Have SFAS 166 and SFAS 167 improved the financial reporting for securitizations?

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Abstract

Critics have alleged that securitization accounting prior to 2010 was among the causes of the recent financial crisis. In response to this criticism, the FASB implemented two new accounting standards, SFAS 166 and SFAS 167, to improve the financial reporting for securitization. Bank regulators have stated their belief that SFAS 166/167 will result in a consolidated balance sheet (and risk-based capital ratios based thereupon) that better reflects a bank's exposure to risk related to securitized assets. We use capital market participants' assessments of risk retention by sponsoring banks as a benchmark, and provide evidence consistent with bank regulators' beliefs. In particular, following SFAS 166/167, equity investors of sponsoring banks do not consider (consider) as risk relevant securitized assets that receive off-balance sheet (on-balance sheet) treatment. Securitized assets that are consolidated under SFAS 166/167 receive the same risk relevance as assets that are not securitized, despite contractual provisions that would seem to imply substantial risk transfer. We attribute this finding to non-contractual recourse. Further, we document that, by ceding retained power or influence through the servicing / special servicing functions to third parties, SFAS 166/167 resulted in real effects to the extent that banks (particularly those that were weakly capitalized) achieved their accounting objectives in the post-SFAS 166/167 period through legitimate transaction structuring in line with the intent of the new rules.

"The agencies use GAAP as the initial basis for determining whether an exposure is treated as on- or off- balance sheet for risk-based capital purposes. The agencies have long maintained that a banking organization should hold capital commensurate with the level and nature of the risks to which it is exposed. As described below, the agencies believe that the effects of FAS 166 and FAS 167 on banking organizations' risk-based capital ratios will result in regulatory capital requirements that better reflect, in many cases, banking organizations' exposure to credit risk."

Federal Register, Rules and Regulations (2010)

1. Introduction

The recent financial crisis was one of the most important events since the Great Depression of the 1930s. The pre-crisis era witnessed a rapid growth in securitizations of credit-risky assets such as mortgages and commercial loans. Observers such as the Financial Crisis Inquiry Commission (2011) have argued that the complex structure of securitizations enabled banks to retain risk in an opaque manner and thus contributed to the crisis. In particular, banks often structured securitizations using Qualified Special Purpose Entities (QSPEs or simply "Qs") to ensure off-balance sheet treatment under the prevailing accounting standards, despite substantial evidence during the pre-crisis era that sponsors typically retained some degree of exposure to credit risks of securitized assets through retained on-balance sheet interests, explicit contractual representations and warranties, and implicit "moral recourse".[1]

Critics, such as The President's Working Group on Financial Markets (2008), have alleged that the securitization accounting prior to 2010 was among the causes of the recent financial crisis.[2] Consistent with the overwhelming capital market-based evidence concerning risk-retention by

[1] See Gorton and Souleles (2005), Niu and Richardson (2006), Landsman, Peasnell, and Shakespeare (2008), Chen, Liu, and Ryan (2008), Barth, Ormazabal, and Taylor (2012), Dou et al. (2014), and Bonsall, Koharki, and Neamtiu (2015) for evidence consistent with these arguments. Standard and Poor's (2001, p. 106) defines "moral recourse" as "the reality that companies feel that they must bail out a troubled securitization although there is no legal requirement for them to do so. Companies that depend on securitizations as a funding source may be especially prone to taking such actions. In many situations, this expectation undermines the notion of securitization as a risk transfer mechanism".

[2] The President's Working Group recommended the following: "Authorities should encourage FASB to evaluate the role of accounting standards in the current market turmoil. This evaluation should include an assessment of the need for further modifications to accounting standards related to consolidation and securitization, with the goal of improving transparency and the operation of U. S. standards in the short-term."

sponsoring banks, U.S. bank regulatory agencies have taken the position that the previous off-balance sheet treatment allowed banks to "obtain lower regulatory capital requirements without a commensurate reduction in risk." (Federal Register Rules and Regulations 2010, p. 4641)[3] In response to this criticism and calls for revised accounting standards that better reflect a bank's exposure to credit risk related to securitized assets, the Financial Accounting Standards Board (FASB) amended the two standards that governed accounting for securitizations, Statement of Financial Accounting Standards (SFAS) 140 and FASB Interpretation 46R (FIN46R), with two new accounting standards, SFAS 166 and SFAS 167 (effective beginning 2010), to improve the financial reporting for off-balance-sheet entities.[4] We investigate whether the on- and off-balance sheet recognition choices after SFAS 166/167 better reflect the extent to which sponsoring banks in the U.S. retain the credit risks of securitized loans.

Prior to the new standards, loan securitizations typically involved a Special Purpose Entity ("SPE") set up to issue asset backed securities. The SPE had to meet certain SFAS 140 tests in order to be deemed a QSPE, and thus exempt from consolidation. Not all SPEs are QSPEs and FIN46R guided the consolidation requirements for SPEs other than QSPEs (i.e., variable interest entities, or VIEs). SFAS 166 and SFAS 167 eliminate the concept of QSPEs that were previously exempt from consolidation. As explained in Deloitte (2010), after the adoption of SFAS 166/167, one first looks to SFAS 167 to determine whether the VIE receiving the transferred loans must be consolidated. If so, the sale criteria in SFAS 166 becomes redundant for the bank's consolidated financial statements. SFAS 167 also requires issuers to consider the former QSPEs as candidates

[3] As explained by Richardson, Ronen, and Subrahmanyam (2011), capital requirements corresponding to the newly issued accounting standards were an important and essential component of the Dodd-Frank Act aimed at reforming the banking sector with regards to regulatory arbitrage related to securitization activities.
[4] The FASB codified SFAS 166 and 167 as part of ASC 860-20 and 810-10 respectively. For expositional purposes, in this paper we refer exclusively to the legacy nomenclature.

for consolidation on an ongoing basis, depending on the degree of power over the entity and retained variable interests.

Richardson, Ronen, and Subrahmanyam (2011) describes SFAS 167 as a crucial new accounting standard that will result in broader consolidation requirements for securitized assets, with implications for the regulatory capital of sponsoring banks. As implied by the opening quotation, in new regulatory capital requirements adopted in 2010, bank regulators will use GAAP-based consolidated assets and liabilities as an initial basis for determining a bank's minimum risk-based capital. Despite the stated belief of bank regulators that SFAS 167 will result in a consolidated balance sheet (and risk-based capital ratios based thereupon) that better reflects exposure to credit risk, there is no systematic evidence showing that the new standards indeed achieve the goal of improving financial reporting for securitizations.

Our study intends to examine whether the recognition of VIE assets as either on- or off-balance sheet under the new GAAP leads to improved regulatory capital measurements. Unfortunately, we lack perfect benchmarks for the true extent of risk-retention by sponsoring banks. Hence, to reliably assess whether regulatory capital calculations based on amounts reported under SFAS 166/167 reflect the underlying economics of the securitization transactions, we turn to capital market assessments as a benchmark. We thus appeal to a long line of literature on regulatory usage of market discipline, in which regulators often look to the capital markets to inform their views regarding supervised banks (e.g., Board of Governors of the Federal Reserve System 1999, Basel Committee on Banking Supervision 2001, and Flannery 2012). Our reliance on capital market assessments of risk-retention is not ad hoc, and has conceptual underpinnings in the literature concerning bank regulators' reliance on market discipline. For example, Flannery and Nikolova (2003) point to a useful role for market information and state the following: "even

if market information cannot systematically improve supervisory assessments of current or future conditions, contemporaneous affirmation of supervisory information can still provide substantial value. Supervisory judgments can be buttressed by market data, provided that market data is properly interpreted." Flannery (2012) also surveys and opines on the literature on market discipline of banks and concludes that "All things considered, it appears that market information can best be used to reinforce supervisory assessments and to constrain the supervisors' ability to forebear." If the new accounting standards better reflect risk retention by banks, we would expect to observe the following patterns in our data: securitized assets that are consolidated by a bank should have demonstrated risk relevance as perceived by investors; securitized assets that are not consolidated by a bank should have no demonstrated risk relevance as perceived by investors; and, finally, there should be no observed difference in the risk relevance of on-balance sheet securitized assets relative to unsecuritized assets on the balance sheet.

This paper addresses an important controversy in the literature of interest to both U.S. bank regulatory agencies and the FASB. A major objective of the FASB for the new consolidation model underlying SFAS 166/167 was to achieve on- and off-balance sheet recognition choices that better align with the extent to which banks retain the risks of securitized loans. SFAS 167 is explicit that non-contractual risks (including reputational risk) are to be considered in the decision to consolidate the assets and liabilities of a securitized entity. In paragraph A58, SFAS 167 states that "when an entity such as a sponsoring bank is involved with the creation of a VIE, the sponsor may have an implicit financial responsibility to ensure that the VIE operates as designed, i.e., it may face an implicit agreement to fund the VIE's losses to protect the sponsor's reputation." Thus, SFAS 167 is intended to require consolidation if the VIE credit risk exposure of sponsoring banks is, according to the judgment of the financial statement preparer and its auditor, greater than

contractual risk due to non-contractual risk, including reputational risk. The U.S. bank regulatory agencies have similarly taken the position that VIE contractual exposure potentially underestimates the true exposure of sponsoring banks to the credit risk of securitization activities. For example, according to the Federal Register Rules and Regulations (2010), U.S. bank regulatory agencies state that "the VIE credit risk exposure of sponsoring banks has in fact been greater than they previously estimated and this is due to non-contractual risk, including reputational risk."

This new consolidation model, however, has attracted criticism from observers such as Richardson et al. (2011), who argue that the consolidation requirements of SFAS 167 may be excessive to the extent that they result in the consolidation of VIE assets that can only be used to settle obligations of the consolidated VIE and the consolidation of VIE liabilities for which creditors do not have recourse to the credit of the sponsoring bank. They argue that such assets and liabilities should not factor into the determination of risk-weighted regulatory capital.[5] We contribute to this debate by providing empirical evidence that bank sponsors' total credit risk exposure to securitized entities extends beyond contractual risk.

Because our research question speaks to risk retention by banks, our primary research design is a risk relevance model. We follow the prior literature examining the risk-relevance of firms' off-balance sheet positions (e.g., Bowman 1980; Dhaliwal 1986; Chen et al. 2008; Dou et al. 2014) and associate a measure of banks' total equity risk with the off-balance-sheet and on-balance-sheet securitized loans before and after SFAS 166/167. Our evidence is consistent with the consolidated balance sheets under SFAS 166/167 better reflecting banking organizations' total

[5] Our calculations from bank regulatory disclosures on Form Y-9C suggest that only 8% of sponsoring banks' consolidated VIE liabilities have general recourse to the bank's credit, which is consistent with minimal contractual obligations for the sponsor. While this descriptive statistic might at first glance support Richardson et al.'s contention, our risk-relevance results suggest that the degree of bank sponsors' risk transference is understated by a narrow focus on the contractual obligations of sponsoring banks.

exposure to the credit risk of securitized assets. Furthermore, for VIE assets consolidated as a result of SFAS 166/167, our evidence is inconsistent with the position of Richardson, Ronen, and Subrahmanyam (2011) that banking organizations' exposure to credit risk is limited to the contractual exposure of the sponsoring banks with respect to securitized assets. Investors assign the same risk relevance to assets of consolidated VIEs as those that are not securitized, despite contractual provisions that would seem to imply substantial risk transfer to VIE investors. We attribute this finding to non-contractual recourse. We also explore underlying mechanisms through which better alignment is achieved. We find that banks decreased their continuing influence or power over their sponsored residential and commercial mortgage securitizations by ceding the servicing and special servicing functions, respectively, to third parties.

The remainder of this paper proceeds as follows. Section 2 contains a brief literature review, outlines our research questions, and develops the hypotheses that arise from those questions. Section 3 details the data used in the study and Section 4 lays out our research design. Section 5 discusses the empirical results of our tests before concluding in Section 6.

2. Related Literature and Hypothesis Development

2.1 Literature Review

The empirical literature in accounting has documented that securitization sponsors often retain some exposure to credit risks of securitized assets (through retained on-balance sheet interests, explicit contractual representations and warranties, and implicit moral recourse). In particular, observers such as Niu and Richardson (2006), Landsman, Peasnell, and Shakespeare (2008), and Barth, Ormazabal and Taylor (2012) have concluded that, in the pre-SFAS 166/167 era, securitized assets were considered relevant to the risk assessment of securitization sponsors by their equity investors. Specifically, Niu and Richardson (2006) examine the systematic equity

risk or equity betas of sponsors and document the risk relevance of off-balance-sheet securitizations on an overall basis. Landsman et al. (2008) provides results consistent with Niu and Richardson (2006) using a value-relevance methodology. Barth, Ormazabal and Taylor (2012) document credit-risk relevance for risks that are contractually and implicitly retained by sponsors, and finds that, whereas credit rating agencies only consider explicitly or contractually retained risks as being relevant, the bond market (as reflected in bond spreads) additionally considers implicit or moral recourse to be credit risk relevant. Chen, Liu, and Ryan (2008) shows that the risk relevance results in the pre-SFAS 166/167 era vary by type of securitized assets (e.g., residential mortgages, credit card receivables, commercial loans, etc.).

