Banks' Asset Securitization and Information Uncertainty[1]

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Abstract

This study investigates whether banks that undertake securitization transactions face higher or lower levels of information uncertainty compared to banks that do not obtain financing through securitizing assets. This study also examines whether and how the extent of risk transfer between the securitizing bank and the asset-backed securities investors affects bank information uncertainty. Using bid-ask spreads and analyst forecast dispersion as proxies for information uncertainty, we consistently find that banks that undertake securitization transactions have higher information uncertainty compared to non-securitizing banks. Our tests based on several measures of implicit recourse and contractual retained interests also document a positive association between the extent of risk transfer and bank information uncertainty. These results are robust to controlling for various determinants of information uncertainty and for endogeneity. Unlike prior literature that focuses on the benefits of asset securitization, our study examines some of the costs of this financing technique. Our findings suggest that an important consequence of asset securitization is higher information uncertainty for securitizing banks.

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I. INTRODUCTION

The volume of securitized financial assets increased considerably over the last two decades. According to the Bond Market Association, as of the end of the first quarter of 2007, the asset-backed market comprised about $8.9 trillion of outstanding securities, compared to $5.4 trillion outstanding corporate bonds and about $4.5 trillion outstanding US Treasury debt.

The rapid growth in securitization activities and the recent turmoil affecting the securitization markets raise interesting questions regarding the benefits and costs of this type of financing mechanism. Prior academic and practitioner literature focuses primarily on the incentives and benefits of securitizing financial assets (e.g., Ryan, 2007; Clarkson et al. 2002). This study extends prior research by examining some of the consequences of asset securitization. Specifically, we investigate whether banks that undertake securitization transactions face different levels of information uncertainty compared to banks that do not obtain financing through securitizing financial assets. We also examine how the extent of risk transfer between the securitizing bank and the asset-backed securities investors affects bank information uncertainty.[1]

We focus on investigating the effect of financing through financial asset securitization on information uncertainty for two reasons. First, information uncertainty can have real economic costs in the form of higher cost of capital. Numerous prior studies support the link between information and the cost of capital. One line of research suggests that information precision reduces the estimation risk associated with market participants' uncertainty about the parameters of the securities' payoff distribution (e.g. Barry and Brown, 1985; Clarkson et al 1996; Easley

[1] In the context of this study, by higher information uncertainty we mean: 1) lower precision of information and/or higher information asymmetry between a firm's insiders and its shareholders, and/or 2) higher information asymmetry among market participants.

and O'Hara, 2004). A second line of literature suggests that the cost of capital is increasing in information asymmetry because investors have to be compensated for the risk of trading with a more informed party (e.g., Amihud and Mendelson, 1986, 1989).[2] In addition, reducing information asymmetry and increasing market liquidity is an important concern of accounting and security regulators (e.g., Loss and Seligman, 2001).

Second, to our knowledge, no study to date has documented the empirical relation between asset securitization and information uncertainty. Prior research focuses mainly on the association between market values or equity risk and asset securitization (e.g., Niu and Richardson 2006; Landsman et al. 2008; Chen et al. 2008) and finds that, *on average*, market participants view off-balance sheet securitized assets as having similar risk and value relevance as the assets kept on the issuer's balance sheet. In contrast, our study focuses on how market participants differ in their understanding of the impact of the securitization transactions and the impact of the degree of risk transfer associated with securitizing assets.

Ex-ante, it is an empirical question whether securitization leaves the banks that engage in this type of financing transactions more or less exposed to information uncertainty compared to banks that do not securitize assets. Securitization transactions can impact information uncertainty through several mechanisms. First, securitizing banks may face greater information uncertainty relative to non-securitizing banks, because securitization exposes the banks to uncertainty about the level of risk transfer associated with the securitized assets. In a securitization transaction, the securitizing bank transfers pools of assets (such as mortgages or trade and credit card receivables) to special purpose entities (SPEs). The SPEs finance these assets by selling to

[2] Note that the relation between information asymmetry and a firm's cost of capital is still debated in the literature. A recent theoretical study (Lambert et al. 2009) argues that, in models of perfect competition, information differences across investors affect the cost of capital through investors' average precision of information and not directly through information asymmetry.

investors various classes of securities backed by the transferred asset pools and the cash flows they generate. The securities issued in this manner are commonly referred to as asset-backed securities. Investors in asset-backed securities face information asymmetry stemming from securitizing banks having better information about the transferred assets than outside investors do. To mitigate potential adverse selection problems, the securitizing bank offers to the outside investors some form of recourse. In the context of securitization transactions, recourse usually referrers to guaranties promised to asset-backed securities investors allowing the transfer of some losses back to the originating bank if the performance of the underlying pools of securitized assets deteriorates. Thus, a critical issue in understanding the impact of securitizing assets on the banks that originate such transactions is the extent to which the credit risk associated with the securitized assets has been transferred from the originating bank to the asset-backed security investors. The extent of risk transfer varies directly with the magnitude of recourse. If market participants have difficulties in assessing and/or disagree about the true extent of recourse, securitizing banks may face higher information uncertainty relative to non-securitizing banks.

