



Do bank managers use securitization gains to smooth earnings in the post- FAS 166/167 period?

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ABSTRACT

Previous literature has documented that securitization gains were used for income smoothing in the era before FAS 166 and FAS 167,¹ which tightened the requirements for sale accounting for securitizations. Using securitizing bank holding companies, we examine whether FAS 166/167 has reduced this income smoothing behavior. Our findings include two facets. First, at the aggregate level, time series statistics show that both the frequency of non-zero securitization gains reported and the magnitude of reported securitization gains are significantly reduced in the post- FAS 166/167 period. Second, at the firm level, our regression results indicate that even though the extent of this income smoothing behavior decreased after the issuance of FAS 166/167, securitization gains continue to be used to smooth earnings by securitizing banks in the post-FAS 166/167 period. Overall, our findings convey that FAS 166/167 has reduced the securitization gains recorded by banks but that after the regulation, banks still use securitization gains to smooth earnings.

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1. Introduction

Securitizing firms have been reported to manipulate securitization gains to smooth income (Dechow, Myers, & Shakespeare, 2010). The success of this type of earnings management hinges on two factors: the securitization transaction being recorded as a sale and managers having sufficient discretion in recognizing a securitization gain (or securitization income).² FAS 166/167 was aimed at tightening the criteria for sale accounting and thus reducing the likelihood of recording a securitization transaction as a sale. If it is effective at reducing the likelihood of structuring securitization transactions as sales, then it may lead to less recognition of securitization income. However, once a securitization transaction is structured to overcome the hurdle of qualifying as a sale, FAS 166/167 does not restrict managers' discretion in recognizing securitization income. Moreover, in the post- FAS 166/167 period, there have been other regulatory changes, such as more stringent leverage and liquidity requirements imposed by

Basel III, that can constrain a securitizing firm's income smoothing channels. With the additional regulatory constraints, securitizing firms might become more reliant on securitization income to smooth earnings. Therefore, in the post- FAS 166/167 period, whether and to what extent securitizing firms use securitization income to smooth earnings are research questions that demand exploration.

The literature has documented that firms used securitization income to manage earnings in the pre- FAS 166/167 period. For example, Dechow and Shakespeare (2009) find that firms are more likely to engage in securitization activities at the end of a fiscal quarter, when they have a clearer idea about how much securitization income they need to meet financial reporting goals. Dechow et al. (2010) give empirical evidence of using securitization income for earnings smoothing in that firms tend to bias their securitization income upward (downward) when their pre-securitization earnings are lower (higher) and when the change in pre-securitization earnings from last period is negative (positive).

Firms' ability to use securitization income to smooth earnings arises from the necessity to estimate asset values. In a securitization, the bank (or other securitizer) transfers a package of loans (or other financial assets) to its Special Purpose Entity (SPE).³

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¹FAS 166 and 167 have been codified by the FASB as parts of ASC 810-10 and 820-20, respectively. In this paper, we refer to the legacy standards to simplify exposition.

²In this paper, "securitization gain" and "securitization income" are used interchangeably.

³ In this paper, Special Purpose Entity (SPE) and Variable Interest Entity (VIE) are used interchangeably.

The SPE securitizes these financial assets, sells a major portion of the assets as asset-backed-securities (ABS), and then delivers the remaining portion of the assets back to the bank as the retained interest. At the securitization date, the bank records the difference between the market price and carrying value of ABS as securitization income. The discretion is in the estimation of the carrying (book) value attributable to the ABS and the retained interest. The bank must allocate the carrying value to the ABS and the retained interest according to their relative fair values. The fair value of the ABS is normally equal to its market price. However, since there is usually no active market for the retained interest, securitizing firms have considerable discretion in estimating its fair value. This would give securitizing firms discretion in reporting the carrying value allocated to the ABS and thus the securitization income.

In addition, [Barth and Taylor \(2010\)](#) point out that another layer of discretion associated with securitization income is managers' decisions whether to securitize assets and which assets to securitize. In other words, managers can "cherry-pick" assets with relatively more (or less) unrecognized gains to securitize to report higher (lower) securitization income. Given that the carrying value is often based on historical cost, there are often unrecognized securitization gains (market price less carrying value) that would be recognized upon securitization. Both of the aforementioned layers of discretion provide managers opportunities to strategically use securitization income to meet earnings targets.

Prior to the issuance of FAS 166/167, securitizing firms followed FAS 140 and FIN 46(R) to report securitization information. Under those regulations, most securitizing firms structured their securitization deals to meet the criteria of sale accounting treatment ([Dechow et al., 2010](#)).⁴ In June 2009, the FASB issued FAS 166 and 167 to amend those regulations by imposing more stringent criteria on sale accounting.⁵ As a result, it became harder for a securitization transaction to be accounted as a sale. If not treated as a sale, there would be no securitization income recognized. In this sense, FAS 166 and 167 can deprive securitizing firms of the opportunity to smooth earnings with securitization income. However, FAS 166 and FAS 167 have no impact on managers' discretion in estimating the securitization income (once treated as a sale) and cherry-picking assets to securitize. This can weaken the regulations' effectiveness in curtailing earnings smoothing through securitization income.

We use bank holding companies to examine whether the use of securitization income to smooth earnings is still prevalent after FAS 166/167. First, from time series statistics, we observe that both the frequency of non-zero securitization income reporting and the magnitude of reported securitization income have been greatly reduced in the post- FAS 166/167 period. This indicates effectiveness of FAS 166/167 in tightening sale accounting criteria. Second, following [Dechow et al. \(2010\)](#), we undertake a regression analysis and use two associations to capture the earnings management behavior: the relation between securitization income and pre-securitization earnings, and the relation between securitization income and the change in pre-securitization earnings. Consistent with time series statistics, our regression results also reveal that the extent of earnings smoothing via securitization income decreases after the issuance of FAS 166/167. However, even though securitization income reporting in the post- FAS 166/167 period is diminished compared to the pre-regulation period, we continue to find negative and significant relationships between securitization income and both pre-securitization earnings and

change in pre-securitization earnings. Such relationships hold when a variety of control variables are used. These results provide evidence that bank managers continue to use securitization income to manage earnings in the post FAS 166/167 period. Our findings are consistent with the argument that FAS 166/167 has limited capability in reducing income smoothing via securitization gains once the securitization activities are classified as sales.

Our study contributes to the literature because, to our knowledge, this is the first study examining the impact of FAS 166/167 on the use of securitization gains to smooth earnings. [Dechow et al. \(2010\)](#) observe securitizers' earnings smoothing behavior via securitization income from years 2000 through 2005 and identify two necessary conditions for such earnings management behavior: the securitization transaction being recorded as a sale and managers having sufficient discretion in recognizing a securitization gain. To the extent that regulations FAS 166/167 constrain the first condition but not the second one, a natural research question is whether and to what extent FAS 166/167 can impact such earnings management behavior. Our study fills this literature gap.

In addition, our findings have important implications for regulators. On the one hand, our time series statistics and regression analysis show that the extent of banks' usage of securitization income to smooth earnings decreases subsequent to the issuance of FAS 166/167, providing support for the effectiveness of FAS 166/167 in reducing securitization transactions structured as sales at the aggregate level. On the other hand, our regression analysis shows that even with limited securitization income reporting, securitizing banks still manage to use securitization income to smooth earnings in the post- regulation period. This implies a limitation of FAS 166/167 in circumscribing this income smoothing behavior at the firm level. Therefore, to further curtail this earnings management behavior, regulations should target managerial discretion in estimating the fair value of assets as well as cherry picking the assets to securitize.

The remainder of this paper is organized as follows. [Section 2](#) provides the institutional background about securitizations and securitization income, the mechanism about how to use securitization income to smooth earnings, and FAS 166/167 and related accounting regulations. [Section 3](#) develops the hypotheses. [Section 4](#) describes the sample selection and research design. [Section 5](#) discusses the main results, [Section 6](#) describes additional analyses, and [Section 7](#) concludes the study.

2. Institutional background

This section presents an overview of the securitization process, the use of securitization income to manage earnings, and how the enactment of FAS 166/167 can impact this behavior.

2.1. Securitization and securitization income

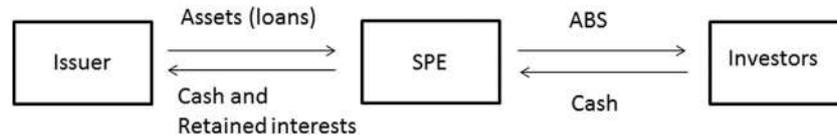
In a bank's securitization process, the bank transfers the right to a cash flow stream from a package of financial assets (such as contract debts and loans) to a special purpose entity (SPE). The SPE then issues asset-backed securities (ABS) and sells them to external investors while delivering the retained interest back to the bank. The process is illustrated in the diagrams shown below.⁶ At initiation of the securitization, the SPE pays the bank (issuer) with the proceeds from selling the ABS. After the initiation of the securitization, the SPE collects cash flow from underlying financial assets and distributes the payments for ABS to investors and the payments for the retained interest to the bank.

⁴ FAS 140 and FIN 46(R) imposed certain criteria for qualification of sale accounting treatment.

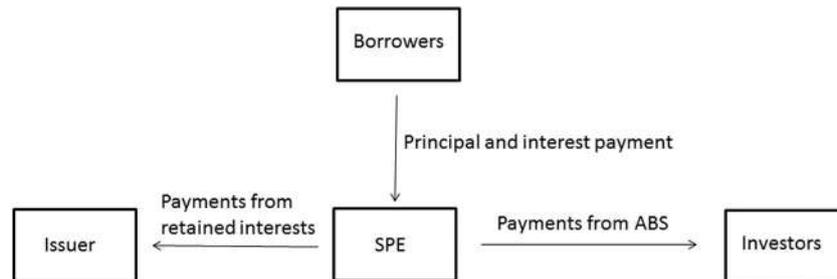
⁵ The details about why FAS 166 and FAS 167 can tighten the criteria of sale accounting are addressed in [Section 2.3](#).

⁶ The diagrams are based on [Ryan \(2007, Exhibit 8.1\)](#), and are also used in [Kilic, Gerald, Ranasinghe, and Yi \(2018\)](#).

At initiation of securitization:



After initiation of securitization:



Banks can have multiple incentives to perform securitizations. First, by transferring substantial parts of loans to outside investors who have varied risk preferences, securitizations can reduce banks' credit risk. Second, to the extent that securitizations can decrease banks' credit risk exposure, securitizations can further help banks reduce their required regulatory capital. Third, securitizations can enhance banks' liquidity by providing an alternative channel of financing through "converting illiquid, hard-to-sell loans into marketable securities" (Loutskina, 2011).

