

**REGULATORY CAPITAL AND EARNINGS MANAGEMENT IN BANKS:
THE CASE OF LOAN SALES AND SECURITIZATIONS**

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Abstract:

I examine whether banks use loan sales and securitizations in managing accounting information for regulatory and other purposes such as meeting analysts' earnings forecasts. Securitizations with certain forms of retained interests can be accounted for as sales and affect earnings and regulatory capital by allowing capitalization of expected future income. My analysis suggests that banks use gains from loan sales and securitizations to affect both earnings and regulatory capital after controlling for other economic motivations to securitize loans such as comparative advantage, funding, and risk management. The gains can be attributed both to cherry-picking of loans whose market values exceed their book values and also to overvaluation of the retained interests that are carried at fair market value after the securitizations.

1. Introduction

In this paper, I investigate whether banks use loan sales and securitizations to influence accounting information for regulatory and other purposes. My analysis includes whether gains from whole loan sales and loan securitizations with retained interests have different properties. The income recognition from securitizations provides useful insights about the trade-offs between historical cost accounting – which applies to loans before a securitization– and fair value accounting –which applies to financial instruments retained after a securitization.

Securitization is the process of transferring illiquid assets such as mortgages, credit card receivables, business loans, and leases to third parties.¹ The ability to transfer otherwise illiquid loans in secondary markets allows banks to focus on core competencies in banking such as origination, servicing, and management of loan portfolios. In addition, banks use securitizations as a source of funding and a tool for risk management.

Securitization also enables banks to influence balance sheet and income statement information. Securitization transactions can be accounted for as sales or secured borrowings. Securitizations that are accounted for as sales increase regulatory capital by allowing the capitalization of expected future income. The *gains or losses from securitization* (*gains* hereafter) result from the discretion in the selection of loans to be securitized and the discretion in the valuation of retained interests after securitization. Since loans constitute over half of the balance sheet of an average commercial bank (Table 1), securitization of loans provides significant opportunities to affect regulatory and financial reporting outcomes.

I use regulatory bank filings between 1997 and 2000 and document both regulatory capital and earnings management using *gains*. These results are generally consistent with prior studies of discretionary behavior in the banking industry. Several studies have investigated whether regulation, taxes, private contracts (e.g. compensation), and communication of private

¹ The debt instruments into which loans are transformed are often referred to as “mortgage-backed securities” – when the underlying asset pools consist of mortgage loans – or “asset-backed securities” – when the underlying asset pools consist of loans other than mortgages. Approximately, \$6 trillion in mortgage- and asset-backed securities is outstanding as of the end of 2002 (Coy et al. [2002]).

information to capital markets motivate regulatory capital and earnings management in banks. Moyer (1990), Beatty, Chamberlain, and Magliolo (1995), Collins, Shackelford, and Wahlen (1995), Kim and Kross (1998) and Ahmed, Takeda, and Thomas (1999) find evidence that regulatory capital and earnings outcomes influence managers' discretion in loan loss provisions, charge-offs, and miscellaneous gains. For example, the latter two studies find a reduction in loan loss allowances, after risk-based capital regulations limited their inclusion in capital. Tax considerations have not been found to have a strong influence (Beatty et al. [1995], Collins et al. [1995], Scholes, Wilson, and Wolfson [1990]).

Prior studies on securitization in banking, such as Pavel and Phillis (1987), Jagtiani, Saunders and Udell (1995), have not examined the accounting impact and have found weak evidence of regulatory capital motivations. In contrast, prior studies of accounting discretion in banking, such as Beatty et al. (1995), have not analyzed loan sales as a distinct class and have combined the securitization gains with the gains from securities' and other assets' sales. In this paper, I simultaneously analyze the decision to sell or securitize loans and the gains recognized as a result of the sale or securitization. Further, I contrast gains from whole loan sales which are "pure" asset sales with gains from securitizations with the further involvement by the securitizer which involves capitalization of expected future income.

Prior research on asset sales, e.g. Bartov (1993), has generally found that smoothing income has been an important consideration in the timing of asset sales. Similarly, prior research by Beatty et al. (1995) on regulatory capital management has found that gains from all asset sales—including securitizations—are used only for earnings management, but not for regulatory capital management. They also find that the combined gains are not determined jointly with loan loss provisions and charge-offs, which are used for regulatory capital management.

Prior research on the consequences of fair value accounting in the banking industry has produced conflicting results. Barth (1994) finds that fair value disclosures of investment securities provide significantly more explanatory power in explaining stock prices beyond that provided by historical costs alone. However, Lys (1996) cautions that the disclosed fair values

do not closely approximate investors' estimates. Two results in this paper contribute to this literature: (i) the fair value estimates for securities retained from securitizations may be biased, and (ii) banks are more likely to securitize loans that have fair values exceeding their book values.

Most of the prior literature on accounting discretion and on loan sales and securitizations, have analyzed the period before the risk based regulation.² The risk-based regulations have limited the impact of discretionary loan loss provisions on capital. Moreover, fair value accounting has substantially reduced the securities gains that can be added to regulatory capital upon a sale. On the other hand, both regulatory and financial reporting changes have impacted banks' discretion in accounting for securitizations.

The remainder of the paper is organized as follows. Section 2 describes the institutional details of securitizations. Research hypotheses are developed in Section 3. Section 4 presents the empirical analyses. Section 5 summarizes the conclusions.

2. Institutional Background

Securitization involves the transfer of loans to third parties. Loan transfers can be with or without a transferor's further involvement. Transferors often retain interests in the transferred loans for three main reasons. First, the transferor has superior information about the quality of the loans at the time of transfer and has a monitoring function over the life of the loan. This creates moral hazard and adverse selection problems that can be mitigated by mechanisms that protect transferees from potential losses and give the transferor a disproportionate share of the gains to monitoring (Pennacchi 1988). Second, lenders value borrowing relationships and do not want to lose them. Therefore, transferors often arrange to service the loans after the transfer.

² Before 1990, regulations required banks to hold equity capital in excess of 5.5% of total assets on balance sheet, regardless of the risk of the banks' assets. The risk-based regulations in effect since 1990 are discussed later in Section 2.

Third, transfers with no further involvement are immediately taxable while transfers with retained interests can be structured as secured borrowings without triggering a taxable sale event. In contrast to the tax treatment, Generally Accepted Accounting Principles (GAAP) treat transfers with retained interests as sales under certain conditions that I discuss below. For the sake of brevity, unless otherwise noted, I refer to all loan transfers as securitizations whether the transferor retains interests or makes a whole loan sale.

Often, loans are transferred to special purposes entities (SPEs) which issue multiple classes of claims on the cash flows from the transferred loans. The senior claims are sold to investors. Residual interests –the most subordinated claims– are often retained by the transferor and they are usually large enough to insulate investors from all likely losses from the transferred loans. In addition to the claims on the cash flows, servicing rights that entitle their owner to service the loans are created. The servicing rights are also often retained by the transferor. Appendix 1 illustrates the institutional structure that is used for securitizations with retained interests.

Effective 1997, SFAS 125, "Accounting for Transfers and Servicing of Financial Assets and Extinguishment of Liabilities," introduced the "control of financial components" approach for securitizations. Under the control of financial components approach, the proceeds from a securitization transaction are broken into financial components, such as the residual interests and servicing rights, and the transferor determines whether it controls each component.³ A transfer of financial assets in which the transferor surrenders control over transferred assets is considered a sale. In a sale, the transferor removes from the balance sheet those assets over which it has surrendered control and recognizes on its balance sheet retained assets and liabilities.⁴

Securitizations that are accounted for as sales affect income by allowing the capitalization of future expected income. The income effect is determined by the difference between fair and

³ Control of transferred assets is surrendered if the assets are put beyond the reach of the transferor and its creditors even in bankruptcy and if transferees have the right to pledge and exchange the assets.

⁴ If the criteria for surrendering control are not met, a securitization is accounted for as a secured borrowing. The loans remain on the balance sheet of the transferor and appear as pledged collateral. There is no income effect.

book values of the components sold. The book values of the components are determined by allocating the previous carrying amount between the sold components and retained components (e.g., residual interests) based on their relative fair values at the date of transfer. Therefore, everything else held constant, gains increase in the reported market value of the retained interests.

The discretion in selection of loans is related to the historical cost accounting for loans. SFAS 114 requires that loans be written down to market value only if it is probable that contractual payments will not be made in full.⁵ Therefore, loan values are not written up or down when interest rates change or creditworthiness of borrowers improve. Consequently, the balance sheet does not reflect most unrealized gains or losses, and loans can be selectively securitized to realize the targeted amount of gains or losses.