Second, securitization transactions may affect banks' information uncertainty because of the potential change in banks' asset composition caused by securitization. When securitizing assets, banks free capital by exchanging assets expected to generate future cash flows (e.g., loans) for known amounts of cash. The decisions regarding the reinvestment of securitization proceeds are crucial in understanding the impact of asset securitization on the originator (Clarkson et al. 2002; Hansel and Krahnen, 2007). Relative to non-securitizing banks, market participants face information uncertainty with respect to the availability and the extent of suitable reinvestment opportunities for the large cash amounts generated by securitizing banks. In addition, if the banks choose to reinvest the securitization proceeds in assets that are more difficult to value (i.e., more

opaque) than the original securitized assets, the securitizing banks may be exposed to more information uncertainty. However, securitization can also lead to less information uncertainty, if banks choose to reinvest the securitization proceeds in assets that are relatively less difficult to value than the securitized assets.

Third, securitization may lead to lower information uncertainty for securitizing banks relative to non-securitizing banks because of the extensive disclosure requirements for securitized assets.[3] Usual types of assets securitized by banks are mortgage loans, consumer and home equity loans, credit card receipts, auto loans, and leases. Market participants find it difficult to value such assets, since the banks always know more than outside investors about borrowers' quality.[4] When issuing asset-backed securities based on pools of such financial assets, securitizing banks are required to disclose more information about these assets (through the process of registering the asset-backed securities with the SEC) compared to non-securitizing banks that keep the loans on the balance sheet (Schwarcz, 2004; Foley et al., 1999). The additional required disclosure can lead to increased transparency with respect not only to the securitized assets, but also to the securitizing firms in general (Foley et al., 1999; Berger and Udell, 1995; Cantor and Rouyer, 2000). In summary, given these conflicting effects, the impact of securitization on information uncertainty is not clear ex-ante.

We empirically assess the relation between securitization and information uncertainty by comparing proxies for information uncertainty such as bid-ask spreads and analysts' earnings forecast dispersion for bank holding companies that engage in loan securitization transactions (accounted for as sales) relative to bank holding companies that do not securitize assets. We find

[3] In addition, prior theoretical research (Iacobucci and Winter, 2005) argues that securitization can reduce agency costs and better discipline managers and thus, contribute to a reduction in information asymmetry.
[4] Prior empirical and theoretical literature (Diamond, 1989, 1991; Berlin and Loeys, 1988; Morgan, 2002; Haggard and Howe, 2007) finds strong support for this argument.

that, after controlling for other determinants of information uncertainty, banks that securitize financial assets have higher spreads and analysts' forecast dispersion compared with banks that do not engage in securitization. In addition, we find that our results are robust to controlling for a potential endogeneity bias induced by the fact that banks with more severe information problems (i.e., higher information uncertainty) may find it more costly to access other forms of financing and thus may be more likely to obtain financing by securitizing financial assets. To mitigate the concern that we spuriously attribute the difference in the level of information uncertainty between securitizing and non-securitizing banks to securitization transactions, when in fact such differences are driven by differences in bank intrinsic risk, we include in all of our multivariate analysis tests various bank risk measures. Our results are robust to these controls.

Since the extent of risk transfer from the securitizing bank to the asset-backed securities investors is critical in understanding the impact of securitization transactions, we further examine whether and how various forms of risk retention associated with the securitized assets affect bank information uncertainty. When securitizing assets, banks can retain risk explicitly. For example, in many securitization transactions, the securitizing banks retain on their balance sheet the most subordinated asset-backed securities and sell to investors senior asset-backed securities. These most subordinated securities often referred to as retained interests bear the first loss from the pool of securitized assets.