As explained in the practitioner literature (e.g., Boulton 2014; Deloitte 2014), SFAS 166/167 tightens the scope for non-consolidation, as compared to prior standards, by eliminating the QSPE concept and considering who effectively controls the VIE. Under SFAS 167, accounting rules deem a sponsor to control the VIE if (i) it has the power to direct the activities of the VIE that most significantly impact on the VIEs performance and (ii) has the obligation to absorb losses of the VIE that could potentially be significant to the VIE. Using securitized mortgages as an example (see for example, Deloitte 2014), if a sponsor retains the servicing function and holds a variable interest for a private label residential mortgage backed security (RMBS),[6] accounting rules may deem the sponsor the primary beneficiary under SFAS 167, and the sponsor would thus have to consolidate the VIE housing the RMBS. Prior to SFAS 166/167, accounting rules deemed private label RMBS to be QSPEs under SFAS 140, and these structures received off-balance sheet treatment. As Boulton (2014, page 4) states: "by looking at who controls the SPE, the revised accounting rules should catch a wider range of relationships, making consolidation harder to avoid.

[6] "Private label" refers to an RMBS involving mortgages without guarantee backing by government agencies.

However, they are no panacea. If the sponsor can demonstrate that it does not have 'control', as defined in the standards, SPEs will remain off balance sheet."

The literature pertaining to post SFAS 166/167 disclosures is relatively nascent. A recent study by Lejard (2015) examines the motivations of firms to conduct asset securitizations. The study reports that funding and cash flow management reasons motivate asset securitizations in general whereas credit risk transfer reasons motivate the use of sale accounting. The only concurrent study examining the efficacy of the new standards, i.e., the impact of SFAS 166/167 instead of the possible motivations behind securitizations, is by Oz (2013). Without doubt, the total information available to investors to assess retained risk increased in the post- relative to the pre-SFAS 166/167 era, for reasons explained by Oz (2013), i.e., newly disclosed information mandated in footnotes by SFAS 166/167 as well as new information arising from the consolidation of VIE assets and liabilities. Using various measures of information uncertainty, the results of Oz (2013) support the inference that total information risk regarding the VIEs of securitizing banks declined in the post relative to the pre SFAS 166/167 era.

We focus on economic risk rather than information risk, and our aim is to assess the efficacy of the new GAAP, particularly for the purposes of measuring risk-weighted regulatory capital. We seek to ascertain whether the on- and off-balance sheet recognized amounts (hereafter referred to as the "ON" and "OFF" labels, respectively) reflect the bank's retained credit risk.[7] If the label ON (OFF) concurs with investors' assessment of retained risk, then during the post SFAS 166/167 period there should be (should not be) observed risk relevance of the bank's consolidated (unconsolidated) securitized assets. As an example, suppose moral recourse (as discussed above)

[7] For expositional ease, we interchangeably use the acronym OFF to imply "off-balance sheet" and the acronym "ON" to imply "on-balance sheet" amounts.

is still not being reflected in considerations by a bank and its auditors in reaching OFF treatment in the post period. Our research design would permit us to infer that the market, using its total information set, assesses that there is substantial retained risk in the SFAS 166/167 period, beyond retained interests on the balance sheet, which should not be the case if the OFF label has been used and the new consolidation rules reflect the underlying economics of the transaction. The study by Oz (2013) nicely complements our study, since her research design (unlike ours) permits an inference that the total information available to investors regarding the VIEs increased post SFAS 166/167. Thus, our results, as well as those of Oz (2013), point to the new accounting standards reflecting the underlying economics of the transactions.

Three concurrent papers examine real effects of SFAS 166/167 on bank lending in credit cards, mortgages, and small business loans (Tian and Zhang 2016; Dou, Ryan, and Xie 2016; Dou 2017). None of them speak to the efficacy of the new standards, which we address in this study. Moreover, unlike those studies which examine real decisions that do not directly influence accounting considerations (e.g., the amount of lending), we investigate the effects of the new standards on the design features of securitization deals that are particularly pertinent to consolidation considerations (i.e., the servicing function). Namely, we test whether banks were compelled to change the structuring of their sponsored securitizations to achieve off-balance sheet status under the new GAAP.

In a related literature, the forced consolidation of SPEs other than QSPEs resulting from the adoption of FIN46R has been examined. While not within the scope of this study, Bens and Monahan (2008) and Luo and Warfield (2014) show that companies took steps to restructure and/or discontinue securitizations in order to avoid consolidation. The real effects we document for former QSPEs are consistent with these findings.

2.2 Hypothesis Development

2.2.1 Does OFF mean OFF in the post-SFAS 166/167 period?

In order to examine whether the revised securitization accounting standards better reflect a bank's exposure to retained credit risk, we propose three distinct research questions. First, are the assets labeled as off-balance sheet in the post-SFAS 166/167 era *not* risk relevant? That is, does "OFF mean OFF"? If the OFF label means that the assets in question are truly off-balance sheet, then there should be no risk relevance for the assets in question involving a measure of the bank's equity risk using an approach similar to extant risk relevance studies (see, for example, Chen et al. 2008; Dou et al. 2014). As a consistency check, we conduct similar tests in the SFAS 140 era, since the prior literature has established that SFAS 140 did not reflect the underlying economics of the transactions (i.e., QSPEs were accounted for as OFF, but research results point to continuing involvement, which suggests that OFF accounting was not appropriate).

In the pre-166/167 period, we expect there to be a positive association for deals accounted for as OFF, since the presumption is that SFAS 140 did not appropriately reflect the underlying economics of the transactions. As such, the pre-period tests represent a replication of Chen et al. (2008). If the predicted results obtain, the test results would point to the efficacy of the new standards, i.e., OFF meaning truly OFF in the post- but not the pre-period. The interpretation would be that SFAS 166/167 forces deals on-balance sheet when the sponsors have *in substance* continuing involvement, including moral recourse, and leaves deals off-balance sheet when there is no continuing involvement. This leads us to the following hypotheses for securitizations accounted for as off-balance sheet (note that H1b, stated in the null from, implies the efficacy of the new GAAP):

*H1a: Pre-166/167, there should be an **observable** risk relevance for banks' off-balance sheet exposures.*

*H1b: Post-166/167, there should be no **observable** risk relevance for banks' off-balance sheet exposures.*

2.2.2 Does ON mean ON in the post-SFAS 166/167 period?

Our next research question examines the risk relevance of securitized assets which receive on-balance sheet status following SFAS 166/167. If the new accounting standards appropriately reflect the underlying economics of the transactions, investors should consider VIE assets that receive on-balance sheet treatment under SFAS 166/167 to be risk-relevant (or at least more risk-relevant than the off-balance sheet VIE assets). That is, our second research question asks does ON mean ON? If the bank issuer is the primary beneficiary of the VIE and if the new standards reflect the underlying economics of the transactions, one would expect to observe demonstrated risk relevance. This leads to the following hypothesis, stated in the alternative form:

H2a: On-balance sheet securitized assets are risk relevant.

As a corollary, H1b and H2a together imply that securitized assets which receive on-balance sheet status as a result of SFAS 166/167 should have risk relevance that is greater than the off-balance sheet assets. One would expect to observe this difference if the tests requiring consolidation are met for the former, but not the latter, group of assets.

Further, securitized assets which receive on-balance sheet status as a result of SFAS 166/167 should have similar risk relevance to like-kind assets already on the balance sheet. As noted by Deloitte, this is a non-trivial issue since the risk-retention related to on-balance sheet

securitized assets may not be the same as the banks' own assets that are already on the balance sheet. Specifically, they point out that: "The company still owns what is in effect a residual even though it cannot be found that way on the balance sheet" (Deloitte, 2010, page 3). On the other hand, as discussed earlier, the sponsoring bank's risk retention of on-balance sheet VIE assets may well extend beyond contractual recourse. If the new accounting standards reflect the underlying economics of the transactions, the risk relevance of the VIE assets accounted for as on-balance sheet should be the same as those unsecuritized. This leads to the following hypothesis (the null form implies the efficacy of the new accounting standards):

H2b: There is no observed difference in the risk relevance of on-balance sheet securitized assets relative to unsecuritized assets on the balance sheet.

2.2.3 Are there real effects arising from the new standards?

In our third and final research question, we examine the structure of securitizations ("real effects") consequent to the new standards. That is, do bank sponsors structure securitization deals in the post-SFAS 166/167 period to achieve off-balance sheet status for the SPE housing the transferred assets? The following quote in the Report to the Congress on Risk Retention (2010, page 2) regarding the real effects of SFAS 166/167 captures the motivation behind our question: "Given the earnings and regulatory capital consequences of maintaining assets on-balance sheet, companies may be encouraged to structure securitization to achieve off-balance sheet treatment".[8]

[8] The Fed Report (page 74) also states the following: "Such effects on earnings and capital may continue to encourage institutions to engage in deal structuring for the purpose of achieving off-balance-sheet treatment. Instead of solely economic factors determining an appropriate level of credit and liquidity protection necessary for ABS issuances, institutions might desire to retain only the minimum level of risk required by regulation if the minimum level enables the institution to avoid consolidation. Similarly, companies may be encouraged as a result of those earnings and capital effects to avoid consolidating assets and liabilities by ceding power over issuance entities when it is not feasible to limit benefits to an amount that is not potentially significant. For example, institutions may cede power over ABS issuance entities, which in some cases results from their ability to manage assets held by the issuance entities, by

This question follows from other studies that have established real effects arising from new accounting standards — effects consistent with a desire of accounting standard setters to allow unconsolidated VIE assets only when control and interest are effectively surrendered. More importantly, as accounting numbers themselves serve as quantitative inputs into regulatory calculations (i.e., to lower regulatory capital requirements), bank managers also have incentives to obtain off-balance sheet treatment by changing the structure of deals.

The risk-relevance hypotheses above examine whether investors agree with the classification of VIEs as on- or off-balance sheet in the post period as per the newly issued standards. However, these predictions do not speak to the issuance and structuring behavior of the sponsors in the post period based on sponsors' incentives to avoid consolidation. Returning to the private label RMBS example discussed in Section 2, the bank sponsor has incentives to transfer the servicing function to an independent entity in order to avoid designation as the primary beneficiary of the VIE. The default management function is an important consideration for the power test in SFAS 167. If a private label RMBS involves a loan which is troubled, the servicer has the ability to work with the borrower in granting loan workouts. If the issuing bank retains the servicing function and holds variable interests in the form of a first loss position, according to Deloitte (2014), the issuer would generally meet both SFAS 167 tests requiring consolidation. Thus, one predicted real effect is that, after SFAS 166/167, sponsoring banks will structure deals so that they do not retain the role as servicer. While the second SFAS 167 test involving holding variable interests might still be met, SFAS 167 requires that both tests (power to direct and the obligation to absorb losses) be met.

selling servicing rights or distancing themselves from their customers in order to avoid consolidating the assets and liabilities of the issuance entities."

Similarly, for commercial mortgage backed securities (CMBS), if the bank sponsor retains the role as special servicer (i.e., the default management function as described above for RMBS) and the special servicer has a first loss position (which is typically the case), the issuer would generally meet both SFAS 167 tests requiring consolidation. Accordingly, another predicted real effect is that, after SFAS 166/167, banks will structure deals so that banks sponsoring CMBS do not retain the role as special servicer. Because the SPEs involved in private label RMBS and many CMBS transactions enjoyed status as QSPEs, there was no on-balance sheet treatment under SFAS 140 for RMBS or CMBS. Accordingly, we state the following hypotheses (in alternate form):

*H3a: Compared to pre-SFAS 166/167, there will be an increase in issues structured so that banks sponsoring **private label RMBS** do not retain the servicing function.*

*H3b: Compared to pre-SFAS 166/167, there will be an increase in issues structured so that banks sponsoring **CMBS** do not retain the special servicer role.*

The change in deal structure to avoid consolidation does not necessarily mean that the efficacy of the standards is compromised. Rather, ceding the servicing function represents a true reduction in risk retention of securitized assets (Deloitte 2014). Thus, it is reasonable to conclude that such deliberate actions by bank sponsors to achieve OFF status in the post-SFAS 166/167 period will not result in misleading recognized amounts. In other words, such recognized amounts are unlikely to distort measures of required regulatory capital.