In addition to economic incentives, securitizations can be utilized by bank managers as an earnings management tool. For example, Karaoglu (2005) reports that bank managers tend to bias gains and losses from securitizations to smooth earnings and meet analysts' forecasts. Dechow and Shakespeare (2009) find that to window-dress financial statements, firms are more likely to engage in securitization transactions toward the end of a quarter, when it is clearer how much securitization income is needed to beat the earnings threshold. Consistent with using securitization income to smooth earnings, Dechow et al. (2010) report that securitization income is negatively associated with both pre-securitization earnings and the change from previous period pre-securitization earnings.

2.2. How to use securitization income to smooth earnings

Barth and Taylor (2010) point out that there are three levels of managerial decisions relating to securitization income. The first level is whether to securitize assets, and if yes, which assets to securitize. The second level is whether the securitizing firm structures the securitization to meet the sale treatment requirement. If assets qualify for sale treatment, securitization income is recognized. If the securitization does not qualify for sale treatment, no securitization income is recognized. The third level is determining the amount of securitization income, which equals the difference between the market price and the allocated carrying value of ABS (Karaoglu, 2005).

Securitizing banks can manage securitization income through two avenues. One avenue is cherry-picking assets with relatively large differences between carrying amount (usually based on historical cost) and fair value to securitize (Barth & Taylor, 2010). The other is to manage the allocated carrying value of ABS through estimating the fair value of the retained interest.⁷ The rationale for the latter avenue is described

⁷ It is hard for managers to manage fair value of ABS since at securitization it is normally the market value.

as follows. Upon securitization, the carrying (book) value of ABS is determined by allocating the carrying value of the pool of financial assets between ABS and the retained interest based on their relative fair values. Because active markets for retained interests normally do not exist, the determination of fair values of retained interests require considerable management judgement, including estimation of default rates, prepayment rates, and discount rates. Bank managers can over-estimate (under-estimate) the fair value of the retained interest to achieve over-allocation (under-allocation) of its carrying value. This will lead to under-allocation (over-allocation) of the carrying value to ABS and result in over-estimation (under-estimation) of the securitization income. For example, managers can use a biased discount rate to estimate fair value of the retained interest. Since retained interests are generally riskier than ABS, the fair value measurements of retained interests should be based on relatively high discount rates. If bank managers, however, apply a lower discount rate, the fair value of the retained interest can be over-estimated, which subsequently results in an over-estimation of securitization income (Dechow et al., 2010; Karaoglu, 2005). With this kind of discretion, securitizing bank managers can smooth earnings by biasing securitization income upward (or downward) when the pre-securitization earnings are low (or high).⁸

2.3. FAS 166/167 and related accounting regulations

According to FAS 140 (issued in September 2000), when the bank (transferor) transfers a package of financial assets to an SPE (transferee) for securitization, there are two types of accounting

⁸ It has been well documented that managers have multiple incentives to smooth earnings. First, managers tend to smooth earnings when they are rewarded by income-based bonus plans with caps and floors (Healy, 1985). Second, to avoid external interference and secure their jobs, risk-averse managers enhance earnings in bad times and save earnings in good times (Fudenberg & Tirole, 1995). Third, to the extent that volatile earnings can imply high risk, smoothing earnings can help reduce a firm's perceived risk and reduce its financing cost (Graham, Harvey, & Rajgopal, 2005; Kanagaretnam et al., 2003; Kanagaretnam et al., 2004; Trueman & Titman, 1988) and obtain more favorable terms when negotiating with customers and suppliers. Indeed, income smoothing is a prevalent managerial preference. According to the survey of Graham et al. (2005), "an overwhelming 96.9% of the executive respondents indicate that they prefer a smooth earnings path," and 78% of respondents admit that they would "sacrifice long-term value to smooth earnings." Income smoothing can be more important for bank managers than nonbank managers because bank risk is rigorously scrutinized not only by investors but also by regulators. There is a large strand of literature that documents income smoothing behavior by banks (e.g., Collins, Shackelford, & Wahlen, 1995; Kanagaretnam et al., 2003; Kanagaretnam et al., 2004; Kilic et al., 2013; Liu & Ryan, 2006; Ma, 1988; Wahlen, 1994).

treatments: secured borrowing and sale accounting. If the securitization is treated as a secured borrowing, the cash received is recorded as a borrowing and the securitized assets remain on the transferor's books until the borrower pays. In this process, no securitization income is recognized. To qualify for sale accounting, the bank needs to surrender control over the securitized assets and meet the following three conditions: 1) The transferred assets have been isolated from the transferor; 2) the transferee has the right to pledge or exchange the assets unless the transferee is a qualified SPE; and 3) the transferor does not maintain effective control over the assets (SFAS No. 140, paragraph 9). To meet the criteria of sale accounting, the risk of the retained interest should be minor. However, under FAS 140, most securitizations were structured to meet the sale accounting requirements even though the firms retained significant risk (Dechow et al., 2010). Using sale accounting, the securitized assets are removed from the transferor's books and the cash proceeds from selling the ABS are recorded. In this process, securitization income can be recognized.

Besides FAS 140, sale accounting treatment of securitized assets was impacted by FIN 46(R).⁹ FIN 46(R) established a new framework to identify a firm that absorbs more than 50% of expected losses or residual rewards of a variable interest entity (VIE) as the accounting primary beneficiary (or the accounting parent) of the VIE. The accounting parent is required to consolidate the VIE. That is, under FIN 46(R), sale accounting is not applicable for accounting parents. However, if the banks' SPEs are classified as qualified SPEs (QSPEs),¹⁰ they are exempted from consolidation by their transferors (paragraph 46 of FIN 46(R)). Therefore, bank managers typically structured their securitization SPEs to meet the conditions for a QSPE so that their SPEs could be exempted from consolidation (Dou, Ryan, & Xie, 2018).

Due to the revelation that banks still bore a significant amount of credit risk for their unconsolidated VIEs during the 2007–2009 financial crisis (Andrew, 2009; Hughes, 2008), the FASB issued FAS 166 and FAS 167 in June 2009 to amend FAS 140 and FIN 46(R). FAS 166 eliminates QSPEs as a category of SPE that can be exempted from consolidation. FAS 167 requires banks and other sponsor firms to consolidate VIEs if they have the power to control the activities to impact economic performance of VIEs and are obliged to absorb significant amounts of losses from VIEs. By applying a partly control-based and qualitative approach to consolidate VIEs, FAS 167 further reduces the likelihood of circumventing consolidation of VIEs by sponsor firms (Dou et al., 2018). For example, before FAS 167, a bank could avoid consolidation of its VIE by selling a portion of the VIE's assets to outside investors and making sure the bank bears slightly less than 50% of the VIE's risk. Such a "bright-line structuring" is unlikely to help the bank to avoid consolidation in the post-FAS 167 period due to the qualitative guidance issued in FAS 167 (Dou et al., 2018). Therefore, in the post-FAS 166/167 period, securitization income might be less frequently recognized due to more stringent consolidation rules (which lead to tightened sale accounting criteria) imposed by FAS 166/167.

3. Hypotheses development

The literature has documented that manipulation of securitization income is a tool that bank managers use to smooth earnings. Because both FAS 166 and FAS 167 potentially lead to a higher probability of consolidation of securitization SPEs, they make it harder for financial asset transfers to meet sale accounting treatment. To the extent that these

⁹ To target accounting-motivated SPEs, following the downfall of Enron in 2002, the FASB developed FIN 46, Consolidation of Variable Interest Entities – an interpretation of ARB No. 51. This interpretation was issued in January 2003 and superseded by FIN 46 (R) in December 2003.

¹⁰ The three qualifying conditions for QSPEs are the following: 1) legal isolation, 2) the ability of the transferee to pledge or exchange the transferred assets, and 3) surrender of effective control.

changes might reduce the prevalence of securitization income in the post- FAS 166/167 period, FAS 166/167 can potentially inhibit the usage of securitization income to perform income smoothing. However, other important factors that facilitate this income smoothing behavior remain - bank managers' discretion in "cherry-picking" loans to securitize (Barth & Taylor, 2010) and estimating the fair values of retained interests (Dechow et al., 2010). Therefore, it is not clear whether securitization income continues to be applied for income smoothing in the post- FAS 166/167 period. Accordingly, we test the following hypothesis:

H1A. In the post- FAS 166/167 period, bank managers use securitization income to smooth earnings.

H1B. In the post- FAS 166/167 period, bank managers do not use securitization income to smooth earnings.

FAS 166/167 was enacted in the post financial crisis period when the banking industry experienced other regulatory scrutiny. For example, Basel III raised banks' required capital reserves at the end of 2010 and further increased banks' capital and liquidity requirements in 2013.¹¹ These regulatory changes can directly affect banks' earnings management behavior. For example, loan loss provisions (LLP), the primary discretionary accounting tool available for bank managers to engage in income smoothing (Kanagaretnam, Lobo, & Mathieu, 2003; Kanagaretnam, Lobo, & Yang, 2004; Kilic, Lobo, Ranasinghe, & Sivaramakrishnan, 2013; Liu & Ryan, 2006; Ma, 1988; Wahlen, 1994), can be constrained by the tightened requirements for leverage and liquidity imposed by Basel III (Gombola, Ho, & Huang, 2016). Indeed, Agarwal, Chomsisengphet, Liu, and Rhee (2007) find that Japanese banks tend not to use LLP as an earnings management tool when facing more intensive capital constraints.

If regulations in the post- FAS 166/167 period constrain banks' other income smoothing channels (such as LLP), and bank managers still have motivation to perform income smoothing, it is possible that they will resort to channels such as securitization gains to perform income smoothing. First, bank managers have sufficient discretion in both cherry-picking loans to securitize and estimating the fair value of retained interests from securitizations. Second, these discretions are not directly impacted by other regulations. Therefore, bank managers might even use securitization gains to a greater extent to perform income smoothing in the post- regulation period. Thus, it is not clear whether securitizing firms use securitization income to smooth earnings to a greater or less extent in the post- FAS 166/167 period than that of the pre-regulation period. So we test the following hypothesis:

H2A. Compared to the pre- FAS 166/167 period, securitizing bank managers use securitization income to smooth earnings to a greater extent in the post- FAS 166/167 period.

H2B. Compared to the pre- FAS 166/167 period, securitizing bank managers use securitization income to smooth earnings to a lesser extent in the post- FAS 166/167 period.

4. Sample selection and research design

4.1. Sample selection and distributions

Our study focuses on bank holding companies for the following two reasons. First, bank holding companies are the primary asset securitizers to the extent that securitizations by banks constitute by far the largest

¹¹ Basel III was developed by the Basel Committee on Banking Supervision in response to the international financial crisis of 2007–09. Its internationally agreed measures intend to strengthen banks' regulation, supervision and risk management.