Securitizing banks can also face risk exposure by offering implicit recourse. To maintain their reputation and maintain future access to securitization markets, issuers may offer an implicit (i.e., non-contractual) promise to support underperforming securitized assets. Implicit recourse involves issuers taking voluntary measures to increase the value of the assets transferred to the SPEs. For example, implicit recourse may consist in transferring additional higher quality

assets to the initial pool of transferred assets to strengthen the quality of the collateral behind the asset-backed securities. Or, the issuer may agree to add cash or other credit enhancements to a deal to protect securitization investors from losses due to underperforming assets. Anecdotal evidence and academic research (Calomiris and Mason, 2004; Higgins and Masson, 2004; Gorton and Souleles, 2006; Vermilyea et al., 2008) indicate that many issuers have chosen to support troubled transactions rather than impose credit losses on asset-backed securities investors.[5]

In this study, we broadly refer to both contractual obligations (e.g., retained interests) and non-contractual promises (i.e., implicit support) as recourse. We hypothesize that the extent of recourse associated with the securitized assets is positively associated with bank information uncertainty.

There are at least two major reasons why the extent of recourse can lead to increased information uncertainty for securitizing banks. First, retained interests are difficult to measure and implicit recourse is difficult to even identify. The retained interests are very illiquid since there is no active market for these securities. Therefore, their valuation depends heavily on managerial assumptions leaving outside investors exposed to high levels of information asymmetry. As for implicit recourse obligations, because issuers may or may not support their securitizations, at their discretion, outside information users may find it difficult to determine the probability that a securitizing bank will offer implicit recourse and thus, undo some of the risk transfer obtained through securitization.

Second, in practice, securitizations are structured in numerous ways that vary considerably in the extent to which issuers retain risks, on a continuum from minimum to almost complete risk

[5] For many issuers, implicit recourse may be an important consideration except in circumstances in which the costs of supporting distressed transactions outweigh the benefits of maintaining access to future funding.

transfer. For a given magnitude of retained interests, the retained interests' level of subordination can vary considerably even across securitization transactions originated by the same bank. By contrast, the reporting treatment for securitization includes only a dichotomous choice: sale vs. secured borrowing. The majority of securitization transactions are accounted for as sales and the securitized assets and liabilities are held off-balance sheet by issuers. Investors face the question of whether to undo the sale accounting. Prior research finds that, on average, the market views these off-balance sheet items as assets and liabilities of the issuer, suggesting that investors bring back the transferred assets onto the consolidated balance sheet. However, it is unlikely that investors would uniformly add back these off-balance sheet securitized items, since they may disagree about where an asset securitization stands on the risk transfer continuum. The great variety and the extreme complexity of possible securitization structures may make it difficult and /or costly for many market participants to completely understand the extent to which securitizing banks remain exposed to the credit risk of the securitized assets.[6]

In summary, investors face uncertainty with respect to the extent of risk transfer achieved in securitization transactions because of: (1) the difficulty in assessing the retained interests' level of subordination and identifying potential implicit recourse promises; and (2) the complexity and great diversity of possible securitization transaction structures. We argue that such uncertainty may lead to higher information asymmetry (if some investors are better informed or better at processing securitization information) and/or disagreement among market participants.

We employ five empirical measures to test how the extent of recourse affects information uncertainty. First, we use as a proxy for the extent of retained risks the amount of retained interests (retained asset-backed securities) kept on balance sheet by securitizing banks. Second,

[6] Compared to other financing techniques, asset securitizations have extremely complex structures. Usually, firms rely on multiple SPEs and on specialists from several disparate areas such as bankruptcy, tax, commercial law, securities law, finance and accounting to structure securitization transactions.

we use the proportion of securitized assets to total assets and the proportion of securitization income to total bank income to proxy for the importance of securitization in the total portfolio of bank activities. We expect banks with a larger proportion of securitized to total assets and a larger proportion of securitization income to total net income to be more dependent on the securitization transactions as a source of financing and profitability. Therefore, such banks may have greater incentives to offer implicit support to some troubled securitization transactions to preserve their future access to securitization markets. Lastly, we use two proxies for the quality of the securitized assets. We expect the proportion of nonperforming loans and charge-offs associated with securitized loans to be positively correlated with the level of potential recourse, since lower quality securitized assets may more likely to need future support from the originating banks. Our empirical tests based on these five measures of implicit recourse and retained interests consistently document a positive association between the extent of recourse and bank information uncertainty.

This study contributes to the literature by investigating the effect of securitization transactions on bank information uncertainty. As noted by Schipper and Yohn (2007), most of the prior securitization literature examines whether in their assessments of firm systematic risk investors treat securitizations as if they were just a form of secured borrowing. In contrast, we follow the suggestion for future research issued by Schipper and Yohn (2007) to "provide additional insight into other investor judgments and decisions" (page 78). Our study also contributes to a better understanding of the market participants' view on the risk transfer related to securitized assets by empirically testing whether and how various forms of recourse related to securitized assets affect securitizing banks' information uncertainty.

