag.

^d Surplus regulatory capital is the bank’s BIS capital ratio, less 7.25% for 1989–1991, and the BIS ratio less 8.0% for 1992–1996.

nondiscretionary earnings is greatest in 1994, and continues at a high level for 1995 and 1996. After dropping to about 1.4% above the regulatory minimum in 1990, Japanese banks’ surplus capital position (BIS) remained fairly stable (the data takes into account the shift in the minimum standard from 7.25% to 8.0% in 1992). Over the eight-year period covered, the mean surplus regulatory-capital levels for banks in the lowest quartile, the middle two quartiles, and the highest quartile, are 0.46%, 1.45%, and 2.70%, respectively (not shown in Table 2). Banks dropped below the regulatory total capital standard in only 19 of the 607 observations. Nine of these were in 1991, and only six in 1996–1997. Net dividends remained at a relatively constant 0.045–0.048% of assets from 1990 to 1995, before declining to 0.031% in 1996.¹⁵

¹⁵ The exceptionally low level of NETDIV in 1989 is due to concentration of banks’ stock issues in that year. These tended to positively skew the NETDIV variable. Of 12 stock issues during 1989–1996, seven occurred in 1989.

Table 2

Descriptive statistics, by year, 1989–1996^a*Panel A: Macroeconomic variables*

Year	Percentage change in industrial production INDPROD	Percentage change in stock prices STOCK	Change in long-term prime rate PRIME	Total liabilities of bankrupt firms (tr.yen) BKRPT	Percentage change in land prices LAND
89	0.078	0.145	0.40	1.6270	0.087
90	0.050	0.026	1.20	1.5700	0.108
91	0.029	-0.153	0.20	4.9525	0.123
92	-0.022	-0.208	-1.30	7.7615	0.043
93	-0.053	-0.070	-1.70	7.1385	-0.037
94	-0.018	0.086	-0.30	6.1070	-0.051
95	0.021	-0.045	-0.45	7.2670	-0.041
96	0.031	0.013	-1.20	8.5140	-0.040

Panel B: Endogenous variables

	Number of banks	Change in bank lending/assets dLOANS	Gains/losses from sale of securities/assets GAINS	Loan-loss provisions/assets PROV	Net dividends/assets NETDIV
89	72	0.0936	0.00059	0.00029	-0.000172
90	76	0.0325	0.00105	0.00027	0.000476
91	77	0.0297	0.00083	0.00052	0.000466
92	79	0.0153	0.00024	0.00103	0.000453
93	79	0.0058	0.00101	0.00151	0.000468
94	78	0.0102	0.00090	0.00179	0.000461
95	79	0.0180	0.00355	0.00581	0.000461
96	67	0.0071	0.00191	0.00329	0.000306

Panel C: Predetermined bank characteristics

	Regional or city bank (REG = 1) REG	Total assets (bils. yen) ^b ASSETS ₋₁	Loan-to-assets ratio LNASS ₋₁	Loan reserves-to-assets ratio RSRVRAT ₋₁	Surplus regulatory capital BIS ₋₁	Nondiscretionary earnings/assets ROI	Negative nondiscretionary earnings/assets (ROI * NEG)
89	0.889	8029	0.658	0.00407	0.0258	0.00492	-0.000033
90	0.895	7247	0.656	0.00354	0.0141	0.00356	-0.000047
91	0.883	8015	0.658	0.00348	0.0171	0.00335	-0.000035
92	0.873	7654	0.672	0.00388	0.0122	0.00425	-0.000016
93	0.873	7640	0.710	0.00459	0.0119	0.00345	-0.000164
94	0.872	7606	0.707	0.00527	0.0159	0.00368	-0.000544
95	0.886	7292	0.715	0.00641	0.0108	0.00393	-0.000411
96	0.866	8299	0.720	0.01076	0.0145	0.00296	-0.000517

^a See Table 1 for variable definitions. Bank data for year t is from the annual report for the period ending March 31 of year $t + 1$. Other variables are for calendar year periods ending December 31 of year t .

^b In billions of US dollars, average assets for 1989–1996 are 61.8, 48.3, 59.4, 58.9, 64.7, 71.1, 78.4, and 78.3, respectively.