Table 1
Sample selection.

Panel A: Full sample (all securitization bank-quarters)	
Bank-quarters with Y-9C filings that report non-zero securitized assets during 2001Q2–2018Q4	5895
Exclude bank-quarters with missing securitization income	(12)
Exclude bank-quarters with missing permco	(2175)
Full sample	3708
Panel B: Subsample in the post- FAS 166/167 period	
Full sample	3708
Exclude bank-quarters prior to 2011Q1	(2286)
Subsample in the post- FAS 166/167 period	1422
Exclude bank-quarters with missing control variables in model (1)	(195)
Subsample in the post – FAS 166/167 period to test H1	1227
Panel C: Subsample in the pre- FAS 166/167 period	
Full sample	3708
Exclude bank-quarters after 2007Q1	(2201)
Subsample in the pre- FAS 166/167 period	1507
Exclude bank-quarters with missing control variables in model (1)	(175)
Subsample in the pre – FAS 166/167 period to test H1	1332

portion of securitizations (Barth, Ormazabal, & Taylor, 2012; Dechow et al., 2010; Karaoglu, 2005; Niu & Richardson, 2004). Second, focusing on this particular industry provides a homogeneous sample that is exposed to the same rigorous regulatory reporting requirements. We obtain securitization information from the Federal Reserve's Bank Regulatory database. This database provides detailed quarterly information (from Y-9C reports) for bank holding companies.¹²

Table 1 panel A presents the sample selection for the full sample. Our full sample period ranges from the second quarter of year 2001¹³ to the fourth quarter of year 2018. To alleviate concerns that test results could be driven by unobservable differences between banks that do and do not engage in securitization activities, we focus only on banks that have non-zero securitized assets. We also exclude bank holding companies with missing securitization income and exclude those companies with missing 'permco' values. Our full sample consists of 3708 bank-quarter observations from 198 bank holding companies. For the regression analyses, we have two subsamples: one is for post- FAS 166/167 period, and the other is for pre- FAS 166/167 period. Panels B and C of Table 1 show the sample selection for subsamples of the post- and pre-FAS 166/167 period, respectively. Since FAS 166/167 became effective at the beginning of 2010, our post- FAS 166/167 period ranges from 2011 to 2018, where we exclude year 2010 as a transition period. Our pre- FAS 166/167 period ranges from the second quarter of 2001 to the end of 2006.¹⁴ We exclude the financial crisis period 2007–2009 from the pre- FAS 166/167 period because banks' securitization-based business models might break down during the financial crisis due to the fact that the performance of subprime mortgages (and other types of credit-risky assets) and the accessibility of financing began to deteriorate at the start of financial crisis (Ryan, 2008; Ryan, Tucker, & Zhou, 2016). Therefore, our subsample for the post- FAS 166/167 period consists of 1422 bank-quarter observations from 85 bank holding companies, and the pre- FAS 166/167 subsample consists of 1507 bank-quarter observations from 126 bank holding companies. For our regression analyses, we obtain

¹² The Federal Reserve's Bank Regulatory database provides information (from Y-9C reports) for bank holding companies with consolidated assets in excess of a certain asset threshold. Prior to March 2006, the asset threshold was \$150 million. It changed to \$500 million in March 2006, \$1 billion in March 2015, and \$3 billion in September 2018.

¹³ The Bank Regulatory database provides information on securitization activities starting from the second quarter of 2001.

¹⁴ The subprime crisis began in February 2007 (Ryan, 2008).

data for control variables from both Y-9C reports and CRSP. Due to the missing control variables for some observations, our regression subsample for the post- FAS 166/167 period consists of 1227 bank-quarter observations from 76 unique bank holding companies, and the regression subsample for the pre- FAS 166/167 period consists of 1332 bank-quarter observations from 111 unique bank holding companies.¹⁵

Fig. 1, panels A and B depict the number and average total assets, respectively, of bank holding companies from our full sample with non-zero securitization gains for each quarter over the period of 2001Q2–2018Q4. As shown in panel A, the number of bank holding companies reporting non-zero securitization gains decreases from 2001 to 2010, with a large drop in the first quarter of 2010, when FAS 166/167 became effective. The number increases slightly after this time period. This trend indicates that securitization-related regulations, such as FAS 140, FIN 46(R), and FAS 166/167, have been tightening the criteria for sale accounting treatment of financial asset transfers, which further reduces the likelihood of recognition of securitization income. Panel B demonstrates that the average size of bank holding companies that report non-zero securitization income increases over the period of years 2001 to 2010, and then increases moderately afterwards. Thus, larger companies keep recognizing securitization income while relatively smaller companies tend to discontinue such behavior.^{16,17}

Fig. 1, panels C and D illustrate the aggregate securitization income¹⁸ and aggregate securitized assets each quarter for the full sample over the same time span. As shown in panel C, aggregate securitization income increases from year 2001 to year 2005, reaches a peak at year 2005, then decreases from year 2005 to year 2009. In the first quarter of 2010, aggregate securitization income goes through a precipitous decline and it remains quite low afterwards. This graph is consistent with the argument that FAS 166/167 is more effective in tightening the sale accounting requirement than previous regulations (such as FAS 140 and FIN 46 (R)). Panels A and C convey that FAS 166/167 not only reduces the number of banks reporting non-zero securitization income but also greatly cuts down the average magnitude of reported securitization income. The time series of aggregate securitized assets, as shown in Panel D, demonstrates fluctuations through 2009, with a peak around the end of 2009. Then it gradually decreases thereafter. This implies that the imposed stringent sale accounting rule does have an impact on banks' tendency to securitize their assets.

Fig. 1 shows that compared to the pre- FAS 166/167 period, fewer bank holding companies engage in reporting non-zero securitization income in the post- regulation period. Those larger banks which continue to do so report much lower magnitude of securitization income. With such a decline in the frequency and magnitude of non-zero securitization income in the post- FAS 166/167 period, is it still possible to use securitization income to smooth earnings at the firm level? We investigate this question by comparing the relative magnitude of securitization income (absolute value) with pre-securitization earnings

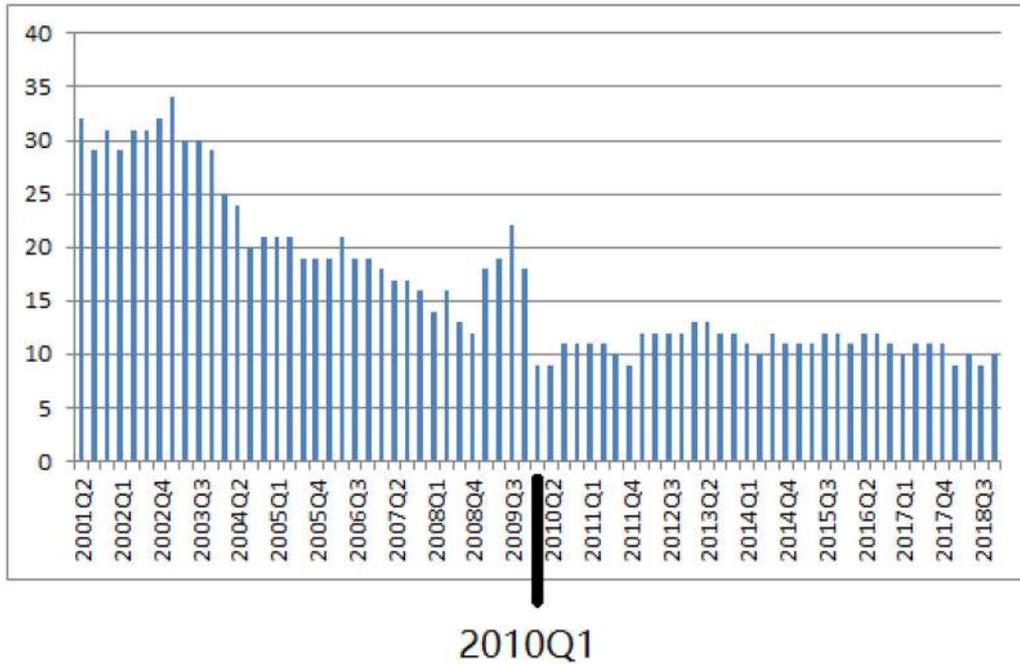
¹⁵ In the regression analyses using "change in pre-securitization earnings", there are 1205 (1103) observations from 72 (92) unique bank holding companies for the post-(pre-) FAS 166/167 period subsample due to missing pre-securitization earnings in the same quarter of the prior year.

¹⁶ For example, in 2015Q1, the average total assets is \$520 billion for bank holding companies that report non-zero securitization income, and \$27 billion for all bank holding companies in the Federal Reserve's Bank Regulatory database. The aggregate total assets of the former group is 48.8% of the aggregate total assets of the latter group.

¹⁷ Another possibility for the increase in bank size is that mergers and acquisitions occur in the banking industry over time. For example, smaller banks are acquired by larger banks.

¹⁸ We use aggregate amount of absolute value of securitization income to alleviate the concern that positive and negative securitization income will cancel out each other. An untabulated figure with aggregate amount of signed securitization income demonstrates almost the same pattern as panel C because the magnitude of positive securitization income is much larger than that of negative securitization income.