The remainder of this study is organized as follows. The next section provides background information and discusses related literature. Section III presents our sample selection and descriptive statistics. Section IV discusses the impact of securitization on information uncertainty and Section V discusses the impact of the extent of recourse on information uncertainty. Section VI concludes the study.

II. BACKGROUND AND RELATED LITERATURE

Accounting Treatment

Under SFAS 140, securitizations can be accounted for as either sales or secured borrowings. For a transfer of financial assets to a SPE to qualify for sale accounting treatment, it must meet the following criteria: 1) the assets are isolated from the transferor and its creditors even in bankruptcy; 2) the SPE has the right to pledge or exchange the assets, and 3) the transferor does not maintain effective control over the assets through certain forms of continuing involvement. If the securitization receives sale accounting treatment, then the transferor: 1) removes the assets from its balance sheet; 2) records cash proceeds in the amount received and recognizes any noncash proceeds in the securitized assets at fair value; 3) recognizes retained asset-backed securities at the book value of the securitized assets times the fair value of the retained securities divided by the fair value of the securitized assets; 4) recognizes retained contractual interests other than asset-backed securities, (e.g., servicing assets and recourse liabilities) at fair value; and 5) records a gain or loss on sale to balance the journal entry. If the securitization is accounted for as a sale and additional conditions are satisfied (see Gorton and Souleles, 2006), the issuer does not have to consolidate the assets and liabilities held by its SPEs. If the transfer is

accounted for as a secured borrowing, the financial assets remain on the balance sheet and the issuer recognizes a liability for the proceeds from this transfer.

Motivation for Securitizations

Prior literature recognizes the ability to obtain off-balance sheet treatment through sale accounting as one of the motivations for financial asset securitizations. While keeping assets off-balance sheet can target many categories of information users, prior studies (Minton et al., 2004; Ambrose et al., 2004) focus on regulators, because regulated financial institutions are some of the most active participants in the securitization market. Because of the significant balance sheet impact of sale treatment, as opposed to secured borrowing treatment, regulated financial institutions that are required to hold minimum levels of capital may securitize assets to manage their regulatory capital. However, these studies find mixed evidence on the hypothesis that financial institution securitizations are motivated by the incentive to minimize regulatory capital.

Other reasons for asset securitizations discussed by prior studies are diversification of funding alternatives, immediate access to capital for expansion purposes, ability to focus on competitive advantages and the ability to manage earnings. Karaoglu (2005) and Pavel and Phillis (1987) find that banks that securitize or sell loans have higher loan concentrations and, therefore, greater needs for asset diversification than non-securitizing banks. In addition, these studies find that banks are more likely to securitize loans if they have a competitive advantage in originating loans. With respect to the motivation to obtain immediate access to capital, Karaoglu (2005) finds that banks that sell or securitize loans have higher growth expectations and greater liquidity needs compared with banks that do not engage in securitizations.

In addition, prior literature investigates earnings management as another potential motivation for securitizing financial assets. Consistent with the view that securitizations are used to manage earnings, Dechow et al. (2009) find that firms use the discretion afforded by fair-value accounting rules to manage the size of reported securitization gains. Dechow and Shakespeare (2009) find that window-dressing the financial statements is an important side-benefit of securitization and that firms engage in securitization towards the end of the quarter to maximize financial statement window-dressing. Karaoglu (2005) finds that securitization gains are negatively related to the change in earnings before securitization effects.

While prior literature focuses on motivations for asset securitization, our study points out to the fact that the benefits of securitization are achieved through very complex transaction structures. In turn, such complexity is not free; it comes at the expense of increased information uncertainty.

Securitization Recourse

In an asset securitization transaction, recourse refers to guarantees promised to asset-backed securities investors allowing the transfer of losses to the originating bank if the performance of the underlying portfolio of securitized loans deteriorates. Recourse may be both explicitly stated and implicit. Securitizing banks frequently offer contractual recourse by retaining the most subordinated asset-backed securities (the first-loss position) and selling to investors more senior asset-backed securities.