4. Results

4.1. Patterns of nondiscretionary income, security gains and loan-loss provisions

The three rows in Panel A of Table 3 gives summary statistics for three measures of bank earnings, expressed as a percentage of total assets: Nondiscretionary earnings (ROI); nondiscretionary earnings adjusted for loan-loss provisions (ROI-PROV); and nondiscretionary earnings adjusted for both loan-loss provisions and security gains (ROI-PROV + GAINS). For each earnings measure, means, standard deviations, minimum and maximum values are shown for the 79 banks with at least five years of data. The data indicate that loan-loss provisions reduced mean earnings-to-assets by almost half, from 0.376% to 0.196%, while increasing the standard deviation of earnings-to-assets by about one half, from 0.195% to 0.300%, (the observed increases in earnings variability may have been even larger in the absence of any discretion over loan-loss provisions). Adding GAINS to ROI-PROV substan-

Table 3

Effects of loan-loss provisions and security gains/losses on levels and variability of income and on income taxes
Panel A: Effects of loan-loss provisions and security gains/losses on pretax income—(1) operating income before provisions and gains, (2) operating income after provisions, and (3) operating income after provisions and gains

Earnings measure	Mean (as a percent of assets)	Standard deviation (as a percent of assets)	Minimum value (as a percent of assets)	Maximum value (as a percent of assets)
(1) Nondiscriminatory income = ROI	0.376	0.195	0.075	0.633
(2) Nondiscriminatory income – provisions = (ROI-PROV)	0.196	0.300	–0.342	0.527
(3) Nondiscriminatory income – provisions + gains = (ROI-PROV) + GAINS	0.319	0.206	–0.070	0.553

Panel B: Estimated average tax rates from estimation of coefficients in Eq. (5)

Income category:	Tax status		
	Positive pretax income years	Tax-loss years	Positive taxable income following a tax-loss year
Nondiscretionary income (ROI)	$\alpha_1 = 48.7\%$	$\alpha_1 + \beta_1 = 18.3\%$	$\alpha_1 + \gamma_1 = -0.9\%$
Security gains/losses (GAINS)	$\alpha_2 = 48.9\%$	$\alpha_2 + \beta_2 = 25.9\%$	$\alpha_2 + \gamma_2 = 5.1\%$
Provisions for loan losses (PROV)	$\alpha_3 = 46.5\%$	$\alpha_3 + \beta_3 = 33.6\%$	$\alpha_3 + \gamma_3 = 3.8\%$

Note to Panel A: The data are calculated over 79 banks, 1989–1996, with an average of 7.608 years per bank (601 observations). The minimum number of observations for any bank is 5.

Notes to Panel B: The total number of observations for regression results is 604; adjusted R^2 is 0.959. The tax status categories are proxies which attempt to distinguish tax-loss and potential loss-carryforward years from years in which a bank's income is fully taxable. Of the 604 bank-year observations, there were 27 with tax losses and 17 with positive income following a tax-loss year.

tially offset the impact of provisions on mean earnings-to-assets, increasing it from 0.196% to 0.319%, while decreasing the standard deviation from 0.300% to 0.206%. The reduction in earnings variability resulting from GAINS nearly offset the increase due to PROV. Non-parametric tests (not shown) indicate that the effects of PROV and GAINS shown in Panel A are highly significant. Panel B presents estimates of average tax rates on the components of income (discussed in Section 5).

4.2. Results for simultaneous-equation estimation

Table 4 gives results for two-stage least squares (2SLS) estimation of the simultaneous-equation model.¹⁶ Panels A through D contains estimation results for lending, security gains, provisions, and net dividends, respectively.

4.2.1. Bank lending

The change in lending as a fraction of assets increases with the rate of change in industrial production (INDPROD), but is not significantly related to bank type (REG), bank size (ASSETS₋₁), or to the beginning-of-period loan-to-assets ratio (LNASS₋₁). The coefficients of ROI and NETDIV are significantly positive and negative, respectively, consistent with capital-constrained lending. A test of the hypothesis that the sum of the coefficients of ROI and ROI * NEG equals zero suggests that the negative association between nondiscretionary income and lending is limited to the positive range of values for ROI.

The significant positive coefficient for GAINS and the significant negative coefficient for PROV are consistent with lending being constrained by Tier 1 capital, and with the regulatory-capital-arbitrage hypothesis. The coefficient of beginning-of-period regulatory-capital surplus for banks most likely to be constrained by the regulatory standard (BISLO₋₁) is positive, although not quite statistically significant.