Collectively, the results from our capital market and real effects tests have the potential to inform the regulatory capital debate underlying the Basel III reforms with respect to Tier 1 capital requirements when a bank is the sponsor of a securitization issue. As explained by Deloitte (2014, page 109), if SFAS 166/167 requires ON accounting treatment, the bank must hold regulatory capital against all the underlying assets as if the bank had not securitized those assets. If SFAS

166/167 allows OFF treatment, the regulatory capital the bank must hold against the securitized assets depends on the degree of subordination of any variable interests retained by the bank, but is generally lower than the Tier 1 capital required by ON accounting status. If we were to find that ON means ON and OFF means OFF, this would support the Basel III approach to required regulatory capital.

3. Data

We conduct our risk relevance tests using data collected from the Y-9C regulatory reports of U.S. bank holding companies. The use of Y9-C data is desirable for these tests because of a clear delineation of off-balance sheet securitization amounts. We obtain stock return data from the CRSP database. To mitigate the likelihood that changes in the composition of banks over a rapidly changing macro-environment and the financial crisis drives our results, we require a bank to have non-zero off-balance sheet securitized assets in at least four quarters during both the 2001–2006 and 2011–2014 periods. For our real effects tests, we collect data at the issue level. The main data source for issue level data is the Asset-Backed Alert (ABS Alert) database compiled by Harrison Scott Publications. This database comprises securitizations of residential mortgages, credit cards, and other consumer and commercial assets from 1985 to the present date for which at least one major credit rating agency provided a rating. We obtain data from the Commercial Mortgage Alert (CM Alert) database, also maintained by Harrison Scott Publications, for commercial mortgage securitization issues. These databases allow us to study details of the securitization issues by type of collateral (e.g., private label RMBS and CMBS). They also include a number of other fields of interest used for our real effects tests (e.g., identity of the servicer, for RMBS, and special servicers, for CMBS).

To gauge the initial impact of SFAS 166/167, in Appendix C, we examine the fiscal 2010 10-Ks and 10-Qs by hand for all firms in our sample and tabulate the aggregate amount of assets that were on-boarded in fiscal 2010 as a result of adoption of the new standards. Across all banks reporting a material effect of SFAS 166/167, the amount on-boarded represents 4.8 percent of their total assets, with some institutions such as American Express, Capital One, and Citigroup being differentially more affected than others. We also follow Dou (2017) and calculate the difference between the Tier 1 risk-based capital ratio as if SFAS 166/167 had not been implemented and the Tier 1 risk-based capital ratio as reported. The average impact is a decrease in the Tier 1 risk-based capital ratio by 1 percent, representing a 6% decrease relative to the mean Tier 1 risk-based capital ratio. This figure likely underestimates the true effect of SFAS 166/167 since deals that are unconsolidated due to changes in structure are not included. We estimate such effects of private label RMBS and CMBS in Section 5.4.

4. Research Design

4.1 Tests of H1: Does OFF mean OFF post-SFAS 166/167?

To proxy for the bank's equity risk, we follow Chen et al. (2008) and begin with the following motivating specification:

$$\sigma_E = \beta_0 + \beta_1 \, S/MV(E) + \varepsilon. \qquad (1)$$

In equation (1), σ_E is the equity volatility, MV(E) is the beginning of quarter market value of equity; S is the book value of off-balance sheet securitized assets; S/MV(E), the ratio of off-balance sheet securitized assets to the beginning of quarter market value of equity, represents the relative extent of securitized assets. Given the above, the base specification we use to empirically test H1 can be written more explicitly as follows:

$$SDRET_{t+1} = \beta_0 + \beta_1 ABS_t + \beta_2 ARI_t + \beta_3 MASSETG_t + \beta_4 MLOANS_t + \beta_5 CONSLOANS_t + \beta_6 COMMLOANS_t + \beta_7 CAP_t + \beta_8 SIZE_t + \beta_9 SDEPS_t + \beta_{10} GAP_t + \beta_{11} NCO_t + \beta_{12} NPL_t + \beta_{13} DERIV_t + \beta_{14} TRADINC_t + \beta_{15} SECINC_t + \beta_{16} SECUR_t + \varepsilon. \quad (2)$$

Under the null hypothesis of no risk relevance of securitized assets, β_1 will be zero. If, however, investors consider the securitized assets to be risk-relevant, then β_1 will be positive. We estimate equation (2) as a panel of pooled quarterly observations. The empirical model controls for other determinants of stock return volatility, including measures of on-balance sheet risk. In order to test H1a and H1b, we conduct tests at the aggregate level as well as by collateral type, both pre- and post-SFAS 166/167. Please refer to Appendix A for variable definitions.

4.2 Tests of H2: Does ON mean ON post-SFAS 166/167?

A pre-post research design, as in model (2) presents a benchmark group dilemma that has been confronted in many other settings. For example, Karolyi (2009) notes that studies that examine the effect of SOX without a clean control sample are susceptible to this dilemma. Similar to the difficulty in observing a control sample unaffected by the SOX regime, in our setting in model (2) we are unable to identify a benchmark group that is not subject to crisis-related market dislocations. Accordingly, we design and present cross-sectional tests that are conducted during the post period only. These post-period cross sectional tests should be less vulnerable to pre-post changes in economic conditions. Specifically, our test of H2 focuses on the risk relevance of on-balance sheet securitized assets in 2011–2014 period after the banks in our sample adopted SFAS 166/167. We do not include 2010 as the on-balance sheet securitization data per Y9-C Schedule HC-V are only available since 2011. We conduct the test at the aggregate level. The empirical approach is similar to that described above regarding banks' equity risk. In particular, we distinguish between VIE assets that are on-balance sheet (ONVIE) and other on-balance sheet loan

assets (LOANS_nonVIE).[9] That is, the base specification we use to empirically test H2 can be written as follows for the post-period:

$$SDRET_{t+1} = \beta_0 + \beta_1 ONVIE_t + \beta_2 ABS_t + \beta_3 ARI_t + \beta_4 MASSETG_t + \beta_5 LOANS\_nonVIE_t + \beta_6 CAP_t + \beta_7 SIZE_t + \beta_8 SDEPS_t + \beta_9 GAP_t + \beta_{10} NCO_t + \beta_{11} NPL_t + \beta_{12} DERIV_t + \beta_{13} TRADINC_t + \beta_{14} SECINC_t + \beta_{15} SECUR_t + \varepsilon. \quad (3)$$

We test the null of no risk relevance of the on-boarded assets (ONVIE), which is *per se* informative regarding the efficacy of the new standards. In addition, we test the difference between the coefficients for on-balance sheet securitized assets and unsecuritized assets that remain in the portfolio. In other words, we can test Richardson et al. (2011)'s argument that SFAS 166/167 may have gone too far in terms of consolidating VIEs with little contractual recourse to sponsors' general credit. If Richardson et al. (2011)'s argument holds then a test of difference between the coefficients of general on-balance sheet assets in the portfolio ($LOANS\_nonVIE_t$) and consolidated ONVIE assets ($ONVIE_t$) should be statistically significant. Please refer to Appendix A for variable definitions.

4.3 Tests of H3: Are there real effects due to the new standards?

In our final set of analyses, we investigate the real effects of the promulgation of the new accounting standards. We test whether, compared to the pre-SFAS 166/167 era, there is an increase in deals structured so that banks sponsoring private label RMBS (CMBS) do not retain the role as servicer (special servicer)**.** We estimate a standard linear probability model (LPM) with dependent variables that indicate whether the sponsor is the same as the servicer (for RMBS) or special

[9] As described in Appendix A, LOANS = ONVIE + LOANS_nonVIE. ONVIE and LOANS_nonVIE can be further broken down by asset type: ONVIE = ONMBS + ONCONSBS + ONCOMMBS and LOANS_nonVIE = MLOANS_nonVIE + CONSLOANS_nonVIE + COMMLOANS_nonVIE. We do not use equation (3) to test H1 since ONVIE is unavailable for the pre-SFAS 166/167 period.

servicer (for CMBS).[10] The test variable is a variable indicating the post-SFAS 166/167 period (*POST*). The base specification we use to empirically test H3 can be written as follows:

$$\text{Sponsor=Servicer}_t \text{ (or Sponsor=Special Servicer}_t) = \beta_0 + \beta_1 \text{ POST}_t + \beta_2 \text{ CAPIMP}_t + \beta_3 \text{ NINTINC}_t + \beta_4 \text{ SIZE}_t + \beta_5 \text{ MB}_t + \beta_6 \text{ MBS}_t \text{ (or COMMBS}_t) + \beta_7 \text{ MLOANS}_t \text{ (or COMMLOANS}_t) + i + \varepsilon \quad (4)$$

We include bank fixed effects (*i*) to control for time-invariant heterogeneity across banks. We control for the total volume of off-balance sheet loans (MBS for RMBS deals, and COMMBS for CMBS deals) to account for the possibility that sponsors cede servicing functions due to declines in securitization volume. To further lend validity to our predictions, we estimate augmented versions of these models after incorporating an additional variable that interacts *POST* with variables that capture the benefits and costs of ceding the servicing function. The downward pressure on banks' Tier 1 capital ratios had the deal been consolidated under SFAS 166/167 (*CAPIMP*) measures the benefits in terms of mitigating adverse impacts on capital ratios due to consolidation. Noninterest income divided by total assets (*NINTINC*) captures direct benefits from keeping the servicing function that promote more loan sales and securitization (e.g., net servicing fees, net securitization income, net gains and losses on sales of loans) and indirect benefits from cross-selling opportunities derived from the servicing function (e.g., income from fiduciary activities, investment banking, advisory, brokerage, and underwriting fees and commissions, and underwriting income from insurance and reinsurance activities). If the estimated results are consistent with our predictions, we expect a negative main effect on *POST* and a negative (positive) interaction effect on *POST*×*CAPIMP* (*POST*×*NINTINC*). To address an alternative explanation that the change in structuring behavior documented could be caused by regulatory capital penalties

[10] The LPM model allows for direct interpretation of estimated coefficients. We note that our inferences are similar using a probit model.

for loan servicing rights (and consequent incentives to shed servicing) under the newly enacted Basel III bank regulatory regime (e.g., Hendricks et al. 2016), we also interact the Hendricks et al.'s (2016) bank-specific regulatory pressure variable (*PRESSURE*) with *POST* to control for this alternative explanation. Please refer to Appendix B for variable definitions.

5. Results

5.1 Descriptive Statistics

Table 1 provides descriptive statistics for the risk relevance tests on the efficacy of SFAS 166/167 found in Tables 2 and 3. Panel A of Table 1 provides statistics for the 22 bank holding companies in our sample over the 2001–2006 period (the pre-166/167 era) and Panel B of Table 1 provides statistics for the 22 bank holding companies in our sample over the 2011–2014 period (the post-166/167 era). Note that here and in our regression analyses, we omit the financial crisis period (2007-2010) to ensure that this event does not drive our results. *ABS*, the total principal balance of aggregated assets securitized from Form Y9-C (as a fraction of beginning of quarter market value of equity), rose from 1.176 in the 2001-2006 period to 2.300 in the 2010-2014 period. A closer look reveals that this increase in ABS between the pre- and post- periods is driven primarily by an increase in securitized mortgages (MBS). Using the Home Mortgage Disclosure Act (HMDA) database, we estimate the portion of MBS sold to government-sponsored enterprises (GSEs) as the amount of MBS times the cumulative approved mortgages sold to GSEs over the past five years divided by the cumulative approved mortgages sold over past five years. The scaled measures of agency-backed mortgage back securities (GMBS) increased from 0.353 in the pre-period to 1.872 in the post-period, whereas private label MBSs (PLMBS) declined from 0.668 to 0.270, reflecting primarily a drop in issuance and some consolidation of pre-existing private label

securitizations in the post-period. This is consistent with broad changes in the mix of assets that are being securitized across the two periods. This shift towards agency-backed securities indicates a flight to quality in the securitization markets. Further, Table 1 also highlights the sharp decline in the amount of off-balance sheet securitized consumer loans (CONSBS) loans during these two periods, partly due to declines in issuance and partly due to virtually complete consolidation of certain pre-existing securitizations such as those of credit cards. In terms of loans retained in the portfolio, we notice an increase in the proportion of mortgage and commercial loans (MLOANS and COMMLOANS), and a decrease in consumer loans (CONSLOANS). In terms of risk, the descriptive statistics also point towards increased volatility (SDEPS) and expected credit losses (NPL) in the post-crisis period. The descriptive statistics for other firm-level variables are provided in Table 1 for both the periods under consideration.[11]