Securitizing banks are also willing to provide implicit recourse because they wish to maintain their reputation for consistent credit quality over repeated sales. Losing their reputation (i.e., the ability to sell loans economically) may expose the banks to decreased liquidity,

increased interest rate risk, as well as potential burdensome regulatory supervision. An originating bank can provide implicit support in various ways. Whether or not such implicit recourse exists depends on ex post facts. In 2002, the Federal Financial Institutions Examination Council (FFIEC) released a document to assist identifying cases of implicit recourse. The guidance lists four major actions that signal possible implicit recourse:

(1) Selling assets to a securitization trust or other SPE at a discount from the price specified in the securitization documents, which is typically par value;

(2) Purchasing assets from a trust or other SPE at an amount greater than fair value;

(3) Exchanging performing assets for non-performing assets in a trust or other SPE;

(4) Funding credit enhancements beyond contractual requirements.

The literature on implicit recourse focuses both on reasons of its existence and the effects. Gorton and Souleles (2006) provide theoretical arguments that the existence of implicit recourse is meant to reduce moral hazard problems. In the context of credit card securitizations, Calomiris and Mason (2004) find that implicit recourse is more in line with an optimal contracting view of securitization rather than an attempt to reduce regulatory capital requirements and avoid early amortization. Prior literature also documents that recourse provides some benefits to the originating banks including improved short- and long-term stock price performance and financial performance (e.g., Higgins and Mason 2004). In contrast, our study emphasizes a consequence of securitization recourse for the originating banks namely, increased information uncertainty.

III. SAMPLE SELECTION AND DESCRIPTIVE STATISTICS

In testing our hypothesis, we focus on the impact of bank securitizations on the level of information uncertainty of securitizing banks. While other types of firms securitize financial assets as well, we choose to investigate banks' loan securitizations for several reasons. First, given that banks operate in a regulated industry, their financial reporting of securitizations is a lot more homogenous than the reporting of firms in various other industries. Specifically, in their regulatory reporting, banks present a standardized securitization schedule that requires the same information to be filled out by all banks. Therefore, focusing on banks' securitizations also allows us to reduce the impact of variations in the regulatory disclosure level on firms' information uncertainty. Second, by focusing on the banking industry, we are able to mitigate data availability concerns. In contrast to banks, firms in other industries vary considerably more in the degree to which they present comprehensive securitization information. Third, banks are major participants in the securitization markets. Prior studies (e.g., Dechow et al., 2009) that use a multi-industry sample find that only 30% of their sample firms come from non-financial industries and banks are the largest category among the financial firms engaged in securitizations.

We start with a sample of bank holding companies (hereafter banks) whose common equity is traded on the NYSE, NASDAQ or AMEX stock exchanges, as one of our information uncertainty measures (i.e., the effective spread) is market based.[7] We collect quarterly financial information about these banks (including information about securitized assets) from the regulatory Y-9C reports that any bank with consolidated assets of at least $150 millions has to

[7] A bank holding company is any firm that controls a bank, where control is defined as holding more than 25% of a bank's equity or having the ability to elect more than two directors.

file with the Federal Reserve.[8] All securitization transactions used in our sample are accounted for as sales and not as secured borrowing. From the Y-9C reports, we gather 4,847 firm-quarter observations from 2001 (second calendar quarter) to 2007 (second calendar quarter). Our sample starts with the second quarter of 2001 because this was the first quarter when banks were required to provide more detailed information about their securitized assets. We end our sample period with the second quarter of 2007 because we are interested in studying the impact of securitization transactions on information uncertainty under normal market conditions (i.e., before the current securitization crisis). Following prior studies (Chordia et al. 2001; Flannery et al. 2004), we use both the consolidated trades and the consolidated quotes files from the TAQ database to compute the effective bid-ask spreads. We use CRSP information to compute the share turnover and return volatility measures, and the IBES summary file to compute the analysts' forecast dispersion and analyst following measures. After eliminating observations with missing values for the necessary control variables used in each of our empirical models, we obtain a sample of 3,333 and 1,803 firm-quarter observations for the spread and dispersion models, respectively.

Table 1 presents descriptive statistics for the more comprehensive sample of 3,333 bank-quarter observations. Of all the sample firm-quarters included in our sample, 18.33% have securitized assets. For the sample banks net loans represent 65.19% of total assets, quarterly net income is 0.62% of total assets, the liability to equity ratio averages about 10.85 and the log value of total assets is 7.73. Bank return volatility has a mean of 0.017 and the average price is 27.55 per share. 65.43% of our sample banks are listed on the NASDAQ, and the rest are listed on the NYSE or the AMEX. Our sample banks' average growth rate of on-balance sheet and

[8] Effective with the March 2006 report date, there has been an increase in the asset-size threshold for filing the FR Y-9C from $150 million to $500 million.

securitized loans is 3.60% while their loans to deposit ratio is 89.50% on average. In summary, the descriptive statistics for our sample are comparable to those reported in Flannery et al. (2004) and Chen et al. (2008).