While the components that are sold have an arm's length transaction price, the retained components often do not have a reference market price and as a result, their fair values have to be estimated by the transferor.⁶ These estimates must often be based on private information about expected cash flows and appropriate discount rates for the securitized loans. Therefore, discretion can be used in the cash flow or discount rate assumptions to yield higher or lower gains. Moreover, the estimates are very sensitive to alternative assumptions. Therefore, securitizers can temporarily increase income and capital by overstating the value of the residual interests retained from securitizations.⁷

Regulatory reporting follows GAAP, but risk-based capital regulations count all off-balance-sheet exposures in risk-weighted assets, including assets securitized with retained interests. Consequently, risk-based capital is held against the entire outstanding amount of securitized loans as long as the securitizer retains any interests.⁸ Therefore, gains are the only

⁵ The fair value accounting applies only to debt and equity securities (SFAS 115). However, SFAS 107 requires the disclosure of the fair values of loans and other financial assets.

⁶ After the transfer, retained residual interests are reported as debt securities available-for-sale.

⁷ Valuation errors are expected to reverse over time with residual write-downs or ultimately with losses.

⁸ To avoid double counting, if the seller's balance sheet includes any retained interest in the assets sold, the retained interest is not risk-weighted separately.

effect of securitizations on regulatory capital.⁹ Appendix 2 contains an example of the balance sheet impact of sales and secured borrowing treatments.

Securitization has mainly a timing effect on the capital ratio. To see this, first consider the benchmark case, in which loans are not securitized and continue to be funded by a combination of equity and deposits. Keeping the loans constant, a constant amount of income is recognized in each period over the life of the loans and the expected capital ratio increases smoothly regardless of implicit gains or losses from the loans at the securitization date. The expected path of the capital ratio following a securitization is a function of the fair values of the securitized loans relative to their book values. After a securitization accounted for as a sale, current income increases by the present value of the expected future income stream. In return, future income stream decreases by the nominal amount of the income expected in each period. In subsequent periods, income and equity are affected only by holding gains and losses from the retained interests. Consequently, the capital ratio increases (decreases) at the date of securitization if the securitized loans have fair values exceeding (below) book values. Since the only remaining income effect of the securitized assets is from retained interests, if any, the capital ratio is expected to increase at a slower pace in the future than it would have without securitization. Therefore, the capital ratio is expected to converge to its level without securitization shortly before the maturity of the loans. Appendix 3 illustrates the expected path of the capital ratio without securitization and with securitization accounted for as a sale.

In summary, managers can use discretion in four aspects of securitization: timing, classification (sale or secured borrowing), selection of loans to be securitized, and valuation of retained interests. The financial statement impacts of securitization lead to testable implications based on the main hypothesis that the discretion in gains from securitization are used to manage regulatory capital and earnings.

⁹ A "low-level recourse" rule applies to transactions accounted for as sales in which a bank holding company contractually limits its risk exposure to less than the full effective minimum risk-based capital requirement. The rule limits the risk-based capital requirement to the lower of (i) a banking organization's maximum contractual exposure from the securitized assets and (ii) 8% of transferred assets. (Instructions for Preparation of Consolidated Financial Statements for Bank Holding Companies Reporting Form FR Y-9C).

3. Research Hypotheses

In this section, I summarize the motivations for banks to securitize loans and develop my hypotheses. The five main motivations that I consider are comparative advantage, funding, risk management, regulatory capital management, and earnings management. Since I am interested in documenting the impact of the latter two factors, the former three factors serve as controls in the subsequent analysis.

Lending can be viewed as three distinct activities: origination of loans, servicing of borrowers, and managing the ownership of cash flows from the loans (Hess and Smith [1988]). These three activities can be separated and performed by their most efficient producers, i.e. those with a comparative advantage in origination, if the cost of separating does not exceed its benefits. These costs include both transaction costs and contracting costs incurred to solve the moral hazard problem associated with loan sales as described by Pennacchi (1988).

Banks that have a comparative advantage in holding loan portfolios may also securitize loans for funding, portfolio management, regulatory capital management, and earnings management purposes. The Modigliani-Miller (1958) capital structure irrelevance theorem establishes that in perfect capital markets with no information asymmetries, and no agency and contracting costs, firm value is unaffected by financing choices and therefore securitizations. However, motivations for securitization may result from information asymmetry in capital markets, agency problems arising from bondholder-shareholder conflicts, and regulation. Below, I discuss factors that may influence securitizations. The funding arguments partly rely on the interpretation that securitization of loans with retained interests is economically similar to the issuance of secured debt where the collateral is a pool of loans.

Banks can finance loans either internally from deposits or externally from capital markets. Securitization can provide a cheaper form of external financing than equity or unsecured debt by reducing three informational costs. First, monitoring costs are likely to be

lower for secured debt than for other forms of funding, because the cash flows to the debt are backed by the cash flows to the securitized assets. This makes asset-backed borrowing less prone to payouts and asset substitution by shareholders. Second, secured debt can be used to solve the underinvestment problem (Myers [1977]). James (1988) argues that in the highly leveraged banking industry, solving the underinvestment problem is a major motivation for securitization.

Securitization may be used to manage interest rate risk and credit risk. When raising capital is costly, hedging may be desirable so that funds are available when needed for investment opportunities. For example, Froot and Stein (1998) argue that banks should hedge risks that can be off-loaded at fair market value. Funding through securitization can perfectly match the duration of the expected loan receipts, hedging away the interest rate risk. In addition, securitization is also useful for managing credit risk. For example, banks with geographic, industry- or borrower-specific concentrations can diversify concentrations of risks by securitization (Demsetz [2000], Samolyk [1993], Pavel and Phillis [1987]).

Regulatory capital requirements have widely been proposed as a main motivation for securitization. The presence of deposit insurance creates a moral hazard problem by giving banks an incentive to take on more risk. Since shareholders effectively have a put option on the assets of the firm, the value of their equity increases with the leverage and riskiness of bank assets. In response to this moral hazard problem, regulators impose capital requirements.

The costs of the requirements have been discussed extensively in prior research (e.g., Moyer [1990]). Regulatory monitoring is costly, because it requires production of information and takes management time. Moreover, regulators supervise banks more closely if they judge that the regulatory capital is low. They can demand capital contributions, restrict distributions, and limit investment activities such as mergers and acquisitions when regulatory capital is low. Ultimately, when a bank is in severe violation of capital requirements, regulators can close the bank and possess its assets.

If the federal safety net insulates counterparties from the full effects of a bank's default, the usual market incentives to maintain adequate capital would disappear and competition drives profit-seeking banks to hold the minimum permissible capital level. This corner solution has been a standard feature in many academic studies of banking (Flannery and Rangan [2002]).

However, this view may not be appropriate in recent years. The regulatory capital ratios have sharply increased since the early 1990s. While this may be spuriously caused by the rise in profitability and stock prices of banks in this period, it may also be due to changes in the weakening of the implied federal safety net following the Federal Deposit Insurance Corporation Improvement Act (Flannery and Rangan [2002]). Moreover, regulators may be using discretion in a way that increases the effective required regulatory capital. My first hypothesis formalizes the tests regarding the regulatory capital motive:

H1.a: Gains from securitizations are negatively associated with regulatory capital ratio before the effect of gains.

H1.b: Gains from securitizations are negatively associated with deviations from bank specific target regulatory capital ratio before the effect of gains.

Apart from regulatory capital management, bank executives have incentives to manage earnings using securitizations for at least three more reasons. First, managers can use reported earnings to convey private information. Second, managers may engage in earnings management to affect compensation or other contracts that rely on reported financial statement numbers.

Third, there is a large body of empirical evidence, e.g., Degeorge, Patel, Zeckhauser (1999), that suggests managers engage in earnings management to avoid losses, declines in earnings or meet market's earnings targets. Matsumoto (2002) considers the motivations for such behavior and suggests that a firm's financial strength favorably affects the terms of trade with its stakeholders and may provide an incentive to meet earning targets because they are highly publicized. Financial institutions have a large number of depositors, borrowers, and other stakeholders who would assess financial performance based on basic metrics such as earnings,

because they have a limited ability or find it costly to conduct a full financial analysis. These stakeholders may assess earnings performance based on time-series or cross-sectional comparisons or relative to analysts' earnings targets.

Securitizations can have a large effect on the income statement, because the present value of all earnings from a loan pool is condensed into the income statement of a single period. Shifting income across periods in this manner can increase income volatility. However, managers can time securitizations to recognize gains (losses) when other sources of income are lower (higher), to smooth earnings or to avoid declines in earnings.

H1.c: Banks use gains from securitizations to smooth earnings or to avoid earnings declines.

H1.d: Banks use gains from securitizations to meet and exceed analyst's forecasts.

Another important question about the use of reporting discretion is whether discretionary valuation of retained interests or selective selling leads to the gains. To realize the gains, banks can selectively sell appreciated loans or provide biased valuations of the retained interests under the fair value accounting. When the accounting system does not recognize the increases in the value of the loans, managers can securitize the loans and recognize the gains that have already been earned economically. Moreover, the gains can be adjusted upward (downward) by over(under)-estimating the fair values of retained interests.

H1.e: The magnitudes of the regulatory capital and earnings effects in H1.a and H1.b are higher securitizations with retained interests than for whole loan sales without retained interests.