Panel A Number of firms each quarter reporting non-zero securitization income



Panel B Average total assets (in \$million) each quarter of firms reporting non-zero securitization income

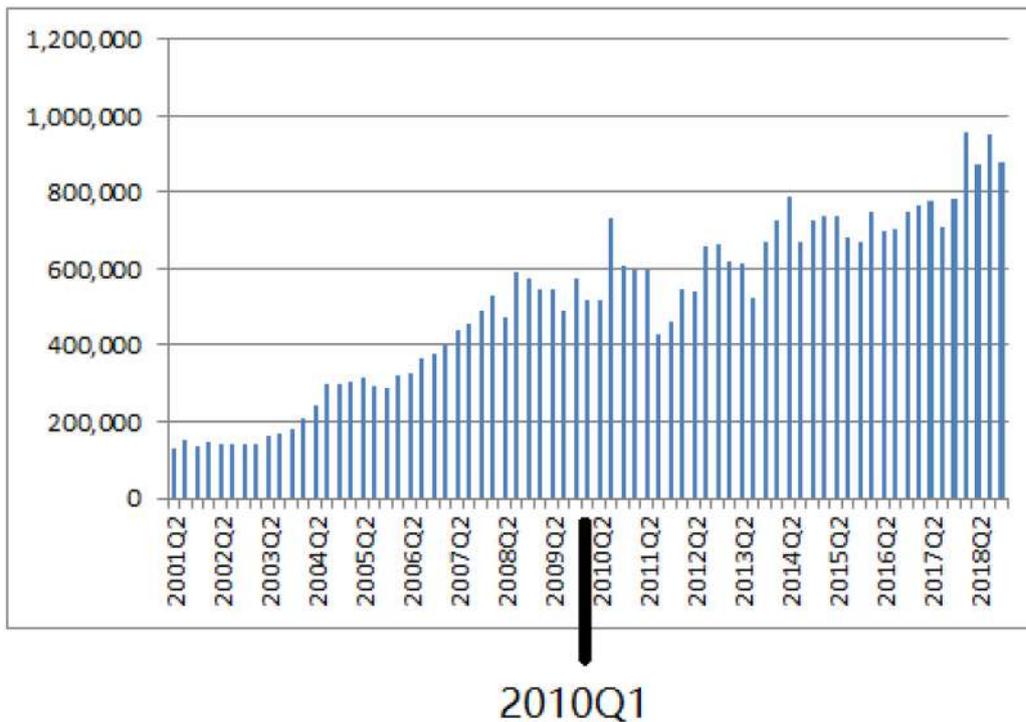
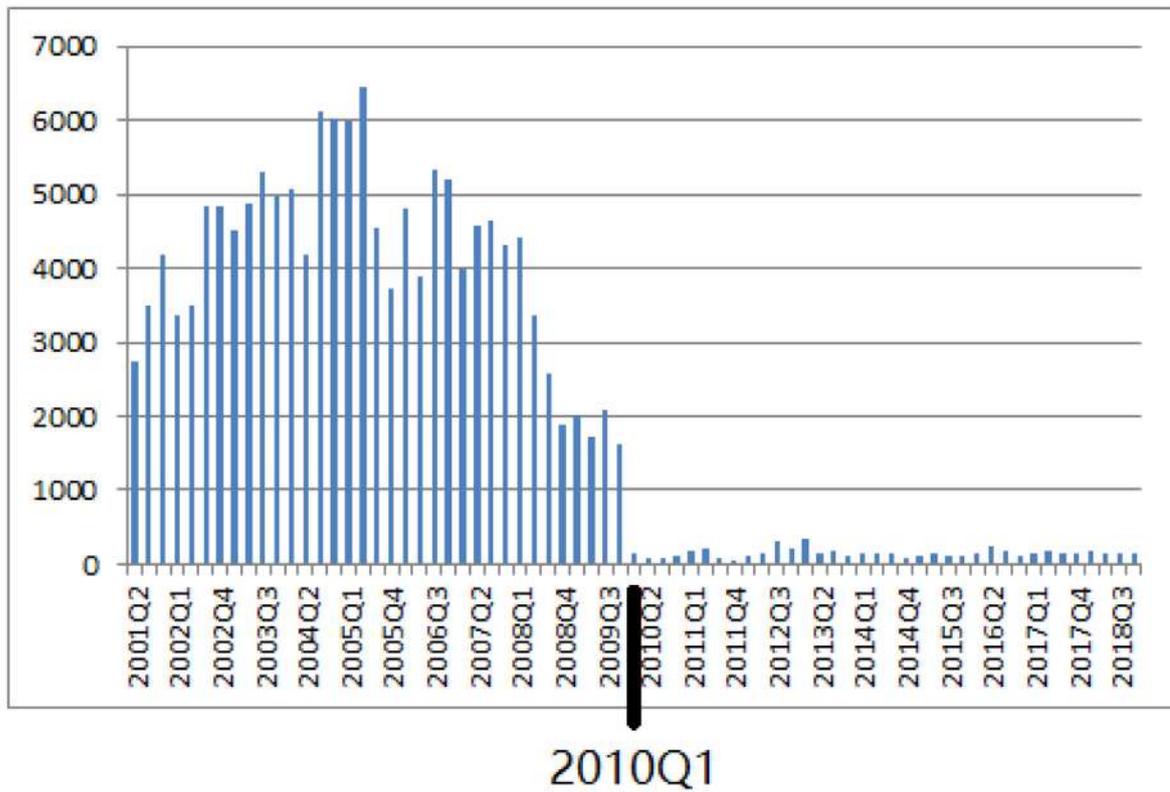


Fig. 1. Time series statistics of full sample from 2001Q2 to 2018Q4. Panel A Number of firms each quarter reporting non-zero securitization income. Panel B Average total assets (in \$million) each quarter of firms reporting non-zero securitization income. Panel C Sample aggregate of securitization income (absolute value in \$million) each quarter. Panel D Sample aggregate securitized assets (in \$million) each quarter.

(absolute value) for banks reporting non-zero securitization income. Fig. 2 depicts the time series median value of such a ratio. Fig. 2 conveys that there is a certain degree of decline in the ratio after FAS 166/167, but it also shows that the magnitude of securitization income can be

large enough to impact earnings both before and after FAS 166/167. Thus, we use multiple regression analyses to examine whether securitization income is used for income smoothing in the post-FAS 166/167 period.

Panel C Sample aggregate of securitization income (absolute value in \$million) each quarter



Panel D Sample aggregate securitized assets (in \$million) each quarter

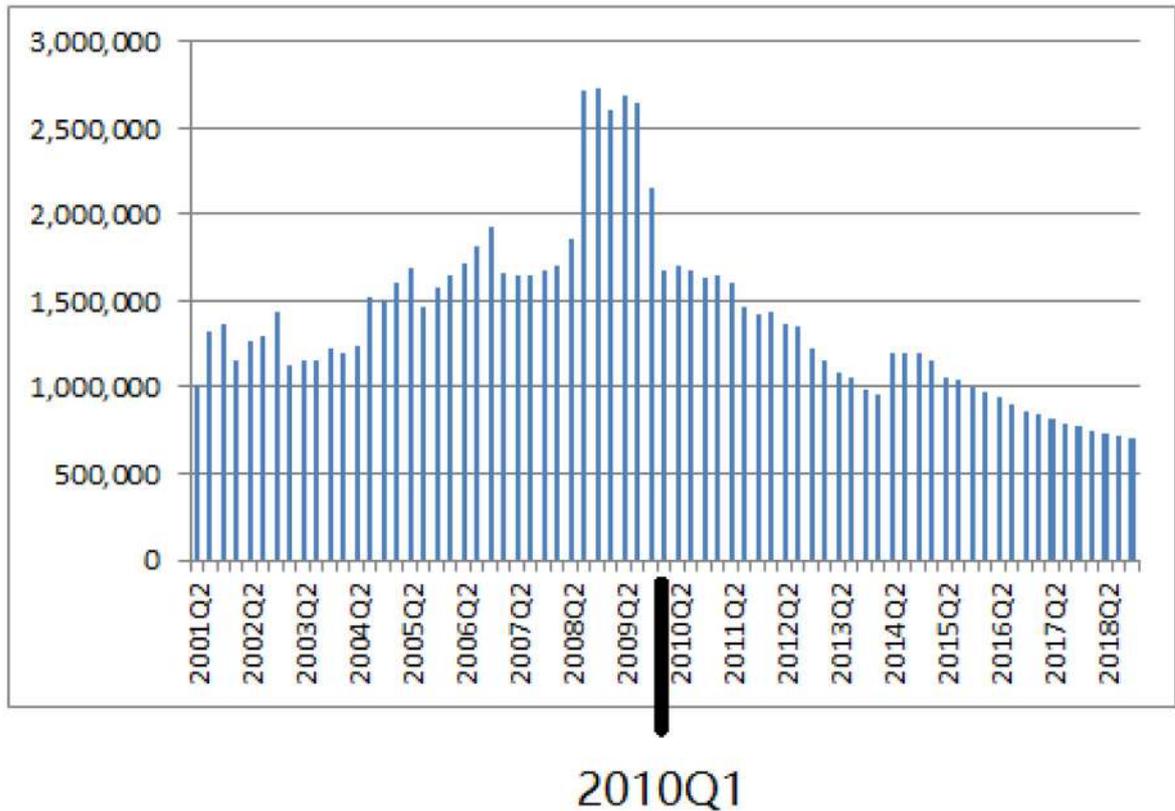


Fig. 1 (continued).

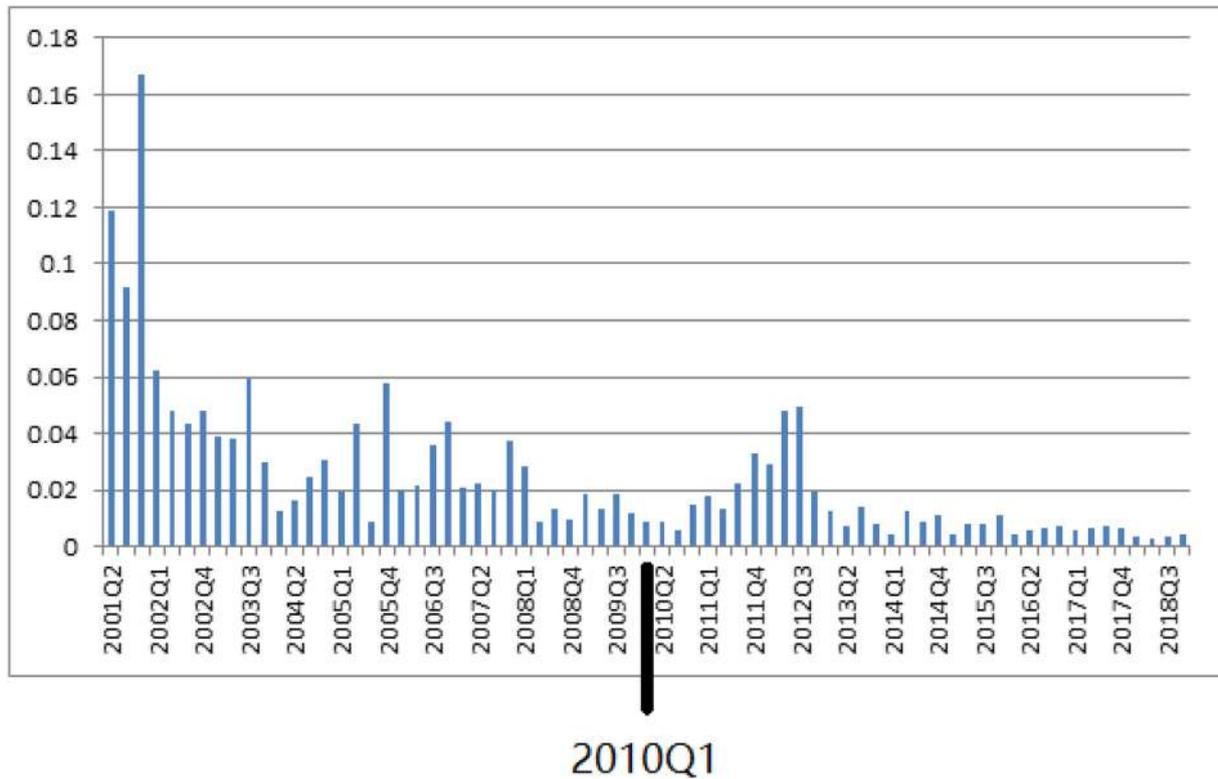


Fig. 2. Median Ratio of securitization income (absolute value) to pre-securitization earnings (absolute value) each quarter for firms with non-zero securitization income.