5.2 Does OFF mean OFF post-SFAS 166/167?

Panel A of Table 2 presents regression results for the risk relevance of aggregate securitized assets in the pre-SFAS 166/167 era in Column (1) and for the post-166/167 era in Column (2). Column (1) is effectually a replication of Chen et al. (2008) with our sample. As such, we find that the coefficient on *ABS* in Column (1) is statistically significant, consistent with Chen et al. (2008) and our first hypothesis. In contrast, the coefficient on *ABS* in Column (2) is statistically insignificant, which is consistent with our second hypothesis in that OFF truly means OFF. Overall, the results in Panel A imply that the new 166/167 standard leaves securitizations off-balance sheet when there is no continuing involvement and recourse, supporting the view that the new

[11] For brevity, we have not provided descriptive statistics for the value relevance tests discussed in Section 6, which upon inspection reveal themselves to be unremarkable except that the market value of banks' equity has declined on average in the post period.

accounting standard appropriately reflects the underlying economics of the transactions, and in particular reflecting the retained credit risk of the sponsoring bank.[12]

Panel B of Table 2 presents regression results for the risk relevance of securitized assets by collateral type. The collateral level tests are motivated in part by the qualitative analysis and discussion provided in the Federal Reserve's Report to the Congress on Risk Retention (2010) about the likely differential impact of SFAS 166/167 on different collateral types. We find that the collateral types that received off-balance sheet treatment in the post-166/167 era (i.e., *COMMBS*, *MBS*, *CONSBS*) exhibit no risk relevance, corroborating the aggregate results found in Panel A. With respect to *MBS*, we note that agency MBSs continued to receive off-balance sheet treatment in the post-period. We would not expect that agency RMBS is risk relevant in either period. However, some private label securitizations were likely on-boarded unless servicing rights were assigned to a third party (this is also confirmed by our reading of banks' annual reports). Accordingly, we conjecture that the difference in the risk relevance of MBS is solely driven by private label RMBS. With respect to *CONSBS*, virtually all credit card securitizations are back on the balance sheet in the post-period, which explains the difference in risk relevance for that collateral type. Overall, we interpret the evidence presented in Panels A and B of Table 2 as

[12] We note an increase in the ARI coefficient in the post-period. We conjecture this could be a reflection of the fact that considerable consumer loans are consolidated and their retained interests are removed from ARI post-SFAS 166/167. In particular, as per Chen et al. (2008), retained interests on consumer loans is expected to be insignificantly related to risk-retention by the sponsor due to moral recourse, and retained interests in securitized C&I loans are expected to be risk-relevant. When we remove retained interests on consumer loans from ARI, we obtain similar coefficients across the two periods.

supportive of the view that the new GAAP standard appears to reflect the underlying economics of the transactions.[13,14]

For the first column of Panels A and B of Table 2, we compare our coefficient estimates to Chen et al. (2008). Beginning with column (1) of Panel A of Table 2, our coefficient estimate for *ABS* is 0.08, which is slightly smaller than the 0.12 documented in Table 4 of the Chen et al. (2008) study. Further, in column (1) of Panel B of Table 2, we disaggregate securitizations and loans by asset class, which allows for a better comparison with the coefficient estimates found in Table 4 of the Chen et al. (2008) study. With respect to the test variables of interest (*MBS*, *CONSBS*, and *COMMBS)*, we obtain a coefficient magnitude for *MBS* which is similar to that reported by Chen et al. (2008) and, like their study, we report statistical insignificance for *COMMBS*.[15] Our estimate for *CONSBS* is positive and statistically significant at the 0.10 level (two-sided), similar to Chen et al. (2008).

Because we would like to attribute the results in Panels A and B of Table 2 to the change in accounting for securitizations under SFAS 166/167, it is important for us to rule out possible confounds to this interpretation. One threat to our accounting based interpretation relates to a change in the mix of securitization products, due largely to fluctuating demand for asset-backed securities following the financial crisis. Specifically, a decreased demand for private label RMBS could reduce our ability to draw valid inferences about the new GAAP for securitizations under SFAS 166/167. We attempt to rule out this confound by separately testing the effects of agency

[13] From the pre- to the post-period, the variance of SDRET increases by a factor of 3.99. In terms of the regression, the total sum of squares increases to a significantly greater extent than the residual sum of squares, driving the difference in R^2.

[14] Untabulated results show robustness to using total assets as a scalar for the variables instead of market value of equity.

[15] As a robustness test, we re-estimate our SDRET regressions by winsorizing securitization variables at the 2.5% or 5% level and estimate a Least Absolute Deviation (LAD) regression. Our results are robust to these approaches to reducing the weight put on influential observations.

versus private label RMBS. The results from this estimation can be found in Panel C of Table 2. We find that agency RMBS ("GMBS") are not risk relevant either before SFAS 166/167 or after. On the other hand, private label RMBS ("PLMBS") are risk relevant prior to SFAS 166/167 but not after. Since we find that the difference in risk relevance of RMBS across the pre- and post-periods is driven solely by private label RMBS (i.e., agency RMBS are off-balance sheet in both periods), it does not appear that a change in the mix of securitization products alone explains our Panel A and B results.[16] In other words, it is unlikely that a change in demand alone for private label RMBS impacts the risk-relevance for those securitizations (unless there is a concurrent change in the structuring of the deals—an aspect that we study in the next section on real effects).

To further corroborate our results in Panels A–C, we next use CDS spreads as the dependent variable. CDS spreads are a widely-used proxy for credit risk, and are potentially less affected by other factors such as information risk, a focus of Oz (2013). Panel D of Table 2 reports the results of our CDS spread tests and confirms our baseline results that use stock return volatility as the dependent variable. Both MBS and CONSBS have positive, statistically significant coefficient estimates during 2001–2006 and statistically insignificant coefficient estimates during 2011–2014. It appears that CDS prices, which incorporate significant private information, do not appear to attribute economic risk to the sponsoring bank holding company following the adoption of SFAS 166/167—again consistent with the notion that the new accounting for securitizations appropriately reflects the underlying economics of the transactions.

[16] To rule out the possibility that the change in risk relevance is because off-balance-sheet securitized assets become less risky after the financial crisis, we examine whether the net loan charge-offs of off-balance sheet securitized loans (divided by the total principal balance of off-balance sheet securitized assets) during the pre-period are significantly higher than that during the post-period. We do not find a statistically significant difference (t=-0.32) between these two periods.

5.3 Does ON mean ON post-SFAS 166/167?

Table 3 presents regression results on the risk relevance of on-balance sheet securitized assets in the post-SFAS 166/167 period. As discussed earlier, if the new standards reflect the underlying economics of the transactions, securitized assets that banks consolidate because of SFAS 166/167 should have some observed risk relevance (H2a), and similar risk relevance to unsecuritized assets already on the balance sheet (H2b). Using *SDRET* as the dependent variable, Column (1) of Table 3 indicates that the estimated risk relevance coefficient of 0.5800 for on-balance sheet securitized assets (*ONVIE*) is positive and significant at the 1% level . Column (2) repeats the same analysis but disaggregates on-balance sheet securitized assets into three categories (mortgages, consumer, and commercial).[17] The estimated coefficient of 0.1467 for mortgages in consolidated VIEs (*ONMBS*) is positive and significant at the 1% level and the estimated coefficient of 0.3603 for consumer loans in consolidated VIEs (*ONCONSBS*) is positive and significant at the 10% level.[18] Thus, our results are consistent with H2a.

We also test for (i) a difference between the risk relevance of on-balance sheet securitized assets (*ONVIE*) and off-balance sheet securitized assets (*ABS*) and (ii) following H2b, on-balance sheet securitized assets (*ONVIE*) and similar (unsecuritized) assets already on the balance sheet (*LOANS_nonVIE*). The *F*-test of *ONVIE = ABS* reported in Column (1) of Table 3 is statistically significant (p=0.09), indicating greater risk relevance for *ONVIE* in the post-SFAS 166/167 period.

[17] Form Y-9C Schedule HC-V does not disaggregate loan assets by type. We follow Dou, Ryan, and Xie (2016) to estimate the fraction of each category. Specifically, we calculate changes in off-balance sheet securitized mortgages, consumer loans, and commercial loans from 2009Q4 to 2010Q1. Negative changes are set to zero and then ONVIE is assigned to the three categories proportionally based on the changes.

[18] The lack of significance on ONCOMMBS and COMMLOANS_nonVIE can be conjecturally attributed to the following argument in Chen et al. (2008, p. 1174) that these amounts "…could be positively or negatively correlated with 'total equity risk' depending on various factors including banks' risk management guidelines and choices as to which of each of the three types of loans to hold versus securitize and how extensively they hedge the risks of the types of loans they hold."

The *F*-test of *ONVIE* = *LOANS_nonVIE* reported in Column (1) of Table 3 is statistically insignificant (p=0.12), indicating that the risk relevance between *ONVIE* and *LOANS_nonVIE* is similar in the post-SFAS 166/167 period (H2b). This result is consistent with our hypothesis that "ON means ON" in the post period, and that the provisions of SFAS 166/167 do not appear to go too far in forcing the consolidation of securitization assets that do not pose economic risk to the sponsoring banks. We obtain similar inferences when conducting *F*-tests of comparisons between disaggregated versions of on-balance sheet securitized assets and their off-balance sheet counterparts and on-balance sheet portfolio loans. Specifically, an *F*-test of *ONMBS* = *MBS* (*ONCONSBS* = *CONSBS*) is statistically significant at the 10% (10%) level and an *F*-test of *ONMBS* = *MLOANS_nonVIE* (*ONCONSBS* = *CONSLOANS_nonVIE*) is statistically insignificant with a *p*-value of 0.18 (0.88).[19] In sum, the body of evidence provided in Table 3 further supports the view that the new accounting standards appropriately reflect the underlying economics of the transactions since the bank combines on-boarded assets with assets that it fully controls—and that these on-boarded assets appear to have similar risk relevance as other consolidated loans in the banks' portfolios. This evidence is inconsistent with the arguments presented by Richardson et al. (2011) and instead is suggestive of investors assessing continued implicit recourse to sponsors' general credit.

5.4 Are there real effects due to the new standards?

In our final set of analyses, we turn to an examine of real effects. Our sample of bank holding companies in Table 1 is matched to the deal tape in ABS Alert and CM Alert by sponsor name. For each collateral type, we focus on banks issuing at least one securitization deal backed

[19] The F-tests for contrasts involving *ONCOMMBS* lack relevance given the insignificance of coefficients for *ONCOMMBS* and *COMMLOANS_nonVIE* reported in Table 3.

by that type of collateral. We initially descriptively document the yearly amounts and frequencies of securitizations for major collateral classes in Table 4. Further, we tabulate the proportion of RMBS issues with the sponsor also being the servicer and the proportion of CMBS issues with the sponsor also being the special servicer. In order to avoid consolidation, we expect fewer RMBS issues in which the sponsor is the servicer and fewer CMBS issues in which the sponsor is the special servicer in the post-SFAS 166/167 period.

We note that while the amount/frequency of securitization issuances have generally dropped during post-SFAS 166/167 period, we cannot necessarily attribute this drop solely to the impact of the new accounting standards. It may be true that the new accounting standards have rendered securitizations less attractive from a regulatory capital arbitrage perspective by forcing consolidation of many of the former QSPEs. We could also attribute this time trend to a general reduction in demand due to a decline in the attractiveness of securitizations to ABS investors. Turning to the fraction of issues in which sponsors also act as servicers or special servicers, we observe a decline in the fraction after 2009 for both RMBS and CMBS issues. We believe that it is more difficult to attribute the change in structure choices to the decline in general attractiveness of securitizations.

In consideration of the above, we now focus on the effects that we can more cleanly attribute to the accounting standards: the change in the structure of securitization deals to meet certain financial reporting objectives. We conduct the analysis at the bank-deal level where each deal is matched to bank characteristics preceding the deal issuance. As discussed earlier, we predict that banks will try to avoid consolidation of securitization structures under the new standards by changing key elements of the structure, and that such behavior is likely to be more pronounced for banks facing more downward pressure on capital ratios.