With respect to ROI, PROV, and GAINS, three observations lend credibility to the conclusion that the significance of these variables is due to their influence on Tier 1 capital, rather than to their implications for the quality of lending opportunities or asset redeployment. First, loan profitability is at least partially captured by the INDPROD variable, which is directly and significantly related to loan demand. Second, the influences of both GAINS and NETDIV, neither of which reflects directly on

¹⁶ Hausman (1978) specification test results support the assumption of endogeneity in lending, security gains, loan-loss provisions, and net dividends, and indicate that OLS estimation may entail simultaneous-equation bias. We also test for misspecification (e.g., omitted variables) which might result in differences in OLS and 2SLS coefficients not due to simultaneity (Godfrey and Hutton, 1994), with the results that none of the tests were significant even at the 0.10 p-level. Another test suggested by Hausman (1978) comparing the 2SLS coefficients with those estimated in a 3SLS framework favors using the estimation results from 2SLS over those of 3SLS.

Table 4

Two-stage least squares model estimation of four equations for lending, securities gains, provisions for loan losses, and dividends

Variable	Parameter estimate	<i>t</i> -Statistic	<i>p</i> -Level
<i>Panel A: Eq. (1) dependent variable = dLOANS (Adj. R² = 0.1632)</i>			
INTERCEPT	0.0342	0.230	0.8185
REG	-0.0038	-0.275	0.7832
ASSETS ₋₁	-0.0019	-0.356	0.7217
LNASS ₋₁	-0.0233	-0.427	0.6693
INDPROD	0.2431	2.825***	0.0049
BISLO ₋₁	1.0845	1.589	0.1125
BISMID ₋₁	-0.2976	-0.722	0.4705
BISHI ₋₁	-0.4356	-1.411	0.1589
ROI	16.1475	3.150***	0.0017
ROI*NEG	-10.7145	-2.811***	0.0051
GAINS	24.6207	2.789***	0.0055
PROV	-18.1456	-3.747***	0.0002
NETDIV	-21.1024	-1.871*	0.0619
<i>Panel B: Eq. (2) dependent variable = GAINS (Adj. R² = 0.5548)</i>			
INTERCEPT	0.0064	1.663*	0.0968
REG	0.0000	-0.043	0.9655
ASSETS ₋₁	-0.0002	-1.515	0.1304
LNASS ₋₁	0.0005	0.297	0.7668
STOCK	-0.0008	-0.987	0.324
PRIME	0.0002	2.029**	0.0429
BISLO ₋₁	-0.0359	-2.039**	0.0419
BISMID ₋₁	0.0134	1.181	0.238
BISHI ₋₁	0.0228	3.078***	0.0022
ROI	-0.5896	-16.681***	0.0001
ROI*NEG	0.2515	2.499**	0.0127
dLOANS	0.0104	2.236**	0.0257
PROV	0.5997	12.560***	0.0001
NETDIV	0.0289	0.077	0.9386
<i>Panel C: Eq. (3) dependant variable = PROV (Adj. R² = 0.4008)</i>			
INTERCEPT	-0.0171	-3.169***	0.0016
REG	0.0005	0.889	0.3744
ASSETS ₋₁	0.0006	2.629***	0.0088
RSRVRAT ₋₁	0.1062	2.566**	0.0105
BKRPT	0.0000	1.966**	0.0498
LAND	-0.0018	-0.783	0.4342
BISLO ₋₁	0.0449	1.690*	0.0916
BISMID ₋₁	-0.0159	-0.975	0.3301
BISHI ₋₁	-0.0361	-3.593***	0.0004
ROI	0.8264	9.678***	0.0001
ROI*NEG	-0.3728	-2.643***	0.0084
dLOANS	-0.0008	-0.100	0.9205
GAINS	1.4040	11.185***	0.0001
NETDIV	0.4753	0.800	0.4242
<i>Panel D: Eq. (4) dependant variable = NETDIV (Adj. R² = 0.0552)</i>			
INTERCEPT	-0.0008	-0.293	0.7699
REG	0.0001	0.492	0.6226

Table 4 (continued)

Variable	Parameter estimate	<i>t</i> -Statistic	<i>p</i> -Level
ASSETS ₋₁	0.0000	0.130	0.8969
NETDIV ₋₁	0.2185	3.642***	0.0003
BISLO ₋₁	0.0121	0.799	0.4246
BISMID ₋₁	-0.0131	-1.603	0.1095
BISHI ₋₁	-0.0074	-1.067	0.2865
ROI	0.2760	2.022**	0.0436
ROI * NEG	-0.1076	-1.151	0.2502
dLOANS	-0.0116	-3.369***	0.0008
GAINS	0.4823	2.158**	0.0314
PROV	-0.3119	-2.300**	0.0218

The number of observations is 607. ***, **, and * denote significance in a two-tailed test at the 0.01, 0.05 and 0.10 levels, respectively.

lending opportunities, tend to corroborate the role of Tier 1 capital as a factor in loan growth. Third, there is substantial evidence that, at least through 1996, Japanese banks' equity sales were matched by repurchases (see footnote 10).