In addition, securitization of mortgages and other financial assets provide different degrees of latitude in accounting treatment. Since the markets for mortgage

backed securities are substantially more liquid, less discretion is available for biased estimates of fair values of retained interests, hence for earnings and capital management.

Thus, my final hypothesis is:

H1.f: Mortgage securitizations are less useful for earnings and regulatory capital management than securitizations of other assets are.

4. Empirical Analysis

4.1 Data and Sample Selection

I use the financial statement data from the Y-9C forms filed quarterly by all bank holding companies (*banks* hereafter) that have total assets exceeding \$150 million. The forms collect basic financial data from banks on a consolidated basis in the form of a balance sheet, an income statement, and detailed supporting schedules, including a schedule of off-balance-sheet items. These forms have been compiled in a database by the Federal Reserve Bank of Chicago since 1986. Since the securitized loan balance data-series started to be reported in 1997, my dataset covers the twelve quarters in the between 1997 and 2000, when SFAS 125 was effective.

In order to analyze stock market consequences, I merge the bank holding company database with CRSP. Stock price data are available in CRSP for 249 banks having 1,949 bank-quarter observations between 1997 and 2000. I analyze only gains from securitizations made by the consolidated entities, because loan sales within a group are not subject to the same informational problems as outside transactions and individual banks within a multi-bank organization have weaker incentives to manage financial statement information (Beatty, Ke, and Petroni [2002]).

The number of banks in the sample that have sold loans at least once is 199 having 1,247 bank-quarter observations. Given the nature of the dataset, multiple loan sales or securitizations within the same quarter appear as a single bank-quarter observation. The number of banks that

have made a securitization with retained interests at least once during the sample period is 58, having 206 bank-quarter observations, 17 of which observations represented the first time a bank securitized its loans.

Using regulatory filings for the purposes of this study has advantages and disadvantages. The reporting requirements are uniform and apply to the whole universe of regulated depository institutions in the United States. Consequently, sampling biases are minimized. On the other hand, the securitization data in the regulatory filings have two limitations. First, the amount of loans securitized is reported only as a stock figure. Second, gains from all loan sales and securitizations are aggregated whether there are retained interests or not. I identify securitizations with retained interests as increases in the total securitized loans outstanding in each loan category. As a result, I will not be able to identify securitizations in periods when total outstanding securitized assets decline. Since such periods are more likely to be associated with lower performance, this limitation would generally create a bias against finding evidence of regulatory capital and earnings management as banks would more actively manage income and capital during periods of weak performance.

4.2 Measurement of Variables

I use two proxies for the incentives to manage regulatory capital. First, I use the total risk-based capital ratio before the effect of gains, net of taxes, to proxy for the motive to manage regulatory capital. Banks that are closer to the permissible minimum capital are likely to engage in actions that will increase capital. I use the raw adjusted capital ratio instead of the difference from the minimum requirement, because regression estimates will be the same except for the intercept terms.

If the minimum permissible regulatory capital level is not binding, then banks are likely to manage capital around higher, perhaps banks specific, target capital levels. Since this bank-specific target capital ratio is unobservable, it requires certain assumptions. Assuming that size is a primary determinant of bank capital level, I consider the mean capital ratio of all banks in

each bank's size quartile as the proxy for the bank-specific target capital ratio. Then, the difference between the current adjusted capital ratio and the target capital ratio provides a proxy for the motive to manage regulatory capital (SCAP). I construct the size quartiles and the averages as of the beginning of each quarter. In sensitivity analyses, I construct this variable in alternative ways.

There are also two proxies for the incentives to manage earnings. Both variables are based on the quarterly net income before the effect of gains, net of taxes, scaled by the total assets at the beginning of the quarter (ROA). The earnings smoothing incentive (Δ ROA) is measured by the difference between the current period's adjusted net income and the previous period's net income. The incentive to meet the analyst forecasts is captured by the difference between the quarterly net income before the gains and the IBES mean analyst forecast during the second month of the quarter (ANALYST).

I use three measures of risk. Two are market measures of risk, and the third one is a measure of loan concentration based on regulatory filings. The first measure is an estimate of the standard deviation of asset returns (RISK). In calculating the standard deviation of assets, I un-lever the equity standard deviation over the quarter preceding the securitization based on a simplifying assumption that the variance of the return on deposits and other liabilities is zero. Then, the implied asset standard deviation can be computed as the product of the observed standard deviation of equity returns and the market equity to asset ratio.

The second measure of risk that I use is the interest rate sensitivity of a bank's equity (IR). I estimate a two-factor market model using the changes in three-month Treasury bill rates over the quarter preceding the securitization, similar to Schrand (1997). This factor measures only the interest rate risk and not credit risk. I prefer this to the maturity mismatch measure often used to measure interest rate risk, because reporting requirements provide only a crude divide with a one-year cut off for short- and long-term assets.

The third risk management variable is a Herfindahl index of loan concentration (DIV) by using the loan types (e.g. real estate, commercial and industrial, credit cards etc.) in Y-9C

Schedule HC-B (Loans and Lease Financing Receivables). This measure approaches to one, as loans are concentrated in fewer categories. Using the same loan concentration index, Pavel and Phillis (1987) and Shakespeare (2001) find that loan concentration affects the sale decision, but not its amount.

I measure the liquidity needs with two variables. The ratio of loans to deposits measures the need to raise external funds other than deposits (LIQ). When this ratio is high, banks have higher external financing needs. Loan growth rate is the percentage growth rate over the preceding quarter. It measures the additional funding requirements due to current growth (GRW).

Securitization is not the only funding mode available to banks. Hence, I have a third variable to proxy for the characteristics of those banks that are more likely to use securitizations for external financing, due to constraints on other fund-raising methods. Banks that both have high growth opportunities and are also highly leveraged, are more likely to use securitizations for funding to solve the underinvestment problem. Therefore, my last funding variable is the interaction of the debt-to-equity ratio with the market-to-book ratio (UND). This variable has been used in other research for this purpose, e.g., Geczy, Minton, and Schrand (1997).

As a measure of a bank's comparative advantage in loan making (COMP), I use the ratio of the non-interest expense to total loans (on balance sheet and securitized combined) as Pavel and Phyllis (1987) do. The more efficient a bank is in originating loans, the lower this ratio would be. Finally, I use the natural logarithm of total assets (SIZE) to control for the high scale of loan origination required to cover the fixed costs of initiating and continuing securitization.

In addition to controls for other motivations to securitize loans, I use controls for time and bank-specific profitability changes in the gains due to changes in interest rates (Δir) and changes in expected default rates. Specifically, for mortgages I use the change in FHA mortgage interest rate (Δmr) and for non-mortgage loans I use the change in short term interest rate ($\Delta 3r$). For expected default rates, I use the change in non-performing loans (ΔNPL) and changes in charge-offs ($\Delta CHOFF$). I prefer non-performing loans and charge-offs to loan loss reserves all

the latter is a forward looking hence potentially a better proxy, because loan loss reserves are discretionary and previous research has shown that banks may bias that information to manage regulatory capital.

4.3 Cross-sectional Test Procedure

The sample is an unbalanced panel dataset of varying number of banks over 15 consecutive quarters. Initially, I model gains from securitizations and loan sales as a function of regulatory capital and earnings management motives, and other motives including risk management, funding, and comparative advantage. I also include controls for changes in profitability. The resulting base model is as follows:

$$Gain = \alpha + \beta_1 CAP + \beta_2 SCAP + \beta_3 \Delta ROA + \beta_4 ANALYST + \beta_5 LIQ + \beta_6 RISK + \beta_7 IR + \beta_8 DIV + \beta_9 GRW + \beta_{10} UND + \beta_{11} SIZE + \beta_{12} COMP + \beta_{13} \Delta ChOff + \beta_{14} \Delta NPL + \beta_{15} \Delta ir + \varepsilon \quad (1)$$

In my cross-sectional analysis, I employ the Fama-MacBeth procedure by running regressions quarterly for each available period. I estimate the cross-sectional regression Eq. (1) for each quarter that data are available. IR and COMP are predicted to have negative coefficients, while all other control variables are predicted to have positive coefficients. The financial statement management proxies CAP, SCAP, and ΔNI are hypothesized to have negative coefficients.

The test of hypotheses are based on the Fama-MacBeth t-statistic, $t = (T-1)^{1/2} \mu_\beta / \sigma_\beta$, where T is the number of quarterly regressions, μ_β is the mean of the quarterly regression coefficients and σ_β is the standard deviation of the quarterly regression coefficients.

This procedure addresses cross-sectional correlation between gains recognized by sample banks in a given quarter. However, the time-series correlation induced by having the same banks over consecutive quarters is also a concern. Therefore, I have made robustness checks using two alternative approaches (unreported). First, I have estimated all of my models as a panel with

quarter fixed-effects and computed standard errors using the Huber-White methodology that corrects for heteroskedasticity and within firm dependence of observations. Second, I have estimated the quarterly equations using the seemingly unrelated regressions (SUR) method, which requires a balanced panel. The results that follow are generally robust across the different techniques.