Table 5 presents descriptive statistics for both the RMBS and CMBS samples for the combined pre- and post-SFAS 166/167 periods. On average, a sponsor is also a servicer for 46.8% of RMBS issues, and a sponsor is also a special servicer for 7% of CMBS issues. In Figure 1, we graphically depict evidence that is consistent with H3 insofar as we see a stark decline in the proportion of new RMBS (CMBS) issues for which the sponsor retained the servicing (special servicing) function. We next test H3 formally using regression analyses in Table 6. Consistent with H3a, we report a negative and significant coefficient for *POST* of -0.533 in Column (1) of Table 6 Panel A, suggesting that sponsors of RMBS securitizations are less likely to retain the servicing function in the post-SFAS 166/167 period in an effort to avoid consolidation. In terms of economic significance, the probability of sponsors retaining the servicing function decreases by 33.2%. In Column (2) of Table 6, Panel A, we document a significant negative coefficient of -0.235 for *POST*×*CAPIMP* ($p<0.05$), which indicates that this structuring behavior is more of a concern for banks with more downward pressure on Tier 1 regulatory capital ratios under SFAS 166/167. In particular, a one percent increase in the downward pressure on Tier 1 ratio increases the reduction in the probability of sponsors being servicers after SFAS 166/167 by 23.5%. We also document a significant positive coefficient of 9.358 for *POST*×*NINTINC* ($p<0.05$), which indicates that banks benefiting more from the servicing function directly and indirectly are more likely to keep this role. We find a significant negative coefficient of -.093 for *POST*×*PRESSURE* ($p<0.05$), confirming a distinct effect of regulatory pressure related to Basel III. Panel B of Table 6 provides similar evidence for H3b in the context of commercial mortgage backed securitizations, except that the dependent variable indicates whether the sponsor is the special servicer. We find that the probability of sponsors retaining the special servicing function declines after SFAS 166/167, and that a one percent increase in the downward pressure on Tier 1 ratio increases the

reduction by 60.6%. We also find that Basel III related regulatory pressure (captured by the negative coefficient of -.223 for *POST×PRESSURE*) reduces the likelihood that banks serve as special servicers following the adoption of SFAS 166/167, again consistent with evidence in Hendricks et al. (2016) regarding operational and financial reporting changes during the Basel III proposal period.

In Table 7, we provide supplemental analysis that validates the argument that a sponsor being the servicer (special servicer) of the same RMBS (CMBS) issue increases the likelihood of consolidating the securitization according to the criteria in SFAS 166/167. As there is no issue-level data on whether a securitization issue is consolidated, we rely on bank annual reports to collect the disclosed amounts of non-agency residential mortgage backed / commercial mortgage backed VIEs that banks consolidated during 2011–2014.[20] For our sample banks, we are able to collect the data for 141 bank-year observations. For each bank-year, we scale the total consolidated amount by the total balance of securitized 1-4 family residential loans (securitized commercial mortgage loans) for RMBS (CMBS) and obtain the variable *NONAGENCY_MORTG_ON* (*COMMERCIAL_ON*) which reflects the proportion of securitized assets that are consolidated. To measure the intensity of involvement in servicing underlying loans, for each bank, following Dou et al. (2014), we aggregate the RMBS (CMBS) issues issued during the past five years and calculate *RMBS SPONSOR=SERVICER* (*CMBS SPONSOR=SPECIAL SERVICER*) as the fraction of RMBS (CMBS) issues where the sponsor is also the servicer (special servicer) during the past five years. We find a correlation between *RMBS SPONSOR=SERVICER* and *NONAGENCY_MORTG_ON* of 0.764 ($p<0.01$) and a correlation between *CMBS SPONSOR=SPECIAL SERVICER* and *COMMERCIAL_ON* of 0.375 ($p<0.01$). These findings

[20] We note as a caveat that our hand-collected data for this validation test may be subject to measurement error.

suggest that retention of servicing (special servicing) function in the post-SFAS 166/167 period leads to a higher likelihood of consolidation.

6. Robustness tests using value relevance methodology

We conduct robustness tests of H1 and H2 using a value-relevance approach since such an approach permits retained credit risk inferences that extend to both VIE liabilities and assets. To test the Richardson et al. (2011) claim that SFAS 166/167 went too far in terms of consolidation of assets and liabilities, we need a model that tests for the relevance of assets as well as liabilities in the same theoretically consistent model (e.g., accounting valuation models motivated by Ohlson 1995). If the new accounting standards appropriately reflect the underlying economics of the transaction, investors should assign the same value relevance to consolidated VIE assets and liabilities as those that are not securitized. We adopt the approach followed by Landsman et al. (2008) to test for value relevance. That is, we start with the following basic equation:

$$MVE_t = \beta_0 + \beta_1 ASSETS_t + \beta_2 LIAB_t + \beta_3 NI_t + \varepsilon \quad (4)$$

where MVE_t, $ASSETS_t$, and $LIAB_t$ are the market value of equity at the fiscal year end, the total assets, and total liabilities, without distinguishing whether the assets and liabilities are off- or on-balance sheet. NI_t is the net income earned during the year. Accounting valuation theory (e.g., Ohlson 1995) suggests that the theoretically correct coefficients for correctly measured assets (β_1) and liabilities (β_2) should be 1 and -1 respectively.

Next, we break out the assets and liabilities into those that are on- and off-balance sheet. This basic specification can in fact be tested even given data availability in the pre-SFAS166/167 era, as is shown below in equation (5-pre). Data availability improved in the post-period, allowing us to further test the relevance of on-balance sheet consolidated VIE assets and liabilities.

Accordingly, in equation (5-post) below, the on-balance sheet assets and liabilities are disaggregated into those that pertain to consolidated VIEs and those that are the general non-VIE on-balance sheet assets and liabilities:

$$MVE_t = \beta_0 + \beta_1 ADJ\_ASSET_t + \beta_2 LIAB_t + \beta_3 OFFVIE\_ASSET_t + \beta_4 OFFVIE\_LIAB_t + \beta_7 ADJ\_NI_t + \varepsilon \quad \text{(5-pre)}$$

$$MVE_t = \beta_0 + \beta_1 ADJ\_ASSET\_nonVIE_t + \beta_2 ONVIE\_ASSET_t + \beta_3 LIAB\_nonVIE_t + \beta_4 ONVIE\_LIAB_t + \beta_5 ABS_t + \beta_6 OFFVIE\_LIAB_t + \beta_7 ADJ\_NI_t + \varepsilon \quad \text{(5-post)}$$

where $OFFVIE\_ASSET_t$ and $OFFVIE\_LIAB_t$ are off-balance sheet securitized assets and liabilities; $ONVIE\_ASSET_t$ and $ONVIE\_LIAB_t$ are on-balance sheet assets and liabilities pertaining to consolidated VIEs; adjusted assets for the pre-period are ADJ_ASSET_t calculated as $ASSET_t$ – (servicing assets and retained interests); adjusted assets for the post-period are $ADJ\_ASSET\_nonVIE_t$ calculated as $ASSET_t - ONVIE\_ASSET_t$; total liabilities for the pre-period are $LIAB_t$; adjusted liabilities for the post-period are $LIAB\_nonVIE_t$ calculated as $LIAB_t - ONVIE\_LIAB_t$ for the post period; adjusted net income is ADJ_NI_t, calculated as net income – securitization gains (losses).[21] Consistent with Landsman et al. (2008), we estimate the regressions using per share amounts.[22]

Equations (5-pre) and (5-post) offer several advantages. First, they can be used to test the value relevance of both off- and on-balance sheet assets and liabilities simultaneously. Second, while both information risk and economic risk can impact the stock return volatility in equations (1) and (2), the value relevance approach in equations (5-pre) and (5-post) allows us to test the

[21] We note that for the pre-period tests, the ONVIE amounts are unavailable, so the adjusted assets and liabilities amounts are not adjusted by the consolidated VIE amounts in the pre-period, permitting only a test of H1 in the pre-period.

[22] The results are robust to using undeflated amounts (Barth and Clinch 2009).

recognition perspective in which we are interested.[23] Finally, it allows us to test whether the coefficients on various cuts of assets and liabilities are equal to the theoretically correct levels of 1 and -1 respectively.

The results of our robustness tests, presented in Table 8, are supportive of our primary risk relevance results related to H1 and H2. Consistent with our return volatility results, we find that off-balance sheet securitization assets (OFFVIE_ASSET) and liabilities (OFFVIE_LIAB) are value relevant during 2001–2006 (coefficients of 1.2711 and −1.2593, respectively, significant at the 5% level), but that they are not during 2011–2014 (insignificant coefficients of 0.3304 and −0.3285, respectively). Thus, from a value relevance perspective OFF appears to mean OFF following the adoption of SFAS 166/167. We conduct a series of *F*-tests to further support of our primary risk relevance results related to H1 and H2. *F*-tests of the equality of the coefficients on ONVIE_ASSET and OFFVIE_ASSET, and ONVIE_LIAB and OFFVIE_LIAB, reject a null of no difference (p=0.03 and 0.07, respectively), suggesting that there is a significantly different value relevance for securitized assets that are unconsolidated compared to those that are consolidated—again suggesting that SFAS 166/167 lead to meaningful labels of ON and OFF. Furthermore, *F*-tests of the equality of the coefficients on ADJ_ASSET_nonVIE compared to ONVIE_ASSET and on LIAB_nonVIE compared to ONVIE_LIAB fail to reject a null of no difference (p=0.29 and 0.91, respectively), suggesting that there is no significantly different value relevance for consolidated VIE assets and liabilities as well as unsecuritized on-balance sheet assets and liabilities. We also note that *F*-tests cannot reject the null of no difference between

[23] Note that while we first and foremost study a recognition question in this paper, we also acknowledge that recognition and measurement are not completely independent issues. Ryan (2007) discusses an embedded measurement issue in the recognition choice — if we measure securitizations in a gross-up fashion, then banks should consolidate them. On the other hand, if we measure securitization as a net value, then only the retained interest is recognized.

ONVIE_ASSET and 1, and ONVIE_LIAB and -1, respectively.[24] The preceding *F*-tests suggest that investors accord no difference to consolidated VIE and other on-balance sheet (non-VIE) assets and liabilities, suggesting that they concur with the ON and OFF classification under the new GAAP (i.e., the entirety of consolidated assets and liabilities are viewed as value relevant). Overall, the results in Table 8 not only support the evidence in Tables 2 and 3 regarding the extent to which banks retain credit risk, but also suggest that SFAS 166/167 appropriately reflects the underlying economics of the transaction insofar as the minimal contractual recourse to sponsors' general credit for consolidated VIE liabilities appears to be overshadowed by the possibility of implicit recourse.

7. Conclusion

Critics have alleged that securitization accounting prior to 2010 was among the causes of the recent financial crisis. U.S. bank regulatory agencies have taken the position that the previous off-balance sheet treatment allowed banks to "obtain lower regulatory capital requirements without a commensurate reduction in risk." In response to this criticism and calls for revised accounting standards that better reflect a bank's exposure to credit risk related to securitized assets, the Financial Accounting Standards Board (FASB) implemented two new accounting standards, SFAS 166 and SFAS 167, to improve the financial reporting for off-balance-sheet entities. A major objective of the FASB for the new consolidation model underlying SFAS 166/167 was to achieve on- and off-balance sheet recognition choices that better align with the extent to which banks retain the risks of securitized loans. In new regulatory capital requirements adopted in 2010, bank

[24] Lending credence to our empirical specification, we note that the F-tests also indicate that the coefficients on unsecuritized on-balance sheet assets and liabilities are statistically indistinguishable from the theoretically correct unity level.

regulators will use consolidated assets and liabilities as an initial basis for determining a bank's minimum risk-based capital. Bank regulators have stated their belief that SFAS 166/167 will result in a consolidated balance sheet (and risk-based capital ratios based thereupon) that better reflects exposure to credit risk.

We investigate whether the on- and off-balance sheet recognition choices after SFAS 166/167 better reflect the extent to which banks retain the credit risks of securitized loans. We rely on the assumption that regulators' views regarding the appropriateness of using accounting for the purposes of measuring bank assets, liabilities, and regulatory capital are positively correlated with those of capital market participants. Our evidence is consistent with the consolidated balance sheets under SFAS 166/167 better reflecting banking organizations' total exposure to credit risk. In particular, following SFAS 166/167, equity investors of sponsoring banks do not consider (consider) as risk relevant securitizations that receive off-balance sheet (on-balance sheet) treatment.

For VIE assets consolidated as a result of SFAS 166/167, our evidence is inconsistent with the position of Richardson, Ronen, and Subrahmanyam (2011) that banking organizations' exposure to credit risk is limited to the contractual exposure of the sponsoring banks with respect to securitized assets. Investors assign the same risk relevance to assets of consolidated VIEs as those that are not securitized, despite contractual provisions that would seem to imply substantial risk transference to VIE investors. We attribute this finding to non-contractual recourse. The U.S. bank regulatory agencies and the FASB's views are congruent with investors' assessments VIE contractual exposure potentially underestimates the true exposure of sponsoring banks to the credit risk of securitization activities.