The estimated coefficients for ROI, PROV, GAINS, and NETDIV, are all consistent with a positive role for Tier 1 capital availability in determining the level of lending activity by Japanese banks during 1989–96. Coupled with weak support from the lagged surplus regulatory-capital variable for banks in the lowest regulatory-capital quartile, these results are consistent with the hypothesis that lending by Japanese banks was responsive to factors influencing regulatory capital.

4.2.2. Security gains

Panel B of Table 4 gives results for the security gains decisions (Eq. (2)). Neither bank size (ASSETS₋₁) nor the loan-to-assets ratio (LNASS₋₁), nor the dividends-to-assets ratio (NETDIV) are significant determinants of GAINS, nor is the distinction between city and regional banks (REG). Gains are insignificantly related to stock market performance (STOCK), and significantly positively related to changes in the prime lending rate (PRIME), suggesting that capital gains on securities transactions were not an end in themselves; banks were not selling equities when the market was doing well, and did not take profits on fixed-income securities when interest rates fell. The strong positive relationship between security gains and the change in lending reinforces the link between lending and regulatory capital.

The coefficients of nondiscretionary income (ROI) and loan-loss provisions (PROV) reflect the dual influences of income smoothing and regulatory-capital arbitrage, while the coefficient of net dividends reflect only on the latter influence. The magnitude of the coefficient for ROI suggests that, on average, each 100 basis point decline in nondiscretionary return on assets (ROI) prompts a 59 basis point increase in security gains as a percent of assets. The significant positive coefficient for ROI * NEG indicates that the influence is not as strong when banks have negative nondiscretionary income, although the sum of the coefficients of ROI and ROI * NEG is

still negative and significant when ROI is negative (p -level = 0.0001).¹⁷ Unlike the results for US companies (Healy, 1985; McNichols and Wilson, 1988), the evidence does not support a conclusion that Japanese banks are “taking a bath” when non-discretionary income is negative.

The significant positive coefficient for provisions-to-assets (PROV) reveals a pattern of security gains as an offset to the effects of loan-loss provisions on reported income. The coefficient value implies that for every 100 basis-point increase in provisions as a percent of assets, security gains increase by 60 basis points. Coupled with the finding that security gains are sensitive to nondiscretionary income, this corroborates the use of security gains for income smoothing and/or regulatory-capital arbitrage. The results are consistent with statements by regulators that Japanese banks time realizations of security gains to coincide with loan-loss provisions.

The surplus regulatory-capital measures reflect a rather complex relationship to security gains. Regulatory capital has an inverse relationship with security gains for the subset of banks most likely to be regulatory-capital-constrained. This is expected under the regulatory-capital arbitrage hypothesis if the scarce capital component is Tier 1 capital. In contrast, the coefficient of capital surplus for banks in the highest regulatory-capital quartile is significantly positive. Comparison of subsample means (not shown) for the high and low regulatory-capital quartiles reveal not only that the high-quartile banks had significantly higher regulatory capital surplus (2.7% vs. 0.46%), but also significantly lower loan-to-assets ratios (67.3% vs. 71.8%) and significantly lower loan-loss reserves-to-loans ratios (0.63% vs. 0.82%). Average loan growth over the period was actually higher for the lower quartile of banks than for the highest quartile (though not significantly). In summary, the high-quartile banks appear to be very conservative in terms of asset portfolio composition as well as regulatory capital position.

4.2.3. *Loan-loss provisions*

The results for the loan-loss provisions equation are given in Panel C of Table 4. The distinction between regional and city banks (REG) is not significant. Provisions are increasing in the size of the bank (ASSETS₋₁). The positive and significant coefficient for the lagged reserves-to-assets ratio (RSRVRAT₋₁) indicates that banks which have higher loan-loss reserves have a propensity to set higher levels of provisions. This may simply reflect the presence of either cross-sectional or time-related differences in levels of provisioning (e.g., the secular increase in provisions over the period of analysis). The coefficients of the two macroeconomic condition variables, BKRPT and LAND, both have the expected signs, though only the coefficient for BKRPT is significant.