I also conduct a two-stage analysis to address the selection bias that is introduced by the fact that only those banks for which benefits –both financial statement benefits as well as funding and risk management benefits– exceed costs sell or securitize loans. Following Heckman (1979), I model the decision to sell or securitize and the amount of gains recognized as a simultaneous system. The first-stage equation is a probit model for the securitization decision, while the second equation is a linear regression model for the amount of gains recognized conditional on the decision to sell or securitize:

$$S^* = X_1\beta_1 + \varepsilon_1 \quad (2)$$

$$\text{Gain} = X_2\beta_2 + \varepsilon_2 \quad (3),$$

if loans are sold or securitized and 0 otherwise

A bank securitizes when the latent variable S^* that measures the net benefits of a securitization is positive in Eq. (2). Conditional on having decided to make a securitization, which occurs with probability less than one, I assume that the bank picks the loans that it wants to securitize and provides fair value estimates for the retained interests based on the model shown in Eq. (3). In my model, X_1 in Eq. (2) include the regulatory capital and earnings management variables as well as the profitability controls for changes in interest rates and credit worthiness. X_2 in Eq. (3) include again regulatory capital and earnings management variables as well as other motivations for securitizations.

$$\begin{aligned} \text{LoanSale} &= \alpha + \beta_1\text{CAP} + \beta_2\text{SCAP} + \beta_3\Delta\text{ROA} + \beta_4\text{ANALYST} + \beta_5\text{LIQ} \\ &\quad + \beta_6\text{RISK} + \beta_7\text{IR} + \beta_8\text{DIV} + \beta_9\text{GRW} + \beta_{10}\text{UND} + \beta_{11}\text{SIZE} + \beta_{12}\text{COMP} + \varepsilon_1 \\ \text{Gain} &= \alpha + \beta_{13}\text{CAP} + \beta_{14}\text{SCAP} + \beta_{15}\Delta\text{ROA} + \beta_{16}\text{ANALYST} + \beta_{16}\Delta\text{NPL} + \beta_{16}\Delta\text{ChOff} + \varepsilon_2 \end{aligned}$$

4.4 Results

4.5.1 Descriptive Statistics

Table 1 presents some descriptive statistics. The 199 banks in the sample that sell or securitize are on average larger than the remaining 50 banks that don't. The 58 banks that securitize are also larger than the average bank that sells but not securitizes. The mean (median) total assets of banks that either sell or securitize loans is \$15.217 billion (\$1.646 billion), while the mean (median) total assets of a bank that both sells and securitizes loans is \$43.034 billion (\$6.475 billion). The mean (median) total assets of banks that don't sell or securitize any loans are \$2.132 (\$0.658 billion) and \$3.344 (1.039 billion) respectively. Clearly, each of these groups are highly skewed with the average bank's assets being almost ten times larger than the median bank's. The amount of securitized loans outstanding also has a skewed distribution with some right-tail banks having securitized loans as much as 1.83 times of their on balance sheet assets.

Table 2 presents comparisons of non-sellers and sellers, non-securitizers and securitizers, and first-time securitizers and non-securitizers. I report Wilcoxon rank-sum test statistics; this test is non-parametric and hence robust to outliers and the skewness in the gains and other accounting data.

When seller banks are compared to non-seller banks, there are significant differences consistent with the hypothesized motivations for selling and securitizing. Sellers have higher concentrations of certain loan types than non-sellers (23.09% vs. 19.66%), higher liquidity needs (loans to deposits ratio of 87.89% vs. 79.96%), higher growth opportunities (market to book ratio of 1.89 vs 1.64), and stronger motives to avoid an underinvestment problem (20.50 vs. 16.67), as predicted. Finally, the median adjusted capital ratio of non-sellers is 14.39%, as opposed to the 12.82% of the seller group consistent with the regulatory capital motivations for securitization. However, the median adjusted return on assets, is approximately equal at 0.30% and 0.28% per quarter.

When securitizing banks are compared to non-securitizing banks (Table 2), the pattern is similar, except that the asset risk is significantly higher for securitizers as predicted, but loan diversity is also significantly higher contrary to the predictions. Similar to loan sellers, securitizers have higher liquidity needs (loans to deposits ratio of 94.44% vs. 84.21%), higher growth opportunities (market to book ratio of 2.23 vs 1.71), and stronger motive to avoid an underinvestment problem (23.92 vs. 17.81), than non-securitizing banks, as predicted. Again, the median adjusted capital ratio of non-securitizers is 13.43%, as opposed to the 12.03% of the securitizer group, but the median adjusted return on assets is statistically indistinguishable.

The comparison of first time securitizations yield the same conclusions except that they have a significantly higher loan growth rate compared to all other groups, but they are not significantly riskier and do not have significantly higher liquidity needs although the differences are in the hypothesized direction.

In Table 3, I tabulate the correlations between the size-deflated variables (beginning book value of assets). Consistently with the earnings and regulatory capital management hypotheses, gains have a Pearson correlation coefficient of -0.31 with adjusted net income and -0.36 with the shortfall from analyst forecast, both significant at the 10% level. The correlation of gains with the adjusted total capital ratio is also negative, but not statistically significant. Not surprisingly, the Tier 1 and total risk based capital ratios are highly correlated with a coefficient of .92. Because of the high correlation between the two ratios, I base the following discussion only on the total risk based capital ratios, but I have obtained similar results using the Tier 1 capital ratio as well.

The correlations in Table 3 are also consistent with the funding and risk management motivations to securitize. The total amount of loans outstanding from securitizations (SECOU) is significantly positively correlated (0.44) with the market-to-book ratio (Hereafter, I use *statistical significance* to refer to the 5% level, unless stated otherwise). Amount of loans outstanding from securitizations is also significantly correlated with asset risk with a coefficient of 0.37. Finally, amount of loans outstanding from securitizations is also positively significantly

correlated with size (0.19) again showing that securitization activity is dominated by larger institutions. This is consistent with the large fixed costs of securitization that makes it uneconomical to securitize small pools of loans.

In summary, the univariate statistics from correlations and comparison of subsets of securitizing vs. non-securitizing banks are consistent with regulatory capital management, as well as with funding and risk management motivations to securitize. In addition, the ranking between the capital ratios of each group is consistent with the costs and benefits of loan sales and securitizations. Since first-time securitizations are costlier than following ones, regulatory capital motivations must be stronger to trigger a first-time securitization. For subsequent securitizations, organizational fixed costs have already been incurred; therefore, securitization may be used in response to smaller shortfalls in capital. Consistent with this reasoning, non-securitizers have the highest median and mean capital ratios. The first-time securitizations have the lowest capital ratios among all groups.

Univariate statistics may be misleading if there are systematic differences between the capital levels of banks and other characteristics. For example, larger banks are known to have lower capital ratios and we see in Table 3 that secondary securitizations are made by larger banks. Therefore, the large differences in capital ratios may be driven by size and possibly other bank attributes, instead of being a securitizer per se. The multivariate analysis in the next section resolves these issues.

4.5.1 Regulatory Capital and Earnings Management with Gains

I first estimate Eq. (2) for gains from securitizations and loan sales as a function of only the control variables that relate to funding, risk management, comparative advantage, and profitability. Panel A in Table 4 reports the estimates for this model. The control variables explain 12.2% of the total variation in the cross-section of gains. All variables enter the regression with their predicted signs. While asset riskiness does not attain significance at the

conventional levels, diversification, liquidity needs, growth rate of loans, underinvestment avoidance, and comparative advantage have positive coefficients and interest rate sensitivity has a negative coefficient at the 1% significance level. Only the coefficients of size, change in charge-offs, and change in non-performing loans are not significantly different from zero.

Next, I re-estimate the equation with the regulatory capital and earnings variables, namely adjusted capital ratio, difference from size adjusted industry capital ratio, and adjusted return on assets (Panel B). The adjusted R^2 almost doubles to 23.7%. While the growth rate of loans and the underinvestment avoidance lose significance, the remaining variables roughly retain the same values and significance for coefficient estimates. Change in the non-performing loans now enters the equation with the predicted negative sign at the 10% significance level.

In addition, I find that adjusted regulatory capital levels are significantly negatively associated with gains, as predicted by hypothesis H1.a. Moreover, ΔROA is significant with a negative coefficient, as predicted by hypothesis H1.c. Gains decrease as the difference between this quarter's pre-gain income and the previous quarter's net income increases. However, the deviation from the size adjusted industry capital ratio has a positive sign opposite to my hypothesis. This raises the concern that the size adjusted average capital level is not capturing the optimal regulatory capital targets of individual banks. Alternatively, minimum permissible levels are binding and such target levels do not exist.