IV. THE IMPACT OF SECURITIZATION ON INFORMATION UNCERTAINTY

As discussed in Section I, there are reasons to believe that securitizing banks may face higher or lower levels of information uncertainty compared to banks that do not securitize assets. First, securitizing banks are exposed to uncertainty about whether the risks associated with the securitized assets have been transferred from the originating bank to the assed-backed security investors. Second, compared with non-securitizing banks, banks that undertake securitization transactions are exposed to uncertainty regarding the effect of reinvesting the securitization proceeds. Through securitization, banks are able to free considerable amounts of capital by exchanging assets expected to generate cash flows in the future (e.g., loans) for known amounts of cash. Thus, for securitizing banks, market participants face uncertainty about the availability of suitable reinvestment opportunities for the cash proceeds. In addition, securitization may make the bank asset composition less (more) transparent if through reinvestment decisions the securitized loans are replaced with more difficult (easier) to value assets. Third, securitizing banks may be subject to less information uncertainty compared to non-securitizing banks, since in the securitization process banks have to satisfy extensive disclosure requirements for the transferred assets. By providing the additional required disclosure, securitization can lead to increased transparency with respect not only to the securitized assets, but also to the securitizing firms in general (Foley et al., 1999; Berger and Udell, 1995; Cantor and Rouyer, 2000). Given these opposite expectations, we hypothesize that securitizing banks have different information

uncertainty levels compared to non-securitizing banks, but we do not provide a directional prediction.

Information Uncertainty Measures

To test our hypothesis, we use two proxies for information uncertainty: bid-ask spreads, and analysts' forecast dispersion. The bid-ask spread is commonly used in the literature as a measure of information asymmetry (e.g., Flannery et al., 2004; Leuz and Verrecchia, 2000).[9] When information asymmetry among market participants is high, informed traders can exploit their informational advantage at the expense of uninformed traders. The market makers realize they are faced with an adverse selection problem and increase the bid-ask spread to protect themselves against expected losses from trading with more informed investors. This argument suggests a positive association between the degree of information asymmetry and bid-ask spreads.

In addition to bid-ask spreads, we also use the analysts' forecast dispersion as a measure of information uncertainty. In the context of our study, analysts' forecast dispersion is a relevant information uncertainty proxy because financial analysts focus on firm profitability and securitization directly affects profitability.[10] Financial analysts face uncertainty about the

[9] We note that, besides an adverse selection component, the bid-ask spreads also include an order-processing component and an inventory holding component. In this study, we are interested in the adverse selection component of the spreads. However, the empirical decomposition of the bid-ask spreads into the three distinct components is not very reliable (Flannery et al., 2004; Van Ness et al. 2001). Prior literature (Van Ness et al. 2001) examining the economic validity of the various models used to decompose bid-ask spreads finds that different models lead to widely varying magnitudes of the estimated adverse selection component. Van Ness et al. (2001) also find that the adverse selection estimate is poorly correlated with alternate indicators of asymmetric information and conclude that some of the decomposition models represent merely "noisy transformations of the spread" (page 96). Therefore, in this study, we chose to use the actual (not decomposed) bid-ask spreads and to include in our multivariate analysis some control variables (e.g., the stock exchange listing and a firm's idiosyncratic risk) that proxy for order-processing and inventory holding costs.

[10] Securitizing banks reported earnings depend on the volume and profitability of their securitizations because, at the date a securitization transaction takes place, sale accounting requires banks to derecognize the securitized assets,

securitization component of earnings for two reasons. First, analysts may have difficulties forecasting the possibility of recourse and its impact on earnings. Second, since the magnitude of gains and losses resulted from securitization is heavily dependent on managerial assumptions, financial analysts may be uncertain about the "true" amount of gains and losses. Prior literature (e.g., Dechow et al., 2009; Dechow and Shakespeare, 2009) finds evidence consistent with banks using securitization transactions to manage earnings. Analysts' forecast dispersion can increase if analysts find it difficult to back out the effect of managerial manipulation on securitizing banks' earnings. Our choice of this information uncertainty measure is consistent with prior literature (e.g., Leuz, 2003; Krishnaswami and Subramaniam, 1999) that interprets disagreement among analysts as an indication of the lack of available information about the firm and uses the dispersion of financial analysts' earnings forecasts as a measure of firm level information asymmetry.