4.2. Research design

4.2.1. Testing H1

We refer to Dechow et al. (2010) and investigate whether bank managers continue to use securitization income to smooth earnings in the post-166/167 period. We examine the relationship between securitization income and pre-securitization earnings (measure 1) and the relationship between securitization income and change in pre-securitization earnings (measure 2) in the post-FAS 166/167 period. The following regression models are used to test our hypothesis:

$$\begin{aligned} \text{Securitization_income} = & \beta_0 + \beta_1 * \text{Pre-sec earnings} + \beta_2 \\ & * \text{Begin_securitization_income} + \beta_3 \\ & * \text{Begin_securitized_residential} + \beta_4 \\ & * \text{Begin_securitized_consumer} + \beta_5 \\ & * \text{Begin_securitized_commercial} + \beta_6 \\ & * \text{Stock_return_volatility} + \beta_7 * \text{Size} + \beta_8 \\ & * \text{Leverage} + \beta_9 * \text{ROA} + \beta_{10} \\ & * \text{Cashflow_operating} + \beta_{11} * \text{MB} + \gamma \\ & * \text{Year Fixed Effects} + \delta \\ & * \text{Quarter fixed effects} + \varepsilon \end{aligned} \quad (1)$$

$$\begin{aligned} \text{Securitization_income} = & \beta_0 + \beta_1 * \text{Change in pre-sec earnings} \\ & + \beta_2 * \text{Begin_securitization_income} + \beta_3 \\ & * \text{Begin_securitized_residential} + \beta_4 \\ & * \text{Begin_securitized_consumer} + \beta_5 \\ & * \text{Begin_securitized_commercial} + \beta_6 \\ & * \text{Stock_return_volatility} + \beta_7 * \text{Size} + \beta_8 \\ & * \text{Leverage} + \beta_9 * \text{ROA} + \beta_{10} \\ & * \text{Cashflow_operating} + \beta_{11} * \text{MB} + \gamma \\ & * \text{Year Fixed Effects} + \delta \\ & * \text{Quarter fixed effects} + \varepsilon \end{aligned} \quad (2)$$

The dependent variable is *Securitization_income*, which is the securitization income in a quarter scaled by the prior quarter's book value of equity.¹⁹ The variable of interest in model (1) is Pre-securitization earnings (*Pre-sec earnings*), which is net income before securitization income scaled by the prior quarter book value of equity. If bank managers have incentives to report higher (lower) securitization income when pre-securitization earnings are lower (higher), we should observe a negative coefficient on *Pre-sec earnings* in model (1). The variable of interest in model (2) is the change in the pre-securitization earnings from the same quarter in the previous year ($q - 4$) to that of the current quarter (q), scaled by the equity in the prior quarter ($q - 1$) (*Change in pre-sec earnings*). If bank managers have a desire to smooth earnings by manipulating securitization income upward (downward) when pre-securitization earnings are lower (higher) relative to those from the same quarter of the previous year, we should observe a negative coefficient on *Change in pre-sec earnings*.

We also control for potential determinants of securitization income.²⁰ One is lagged securitization income (*Begin_securitization_income*), which is a predictor of the normal securitization income for the current quarter. Since we are interested in whether managers manipulate securitization income when they have an incentive to do so, we need to control for the lagged securitization income to separate the unexpected component of securitization income from the expected component (Ryan et al., 2016). We expect a positive association between *Begin_securitization_income* and *Securitization_income*.

Following Ryan et al. (2016), we control for beginning-of-quarter securitized assets, including securitized residential

¹⁹ If there is a securitization loss, then the securitization income value is negative.

²⁰ We thank an anonymous reviewer for control variable suggestions.

loans (*Begin_secured_residential*), securitized consumer loans (*Begin_secured_consumer*), and securitized commercial loans (*Begin_secured_commercial*). These lagged securitized assets are controlled for because they capture the tendency for banks to conduct securitization activities, which can further predict banks' subsequent securitization income (as shown in Table 5 in Ryan et al., 2016). Therefore, we expect positive associations between *Securitization_income* and these securitized assets.

We also follow Dechow et al. (2010) to control for the bank's specific market volatility by using the standard deviation of the bank's value-weighted market adjusted stock return over the previous 12 months (*Stock_return_volatility*). Since a bank's higher market volatility implies that the bank is bearing riskier loans and charging higher rates to customers (Dechow et al., 2010), a bank's market volatility should be positively associated with the volatility of securitized assets' future cash flows. The volatility of future cash flow from securitized assets is associated with assumptions regarding the prepayment risk, the default risk, and the discount rate used to value the retained interest, which are related to the magnitude of the securitization income. So we use banks' *Stock_return_volatility* to control for the underlying assumptions used to estimate fair value of retained interests.

To the extent that banks with greater propensity to securitize loans are more likely to generate securitization income, we control for banks' two major incentives for securitization. First, since banks tend to securitize loans to reduce their credit risk, we control for banks' credit risk using banks' *Size*, *Leverage*, and return-on-assets (*ROA*) (Barth et al., 2012). Because banks with greater credit risk (smaller *Size*, higher *Leverage*, and lower *ROA*) are likely to have stronger incentives to securitize loans, which can generate securitization income, we expect negative (positive) association between *Size/ROA (Leverage)* and *Securitization_income*.²¹ Second, because securitization provides banks another financing channel, banks have incentives to securitize loans to enhance cash flow. We use two proxies to capture banks' tendency to securitize loans to increase their cash flow: banks' operating cash flows (*Cashflow_operating*) and Market-to-Book ratio (*MB*). To the extent that banks with lower operating cash flow and higher growth opportunities are more likely to resort to financing and therefore could be more apt to engage in securitization, we expect a negative (positive) association between *Cashflow_operating*²² (*MB*)²³ and *Securitization_income*.

All our regression models employ time (year and quarter) fixed effects and clustered standard errors by bank and time. Also, all variable definitions are provided in the Appendix.

4.2.2. Testing H2

H2 investigates whether the use of securitization income to smooth earnings is regulated or exacerbated in the post-FAS 166/167 period. We test H2 by modifying regression models (1) and (2) and introducing the variable *Post_166/167* as follows:

$$\begin{aligned} \text{Securitization_income} = & \beta_0 + \beta_1 * \text{Pre-sec earnings} + \beta_2 \\ & * \text{Post_166/167} + \beta_3 * \text{Pre-sec earnings} \\ & * \text{Post_166/167} + \beta_4 \\ & * \text{Begin_securitization_income} + \beta_5 \\ & * \text{Begin_securitized_residential} + \beta_6 \\ & * \text{Begin_securitized_consumer} + \beta_7 \\ & * \text{Begin_securitized_commercial} + \beta_8 \\ & * \text{Stock_return_volatility} + \beta_9 * \text{Size} + \beta_{10} \\ & * \text{Leverage} + \beta_{11} * \text{ROA} + \beta_{12} \\ & * \text{Cashflow_operating} + \beta_{13} * \text{MB} + \gamma \\ & * \text{Year Fixed Effects} + \delta \\ & * \text{Quarter fixed effects} + \varepsilon \end{aligned} \quad (3)$$

$$\begin{aligned} \text{Securitization_income} = & \beta_0 + \beta_1 * \text{Change in pre-sec earnings} + \beta_2 \\ & * \text{Post_166/167} + \beta_3 \\ & * \text{Change in pre-sec earnings} \\ & * \text{Post_166/167} + \beta_4 \\ & * \text{Begin_securitization_income} + \beta_5 \\ & * \text{Begin_securitized_residential} + \beta_6 \\ & * \text{Begin_securitized_consumer} + \beta_7 \\ & * \text{Begin_securitized_commercial} + \beta_8 \\ & * \text{Stock_return_volatility} + \beta_9 * \text{Size} + \beta_{10} \\ & * \text{Leverage} + \beta_{11} * \text{ROA} + \beta_{12} \\ & * \text{Cashflow_operating} + \beta_{13} * \text{MB} + \gamma \\ & * \text{Year Fixed Effects} + \delta \\ & * \text{Quarter fixed effects} + \varepsilon \end{aligned} \quad (4)$$

The variables of interest in models (3) and (4) are the interaction terms (β_3) *Pre-sec earnings*Post_166/167* and *Change in pre-sec earnings*Post_166/167*, respectively. If bank managers apply securitization income to smooth earnings to a lesser (greater) extent in the post-FAS 166/167 period compared to that in the pre-regulation period, we should observe positive (negative) coefficients on the interaction terms in those models.

5. Results

5.1. Descriptive statistics

Table 2, panels A and B, present descriptive statistics for the subsample in the post- and pre-FAS 166/167 period, respectively. Compared to the banks in the pre-FAS 166/167 period, banks in the post-regulation period have much lower *Securitization_income*, which attributes to both the decrease in the number of securitizing banks that report non-zero securitization income and the decrease in the magnitude of reported securitization income.²⁴ Banks in the post-FAS 166/167 period also have lower *Pre-sec earnings* and higher mean along with lower median *Change in pre-sec earnings*. Moreover, *Cashflow_operating* is lower in the post-regulation period, which indicates that banks in this period may be more likely to resort to securitization to increase cash flow. We also observe that in the post-regulation period, securitizing banks tend to have lower securitized assets (lower securitized residential loans, lower securitized consumer loans, and lower securitized commercial loans). In addition, compared to the pre-regulation sample, post-regulation sample firms have larger *Size*, lower *MB*, higher mean and lower median *Stock_return_volatility*, and slightly lower *Leverage* and *ROA*.

²¹ Compared to smaller banks, larger banks can be more likely to securitize due to their lower difficulty in surmounting the fixed costs of setting up securitization programs. This can cause a positive association between *Size* and *Securitization_income*.

²² Banks' tendency to engage in securitization should be related to *Cashflow_operating* excluding proceeds from securitization. However, due to data limitations, we are unable to isolate proceeds from securitization from *Cashflow_operating*, which is a caveat of using this control variable.

²³ Higher market-to-book ratio could also indicate lower risk (Fama & French, 1993), and lower risk can lead to lower propensity to securitize loans to reduce risk. This can lead to a negative association between *MB* and *Securitization_income*.

²⁴ Untabulated results show that the mean of *Securitization_income* is 0.0009 and 0.0128 in the subsample of post- and pre-regulation period, respectively, for non-zero securitization income banks.

Table 2
Descriptive statistics.