I further analyze the earnings management incentive by including the shortfall of adjusted earnings from the mid-quarter consensus analyst forecast. I first replace ΔROA variable with the ANALYST variable (Panel C). The adjusted R^2 climbs further to 26.7% and the variable attains a highly significant negative coefficient as hypothesized. Interestingly, when I include both variables in the regression they both enter significantly with slightly reduced coefficient estimates and the adjusted R^2 climbs further to 30.2% (Panel D). This suggests that the two variables capture different aspects of earnings management. For example, the ΔROA variable may be partly capturing a regulatory capital management motive given that earnings directly affect capital. Alternatively, ΔROA may capture earnings management motivated by contracts

that are written based on GAAP earnings and ANALYST may capture earnings management in response to market expectations.

Next, I explore whether the earnings management result found above is symmetrical when earnings are above or below the preceding quarter's earnings. If it is, then earnings smoothing may explain the pattern of gains. Otherwise, if gains are recognized only when earnings decline, then it indicates an attempt to avoid declines in earnings. Also, I similarly explore whether the insignificance of the firm-specific capital is because gains are recognized only when capital declines.

Thus, I re-estimate Eq. (2) by decomposing ΔROA and SCAP to their negative and positive parts (Panel E). I find that earnings management is not symmetrical around last quarter's earnings level, i.e., banks do not securitize loans that have unrealized losses when pre-gain income exceeds last quarter's net income.

The combined results in Table indicate that banks are more likely to securitize when their earnings fall short of the preceding quarter's earnings or analysts' forecasts. They recognize gains when earnings are low, but do not recognize losses when earnings are high.

4.5.2 Two-stage Model for Gains with Selection Bias

Table 5 reports the results from the Heckman two-stage estimation. In Panel A, all gains from loan sales and securitizations are included. In the first stage, total risk based capital ratio, change in net income, deviation from target regulatory capital, shortfall from analyst forecasts are statistically significant with hypothesized signs. Liquidity, diversification, and comparative advantage are also significant. In the second stage, regulatory capital and analyst forecasts are significant after controlling for the changes in interest rates. However, the regulatory capital ratio has a positive sign.

In Panel B, I only include the gains from securitizations and not whole loan sales. In the first stage, once again regulatory capital is significant, but not earnings. Liquidity, and size have significantly positive signs as well as asset risk and loan growth rate. Analyst forecasts have the

hypothesized negative sign, but it is insignificant. In the first stage, only income smoothing has a significant coefficient as hypothesized. Regulatory capital and analyst forecasts are negative as hypothesized, but not significant.

A comparison of Panel A and Panel B does not provide strong support for any differences between whole loan sales as opposed to securitizations. While the analysis of loan sales suggests they are useful for meeting analysts' forecasts, the results from securitizations suggests that they are useful for earnings smoothing.

Following the relatively weak results in Panel B, I ask whether there are differences between pure loan sales and securitizations with retained interest as hypothesized in H.1e and mortgage securitization and other asset securitizations as hypothesized in H.1f. Managers have much less discretion in accounting for mortgage securitizations, because mortgage backed securities have very liquid markets that provide reference prices for fair value accounting.

Consistent with this hypothesis, for mortgages, regulatory capital enters the first stage equation, but not the second stage equation significantly (Panel C). In the second stage, only earnings smoothing is significant and only at the ten percent level. In the first stage equation, growth rate of loans, liquidity needs, size and comparative advantage remain statistically significant.

In Panel D, however, both earnings smoothing and analyst forecasts load significantly negative after the effect of changes in interest rates. Again, this is consistent with the availability of more discretion for accounting estimates for less liquid and homogenous assets. In the first stage equation, liquidity, growth rate of loans, and size remain to be significant while comparative advantage is no longer significant. Also, asset risk is significant with the predicted positive coefficient.

5. Conclusions

I have presented evidence that gains from securitizations are used to manage regulatory capital and earnings in the banking industry. The capital ratio and deviations from the prior quarter's earnings explain a large portion of the cross-sectional variation in the gains. By comparing whole loan sales to loan securitizations with retained interests, I also presented evidence that the source of the realized gains from securitizations is not only the selection of appreciated loans relative to their historical costs, but also the biased valuations of retained interests from securitizations. Evidence from the comparison of mortgage securitizations to non-mortgage securitizations is also consistent with the use of retained residual interest valuations for financial statement management. In particular, managers seem to be using their discretion in biased manner when it is more difficult to gather objective market data to challenge their accounting estimates. As fair value accounting becomes more pervasive in banking and elsewhere such as revenue recognition, this has serious implications about the reliability of reported fair values in the absence of liquid markets that provide reference prices. Further, as a more general point, this raises concerns about the reliability of bank risk disclosures that will be generated by internal models under Basel II.

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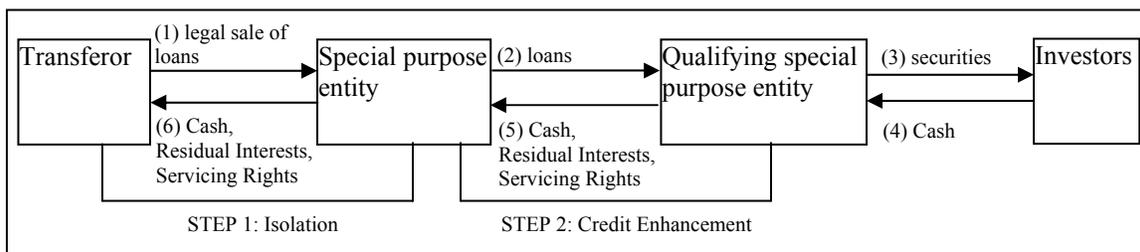
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Appendix 1. Institutional Structure of a Securitization Transaction with Retained Interests

The often conflicting objectives of preserving lender-borrower relationships, providing protections to buyers of loans, and obtaining different outcomes for financial reporting and tax purposes lead to complex institutional structures for securitizations. The most common structure of securitization involves two steps (Figure 1). In the first step, the originator transfers the loans in a legal sale to a special purpose entity that is owned by the originator. The legal sale isolates the assets beyond the reach of the transferor and its creditors. Therefore, the first step meets the SFAS 125 isolation criterion without causing a taxable event, because the transferee is a part of the consolidated tax return of the transferor.

In the second step, the loans are transferred to a special purpose entity (SPE) with credit enhancements that protect investors from loan losses. Therefore, this step is not legally considered a sale, yet GAAP allows the whole transfer to be accounted for as a sale, if it meets the criteria stated in Section 2.

Figure 1. Institutional Structure



The second step determines whether the securitization is a sale or a borrowing for tax purposes. For tax purposes, asset-backed securities are generally characterized as the transferor's debt independent of the accounting treatment (Coopers & Lybrand 1997).¹⁰ Instead of control, the tax code focuses on risks and rewards of the securitized loans and determines that

¹⁰ Two attributes generally support the debt characterization. First, the timing and amount of the cash flows paid for the securities are generally different from the timing and amount of payments received from the securitized loans. Second, it can be argued that the transferor, as opposed to the SPE and the ultimate investors, retains substantially all the burdens and benefits of owning the financial assets.

transferor retains the risks and rewards. Therefore, the transferor continues to be the owner of the assets for tax purposes.

After receiving the loan pool, the SPE issues debt securities that are backed by cash flows from transferred assets. Debt securities issued by the SPE usually have multiple seniority classes and different cash flow patterns from the underlying loan pool. The SPE also arranges for a servicer to collect the loan receipts from borrowers over the life of the securitization. Often, the transferor services the loans.

Appendix 2. Example of Financial Reporting for Securitizations

Suppose Company C originates \$1,000 of loans yielding 12% percent. Company C sells the \$1,000 principal plus the right to receive interest income of 8% to another entity for \$1,000. Assume further that Company C receives half of the interest income not sold as compensation for servicing the loan. The remaining half of the interest income not sold is considered an interest-only strip receivable and is a residual interest. At the date of the transfer, the fair value of the loans, including servicing, is \$1,100, which equals the present value of the loans' expected cash flows discounted at the appropriate risk-adjusted rate. Further, assume that the transferor is fairly compensated for its services so that the fair value of the servicing asset is zero. Then, the fair value of the interest-only strip receivable is \$100. The carrying amount of the loan is allocated at the relative fair values of each component shown in Figure 2.

Figure 2. Carrying Amount Based on Fair Values

	Fair Value	% of Total Value	Allocated Carrying Amount
Loans sold	\$1,000	90.90%	\$909.09
Interest-only strip receivable	100	9.09%	90.90
Total	\$1,100	100%	\$1,000

Gain from securitization is the \$90.90 difference between the \$1,000 fair value and the \$909.09 allocated carrying amount. Following the transfer two journal entries are made:

<u>To record transfer</u>		<u>To measure interest-only strip receivable as available-for-sale</u>	
Cash	\$1,000	Interest-only strip receivable	\$9.09
Interest-only receivable	\$90.90	<i>Equity (comprehensive income)</i>	<i>\$9.09</i>
Loans	\$1,000		
<i>Gain on sale</i>	<i>\$90.90</i>		

The balance sheet effects of the securitization example given above are demonstrated in Figure 3 for both secured borrowing and sale accounting. In this example, securitizing 10% of the loan portfolio increases the equity to total assets ratio of the bank to 10.9% from 10% if accounted as a sale, whereas it decreases to 9.1% when accounted as a secured borrowing.