Further, we document that, by ceding retained power or influence through the servicing / special servicing functions to third parties, SFAS 166/167 resulted in real effects to the extent that banks (particularly those that were weakly capitalized) achieved their accounting objectives in the post-SFAS 166/167 period through legitimate transaction structuring in line with the intent of the new rules.

Our research, which demonstrates that on- and off-balance sheet recognition choices after SFAS 166/167 better reflect the extent to which banks retain the credit risks of securitized loans, complements evidence in concurrent papers such as Oz (2013). The results of Oz (2013) permit an inference that the total information sources about the VIEs of securitizing banks increased in the post relative to the pre SFAS 166/167 era. Our results imply that, given the information set available, investors concur with the accounting classification and recognition according to the new standards. In other words, regulatory capital assessments based on SFAS 166/167 are more likely to reflect sponsoring banks' risk-retention in securitizations.

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Appendix A – Variable Definitions for the Risk and Value Relevance Tests

SDRET	Standard deviation of daily stock returns during quarter *t+1*
ABS	The total principal balance of off-balance sheet securitized assets from Form Y9-C Schedule HC-S divided by beginning of quarter market value of equity
MBS	The total principal balance of off-balance sheet securitized 1-4 family residential loans from Form Y9-C Schedule HC-S divided by beginning of quarter market value of equity
GMBS	The portion of MBS sold to GSEs from the HMDA database, calculated as the amount of MBS times cumulative approved mortgages sold to GSEs over past five years divided by the cumulative approved mortgages sold over past five years
PLMBS	The portion of MBS sold to non-GSEs (or private label MBS), calculated as MBS minus GMBS
CONSBS	The total principal balance of off-balance sheet securitized consumer loans, including home equity loans, credit card receivables, auto loans, and other consumer loans from Form Y9-C Schedule HC-S divided by beginning of quarter market value of equity
COMMBS	The total principal balance of off-balance sheet securitized commercial loans, including commercial and industrial loans and all other loans from Form Y9-C Schedule HC-S divided by beginning of quarter market value of equity
ARI	Credit enhancing interest-only strips, subordinated securities, and other residual interests for all asset classes from Form Y9-C Schedule HC-S divided by beginning of quarter market value of equity
MASSETG	Percentage growth in managed assets for the quarter (bank total assets on balance sheets + the total principal balance of off-balance sheet securitized assets from Form Y9-C Schedule HC-S)
LOANS	Total loans divided by beginning of quarter market value of equity. Note that LOANS = ONVIE + LOANS_nonVIE.
ONVIE	Total loans in consolidated securitization related variable interest entities from Form Y9-C Schedule HC-V for 2011-2014 divided by beginning of quarter market value of equity. Note that ONVIE = LOANS – LOANS_nonVIE = ONMBS + ONCONSBS + ONCOMMBS.
ONMBS	The portion of ONVIE that is 1-4 family residential loans, calculated as ONVIE times the change in off-balance sheet securitized 1-4 family residential loans from 2009Q4 to 2010Q1, divided by the sum of changes in off-balance sheet securitized 1-4 family residential loans, consumer loans, and commercial loans from 2009Q4 to 2010Q1. We set all negative changes to zero
ONCONSBS	The portion of ONVIE that is consumer loans, calculated as ONVIE times the change in off-balance sheet securitized consumer loans from 2009Q4 to 2010Q1, divided by the sum

	of changes in off-balance sheet securitized 1-4 family residential loans, consumer loans, and commercial loans from 2009Q4 to 2010Q1. We set all negative changes to zero
ONCOMMBS	The portion of ONVIE that is commercial loans, calculated as ONVIE times the change in off-balance sheet securitized commercial loans from 2009Q4 to 2010Q1, divided by the sum of changes in off-balance sheet securitized 1-4 family residential loans, consumer loans, and commercial loans from 2009Q4 to 2010Q1. We set all negative changes to zero
LOANS_nonVIE	Total loans other than loans in consolidated securitization related variable interest entities from Form Y9-C Schedule HC-V for 2011-2014 divided by beginning of quarter market value of equity. Note that LOANS_nonVIE = LOANS – ONVIE = MLOANS_nonVIE + CONSLOANS_nonVIE + COMMLOANS_nonVIE.
MLOANS	On-balance sheet mortgage loans divided by beginning of quarter market value of equity
CONSLOANS	On-balance sheet consumer loans, including credit card, revolving credit, auto, and other consumer loans divided by beginning of quarter market value of equity
COMMLOANS	On-balance sheet commercial loans, including commercial and industrial loans divided by beginning of quarter market value of equity
MLOANS_nonVIE	On-balance sheet mortgage loans other than the 1-4 family residential loans in consolidated securitization related variable interest entities from Form Y9-C Schedule HC-V for 2011-2014 divided by beginning of quarter market value of equity
CONSLOANS_nonVIE	On-balance sheet consumer loans other than the consumer loans in consolidated securitization related variable interest entities from Form Y9-C Schedule HC-V for 2011-2014 divided by beginning of quarter market value of equity
COMMLOANS_nonVIE	On-balance sheet commercial loans other than the commercial loans in consolidated securitization related variable interest entities from Form Y9-C Schedule HC-V for 2011-2014 divided by beginning of quarter market value of equity
CAP	Tier 1 risk-based capital ratio
SIZE	Logarithm of total assets ($ thousands)
SDEPS	Standard deviation of earnings per share for past six quarters
GAP	Absolute value of difference between book values of assets and liabilities expected to reprice in the following year divided by beginning of quarter market value of equity
NCO	Net loan charge-offs of securitized loans during quarter divided by the total principal balance of off-balance sheet securitized assets from Form Y9-C Schedule HC-S
NPL	Total past due loans divided by the total principal balance of off-balance sheet securitized assets from Form Y9-C Schedule HC-S
DERIV	Notional amounts of interest-rate derivatives divided by beginning of quarter market value of equity

TRADINC	Trading income during quarter divided by beginning of quarter market value of equity
SECINC	Servicing fee and securitization income during quarter divided by beginning of quarter market value of equity
SECUR	Total (trading, available-for-sale, and held-to-maturity) securities minus ARI divided by total assets
MVE	The stock price 3 months after the year-end
ADJ_ASSET	Total assets minus retained interests and servicing rights from securitization transactions, deflated by common shares outstanding 3 months after the year-end
ADJ_ASSET_nonVIE	ADJ_ASSET minus ONVIE_ASSETS
ONVIE_ASSET	Total assets in consolidated securitization related variable interest entities from Form Y9-C Schedule HC-V for 2011-2014, deflated by common shares outstanding 3 months after the year-end
LIAB	Total liabilities, deflated by common shares outstanding 3 months after the year-end
LIAB_nonVIE	LIAB minus ONVIE_LIAB
ONVIE_LIAB	Total liabilities in consolidated securitization related variable interest entities from Form Y9-C Schedule HC-V for 2011-2014, deflated by common shares outstanding 3 months after the year-end
OFFVIE_ASSET	Total off-balance sheet securitized assets, deflated by common shares outstanding 3 months after the year-end
OFFVIE_LIAB	Total off-balance sheet securitization liabilities, deflated by common shares outstanding 3 months after the year-end
ADJ_NI	Net income minus gains (losses) from securitization, deflated by common shares outstanding 3 months after the year-end
SPREAD	Average of daily CDS premiums (in basis points) over quarter *t+1* for the sponsor, as reported by Markit

Appendix B – Variable Definitions for the Real Effects Tests

Variables at the securitization issue level used in Tables 6 and 7	
SPONSOR = SERVICER	An indicator equal to one if the sponsor is also the servicer for the RMBS deal, zero otherwise.
SPONSOR = SPECIAL SERVICER	An indicator equal to one if the sponsor is also the special servicer for the CMBS deal, zero otherwise.
POST	An indicator equal to one for year 2010 and afterwards, zero otherwise.
CAPIMP	The reported tier 1 risk-based capital ratio minus the tier 1 risk-based capital ratio as if the deal is consolidated, times 100, divided by the reported tier 1 risk-based capital ratio. For RMBS deals, the as-if ratio is calculated as the tier 1 capital divided by risk-weighted assets plus total deal amounts times 50%. For CMBS deals, the as-if ratio is calculated as the tier 1 capital divided by risk-weighted assets plus total deal amounts
NINTINC	Noninterest income divided by total assets
PRESSURE	An indicator equal to one for banks subject to Basel III pressure, identified by Hendricks et al. (2016)
SIZE	Logarithm of total assets ($ thousands)
MB	The market value of equity divided by the book value of equity.
MBS	The total principal balance of 1-4 family residential loans securitized from Form Y9-C Schedule HC-S divided by beginning of quarter market value of equity
MLOANS	Mortgage loans divided by beginning of quarter market value of equity
COMMBS	The total principal balance of commercial and industrial loans and all other loans securitized from Form Y9-C Schedule HC-S divided by beginning of quarter market value of equity
COMMLOANS	Commercial and industrial loans divided by beginning of quarter market value of equity
Variables at the bank-year level used in correlation test in Table 8	
RMBS SPONSOR=SERVICER	The fraction of RMBS securitization issues with the same sponsor and servicer over past five years, using the ABS Alert database
CMBS SPONSOR=SPECIAL SERVICER	The fraction of CMBS deals with the same sponsor and special servicer over past five years, using the CM Alert database
NONAGENCY_MORTG_ON	The percentage of non-agency MBS securitizations that are accounted for as on-balance sheet and are hand-collected from annual reports of banks during the 2010-2013 period
COMMERCIAL_ON	The percentage of CMBS securitizations that are accounted for as on-balance sheet and are hand-collected from annual reports of banks during the 2010-2013 period

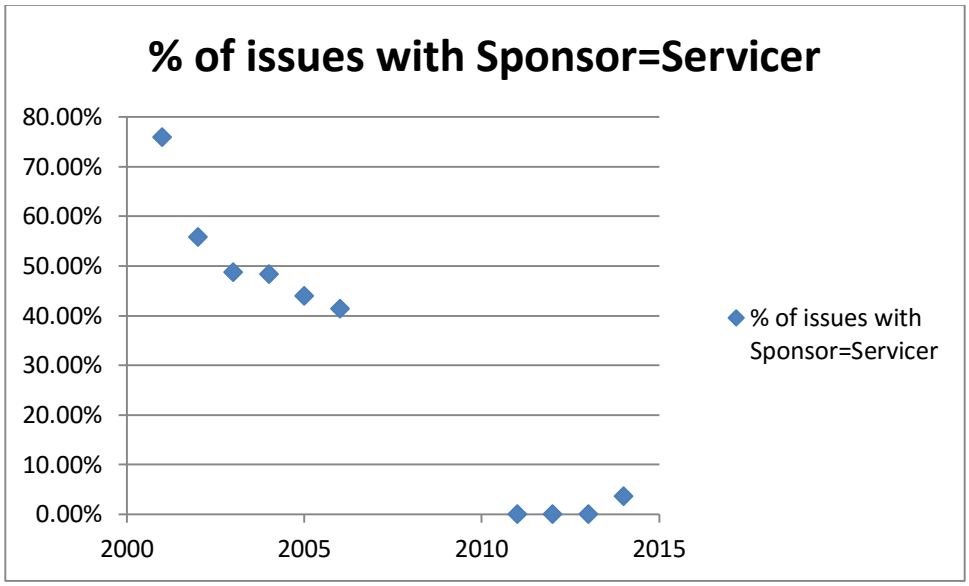
Appendix C – Assets On-boarded Consequent to SFAS 166/167 by Firm

Name of Bank	Onboarding as a % of Total Assets
American Express	21.8%
Capital One	20.2%
CitiGroup	7.2%
Bank of America	4.5%
JPMorgan Chase	4.1%
KeyCorp	2.7%
Susquehanna Bancshares	1.8%
CIT Group	1.5%
Wells Fargo	1.5%
PNC Financial	1.5%
SunTrust Bank	1.2%
Huntington Bancshares	1.2%
First Horizon National	0.9%
M&T Bank	0.6%
US Bancorp	0.5%
First Citizens Bancshares	0.5%

Appendix C provides a list of sample banks disclosing that the adoption of SFAS 166/167 in fiscal 2010 had a material impact on their financial statements along with the amount of assets brought on the balance sheet ('onboarded') as a percentage of total assets. These data are hand-collected from firms' 10-K's and are subject to the limitation that some sample firms did not deem SFAS 166/167 to have a material impact and thus did not disclose asset amounts. Across banks reporting a material effect (roughly 2/3 of the banks in our sample reported no material effect), the amount on-boarded represents 4.8% of total assets.