	Mean	Median	Standard deviation	5th percentile	95th percentile	N
Panel A Subsample in the post- FAS 166/167 period						
Securitization_income	0.0002	0.0000	0.0011	-0.0000	0.0013	1227
Pre-sec earnings	0.0217	0.0214	0.0544	-0.0030	0.0369	1227
Change in pre-sec earnings	0.0052	0.0025	0.0539	-0.0187	0.0275	1205
Begin_securing_income	0.0002	0.0000	0.0011	-0.0000	0.0013	1227
Begin_securing_residential	0.8303	0.0770	1.5461	0.0000	3.6935	1227
Begin_securing_consumer	0.0169	0.0000	0.0681	0.0000	0.1036	1227
Begin_securing_commercial	0.0863	0.0000	0.6710	0.0000	0.2296	1227
Stock_return_volatility	0.1963	0.0537	1.0833	0.0302	0.1770	1227
Size	17.4815	17.0610	2.2235	14.1894	21.4774	1227
Leverage	0.8853	0.8878	0.0263	0.8481	0.9177	1227
ROA	0.0021	0.0024	0.0028	-0.0004	0.0041	1227
Cashflow_operating	0.0105	0.0077	0.0219	-0.0143	0.0443	1227
MB	1.0915	1.0664	0.4248	0.4514	1.8529	1227
Panel B Subsample in the pre- FAS 166/167 period						
Securitization_income	0.0053	0.0000	0.0226	0.0000	0.0213	1332
Pre-sec earnings	0.0313	0.0362	0.0293	-0.0174	0.0596	1332
Change in pre-sec earnings	0.0043	0.0040	0.0272	-0.0260	0.0301	1103
Begin_securing_income	0.0055	0.0000	0.0230	0.0000	0.0213	1332
Begin_securing_residential	2.0309	0.0674	7.2152	0.0000	8.0437	1332
Begin_securing_consumer	0.3285	0.0000	1.1092	0.0000	1.6766	1332
Begin_securing_commercial	0.0931	0.0000	0.2300	0.0000	0.4763	1332
Stock_return_volatility	0.1797	0.0653	0.2960	0.0321	0.1013	1332
Size	16.6219	16.6715	2.0720	13.0282	20.2746	1332
Leverage	0.9055	0.9079	0.0220	0.8697	0.9328	1332
ROA	0.0025	0.0029	0.0029	-0.0013	0.0054	1332
Cashflow_operating	0.0243	0.0167	0.0712	-0.0131	0.0822	1332
MB	1.9603	1.9661	0.9661	0.7921	3.3575	1332

All variables are defined in the Appendix.

Table 3
The relation between securitization income and pre-securitization earnings.

	Coefficient	p-value
Panel A SubSample in the post- FAS 166/167 period		
Pre-sec earnings	β_1	-0.0009 0.040
Begin_securing_income	β_2	0.7559 0.000
Begin_securing_residential	β_3	0.0001 0.010
Begin_securing_consumer	β_4	-0.0002 0.778
Begin_securing_commercial	β_5	0.0000 0.957
Stock_return_volatility	β_6	0.0000 0.340
Size	β_7	-0.0000 0.220
Leverage	β_8	0.0013 0.022
ROA	β_9	-0.0160 0.072
Cashflow_operating	β_{10}	0.0011 0.165
MB	β_{11}	-0.0002 0.004
Time fixed effect?	Yes	
Adj. R ²	0.766	
N	1227	
Panel B SubSample in the pre- FAS 166/167 period.		
Pre-sec earnings	β_1	-0.3473 0.033
Begin_securing_income	β_2	0.4556 0.000
Begin_securing_residential	β_3	0.0003 0.002
Begin_securing_consumer	β_4	0.0051 0.001
Begin_securing_commercial	β_5	-0.0015 0.083
Stock_return_volatility	β_6	0.0011 0.244
Size	β_7	0.0004 0.049
Leverage	β_8	0.0060 0.869
ROA	β_9	1.2308 0.406
Cashflow_operating	β_{10}	-0.0137 0.223
MB	β_{11}	0.0017 0.006
Time fixed effect?	Yes	
Adj. R ²	0.778	
N	1332	

The dependent variable is the securitization income. All results are based on standard errors clustered simultaneously by firm and by time. All p-values are based on two-tailed t-tests. All variables are defined in the Appendix.

Table 4
The relation between securitization income and change in pre-securitization earnings.

	Coefficient	p-value
Panel A SubSample in the post- FAS 166/167 period		
Change in pre-sec earnings	β_1	-0.0005 0.048
Begin_securing_income	β_2	0.7689 0.000
Begin_securing_residential	β_3	0.0001 0.010
Begin_securing_consumer	β_4	-0.0002 0.762
Begin_securing_commercial	β_5	-0.0000 0.976
Stock_return_volatility	β_6	0.0000 0.277
Size	β_7	-0.0000 0.303
Leverage	β_8	0.0011 0.036
ROA	β_9	-0.0158 0.084
Cashflow_operating	β_{10}	0.0011 0.185
MB	β_{11}	-0.0002 0.009
Time fixed effect?	Yes	
Adj. R ²	0.744	
N	1205	
Panel B SubSample in the pre- FAS 166/167 period.		
Change in pre-sec earnings	β_1	-0.0760 0.020
Begin_securing_income	β_2	0.5527 0.000
Begin_securing_residential	β_3	0.0003 0.039
Begin_securing_consumer	β_4	0.0025 0.080
Begin_securing_commercial	β_5	-0.0013 0.045
Stock_return_volatility	β_6	0.0006 0.471
Size	β_7	0.0006 0.002
Leverage	β_8	-0.0266 0.201
ROA	β_9	-1.7702 0.004
Cashflow_operating	β_{10}	0.0046 0.307
MB	β_{11}	0.0008 0.047
Time fixed effect?	Yes	
Adj. R ²	0.817	
N	1103	

The dependent variable is the securitization income. All results are based on standard errors clustered simultaneously by firm and by time. All p-values are based on two-tailed t-tests. All variables are defined in the Appendix.

5.2. Results

5.2.1. Results for hypothesis 1

Results from testing Hypothesis 1 are shown in Tables 3 and 4. In each table, panels A and B demonstrate the results in the post- and pre- FAS 166/167 period, respectively.

As shown in panel A of Table 3, the coefficient of *Pre-sec earnings* is significantly negative ($\beta_1 = -0.0009$, p -value = .040), which is consistent with hypothesis H1A that banks use securitization income to smooth earnings in the post- FAS 166/167 period.²⁵ In panel A of Table 4, the coefficient of *Change in pre-sec earnings* is also significantly negative ($\beta_1 = -0.0005$, p -value = .048), which provides further support for Hypothesis H1A. Therefore, our results provide evidence that securitizing banks use securitization income to smooth earnings in the post- FAS 166/167 period.

In Panel B of Table 3, the coefficient of *Pre-sec earnings* is negative and significant ($\beta_1 = -0.3473$, p -value = .033). Also, in Panel B of Table 4, the coefficient on *Change in pre-sec earnings* is negative and significant ($\beta_1 = -0.0760$, p -value = .020). Consistent with Dechow et al. (2010), we find evidence of banks using securitization income to smooth earnings in the pre- FAS 166/167 period.

As for the control variables, in both Tables 3 and 4, the coefficients on *Begin_securing_income* are consistently positive and significant, which is in line with the argument that lagged securitization income is a predictor of current quarter securitization income. In addition, *Begin_secured_residential* is positive and significant. *Begin_secured_consumer* is insignificant in the post-regulation period but significantly positive in the pre-regulation period. *Begin_secured_commercial* is insignificant in the post-regulation period but significantly negative in the pre-regulation period. *Size* is insignificant in the post-regulation sample, but significantly positive in the pre-regulation period. *Leverage* is positive and significant in the post-regulation period, but insignificant in the pre-regulation period. The coefficients on *ROA* are negative and significant for both treatment variables in the post-regulation period and when *Change in pre-sec earnings* is the treatment variable in the pre-regulation period, but the coefficient is insignificant when *pre-sec earnings* is the treatment variable in the pre-regulation period. In addition, the coefficients on *Cashflow_operating* are insignificant, and those on *MB* are negative and significant in the post-regulation period but positive and significant in the pre-regulation period. This indicates that in the pre-regulation period, banks with higher growth opportunity were more likely to resort to securitization to raise cash flow, whereas in the post-regulation period, this incentive is not prevalent.²⁶

5.2.2. Results for hypothesis 2

Panels A and B in Table 5 compare the extent of using securitization income to smooth earnings in the post- and pre- FAS 166/167 periods using two measures. In panels A and B, the variable of interest is the interaction term *Pre-sec earnings*Post_166/167* and *Change in pre-sec earnings*Post_166/167*, respectively. In each panel, the third and fourth columns include the results for the unbalanced sample and the fifth and sixth columns contain the results for the balanced sample. The unbalanced sample includes all the observations in the post- and pre-regulation period that satisfy our sample selection criteria listed in Table 1. The balanced sample is generated from the unbalanced sample

²⁵ We follow Dechow et al. (2010) to scale the continuous variables in model (1) with the lagged book value of equity. However, Barth and Taylor (2010) show that using the book value of equity as a deflator can induce a mechanical negative relationship between securitization income and pre-securitization earnings.

²⁶ As we mentioned in footnote 23, higher *MB* can also be a proxy for lower risk. The negative and significant coefficient of *MB* in the post-regulation sample might be driven by the fact that less risky banks are less likely to use securitization to reduce risk in the post-regulation period.

Table 5

The impact of FAS 166/167 on the relation between securitization income and Pre-securitization earnings (and change in pre-securitization earnings).