Figure 3. Analysis of Balance Sheet Before and After Securitization

	Before Transfer	After Sale	After Secured Borrowing
Cash	-	1,000	1,000
Loans *	10,000	9,000	9,000
Pledged loans to Securitization	-	-	1,000
Interest-only strip	-	100	-
Total Assets	<u>10,000</u>	<u>10,100</u>	<u>11,000</u>
Debt	9,000	9,000	9,000
Secured Borrowing	-	-	1,000
Shareholder's Equity	1,000	1,100	1,000
Total Liabilities and Shareholders' Equity	<u>10,000</u>	<u>10,100</u>	<u>11,000</u>

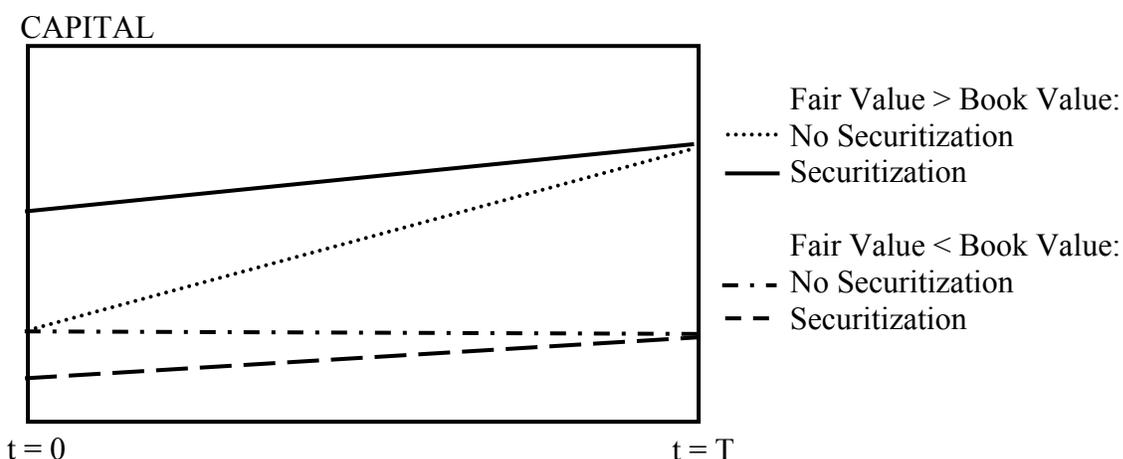
* Assume that the bank had \$9,000 of net loans, in addition to the \$1,000 of loans transferred.

I illustrate the risk-based capital calculations using the previous example. The capital ratio for the firm after the sale is $1,100/10,000=11\%$ up from 10%. Figure 4 illustrates this calculation.

Figure 4. Risk-based Capital Ratio after Securitization

	Before Transfer	After Sale	After Secured Borrowing
Assets Sold with Retained Interests	-	\$1,000	-
Maximum Exposure from Retained Interests	-	\$100	-
Other Risk-weighted Assets	\$10,000	\$9,000	\$10,000
Total Risk-weighted Assets	\$10,000	\$10,000	\$10,000
Total Risk Based Capital	\$1,000	\$1,100	\$1,000
Total Capital Ratio	10.0%	11.00%	10.00%

Appendix 3. Impact of Securitization with Retained Interests on Regulatory Capital Ratio



Assumptions: $t=0$ is the securitization date and $t=T$ is the maturity date of the loans and the securitization. Proceeds are invested in risk-free government securities. The securitized loans are interest-only and their principal is paid back at maturity.

Table 1. Descriptive Statistics

A. All Banks (n=249)

Variable	mean	std	min	Q1	median	Q3	max
TA	12,589,635	64,338,421	160,011	640,028	1,308,390	4,693,448	731,208,571
SECOUT	1.58%	12.00%	0.00%	0.00%	0.00%	0.13%	183.15%
GAIN	0.03%	0.07%	-0.01%	0.00%	0.01%	0.02%	0.70%
CAP	14.05%	4.13%	8.41%	11.83%	13.07%	14.85%	46.15%
ROA	0.30%	0.16%	-0.69%	0.23%	0.29%	0.35%	1.72%
Gain/CAP	0.20%	0.57%	-0.11%	0.00%	0.06%	0.17%	6.53%
Gain/NI	-12.85%	306.82%	-4797.50%	0.00%	1.29%	5.65%	458.06%
LIQ	86.71%	18.14%	6.65%	77.40%	86.96%	96.18%	140.65%
RISK	1.96%	1.07%	0.23%	1.31%	1.70%	2.34%	7.48%
IR	-5.52	18.87	-167.08	-11.55	-4.19	2.50	64.63
DIV	24.04%	11.86%	0.10%	16.31%	22.07%	28.87%	66.29%
GRW	4.09%	6.81%	-4.93%	1.78%	3.08%	5.01%	92.40%
MB	1.97	0.88	0.58	1.44	1.84	2.31	6.86
UND	21.62	12.57	1.41	13.97	19.71	26.60	110.87
SIZE	14.48	1.53	11.98	13.35	14.08	15.36	20.48
COMP	3.93%	7.75%	1.16%	2.68%	3.20%	3.92%	122.43%

B. Banks that Sold or Securitized Loans (n=199)

Variable	mean	std	min	Q1	median	Q3	max
TA	15,217,137	71,722,842	160,011	758,317	1,646,242	5,632,471	731,208,571
SECOUT	1.96%	13.40%	0.00%	0.00%	0.00%	0.30%	183.15%
GAIN	0.04%	0.08%	-0.01%	0.00%	0.01%	0.03%	0.70%
CAP	13.51%	2.93%	8.41%	11.77%	12.83%	14.59%	28.08%
ROA	0.30%	0.17%	-0.69%	0.24%	0.29%	0.35%	1.72%
Gain/CAP	0.25%	0.63%	-0.11%	0.03%	0.08%	0.24%	6.53%
Gain/NI	-16.08%	343.31%	-4797.50%	0.34%	2.36%	6.90%	458.06%
LIQ	88.51%	16.46%	22.17%	79.22%	87.89%	97.51%	139.49%
RISK	1.95%	1.06%	0.23%	1.31%	1.70%	2.31%	7.48%
IR	-5.58	17.98	-167.08	-11.43	-4.19	2.50	48.13
DIV	24.58%	11.62%	0.48%	16.85%	23.09%	30.03%	66.29%
GRW	4.28%	7.48%	-4.93%	1.82%	3.11%	5.06%	92.40%
MB	2.01	0.85	0.58	1.50	1.89	2.35	6.86
UND	22.39	11.38	3.53	14.76	20.50	27.88	84.73
SIZE	14.67	1.56	11.98	13.51	14.29	15.53	20.48
COMP	3.45%	1.83%	1.16%	2.70%	3.19%	3.90%	22.18%

C. Banks that Securitized Loans (n=58)

Variable	mean	std	min	Q1	median	Q3	max
TA	43,034,254	128,717,628	433,509	2,115,643	6,475,674	26,956,927	731,208,571
SECOUT	6.62%	24.34%	0.01%	0.28%	0.88%	5.22%	183.15%
GAIN	0.04%	0.06%	-0.01%	0.00%	0.02%	0.05%	0.32%
CAP	12.52%	2.11%	8.50%	11.04%	12.09%	13.08%	19.77%
ROA	0.30%	0.20%	-0.69%	0.27%	0.32%	0.36%	0.91%
Gain/CAP	0.27%	0.41%	-0.11%	0.04%	0.12%	0.32%	2.20%
Gain/NI	16.95%	68.46%	-57.06%	0.71%	2.96%	10.94%	458.06%
LIQ	95.00%	12.15%	58.15%	87.27%	94.44%	102.89%	125.39%
RISK	2.24%	1.07%	0.51%	1.60%	2.12%	2.53%	7.48%
IR	-3.43	14.14	-39.36	-9.87	-3.51	2.29	48.13
DIV	21.05%	9.53%	0.57%	14.42%	19.73%	25.86%	43.58%
GRW	4.50%	4.72%	-4.93%	2.09%	3.29%	6.08%	29.16%
MB	2.32	0.89	0.66	1.86	2.23	2.55	6.86
UND	25.77	10.27	6.42	20.37	23.92	29.26	61.60
SIZE	15.94	1.70	13.00	14.62	15.73	17.12	20.48
COMP	3.37%	1.67%	1.54%	2.60%	3.05%	3.55%	13.71%

Sample contains all banks that have reported net income, total assets, and loans and leases in the Bank Holding Company Database between first quarter 1997 and fourth quarter 2000. First quarter 1997 observations are lost due to differencing and growth rate computation. Securitizers have had an outstanding balance of securitized loans with retained interests anytime during the sample period. Secondary securitizations are observations by banks that had securitized before. Non-securitizers have never sold assets with retaining interests. TA= Total Assets; SECOUT=Total outstanding securitized receivables scaled by beginning of period total assets; GAIN=Gain from securitization scaled by beginning of period total assets; CAP=Total capital ratio adjusted for after tax gain from sale; NI=Net income adjusted for after tax gain from sale scaled by beginning of period total assets; Gain/CAP = After tax gain divided by the total regulatory capital before the gain; Gain/NI= After tax gain divided by the net income before the gain; LIQ=Loans to deposits ratio adjusted for the loans securitized; RISK=Standard deviation of asset returns; IR=Interest rate sensitivity of equity returns; DIV=Loan concentration (Herfindahl) index; GRW=Growth rate of on balance sheet and outstanding securitized loans; MB=Market-to-book ratio; UND=Interaction of the debt-to-equity ratio with the market-to-book ratio; SIZE=Natural logarithm of total assets including securitized loans; COMP=Non-interest expense to total on-balance sheet and outstanding securitized loans.