Figure 1 Restructuring Around SFAS 166/167

Panel A: Percentage of RMBS issues with overlap between sponsor and servicer



Panel B: Percentage of CMBS issues with overlap between sponsor and special servicer

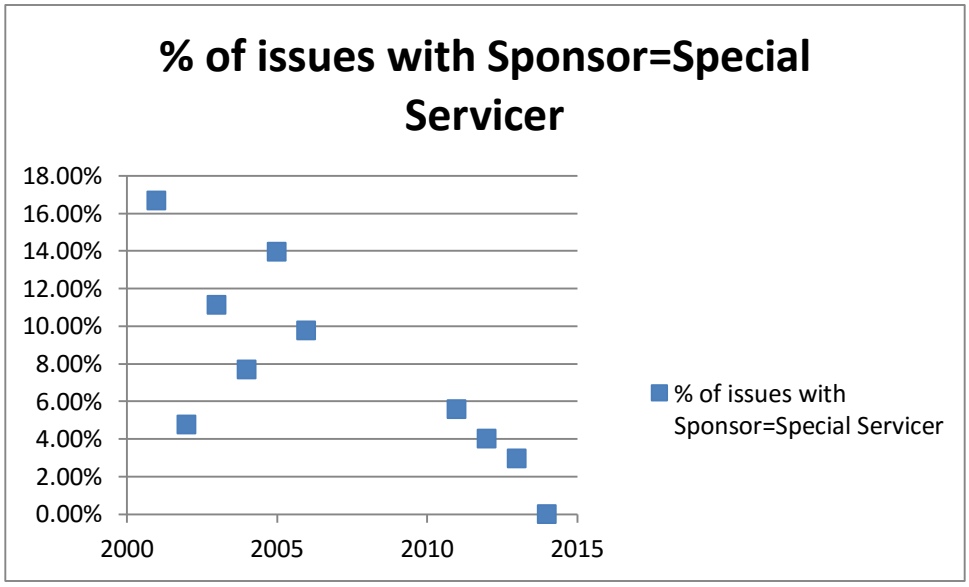


Table 1 – Descriptive Statistics for Risk Relevance Tests

PANEL A	Mean	Std. Dev.	Q1	Median	Q3
STDRET	1.444	0.730	0.975	1.232	1.719
ABS	1.176	2.075	0.052	0.613	1.452
MBS	1.021	2.070	0.001	0.271	1.083
GMBS	0.353	0.838	0.000	0.009	0.410
PLMBS	0.668	1.906	0.000	0.043	0.449
CONSBS	0.116	0.275	0.000	0.002	0.057
COMMBS	0.033	0.058	0.000	0.000	0.040
ARI	0.014	0.035	0.000	0.002	0.012
MASSETG	1.032	0.078	1.000	1.017	1.044
MLOANS	2.144	1.349	1.365	2.141	2.606
CONSLOANS	0.487	0.373	0.216	0.492	0.658
COMMLOANS	0.725	0.402	0.505	0.687	0.916
CAP	13.373	15.014	8.330	9.100	11.490
SIZE	7.575	0.908	6.949	7.563	8.021
SDEPS	0.187	0.317	0.053	0.100	0.195
GAP	1.013	1.005	0.337	1.085	1.758
NCO	0.004	0.009	0.000	0.000	0.005
NPL	0.065	0.057	0.011	0.058	0.102
DERIV	21.486	67.712	0.211	1.542	4.192
TRADINC	0.006	0.014	0.000	0.001	0.005
SECINC	0.009	0.018	0.000	0.002	0.012
SECUR	1.498	1.455	0.708	1.112	1.746

Table 1, Panel A provides descriptive statistics for the 22 bank holding companies in our sample for the 2001-2006 period from the Federal Reserve Bank's Y9-C report. All variables are defined in Appendix A.

PANEL B	Mean	Std. Dev.	Q1	Median	Q3
STDRET	2.039	1.459	1.250	1.531	2.266
ABS	2.300	4.880	0.007	0.383	2.340
MBS	2.141	4.592	0.000	0.242	2.209
GMBS	1.872	4.466	0.000	0.030	1.905
PLMBS	0.270	0.883	0.000	0.001	0.235
CONSBS	0.021	0.059	0.000	0.000	0.010
COMMBS	0.063	0.176	0.000	0.000	0.005
ARI	0.012	0.044	0.000	0.000	0.000
MASSETG	1.011	0.050	0.992	1.005	1.020
LOANS	10.110	21.504	4.327	5.516	6.961
ONVIE	0.183	0.403	0.000	0.003	0.150
ONMBS	0.019	0.045	0.000	0.000	0.017
ONCONSBS	0.162	0.381	0.000	0.000	0.091
ONCOMMBS	0.001	0.004	0.000	0.000	0.000
LOANS_nonVIE	9.997	22.119	4.139	5.246	6.890
MLOANS_nonVIE	6.990	16.797	2.307	3.268	4.712
CONSLOANS_nonVIE	0.758	1.210	0.214	0.586	0.971
COMMLOANS_nonVIE	2.047	3.473	0.808	1.351	1.818
MLOANS	7.009	16.793	2.342	3.295	4.728
CONSLOANS	0.920	1.325	0.214	0.644	1.142
COMMLOANS	2.048	3.473	0.808	1.351	1.818
CAP	14.706	9.075	11.560	12.395	14.360
SIZE	7.733	0.876	7.102	7.748	8.239
SDEPS	0.332	0.555	0.054	0.154	0.361
GAP	2.073	3.109	0.318	2.666	3.585
NCO	0.005	0.011	0.000	0.000	0.002
NPL	0.110	0.148	0.000	0.053	0.137
DERIV	33.441	92.639	0.146	1.913	7.018
TRADINC	0.016	0.036	0.000	0.002	0.011
SECINC	0.011	0.027	0.001	0.004	0.009
SECUR	2.507	3.106	1.375	1.806	2.691

Table 1, Panel B provides descriptive statistics for the 22 bank holding companies in our sample for the 2011-2014 period from the Federal Reserve Bank's Y9-C report. All variables are defined in Appendix A.

Table 2 – The Risk Relevance of Off-Balance Sheet Securitized Assets

PANEL A (aggregate tests)	(1) SDRET 2001-2006	(2) SDRET 2011-2014
ABS	0.0821***	-0.5135
	(2.66)	(0.89)
ARI	1.7515*	12.2458***
	(1.92)	(6.14)
MASSETG	-0.2293	0.5097
	(0.64)	(1.14)
MLOANS	-0.1263	0.0789**
	(1.25)	(2.39)
CONSLOANS	-0.1653	0.1388
	(1.47)	(1.28)
COMMLOANS	0.2466	-0.1437
	(1.21)	(0.98)
CAP	0.0022	0.0041
	(0.74)	(0.64)
SIZE	-0.2205***	-0.3457***
	(3.35)	(2.69)
SDEPS	0.1278	0.1328
	(1.09)	(0.47)
GAP	-0.0662*	0.1415*
	(1.78)	(1.67)
NCO	6.3149**	-2.5152
	(2.03)	(0.23)
NPL	-0.2435	-0.5549*
	(0.34)	(1.69)
DERIV	-0.0009	0.0044**
	(0.79)	(2.18)
TRADINC	-1.6462	-6.3881
	(0.51)	(1.05)
SECINC	-0.0490	7.5600
	(0.04)	(1.47)
SECUR	0.2952***	-0.0438
	(4.84)	(0.73)
Constant	2.9918***	3.4313***
	(6.39)	(3.43)
Observations	455	326
Adj. R-squared	0.446	0.637

Table 2, Panel A provides regression results on the risk relevance of aggregate off-balance sheet securitized assets before and after SFAS 166/167 (financial crisis omitted). All variables are defined in Appendix A. Standard errors are clustered by firm and year-quarter. * p<0.10, ** p<0.05, *** p<0.01

Table 2 – The Risk Relevance of Off-Balance Sheet Securitized Assets (continued)

PANEL B (by collateral type)	(1) SDRET 2001-2006	(2) SDRET 2011-2014
MBS	0.0771***	1.3247
	(2.66)	(1.08)
CONSBS	0.9809*	-1.0844
	(1.74)	(1.05)
COMMBS	-0.5838	0.1349
	(0.65)	(0.38)
ARI	1.1893	12.7492***
	(1.04)	(6.47)
MASSETG	-0.2332	0.7697
	(0.69)	(1.38)
MLOANS	-0.1251	0.0799**
	(1.35)	(2.35)
CONSLOANS	-0.2154	0.1595
	(1.51)	(1.37)
COMMLOANS	0.1810	-0.1075
	(0.79)	(0.81)
CAP	0.0011	0.0079
	(0.36)	(1.21)
SIZE	-0.2534***	-0.3284***
	(3.43)	(2.63)
SDEPS	0.1418	0.0212
	(1.37)	(0.07)
GAP	-0.0631	0.1573*
	(1.59)	(1.80)
NCO	4.0076	-1.2102
	(1.43)	(0.10)
NPL	0.0272	-0.8245
	(0.04)	(1.52)
DERIV	-0.0009	0.0044**
	(0.83)	(2.22)
TRADINC	-3.2624	-8.2417
	(0.98)	(1.34)
SECINC	1.4138	6.7175
	(0.55)	(1.24)
SECUR	0.3053***	-0.0682
	(5.07)	(1.13)
Constant	3.2926***	2.8220***
	(6.26)	(3.43)
Observations	455	326
Adj. R-squared	0.447	0.634

Table 2, Panel B provides regression results on the risk relevance of off-balance sheet securitized assets by collateral type before and after SFAS 166/167 (financial crisis omitted). All variables are defined in Appendix A. Standard errors are clustered by firm and year-quarter. * p<0.10, ** p<0.05, *** p<0.01

Table 2 – The Risk Relevance of Off-Balance Sheet Securitized Assets (continued)

PANEL C (agency- vs. private label MBS)	(1) SDRET 2001-2006	(2) SDRET 2011-2014
GMBS	0.3285	0.4194
	(1.47)	(1.14)
PLMBS	0.0718**	0.0309
	(2.04)	(0.39)
CONSBS	1.1859**	-1.1061
	(2.23)	(1.13)
COMMBS	-0.5735	0.0576
	(0.64)	(0.14)
ARI	1.3500	13.1740***
	(1.02)	(6.28)
MASSETG	-0.1993	0.8251
	(0.59)	(1.55)
MLOANS	-0.1258	0.0792**
	(1.32)	(2.31)
CONSLOANS	-0.2482	0.1578
	(1.49)	(1.34)
COMMLOANS	0.1678	-0.1012
	(0.72)	(0.76)
CAP	0.0010	0.0080
	(0.31)	(1.16)
SIZE	-0.2749***	-0.3115**
	(3.81)	(2.43)
SDEPS	0.1346	0.0183
	(1.25)	(0.06)
GAP	-0.0655	0.1533*
	(1.51)	(1.80)
NCO	3.9715	-0.7080
	(1.31)	(0.06)
NPL	0.1701	-0.8015*
	(0.23)	(1.80)
DERIV	-0.0011	0.0049***
	(0.86)	(2.84)
TRADINC	-1.8964	-8.4610
	(0.55)	(1.38)
SECINC	1.4628	5.5972
	(0.61)	(0.94)
SECUR	0.3139***	-0.0727
	(5.13)	(1.10)
Constant	3.3960***	2.6348***
	(6.53)	(3.02)
Observations	455	326
Adj. R-squared	0.448	0.635

Table 2, Panel C provides regression results on the risk relevance of off-balance sheet securitized assets by agency versus non-agency MBS collateral type before and after SFAS 166/167 (financial crisis omitted). All variables are defined in Appendix A. Standard errors are clustered by firm and year-quarter. * p<0.10, ** p<0.05, *** p<0.01

Table 2 – The Risk Relevance of Off-Balance Sheet Securitized Assets (continued)