	Unbalanced sample		Balanced sample		
	Coefficient	p-value	Coefficient	p-value	
Panel A The impact of FAS 166/167 on the relation between securitization income and pre-securitization earnings					
<i>Pre-sec earnings</i>	β_1	-0.2466	0.002	-0.0306	0.063
<i>Post_166/167</i>	β_2	-0.0072	0.002	-0.0005	0.321
<i>Pre-sec earnings*Post_166/167</i>	β_3	0.2461	0.002	0.0295	0.074
<i>Begin_securing_income</i>	β_4	0.4522	0.000	0.7739	0.000
<i>Begin_secured_residential</i>	β_5	0.0003	0.001	0.0001	0.015
<i>Begin_secured_consumer</i>	β_6	0.0044	0.000	0.0019	0.081
<i>Begin_secured_commercial</i>	β_7	0.0002	0.271	-0.0002	0.513
<i>Stock_return_volatility</i>	β_8	0.0000	0.753	-0.0000	0.676
<i>Size</i>	β_9	0.0002	0.000	0.0000	0.578
<i>Leverage</i>	β_{10}	-0.0054	0.595	0.0038	0.346
<i>ROA</i>	β_{11}	0.0232	0.869	-0.0351	0.162
<i>Cashflow_operating</i>	β_{12}	-0.0124	0.216	-0.0009	0.155
<i>MB</i>	β_{13}	0.0015	0.004	0.0002	0.096
<i>Time fixed effect?</i>		Yes		Yes	
<i>Adj. R²</i>		0.779		0.914	
<i>N</i>		2559		1216	
Panel B The impact of FAS 166/167 on the relation between securitization income and change in pre-securitization earnings					
<i>Change in pre-sec earnings</i>	β_1	-0.1260	0.002	-0.0268	0.102
<i>Post_166/167</i>	β_2	0.0000	0.998	-0.0002	0.609
<i>Change in pre-sec earnings*Post_166/167</i>	β_3	0.1289	0.002	0.0262	0.111
<i>Begin_securing_income</i>	β_4	0.6008	0.000	0.7757	0.000
<i>Begin_secured_residential</i>	β_5	0.0002	0.048	0.0001	0.155
<i>Begin_secured_consumer</i>	β_6	0.0043	0.007	0.0015	0.170
<i>Begin_secured_commercial</i>	β_7	0.0001	0.664	-0.0002	0.602
<i>Stock_return_volatility</i>	β_8	-0.0002	0.064	-0.0000	0.958
<i>Size</i>	β_9	0.0001	0.004	0.0000	0.178
<i>Leverage</i>	β_{10}	-0.0104	0.202	0.0028	0.524
<i>ROA</i>	β_{11}	-0.4310	0.011	-0.0485	0.109
<i>Cashflow_operating</i>	β_{12}	0.0029	0.316	-0.0003	0.591
<i>MB</i>	β_{13}	0.0004	0.073	0.0001	0.501
<i>Time fixed effect?</i>		Yes		Yes	
<i>Adj. R²</i>		0.810		0.869	
<i>N</i>		2308		1144	

The dependent variable is the securitization income. All results are based on standard errors clustered simultaneously by firm and by time. All p -values are based on two-tailed t -tests. All variables are defined in the Appendix.

by excluding banks that only exist in either the pre-regulation period or the post-regulation period.^{27,28} The third and fourth columns of panels A and B of Table 5 provide positive and significant interaction terms (Panel A: $\beta_3 = 0.2461$, p -value = .002; Panel B: $\beta_3 = 0.1289$, p -value = .002), which implies that for the unbalanced sample, income smoothing via securitization gains is significantly reduced after the FAS 166/167 regulation. As for the balanced sample, the interaction term is positive and significant when *Pre-sec earnings* is used (fifth and sixth columns of Panel A: $\beta_3 = 0.0295$, p -value = .074), and the term becomes insignificant at conventional levels when *Change in pre-sec earnings* is applied (fifth and sixth columns of panel B: $\beta_3 = 0.0262$, p -value = .111). Overall, the results convey that securitizing banks' income smoothing via securitization gains decreases in the post- FAS 166/167 period, which is consistent with H2B.

In summary, our regression results show that securitizing banks keep using securitization income to smooth earnings in the post- FAS 166/167 period. However, compared to the pre-regulation period, this earnings management behavior is reduced.

²⁷ We apply models (3) and (4) on the balanced sample due to the concern that our unbalanced sample is susceptible to the sample bias problem incurred by the variation of asset threshold required by Federal Reserve's Bank regulatory database over our sample period (see footnote 12).

²⁸ We thank our associate editor for this suggestion.

Table 6
Control of capital ratios for the sample in the post- FAS 166/167 period.

		Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Panel A The Relation between Securitization Income and Pre-Securitization Earnings.									
Pre-sec earnings	β_1	-0.0009	0.043	-0.0009	0.057	-0.0009	0.060	-0.0009	0.053
<i>Begin_securitization_income</i>	β_2	0.8432	0.000	0.8506	0.000	0.8504	0.000	0.8428	0.000
<i>Begin_securitized_residential</i>	β_3	0.0001	0.027	0.0001	0.035	0.0001	0.033	0.0001	0.029
<i>Begin_securitized_consumer</i>	β_4	-0.0002	0.536	-0.0005	0.239	-0.0004	0.251	-0.0003	0.453
<i>Begin_securitized_commercial</i>	β_5	0.0000	0.888	-0.0000	0.596	-0.0000	0.590	0.0000	0.851
<i>Stock_return_volatility</i>	β_6	0.0000	0.448	0.0000	0.482	0.0000	0.476	0.0000	0.487
<i>Size</i>	β_7	-0.0000	0.251	-0.0000	0.801	-0.0000	0.972	-0.0000	0.204
<i>Leverage</i>	β_8	-0.0009	0.540	0.0014	0.225	0.0015	0.221	-0.0009	0.525
<i>ROA</i>	β_9	-0.0111	0.207	-0.0133	0.141	-0.0134	0.141	-0.0112	0.204
<i>Cashflow_operating</i>	β_{10}	0.0017	0.200	0.0018	0.182	0.0018	0.176	0.0016	0.228
<i>MB</i>	β_{11}	-0.0002	0.047	-0.0002	0.050	-0.0002	0.051	-0.0002	0.044
<i>Tier1_Leverage</i>	β_{12}	-0.0000	0.168					-0.0000	0.114
<i>Tier1_Capital</i>	β_{13}			-0.0000	0.561			-0.0000	0.350
<i>Total_Capital</i>	β_{14}					-0.0000	0.603	0.0000	0.320
<i>Time fixed effect?</i>		Yes		Yes		Yes		Yes	
<i>Adj. R²</i>		0.833		0.832		0.832		0.833	
<i>N</i>		538		538		538		538	
Panel B The Relation between Securitization Income and change in pre-securitization earnings.									
Change in pre-sec earnings	β_1	-0.0005	0.095	-0.0005	0.092	-0.0005	0.093	-0.0005	0.100
<i>Begin_securitization_income</i>	β_2	0.9128	0.000	0.9206	0.000	0.9203	0.000	0.9118	0.000
<i>Begin_securitized_residential</i>	β_3	0.0001	0.051	0.0001	0.061	0.0001	0.059	0.0001	0.058
<i>Begin_securitized_consumer</i>	β_4	-0.0003	0.454	-0.0005	0.244	-0.0005	0.256	-0.0004	0.385
<i>Begin_securitized_commercial</i>	β_5	-0.0000	0.756	-0.0001	0.414	-0.0001	0.409	-0.0000	0.807
<i>Stock_return_volatility</i>	β_6	0.0000	0.428	0.0000	0.460	0.0000	0.457	0.0000	0.463
<i>Size</i>	β_7	-0.0000	0.384	-0.0000	0.931	0.0000	0.904	-0.0000	0.288
<i>Leverage</i>	β_8	-0.0007	0.625	0.0010	0.375	0.0010	0.367	-0.0008	0.620
<i>ROA</i>	β_9	-0.0075	0.331	-0.0089	0.262	-0.0091	0.261	-0.0076	0.338
<i>Cashflow_operating</i>	β_{10}	0.0016	0.207	0.0016	0.201	0.0016	0.195	0.0015	0.237
<i>MB</i>	β_{11}	-0.0002	0.145	-0.0002	0.150	-0.0002	0.153	-0.0002	0.136
<i>Tier1_Leverage</i>	β_{12}	-0.0000	0.232					-0.0000	0.189
<i>Tier1_Capital</i>	β_{13}			-0.0000	0.584			-0.0000	0.374
<i>Total_Capital</i>	β_{14}					-0.0000	0.635	0.0000	0.366
<i>Time fixed effect?</i>		Yes		Yes		Yes		Yes	
<i>Adj. R²</i>		0.814		0.813		0.813		0.814	
<i>N</i>		529		529		529		529	

The dependent variable is the securitization income. All results are based on standard errors clustered simultaneously by firm and by time. All p-values are based on two-tailed t-tests. All variables are defined in the Appendix.

6. Additional analyses

6.1. Control for capital ratios

In the post- FAS 166/167 period, other regulations, such as Basel III, also were phased in, imposing more stringent scrutiny on the banking industry. For example, Basel III raised banks' required capital reserves at the end of 2010 and further increased banks' capital requirements and liquidity in 2013. This can impact banks' earnings management behavior (Gombola et al., 2016). To control for the impact of Basel III, we add capital ratios including the Tier1 Leverage Ratio (*Tier1_Leverage*), the Tier1 Capital Ratio (*Tier1_Capital*), and the Total Capital Ratio (*Total_Capital*) as control variables and retest H1 in the post-regulation period.²⁹ The results are listed in Table 6. Panels A and B demonstrate the results with the treatment variable *Pre-sec earnings* and *Change in pre-sec earnings*, respectively. Each panel controls for *Tier1_Leverage*, *Tier1_Capital*, and *Total_Capital* individually, and for all three capital ratios simultaneously. In panel A (B), the coefficient of *Pre-sec earnings* (*Change in pre-sec earnings*) is negative and significant at conventional levels for all of the four specifications, which is consistent with hypothesis H1A that banks use securitization income to smooth earnings in the post- FAS 166/167 period.

²⁹ We do not include this in our main tests because inclusion of these capital ratios reduces our sample size to a large extent.

6.2. Bank size effect

To the extent that bank size plays a significant role in both securitizations³⁰ and earnings smoothness (Beatty, Ke, & Petroni, 2002), we examine whether the influence of FAS 166/167 is more effective in larger banks or smaller banks. To facilitate this comparison, we use our balanced sample³¹ and perform the following analysis: We split each of our pre- and post- regulation balanced subsample into larger and smaller groups by the subsample median of total assets, and only keep those banks that are larger (or smaller) in both subsamples. Then using the combined sample, we retest H2 for the larger banks and smaller banks, separately. We find that for the larger banks, the interaction term β_3 of both models (3) and (4) are positive and significant; but for smaller banks, β_3 is not significant at the conventional level for either measure. This indicates that FAS 166/167 plays a more significant role in larger banks than smaller banks with respect to

³⁰ Bank size can impact securitization in two aspects: On the one hand, due to the economic scale of the fixed cost of setting up a securitization program, larger banks are more likely to securitize than smaller banks. For example, in 2015Q1, the average total assets is \$250 billion for bank holding companies that report non-zero securitized assets, and \$27 billion for all bank holding companies in the Federal Reserve's Bank Regulatory database. On the other hand, larger banks have greater access to alternative sources of funds and greater ability to manage liquidity risk, which could give them less incentive to securitize loans to raise cash flow compared to smaller banks (Loutschina & Strahan, 2009).