Table 2. Comparisons of Securitizer v Non-Securitizer Characteristics

Variable	Non-Seller	Seller	Non-Securitizer	Securitizer	NonSecuritizer	Firsttime
TA	\$ 657,605	\$ 1,646,242 ***	\$ 1,283,362	\$ 6,475,674 ***	\$ 1,283,362	\$ 5,130,378 ***
RISK	1.68%	1.70%	1.60%	2.12% ***	1.66%	1.91%
COMP	3.26%	3.19%	3.26%	3.05%	3.14%	2.94%
UND	16.67	20.50 ***	17.81	23.92 ***	18.94	27.62 ***
DIV	19.66%	23.09% **	22.83%	19.73% **	21.25%	20.24%
GAIN	0.00%	0.01% ***	0.01%	0.02% ***	0.00%	0.02% ***
GRW	2.96%	3.11%	2.89%	3.29% ***	2.67%	4.99% ***
Gain/CAP	0.00%	0.08% ***	0.04%	0.12% ***	0.00%	0.10% ***
Gain/NI	0.00%	2.36% ***	0.52%	2.96% ***	0.05%	3.15% ***
IR	-4.41	-4.19	-4.52	-3.51	-4.13	-1.05
LIQ	79.96%	87.89% ***	84.21%	94.44% ***	83.59%	89.49%
MB	1.64	1.89 ***	1.72	2.23 ***	1.86	2.38 **
SECOUT	0.00%	0.00% ***	0.00%	0.88% ***	0.00%	1.29% ***
SIZE	13.39	14.29 ***	14.07	15.73 ***	14.07	15.47 ***
CAP	14.39%	12.82% ***	13.43%	12.03% ***	13.41%	11.70% ***
ROA	0.30%	0.28%	0.27%	0.29%	0.29%	0.33%

Sample contains all banks that have reported net income, total assets, and loans and leases in the Bank Holding Company Database between first quarter 1997 and fourth quarter 2000. First quarter 1997 observations are lost due to differencing and growth rate computation. Securitizers have had an outstanding balance of securitized loans with retained interests anytime during the sample period. Wilcoxon rank-sum test is performed to test for the equality between bank characteristics in each group. *** denotes significance at the 1% level, ** at the 5% level, and * at the 10% level. GAIN=Gain from loan sales and securitizations scaled by beginning of period total assets; SECOUT=Total outstanding securitized receivables scaled by beginning of period total assets; CAP=Total capital ratio adjusted for after tax gain from sale; NI=Net income adjusted for after tax gain from sale scaled by beginning of period total assets; Gain/CAP = After tax gain divided by the total regulatory capital before the gain; Gain/NI= After tax gain divided by the net income before the gain; TA=Total assets; RISK=Standard deviation of asset returns; COMP=Non-interest expense to total on-balance sheet and outstanding securitized loans; UND=Interaction of the debt-to-equity ratio with the market-to-book ratio; DIV=Loan concentration (Herfindahl) index; GRW=Growth rate of on balance sheet and outstanding securitized loans; IR=Interest rate sensitivity of equity returns; LIQ=Loans to deposits ratio adjusted for the loans securitized; MB=Market-to-book ratio; SIZE=Total assets including securitized loans.

Table 3. Pearson Correlation Coefficients of Explanatory Variables and Gains from Securitization

	GAIN	SECOUT	T1	CAP	ROA	ANALYST	LEV	LIQ	RISK	IR	DIV	GRW	MB	DIST	SIZE
SECOUT	0.16														
T1	-0.10	-0.02													
CAP	-0.13	0.01	0.92***												
ROA	-0.31*	0.26*	0.17*	0.15											
ANALYST	-0.36*	0.17	0.08	0.08	0.75***										
LEV	0.02	0.29**	0.74***	0.69***	0.35***	0.12									
LIQ	0.22	0.16	-0.23	-0.20	0.00	-0.15	0.12								
RISK	0.10	0.37***	0.07	0.06	0.38***	0.12	0.28**	0.00							
IR	-0.02	0.00	-0.08	-0.06	-0.02	0.01	-0.05	0.01	-0.03						
DIV	0.25*	0.00	0.10	0.01	-0.11	-0.12	0.15	0.56***	-0.08	0.02					
GRW	0.09	0.11	-0.07	-0.08	-0.07	-0.04	0.00	0.06	0.06	-0.05	0.00				
MB	0.04	0.44***	-0.14	-0.11	0.41***	0.22*	0.07	-0.02	0.72***	0.02	-0.22*	0.08			
DIST	0.04	0.27	-0.29*	-0.23*	0.12	0.12	-0.25*	-0.13	0.46***	0.03	-0.26**	0.11	0.85***		
SIZE	-0.01	0.23**	-0.33***	-0.17	0.19	0.10	-0.22*	0.11	0.25	0.05	-0.38***	-0.05	0.45***	0.42***	
COMP	-0.01	-0.02	0.04	0.04	-0.12	0.00	-0.17*	-0.46***	0.15	-0.01	-0.33***	0.01	0.26*	0.44***	0.17

The correlation coefficients and their p-values are averages over the 15 available quarters. *** denotes significance at the 1% level, ** at the 5% level, and * at the 10% level. Sample contains all banks that have reported net income, total assets, and loans and leases in the Bank Holding Company Database between first quarter 1997 and fourth quarter 2000. First quarter 1997 observations are lost due to differencing and growth rate computation. Variables are defined as follows: GAIN=Gain from securitization scaled by beginning of period total assets; SECOUT=Total outstanding securitized receivables with retained interests scaled by beginning of period total assets; T1=Tier 1 capital ratio adjusted for after tax gain from sale; CAP=Total capital ratio adjusted for after tax gain from sale; LEV=Leverage ratio adjusted for after tax gain from sale; NI=Net income adjusted for after tax gain from sale scaled by beginning of period total assets; ANALYST= Difference of net income before the after-tax gain from sale from IBES consensus forecast (mean) in the second month of the quarter; LIQ=Loans to deposits ratio adjusted for the loans securitized; RISK=Standard deviation of asset returns; IR=Interest rate sensitivity of equity returns; DIV=Loan concentration (Herfindahl) index; GRW=Growth rate of balance sheet and outstanding securitized loans; MB=Market-to-book ratio; UND=Interaction of the debt-to-equity ratio with the market-to-book ratio; SIZE=Natural logarithm of total assets including securitized loans; COMP=Non-interest expense to total on-balance sheet and outstanding securitized loans.

Table 4. Incentives to Manage Regulatory Capital and Earnings and Gains from Loan Sales and Securitizations

Panel A: $Gain = \beta_0 + \sum_{i=1}^9 \beta_i ControlVar_i + \varepsilon$

Panel B: $Gain = \beta_0 + \beta_1 CAP + \beta_2 SCAP + \beta_3 \Delta NI + \beta_4 ANALYST + \sum_{i=5}^9 \beta_i ControlVar_i + \varepsilon$

Panel C: $Gain = \beta_0 + \beta_1 CAP + \beta_2' SCAP^- + \beta_2'' SCAP^+ + \beta_3' \Delta NI^- + \beta_3'' \Delta NI^+ + \beta_4 ANALYST + \sum_{i=5}^9 \beta_i ControlVar_i + \varepsilon$