As with the equation for security gains, the coefficients on the BIS capital variables reveal a rather complex set of relationships. Poorly capitalized banks' provisions vary directly with their surplus regulatory capital, as we would expect under regula-

¹⁷ Inspection of the data reveals 80 instances of negative nondiscretionary income, 49 of which occurred during the last three years of the sample period (1994–1996).

tory-capital arbitrage if investment is constrained due to low Tier 1 capital. At the other extreme, for banks in the high regulatory-capital quartile, capital is significantly inversely related to loan-loss provisions. As with findings regarding security gains, it appears that provisions by these banks may be driven by conservatism.

With regard to the income smoothing and regulatory-capital arbitrage motivations for setting provisions, the highly significant positive coefficient of ROI is consistent with both. The magnitude of the coefficient value implies that for every 100 basis-point increase in nondiscretionary income as a percent of assets, provisions-to-assets increase by 83 basis points. On the other hand, the coefficient for ROI*NEG is significantly negative. The sum of the coefficients of ROI and ROI*NEG is significantly positive (p -level = 0.001).

As discussed above, discretion with respect to security gains and loan-loss provisions may be complimentary mechanisms for smoothing income and/or managing regulatory capital. The positive and highly significant coefficient of GAINS in Eq. (3) corroborates that finding. But in contrast to results for security gains, provisions are not significantly determined by concurrent changes in lending (dLOANS), though the coefficient is of the sign predicted under the regulatory-capital-arbitrage hypothesis. The coefficient on net dividends-to-assets is insignificant, suggesting that the impact of dividends on bank capital does not “feed back” into the decision on provisions.

4.2.4. Net dividends

The last panel in Table 4, Panel D, reports results of estimation of the determinants of banks' dividend decisions. The distinction between regional and city banks (REG) is insignificant, as well as the role of bank size (ASSETS₋₁).

The components of earnings have the expected relationship to banks' dividend decisions: dividends are increasing in nondiscretionary income (ROI), increasing in security gains (GAINS), and decreasing in provisions (PROV). Other things equal, banks experiencing larger increases in lending (dLOANS) tend to finance their expansion partially by paying lower dividends, corollary to the capital-constrained investment hypothesis discussed in connection with Eq. (1).

Insignificance of the coefficients for the lagged surplus regulatory-capital variables, coupled with dividend persistence as indicated by the significant positive coefficient for NETDIV₋₁, may reflect dominance of the objective of stable dividends. Banks manage to stabilize regulatory capital, earnings, and dividends via discretion with respect to security gains and loan-loss provisions, hence the role of beginning-of-period surplus regulatory capital is minimized.

5. Tax implications of earnings management

The estimated coefficients of ROI*NEG in Eqs. (2) and (3) are opposite those implied by tax incentives, since they imply that security gains are *less* responsive to non-discretionary income, and provisions *more* responsive, when such income is negative. To ascertain more directly the tax effects associated with security gains/losses and

loan-loss provisions, we estimate average tax rates paid by our sample of banks on three elements of income: nondiscretionary income, security gains/losses, and loan-loss provisions. We estimate the following relationship between taxes paid and the nondiscretionary and discretionary elements of pretax income:

$$\begin{aligned} \text{TAXES} = & \alpha_1 \text{NONDISC} + \alpha_2 \text{SGL} + \alpha_3 \text{LLP} + \beta_1 (\text{NONDISC} * \text{LOSS}) \\ & + \beta_2 (\text{SGL} * \text{LOSS}) + \beta_3 (\text{LLP} * \text{LOSS}) \\ & + \gamma_1 (\text{NONDISC} * \text{CARRY}) + \gamma_2 (\text{SGL} * \text{CARRY}) \\ & + \gamma_3 (\text{LLP} * \text{CARRY}) \end{aligned} \quad (5)$$

where NONDISC is nondiscretionary income, SGL is security gains or losses, LLP is loan-loss provisions; LOSS and CARRY are proxies for tax status. LOSS is a binary variable equal to unity if pretax income (NONDISC + SGL-LLP) is negative, zero otherwise; and CARRY is a binary variable equal to unity if the current period pretax income is positive, but the previous period's pretax income was negative, zero otherwise. The model is estimated for the pooled sample of 604 observations (three "tax outliers", with tax rates outside the range -100% to $+100\%$, were deleted).