PANEL D (CDS spreads as dep.var.)	(1) SPREAD 2001-2006	(2) SPREAD 2011-2014
MBS	0.0206***	-0.0007
	(3.77)	(1.20)
CONSBS	0.1443*	0.3444
	(1.91)	(0.91)
COMMBS	0.0076	0.0034
	(1.03)	(0.61)
ARI	0.1082***	0.2398
	(5.40)	(0.88)
MASSETG	0.0008	0.0031
	(0.36)	(0.64)
MLOANS	0.0019**	0.0041
	(2.32)	(1.49)
CONSLOANS	-0.0043***	0.0018
	(3.12)	(0.92)
COMMLOANS	-0.0011	0.0051
	(0.95)	(1.32)
CAP	-0.0000	0.0001
	(0.26)	(1.58)
SIZE	-0.0026***	-0.0091*
	(2.67)	(1.87)
SDEPS	0.0028**	-0.0027
	(2.60)	(1.55)
GAP	-0.0008*	-0.0002
	(1.94)	(0.16)
NCO	0.0514	-0.0168
	(1.39)	(0.39)
NPL	-0.0027	0.0154**
	(0.42)	(2.25)
DERIV	-0.00003***	0.0000
	(3.55)	(1.31)
TRADINC	0.0070	-0.0024
	(0.51)	(0.03)
SECINC	-0.0318	-0.0753
	(1.35)	(0.83)
SECUR	0.0033***	-0.0026
	(4.40)	(1.07)
Constant	0.0186**	0.0540
	(2.08)	(1.37)
Observations	203	135
Adj. R-squared	0.887	0.623

Table 2, Panel D provides regression results on the relevance to CDS spread of off-balance sheet securitized assets before and after SFAS 166/167 (financial crisis omitted). All variables are defined in Appendix A. Standard errors are clustered by firm and year-quarter. * p<0.10, ** p<0.05, *** p<0.01

Table 3 – The Risk Relevance of On-Balance Sheet Securitized Assets in the 2011-2014 Period

	(1) SDRET 2011-2014	(2) SDRET 2011-2014
ONVIE	0.5800***	
	(3.27)	
ONMBS		0.1467***
		(3.08)
ONCONSBS		0.3603*
		(2.04)
ONCOMMBS		0.6836
		(1.44)
ABS	-0.1705	
	(0.42)	
MBS		-1.5073
		(1.53)
CONSBS		-4.0828
		(1.55)
COMMBS		-0.3682
		(1.27)
ARI	11.1451***	17.0869***
	(4.97)	(3.71)
MASSETG	0.3448	0.8245
	(0.53)	(1.34)
LOANS_nonVIE	0.2890***	
	(4.37)	
MLOANS_nonVIE		0.0600***
		(3.02)
CONSLOANS_nonVIE		0.4169*
		(1.92)
COMMLOANS_nonVIE		-0.1026
		(0.43)
CAP	0.0077	0.0069
	(1.04)	(1.07)
SIZE	-0.4131***	-0.5006***
	(3.25)	(3.21)
SDEPS	0.1467	0.0205
	(0.62)	(0.08)
GAP	0.1164***	0.1322
	(2.86)	(1.53)
NCO	-6.8502	-3.4144
	(0.67)	(0.33)
NPL	-0.3483	-1.6192*
	(0.66)	(1.94)
DERIV	0.0035***	0.0030***
	(3.24)	(3.11)

TRADINC	-7.3681	-11.0593*
	(1.36)	(1.91)
SECINC	5.2315	4.6875
	(0.82)	(0.64)
SECUR	-0.0206	-0.0576
	(0.73)	(1.09)
Constant	3.9274***	4.1258**
	(3.01)	(2.72)
Observations	326	326
Adj. R-squared	0.646	0.663
F-Test: ONVIE=ABS	0.09	
F-Test: ONVIE=LOANS_nonVIE	0.12	
F-Test: ONMBS=MBS		0.09
F-Test: ONCONSBS=CONSBS		0.09
F-Test: ONCOMMBS=COMMBS		0.11
F-Test: ONMBS=MLOANS_nonVIE		0.18
F-Test: ONCONSBS=CONSLOANS_nonVIE		0.88
F-Test: ONCOMMBS=COMMLOANS_nonVIE		0.25

Table 3 provides regression results on the risk relevance of on-balance sheet securitized assets in the post-SFAS 166/167 period. All variables are defined in Appendix A. Standard errors are clustered by firm and year-quarter. * p<0.10, ** p<0.05, *** p<0.01

Table 4 – Amount and Frequency of Securitization Issues by Bank Holding Companies

	RMBS			CMBS		
Year	Amount ($Mil.)	# of issues	% of issues with Sponsor=Servicer	Amount ($Mil.)	# of issues	% of issues with Sponsor=Special Servicer
2001	62,383	158	75.95%	10,943	18	16.67%
2002	84,576	222	55.86%	17,122	21	4.76%
2003	128,162	296	48.65%	26,093	27	11.11%
2004	173,336	269	48.33%	44,782	39	7.69%
2005	256,203	350	44.00%	84,344	43	13.95%
2006	249,873	317	41.32%	94,856	41	9.76%
2011	743	8	0.00%	14,434	18	5.56%
2012	4,478	22	0.00%	18,409	25	4.00%
2013	5,834	21	0.00%	22,940	34	2.94%
2014	6,554	28	3.57%	49,504	67	0.00%

Table 4 documents descriptively the amounts and number of securitization issues by collateral type. The main years of interest are 2010-2013 that follow the implementation of SFAS 166/167.

Table 5 – Summary Statistics for the Real Effects Tests

Panel A: RMBS sample

	N	Mean	Std. Dev.	Q1	Median	Q3
Sponsor=Servicer	1659	0.468	0.499	0.000	0.000	1.000
POST	1659	0.046	0.210	0.000	0.000	0.000
CAPIMP	1659	0.304	0.466	0.035	0.106	0.420
NINTINC	1659	0.022	0.012	0.013	0.020	0.030
PRESSURE	1659	0.322	0.467	0.000	0.000	1.000
SIZE	1659	8.389	0.606	7.991	8.290	8.899
MB	1659	1.925	0.618	1.434	1.815	2.415
MBS	1659	7.975	10.175	0.448	2.345	15.125
MLOANS	1659	2.617	1.458	1.586	2.106	3.616

Panel B: CMBS sample

	N	Mean	Std. Dev.	Q1	Median	Q3
Sponsor=Special Servicer	326	0.067	0.251	0.000	0.000	0.000
POST	326	0.439	0.497	0.000	0.000	1.000
CAPIMP	326	0.184	0.162	0.072	0.143	0.250
NINTINC	326	0.015	0.008	0.008	0.015	0.020
PRESSURE	326	0.653	0.477	0.000	1.000	1.000
SIZE	326	9.065	0.232	8.893	9.080	9.277
MB	326	1.307	0.500	0.872	1.318	1.734
COMMBS	326	0.216	0.215	0.050	0.126	0.323
COMMLOANS	326	0.739	0.345	0.556	0.690	0.897

Table 5, **Panel A** provides the summary statistics for the sample of private label RMBS securitizations. **Panel B** provides the summary statistics for the sample of private label CMBS securitizations. All variables are defined in Appendix B.

Table 6 – Real Effects of SFAS 166/167: Impact on Transaction Structuring

Panel A: SFAS 166/167 and the incidence of a sponsor being the servicer for RMBS deals

	(1) Sponsor=Servicer	(2) Sponsor=Servicer
POST	-0.533***	-0.614***
	(13.48)	(9.32)
POST×CAPIMP		-0.194**
		(2.26)
POST×NINTINC		9.358**
		(2.23)
POST×PRESSURE		-0.270***
		(2.95)
CAPIMP	0.002	0.007
	(0.38)	(1.50)
NINTINC	0.082	0.007
	(0.19)	(0.02)
SIZE	-0.380***	-0.388***
	(6.91)	(6.57)
MB	0.135***	0.130***
	(6.94)	(6.76)
MBS	-0.000	-0.000
	(0.36)	(0.46)
MLOANS	0.058***	0.061***
	(4.76)	(4.53)
Constant	3.266***	3.343***
	(7.72)	(7.35)
Firm FE	Yes	Yes
Observations	1659	1659
Adj. R-squared	0.792	0.793

Table 6, **Panel A** tests whether banks are more likely to structure their private label RMBS securitizations to achieve off-balance sheet treatment in the post-SFAS 166/167 period. The test in this panel assumes that securitizations where the sponsoring bank retains the servicing function are more likely to be consolidated. All variables are defined in Appendix B. Standard errors are clustered by firm and year-quarter. * p<0.10, ** p<0.05, *** p<0.01

Panel B: SFAS 166/167 and the incidence of a sponsor being the special servicer for CMBS deals

	(1) Sponsor=Special Servicer	(2) Sponsor=Special Servicer
POST	-0.182**	0.133
	(2.26)	(1.08)
POST×CAPIMP		-0.693***
		(3.21)
POST× NINTINC		5.700
		(1.11)
POST×PRESSURE		-0.259**
		(2.08)
CAPIMP	0.497***	0.691***
	(3.02)	(3.31)
NINTINC	2.604*	0.272
	(1.74)	(0.08)
SIZE	-0.150	0.190
	(0.91)	(0.70)
MB	-0.049	0.047
	(0.79)	(0.51)
COMMBS	0.360***	0.333***
	(3.12)	(3.55)
COMMLOANS	-0.057	0.027
	(0.62)	(0.23)
Constant	1.384	-1.908
	(0.92)	(0.73)
Firm FE	Yes	Yes
Observations	326	326
Adj. R-squared	0.153	0.170

Table 6, **Panel B** tests whether banks are more likely to structure their CMBS securitizations to achieve off-balance sheet treatment in the post-SFAS 166/167 period. The test in this panel assumes that securitizations where the sponsoring bank retains the special servicing function are more likely to be consolidated. All variables are defined in Appendix B. Standard errors are clustered by firm and year-quarter. * p<0.10, ** p<0.05, *** p<0.01

Table 7 – Structuring of Issuances to Achieve Off-Balance Sheet Status post-SFAS 166/167

Pearson correlation coefficients

	NONAGENCY_MORTG_ON	*COMMERCIAL_ON*
RMBS SPONSOR = SERVICER	0.764 (p<0.01)	
CMBS SPONSOR = SPECIAL SERVICER		0.375 (p<0.01)

Table 7 provides validation tests for the underlying assumptions in **Table 6**. In particular, it tests whether the structure of the securitization (i.e., Sponsor=Servicer or Sponsor=Special Servicer) increases the likelihood of consolidation. Specifically, we calculate *RMBS SPONSOR=SERVICER* (the fraction of RMBS deals with the same sponsor and servicer over past five years) and *CMBS SPONSOR=SPECIAL SERVICER* (the fraction of CMBS deals with the same sponsor and special servicer over past five years) using the ABS Alert and CM Alert databases. *NONAGENCY_MORTG_ON* and *COMMERCIAL_ON* are the percentages of non-agency MBS and CMBS securitizations, respectively, that are accounted for as on-balance sheet and are hand-collected from annual reports of banks during the 2011–2014 period. We then correlate these two fractions with *NONAGENCY_MORTG_ON* (scaled by total RMBS) and *COMMERCIAL_ON* (scaled by total CMBS), respectively. N=141 bank-year observations.

Table 8 – The Value Relevance of Off- and On-Balance Sheet Securitized Assets

	(1) MVE 2001-2006	(2) MVE 2011-2014
ADJ_ASSET	0.8167***	
	(3.60)	
ADJ_ASSET_nonVIE		1.1371***
		(4.84)
ONVIE_ASSET		1.0096***
		(4.62)
LIAB	-0.8348***	
	(3.28)	
LIAB_nonVIE		-0.9572***
		(4.81)
ONVIE_LIAB		-0.9072*
		(1.96)
OFFVIE_ASSET	1.2711**	0.3304
	(2.41)	(1.05)
OFFVIE_LIAB	-1.2593**	-0.3285
	(2.38)	(1.03)
ADJ_NI	5.0895***	7.8700***
	(3.89)	(4.74)
Constant	16.2978***	7.0439***
	(3.32)	(4.12)
Observations	455	326
Adj. R-squared	0.460	0.812
F-Test: ADJ_ASSET=OFFVIE_ASSET	0.45	
F-Test: LIAB=OFFVIE_LIAB	0.49	
F-Test: ADJ_ASSET_nonVIE=ONVIE_ASSET		0.29
F-Test: LIAB_nonVIE=ONVIE_LIAB		0.91
F-Test: ADJ_ASSET=1	0.42	
F-Test: LIAB=–1	0.52	
F-Test: OFFVIE_ASSET=1	0.61	0.03
F-Test: OFFVIE_LIAB=–1	0.63	0.04
F-Test: ADJ_ASSET_nonVIE=1		0.56
F-Test: ONVIE_ASSET=1		0.97
F-Test: LIAB_nonVIE=–1		0.83
F-Test: ONVIE_LIAB=–1		0.84

Table 8 provides regression results on the value relevance of off-balance sheet securitized assets following Landsman et al. (2008) before and after SFAS 166/167 (financial crisis omitted). All variables are defined in Appendix A. Standard errors are clustered by firm and year-quarter. * p<0.10, ** p<0.05, *** p<0.01