	CAP	SCAP	SCAP ⁻	SCAP ⁺	ΔROA	ΔROA ⁻	ΔROA ⁺	ANALYST	σ _{Asset}	IR	DIV	GRW	LIQ	UND	COMP	SIZE	ΔCHOFF	ΔNPL	adj.R ²
A.									0.004	0.000	0.002	0.001	0.001	0.000	0.008	0.000	-0.030	-0.015	12.2%
									(1.654)	(-2.001)	(4.298)	(2.672)	(3.021)	(0.993)	(3.178)	(0.158)	(-1.144)	(-0.857)	
B.	-0.007	0.005			-0.187				0.005	0.000	0.001	0.000	0.000	0.000	0.007	0.000	-0.047	-0.024	23.7%
	(-3.222)	(2.496)			(-7.559)				(2.248)	(-2.303)	(4.259)	(0.675)	(2.686)	(-0.366)	(3.872)	(-1.046)	(-1.395)	(-1.743)	
C.	-0.005	0.004						-0.250	0.010	0.000	0.002	0.000	0.000	0.000	0.002	0.000	-0.031	-0.037	26.7%
	(-2.291)	(1.566)						(-9.171)	(4.560)	(-1.835)	(5.381)	(1.088)	(-0.115)	(1.329)	(2.093)	(0.736)	(-0.970)	(-3.238)	
D.	-0.004	0.003			-0.135			-0.181	0.008	0.000	0.002	0.000	0.000	0.000	0.002	0.000	-0.040	-0.033	30.2%
	(-2.238)	(1.513)			(-5.995)			(-7.042)	(3.996)	(-1.685)	(4.944)	(0.527)	(0.803)	(0.620)	(2.550)	(0.481)	(-1.147)	(-2.786)	
E.	-0.008		0.003	0.007	-0.273	-0.004		-0.125	0.007	0.000	0.001	0.000	0.000	0.000	0.002	0.000	-0.027	-0.024	33.4%
	(-3.218)		(1.234)	(2.750)	(-7.122)	(0.015)		(-4.834)	(3.658)	(-1.496)	(4.694)	(-0.229)	(0.952)	(0.317)	(2.123)	(-0.135)	(-0.874)	(-1.607)	

Estimates represent the average coefficient estimated from the 15 quarterly equations. $t = (T-1)^{1/2} \mu_{\beta} / \sigma_{\beta}$, where T is the number of quarterly regressions, μ_{β} is the mean of the quarterly regression coefficients and σ_{β} is the standard deviation of the quarterly regression coefficients $adj.R^2$ is the average over all quarters. Sample contains all banks that have reported net income, total assets, and loans and leases in the Bank Holding Company Database between first quarter 1997 and fourth quarter 2000. First quarter 1997 observations are lost due to differencing and growth rate computation. GAIN=Gain from securitization scaled by beginning of period total assets; CAP=Total capital ratio adjusted for after tax gain from sale; SCAP= Difference of CAP from the mean capital ratio computed for the bank's size quartile as of the beginning of the quarter; SCAP⁻=min[0, SCAP]; SCAP⁺=max[0, SCAP]; ΔNI= Difference of net income before the after-tax gain from sale from last quarter's net income scaled by beginning of period total assets; ΔNI⁻=min[0, ΔNI]; ΔNI⁺=max[0, ΔNI]; ANALYST= Difference of net income before the after-tax gain from sale from IBES consensus forecast (mean) in the second month of the quarter; LIQ=Loans to deposits ratio adjusted for the loans securitized; RISK=Standard deviation of asset returns; IR=Interest rate sensitivity of equity returns; DIV=Loan concentration (Herfindahl) index; GRW=Growth rate of on balance sheet and outstanding securitized loans; UND=Interaction of the debt-to-equity ratio with the market-to-book ratio; SIZE=Natural logarithm of total assets including securitized loans; COMP=Non-interest expense to total on-balance sheet and outstanding securitized loans.

Table 5. Gains from Loan Sales and Securitizations with First Stage Selection Model

$$Gain = \alpha + \beta_{13}CAP + \beta_{14}SCAP + \beta_{15}\Delta ROA + \beta_{16}ANALYST + \beta_{16}\Delta NPL + \beta_{16}\Delta ChOff + \nu$$

$$LoanSale = \alpha + \beta_1CAP + \beta_2SCAP + \beta_3\Delta ROA + \beta_4ANALYST + \beta_5LIQ$$

$$+ \beta_6RISK + \beta_7IR + \beta_8DIV + \beta_9GRW + \beta_{10}UND + \beta_{11}SIZE + \beta_{12}COMP + \varepsilon$$

A. Loan Sales and Securitizations

	CAP	ΔROA	ANALYST	$\Delta 3r$	$\Delta CHOFF$	ΔNPL						
Coef.	0.004**	-0.018	-0.089***	-0.031***	0.035	-0.002						
s.e.	0.002	0.017	0.026	0.012	0.028	0.018						
	CAP	ΔROA	ANALYST	LIQ	σ_{Asset}	IR	DIV	GRW	UND	SIZE	COMP	λ
Coef.	-5.160***	-41.902**	-60.351**	0.662***	1.460	-0.001	0.775**	-0.329	0.005	0.092***	-2.345**	-0.002***
s.e.	0.889	20.013	25.250	0.246	2.642	0.001	0.378	0.534	0.003	0.026	1.116	$3.0 \cdot 10^{-4}$
$n_{LSS} =$	1,247	$Wald \chi^2(9) =$		90.74								

B. Securitizations

	CAP	ΔROA	ANALYST	$\Delta 3r$	$\Delta CHOFF$	ΔNPL						
Coef.	-0.004	-0.223***	-0.055	-0.036	-0.148	-0.050						
s.e.	0.004	0.061	0.054	0.029	0.097	0.056						
	CAP	ΔROA	ANALYST	LIQ	σ_{Asset}	IR	DIV	GRW	UND	SIZE	COMP	λ
Coef.	-6.425***	0.424	-9.690	1.600***	11.614***	0.002	-1.021*	2.545***	-0.001	0.271***	-2.478	$-1.6 \cdot 10^{-4}$
s.e.	2.033	0.986	24.042	0.365	3.344	0.002	0.584	0.598	0.004	0.038	2.335	$1.4 \cdot 10^{-4}$
$n_S =$	206	$Wald \chi^2(9) =$		62.8								

C. Mortgage Securitizations

	CAP	Δ ROA	ANALYST	Δ mr	Δ CHOFF	Δ NPL						
Coef.	-0.006	-0.163*	-0.072	0.001	-0.075	-0.060						
s.e.	0.007	0.092	0.091	0.035	0.114	0.062						
	CAP	Δ ROA	ANALYST	LIQ	σ_{Asset}	IR	DIV	GRW	UND	SIZE	COMP	λ
Coef.	-8.693***	0.442	-45.160*	0.701*	5.423	0.000	-0.540	1.834***	-0.001	0.216***	-7.087**	-1.2 10 ⁻⁴
s.e.	2.534	4.861	24.667	0.390	4.084	0.002	0.640	0.628	0.004	0.041	2.987	2.6 10 ⁻⁴
$n_{MS} =$	124	Wald $\chi^2(9) =$		43.81								

D. Financial Asset Securitizations

	CAP	Δ ROA	ANALYST	Δ 3r	Δ CHOFF	Δ NPL						
Coef.	-0.004	-0.315***	-0.175**	-0.068*	-0.045	-0.092						
s.e.	0.005	0.083	0.077	0.041	0.154	0.117						
	CAP	Δ ROA	ANALYST	LIQ	σ_{Asset}	IR	DIV	GRW	UND	SIZE	COMP	λ
Coef.	-4.279*	0.407	8.593	1.776***	17.369***	0.003	-1.030	2.306***	-0.006	0.308***	-0.673	-4.9 10 ⁻⁴ **
s.e.	2.581	1.162	28.885	0.440	3.888	0.002	0.743	0.673	0.005	0.047	2.268	2.1 10 ⁻⁴
$n_{FAS} =$	110	Wald $\chi^2(9) =$		62.62								

There are 1,916 observations in each panel. $adj.R^2$ is the average over all quarters. Sample contains all banks that have reported net income, total assets, and loans and leases in the Bank Holding Company Database between first quarter 1997 and fourth quarter 2000. First quarter 1997 observations are lost due to differencing and growth rate computation. GAIN=Gain from securitization scaled by beginning of period total assets; CAP=Total capital ratio adjusted for after tax gain from sale; SCAP= Difference of CAP from the mean capital ratio computed for the bank's size quartile as of the beginning of the quarter; SCAP⁻=min[0, SCAP]; SCAP⁺=max[0, SCAP]; Δ NI= Difference of net income before the after-tax gain from sale from last quarter's net income scaled by beginning of period total assets; Δ NI⁻=min[0, Δ NI]; Δ NI⁺=max[0, Δ NI]; ANALYST= Difference of net income before the after-tax gain from sale from IBES consensus forecast (mean) in the second month of the quarter; LIQ=Loans to deposits ratio adjusted for the loans securitized; RISK=Standard deviation of asset returns; IR=Interest rate sensitivity of equity returns; DIV=Loan concentration (Herfindahl) index; GRW=Growth rate of on balance sheet and outstanding securitized loans; UND=Interaction of the debt-to-equity ratio with the market-to-book ratio; SIZE=Natural logarithm of total assets including securitized loans; COMP=Non-interest expense to total on-balance sheet and outstanding securitized loans.