Matched Sample Design

Prior literature (Leuz, 2003; Flannery et al. 2004) documents that firm size and risk level are critical determinants of information asymmetry. Prior research also finds that, due to the high level of complexity and high start-up costs associated with securitization transactions, firm size plays a crucial role in the decision of whether to undertake such transactions. Therefore, we start empirical analysis by matching our sample of securitizing banks by size, risk level (i.e., standard deviation of returns) and quarter with a sample of non-securitizing banks. This matching allows

record the cash proceeds and record a gain or a loss from securitization. Transaction and servicing fees generated through securitization are also an important component of total earnings.

us to investigate whether, holding constant important bank characteristics such as size and risk, the propensity to undertake securitization transactions affects bank information uncertainty. [11]

We regress each of the two information uncertainty proxies on a measure of securitization activities and control variables. Our main regressions are specified as follows (firm and quarter subscripts omitted):

$$SPREAD = a_0 + a_1*ABSD + a_2*NETLNS + a_3*PROFIT + a_4*MVLEV + a_5*SIZE + a_6*STDRET + a_7*PRICE + a_8*NASDAQ + a_9*TURNOVER + a_{10}*FOLLOW + a_{11}*DERIVATIVE + a_{12}*CHGOFF\_ONBS + a_{13}*NPL\_ONBS + a_{14}*GAP + e, \quad (1)$$

$$DISPERSION = b_0 + b_1*ABSD + b_2*NETLNS + b_3*PROFIT + b_4*MVLEV + b_5*SIZE + b_6*STDRET + b_7*FOLLOW + b_8*DERIVATIVE + b_9*CHGOFF\_ONBS + b_{10}*NPL\_ONBS + b_{11}*GAP + e, \quad (2)$$

Dependent variables:

SPREAD = average of daily effective bid-ask spreads during quarter t, where the effective bid-ask spread is measured as two times the absolute value of the difference between daily ending trading price and the average of the ask and bid scaled by the average of bid and ask (from TAQ consolidated trades and consolidated quotes files);

DISPERSION = analysts' one-year ahead forecast dispersion calculated in the middle of the second month during quarter t, where dispersion is measured as standard deviation of forecasts scaled by mean of forecasts (from IBES summary file);

Independent variable:

ABSD = indicator variable that takes the value of one if a firm has any securitized assets at the end of quarter t, and zero otherwise;

Control variables:

NETLNS = total loans, net of the allowance for loan and lease losses plus customers' liabilities on outstanding acceptances scaled by total assets at end of quarter t;

PROFIT = the ratio of net income to total assets at the end of the quarter t;

MVLEV = the ratio of total liability to book value of equity at the end of quarter t;

SIZE = the log of total assets at the end of quarter t;

STDRET = return volatility measured as the standard deviation of daily returns during quarter t;

PRICE = price per share at the end of quarter t;

[11] Following prior literature (e.g., Beatty and Harris, 1999; Becher et al, 2005), we include our matching criteria measures as control variables in the multivariate analysis, to insure that we control for any potential inefficiencies in the matching process.

NASDAQ	= dummy variable that takes the value of one if a firm is listed on the NASDAQ, and zero if the firm is listed on the NYSE or the AMEX;
TURNOVER	= average daily turnover during quarter t, where turnover is measured as trading volume scaled by market capitalization at the end of each day (from CRSP daily stock file);
FOLLOW	= log of one plus the number of analyst following measured in the middle of the last month during quarter t (from the IBES summary file); if a firm is not covered by analysts $FOLLOW_t$=0,
DERIVATIVE	=total notional amount of derivative contracts scaled by total assets at the end of quarter t;
CHGOFF_ONBS	=charge-offs on balance sheet loans scaled by total assets at the end of quarter t;
NPL_ONBS	=past due on balance sheet loans scaled by total assets at the end of quarter t (where the past due loans equal loans past due 30 through 89 days plus loans past due 90 days or more), and
GAP	=absolute value of the difference between assets and liabilities expected to reprice within the next twelve months scaled by total assets at the end of quarter t.

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A significant positive (negative) coefficient on the indicator variable (ABSD) in models (1) and (2) would indicate that firms engaging in asset securitizations are subject to greater (less) information uncertainty, compared to firms that do not use this financing technique.