³¹ We focus on the balanced sample because it consists of banks that are included in both pre- and post- regulation subsamples. To the extent that we want to compare the effectiveness of FAS 166/167 for larger and smaller banks, we want to ensure that the banks exist in both periods.

curtailing the behavior of income smoothing via securitization gains. Note that our sample only includes banks with non-zero securitized assets, which are relatively larger banks in the whole pool of bank holding companies. Therefore, our results indicate that FAS 166/167 more effectively curtails earnings management behavior in the largest banks. This might be due to the fact that the largest banks are under the most stringent scrutiny by regulators.

6.3. Role of corporate governance

Dechow et al. (2010) find some evidence that corporate governance can inhibit earnings smoothing via securitization income in the pre-FAS 166/167 period. Following Dechow et al. (2010), we use the proportion of non-executive directors, existence of a female director, and the proportion of directors who joined the board before the CEO took office to proxy for corporate governance,³² and examine whether corporate governance still plays such a role in the post-regulation period. Our results show that such an inhibition function of corporate governance is not significant in the post-regulation period. Consistent with Dechow et al. (2010), we find some evidence that stronger corporate governance inhibits banks' tendency to smooth income via securitization gains in the pre-regulation period. A possible explanation for our finding is that banks are under more stringent scrutiny by regulators after the regulation (which is also after the financial crisis), and corporate governance plays a less important role in such an environment.

6.4. Shorter time window

When we compare the extent of using securitization income to smooth earnings in the post- and pre-FAS 166/167 periods (tested by H2), our post-regulation period spans from 2011Q1 to 2018Q4 and our pre-regulation period spans from 2001Q2 to 2006Q4. To alleviate the concern that our H2 results are driven by factors other than the enactment of FAS 166/167, we retest H2 using a shorter time window, which is from 2011Q1 to 2013Q4 for the post-regulation period and 2004Q1 to 2006Q4 for the pre-regulation period. The results using the shorter time window are consistent with those for the longer time window.

7. Conclusions

Securitizing firms had been reported to use securitization income to smooth earnings in the pre-FAS 166/167 period. To the extent that FAS 166/167 tightens the sale accounting criteria for securitizations, it is expected to curtail this earnings management behavior. We find such evidence from two perspectives: First, time series statistics for our full sample show that the number of bank holding companies engaging in non-zero securitization income reporting decreases after the regulation, and the magnitude of reported securitization income is greatly reduced. Second, our multiple regression results show that such earnings management behavior is inhibited by FAS 166/167. However, our post-regulation subsample analyses provide evidence to show that despite the limited reporting of securitization income in the post-regulation period, securitizing banks continue to apply securitization income to smooth earnings. This is consistent with the argument that fair value estimation of retained interests from securitizations is not affected by FAS 166/167. As a result, among banks that continue to structure the securitizations as sales, earnings smoothing using securitization income is still applied.

To our knowledge, our study is the first to examine the impact of FAS 166/167 on the behavior of using securitization income to smooth earnings. Our results provide evidence that FAS 166/167 does strengthen the sale accounting requirement of securitization. However, securitizing managers continue to smooth earnings via securitization income at the firm level in the post-regulation period.

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Appendix A. Appendix variable definitions

Variable Name	Definition
<i>Securitization_income</i>	Firm i's securitization income (BHCKB493 ^a) at quarter t scaled by prior quarter t-1 (book value of) equity (BHCK3210).
<i>Pre-sec earnings</i>	Firm i's earnings before the securitization income (BHCK4340 ^a - BHCKB493 ^a) scaled by quarter t-1 equity.
<i>Change in pre-sec earnings</i>	Firm i's pre-securitization earnings at quarter t less pre-securitization earnings at quarter t-4 (the same quarter from the previous year), divided by equity at quarter t-1.
<i>Begin_secritization_income</i>	Firm i's securitization income (BHCKB493 ^a) at quarter t-1 scaled by equity at quarter t-2.
<i>Begin_secritized_residential</i>	Firm i's securitized residential loans (BHCKB705) at quarter t-1 scaled by equity at quarter t-2.
<i>Begin_secritized_consumer</i>	Firm i's securitized consumer loans, including home equity lines (BHCKB706), credit card receivables (BHCKB707), auto loans (BHCKB708), and other consumer loans (BHCKB709) at quarter t-1, scaled by equity at quarter t-2.
<i>Begin_secritized_commercial</i>	Firm i's securitized commercial loans, including commercial and industrial loans (BHCKB710) and all other loans (BHCKB711) at quarter t-1, scaled by equity at quarter t-2.
<i>Stock_return_volatility</i>	Standard deviation of firm i's value-weighted market adjusted stock return in the previous 12 months (from CRSP).
<i>Size</i>	Natural log of firm i's total assets (BHCK2170) at quarter t.
<i>Leverage</i>	The ratio of firm i's total liabilities (BHCK2948) to total assets (BHCK2170) at quarter t.
<i>ROA</i>	The ratio of firm i's earnings before the securitization income (BHCK4340 ^a - BHCKB493 ^a) to total assets (BHCK2170) at quarter t.
<i>Cashflow_operating</i>	Firm i's operating cash flow (BHCP3619 ^a) at quarter t, scaled by equity at quarter t-1.
<i>MB</i>	The ratio of firm i's market value of equity to book value of equity (BHCK3210) at quarter t.
<i>Tier1_Leverage</i>	Tier1 leverage capital ratio (BHCK7204) at quarter t.
<i>Tier1_Capital</i>	Tier1 risk-based capital ratio (BHCK7206) at quarter t.
<i>Total_Capital</i>	Total risk-based capital ratio (BHCK7205) at quarter t.

^aYear-to-date data, which is adjusted to quarterly data.

Appendix presents definitions of all variables used in regression analyses. The relevant item numbers as reported in bank Y-9C reports are presented within parenthesis.

References

- Agarwal, S., Chomsisengphet, S., Liu, C., & Rhee, S. G. (2007). Earnings management behaviors under different economic environments: Evidence from Japanese banks. *International Review of Economics and Finance*, 16(3), 429–443.
- Andrew, H. (2009). Today's crisis and the great depression. *Financial Times* London, UK, Oct 30, 2009.
- Barth, M., & Taylor, D. (2010). In defense of fair value: Weighing the evidence on earnings management and asset securitizations. *Journal of Accounting and Economics*, 49(1–2), 26–33.
- Barth, M. E., Ormazabal, G., & Taylor, D. J. (2012). Asset securitizations and credit risk. *The Accounting Review*, 87(2), 423–448.
- Beatty, A. L., Ke, B., & Petroni, K. R. (2002). Earnings Management to Avoid Earnings Declines across Publicly and Privately Held Banks. *The Accounting Review*, 77(3), 547–570.
- Collins, J. H., Shackelford, D., & Wahlen, J. M. (1995). Bank differences in the coordination of regulatory capital, earnings, and taxes. *Journal of Accounting Research*, 33(2), 263–291.

³² We obtain these proxies from the BoardEx database.

- Dechow, P. M., Myers, L. A., & Shakespeare, C. (2010). Fair value accounting and gains from asset securitizations: A convenient earnings management tool with compensation side-benefits. *Journal of Accounting and Economics*, 49(1–2), 2–25.
- Dechow, P. M., & Shakespeare, C. (2009). Do managers time securitization transactions to obtain accounting benefits? *The Accounting Review*, 84(1), 99–132.
- Dou, Y., Ryan, S. G., & Xie, B. (2018). The real effects of FAS 166/167 on banks' mortgage approval and sale decisions. *Journal of Accounting Research*, 56(3), 843–882.
- Fama, E. F., & French, K. R. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33(1), 3–56.
- Fudenberg, D., & Tirole, J. (1995). A theory of income and dividend smoothing based on incumbency rents. *Journal of Political Economy*, 103(1), 75–93.
- Gombola, M. J., Ho, A. Y., & Huang, C. (2016). The effect of leverage and liquidity on earnings and capital management: Evidence from U. S. commercial banks. *International Review of Economics and Finance*, 43, 35–58.
- Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics*, 40(1–3), 3–73.
- Healy, P. M. (1985). The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics*, 7, 85–107.
- Hughes, J. (2008). Off-balance sheet rules 'irretrievably broken'. *Financial Times* London, UK, Apr 9, 2008.
- Kanagaretnam, K., Lobo, G. J., & Mathieu, R. (2003). Managerial incentives for income smoothing through bank loan loss provisions. *Review of Quantitative Finance and Accounting*, 20(1), 63–80.
- Kanagaretnam, K., Lobo, G. J., & Yang, D. (2004). Joint tests of signaling and income smoothing through bank loan loss provisions. *Contemporary Accounting Research*, 21(4), 843–884.
- Karaoglu, E. (2005). Regulatory capital and earnings management in banks: The case of loan sales and securitizations. *Working paper*. FDIC Center for Financial Research.
- Kilic, E., Gerald, G. J., Ranasinghe, T., & Yi, L. (2018). *Strategic usefulness of ignorance: Income smoothing via retained interest of securitized loans*. (Working paper).
- Kilic, E., Lobo, G. J., Ranasinghe, T., & Sivaramakrishnan, K. (2013). The impact of SFAS 133 on income smoothing by banks through loan loss provisions. *The Accounting Review*, 88(1), 233–260.
- Liu, C., & Ryan, S. G. (2006). Income smoothing over the business cycle: Changes in banks' coordinated management of provisions for loan losses and loan charge-offs from the pre-1990 bust to the 1990s boom. *The Accounting Review*, 81(2), 421–441.
- Loutskina, E. (2011). The role of securitization in bank liquidity and funding management. *Journal of Financial Economics*, 100(3), 663–684.
- Loutskina, E., & Strahan, P. E. (2009). Securitization and the declining impact of bank finance on loan supply: evidence from mortgage originations. *Journal of Finance*, 64(2), 861–889.
- Ma, C. K. (1988). Loan loss reserves and income smoothing: The experience in the U.S. banking industry. *Journal of Business Finance & Accounting*, 15(4), 487–497.
- Niu, F., & Richardson, G. D. (2004). *Earnings quality, off-balance sheet risk, and the financial-components approach to accounting for transfers of financial assets*. (Working paper).
- Ryan, S. G. (2007). *2nd Ed. Financial instruments and institutions: accounting and disclosure rules*. Hoboken, New Jersey: John Wiley & Sons, Inc.
- Ryan, S. G. (2008). Accounting in and for subprime crisis. *The Accounting Review*, 83(6), 1605–1638.
- Ryan, S. G., Tucker, J. W., & Zhou, Y. (2016). Securitization and insider trading. *The Accounting Review*, 91(2), 649–675.
- Trueman, B., & Titman, S. (1988). An explanation for accounting income smoothing. *Journal of Accounting Research*, 26(Supplement), 127–139.
- Wahlen, J. M. (1994). The nature of information in commercial bank loan loss disclosures. *The Accounting Review*, 69(3), 455–478.