The coefficients in Eq. (5) represent estimates of average tax rates over the sample of 604 observations, conditioned on proxies for the tax status of the bank. The α_j coefficients represent average tax rates applying to nondiscretionary income ($j = 1$), security gains/losses ($j = 2$), and loan-loss provisions ($j = 3$), respectively, conditional on the bank having positive pretax income in both the current and prior years. The β_j coefficients represent the differential tax rate that applies when the bank's current year pretax income is negative; so the average tax rate for income element j when income is negative is $\alpha_j + \beta_j$. Finally, the γ_j coefficients represents the differential average tax rate when current pretax income is positive, but there is a potential tax-loss carryforward due to negative income in the prior period; so the average tax rate for income element j when the bank has a carryforward is $\alpha_j + \gamma_j$. Results from estimation of (5) are presented in Panel B of Table 3.

Inspection of the α_j coefficients reveals an average tax rate on nondiscretionary income, security gains/losses, and provisions, respectively, are 48.7%, 48.9%, and 46.5%.¹⁸ The rate on provisions, though statistically lower than the other two rates, nevertheless suggests that, for the 560 positive pretax income observations that encompass the bulk of our observations, Japanese banks have gotten substantial tax benefits from their provisions, in spite of the reputed restrictive nature of the tax deductibility of general provisions (footnote 5). Combining the α_j estimates with the results for the β_j coefficients indicates that for 27 tax-loss observations, the effective rates drop to 18.3, 25.9, and 33.6%, respectively, for nondiscretionary income, security gains, and provisions. For 17 observations with positive taxable income, but which follow a tax-loss year ($\alpha_j + \gamma_j$), banks' effective tax rates fall to near zero on all three income components.

¹⁸ Statutory tax rates in Japan are comprised of 37.5% corporate tax plus local taxes bringing the total to about 50% (Ishi, 1993, pp. 181–182).

In all, the evidence is consistent with a conclusion that the vast majority of security gains are exposed to significant tax penalties. Securities gains were taken in spite of these penalties, which must be regarded as a cost of achieving banks' earnings and capital management objectives.

6. Conclusions

This paper explores variation in discretionary accounting by Japanese banks during 1989–1996. Over this period, Japanese banks, by-and-large, continued to comply with international capital regulation under the Basle Accord, despite significant deterioration in the Japanese economy and in the quality of banking assets. Findings are consistent with conclusions that Japanese banks utilized accounting discretion as a means of managing earnings, and that the subset of Japanese banks with relatively low regulatory capital used earnings management for regulatory-capital arbitrage. Earnings management, whether its primary objective was income smoothing or regulatory-capital arbitrage, does appear to have influenced lending.

We also find that provisions are positively related to nondiscretionary earnings, that security gains are negatively related to nondiscretionary earnings, and that there is strong complementarity between provisions and gains. These findings buttress the argument that loan-loss provisions, while increasing due to external pressures on Japanese banks, also contained a discretionary component, and that Japanese banks used both gains and provisions as tools of earnings management.

Results are consistent with poorly capitalized banks' use of the security gains component of earnings for improving Tier 1 capital levels by offsetting rising levels of provisions after 1990. The result was lower earnings volatility and compliance with Basle capital standards in spite of the course of the Japanese economy over the period.

Analysis indicates that banks achieved substantial deductibility of provisions, but paid the full tax rate on security gains. The fact that these taxes would have been substantially avoided, at least to the extent that they involved sales of equity positions which are part of stable shareholdings arrangements between banks and their borrowers, implies that Japanese banks incurred substantial tax costs in achieving income smoothing and regulatory-capital objectives.

The earnings management strategies of Japanese banks over this period did not obscure banks' true condition, as evidenced by numerous articles in the financial press, rating actions by international credit-rating agencies, the so-called "Japan premium" on eurodollar loans to Japanese banks, and the intense public debate in Japan over resolution of the "banking crisis". It appears that regulatory-capital arbitrage enabled Japanese banks and their domestic regulators to postpone decisions on how to resolve the crisis, perhaps in hope that the economy would recover sufficiently to alleviate the need for direct intervention. In late 1998, of course, direct intervention finally occurred in the form of a taxpayer-financed bailout fund of some \$500 billion. Ironically, the bailout may be construed, in part, as "payback" to Japanese banks for the tax burden they incurred under the capital management strategy documented.

The pressing issue is how Japanese banks will respond to the new environment in which accounting rules and equity values in Japan will no longer support the capital-management strategies observed over most of the decade of the 90s. Short of significant improvement in the domestic economy of Japan, conforming with international capital standards requires a new strategy, or alternatively, further withdrawal from the international banking arena.

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