Prior research finds that firm size, stock return volatility and analyst following are associated with information uncertainty. Therefore, we include these control variables in our empirical models. We expect firm size and analyst following (SIZE and FOLLOW) to be negatively associated with our measures of information uncertainty, because the greater information availability for larger firms and firms with larger analyst following can reduce information uncertainty. Following prior literature, we use bank stock price, share turnover and an indicator variable for a firm's stock exchange listing in our spread regression. The indicator variable for the exchange listing (NASDAQ) is expected to be positively associated with spreads, since prior literature finds that firms listed on the NASDAQ stock exchange have larger bid-ask spreads compared to the NYSE and AMEX firms. Price is expected to have a negative coefficient in the

spread regressions. We also include share turnover (TURNOVER) as a control variable in the bid-ask spread model and predict a negative coefficient on turnover since prior literature finds that spreads are decreasing in trading volume.

To control for differences in bank asset composition, we include the proportion of on-balance sheet net loans to total assets (NETLNS), since loans are by far the largest asset on our sample firms' balance sheet.[12] Because prior studies (e.g., Flannery et al., 2004) find mixed results whether more loans would increase risk or not, we do not have directional predictions for this variable. In addition, we include the ratio of net income to total assets (PROFIT), to capture the effect of banks' profitability on information uncertainty.

One potential concern regarding our empirical models is that we spuriously attribute the difference in the level of information uncertainty between securitizing and non-securitizing banks to securitization transactions, when in fact such differences are driven by differences in bank intrinsic risk, and the securitization transactions just happen to be correlated with bank risk.[13] To some extent, the bank size and the on-balance sheet net loans already control for differences in banks' risk profile. To further address this issue, we include in our regressions two measures traditionally used in prior literature as proxies for firm risk, the standard deviation of returns (STDRET) and firm leverage (MVLEV).[14] In addition, we include several proxies for bank risk that are specific to the banking industry (DERIVATIVE, CHGOFF_ONBS,

[12] In robustness tests, we further control for the composition of bank on-balance sheet assets by including in our regressions the proportion of securities to total assets. After loans, securities are the second largest type of assets on our sample firms' balance sheet. On average, loans and securities account for about 87% of total on-balance sheet assets. Our results are very robust to this alternative specification.

[13] Prior literature finds mixed results on how bank risk levels affect the decision to securitize assets. On the one hand, Minton et al. (2004) measure bank risk using capital ratios and find that low risk banks are more likely to undertake securitization transactions. On the other hand, Bannier and Hansel (2007) using a sample of European banks and various risk measures find that riskier banks are more likely to securitize assets.

[14] Although, prior information asymmetry literature does not traditionally include beta (i.e., a systematic risk measure) as a control variable in bid-ask spreads and forecast dispersion regressions, in untabulated analysis we add firm beta as an additional risk measure. Our results are robust to the inclusion of this control variable.

NPL_ONBS and GAP). We control for banks' credit derivative use to account for the possibility that banks make the decision to securitize financial assets in the broader context of an overall risk management strategy. Prior literature (Minton et al. 2006) finds that banks are more likely to buy credit derivative protection if they are engaged in asset securitization. Given the level of complexity and illiquidity of some credit derivative transactions, it is possible that the use of credit derivatives also leads to increased bank information uncertainty and thus, we expect a positive coefficient on DERIVATIVE. The next two measures (CHGOFF_ONBS and NPL_ONBS) are intended to capture the riskiness of on-balance sheet loans. If market participants face greater uncertainty in assessing banks that have exposure to riskier on-balance loans, then we expect a positive association between the CHGOFF_ONBS and NPL_ONBS variables and our measures of information uncertainty. The GAP variable is a proxy for interest rate risk stemming from the possible mismatching between assets and liabilities that will reprice in the short-run. We expect positive coefficients on all of these risk variables in equations (1) and (2).

Table 2 presents multivariate regression results for the matched sample analysis. We use two model specifications. Model 1 (Model 2) uses the effective bid-ask spread (analysts' forecast dispersion) as our proxy for information uncertainty. We find that the coefficients for ABSD in Model 1 and Model 2 are positive and significantly significant (at p=0.05 and p=0.10, respectively), suggesting that information uncertainty is higher for banks that securitize assets, relative to banks that do not use this financing technique. All the control variables are either consistent with our predictions or insignificant. These empirical findings support our hypothesis that securitizing and non-securitizing banks have different levels of information uncertainty.

Two-Stage Least Square Design

It is possible that a bank's level of information uncertainty and its securitization activities are endogenously determined. In Section I, we hypothesize that the securitization transactions undertaken by a bank affect its information uncertainty. However, the information uncertainty faced by banks may also influence their decision of whether to securitize. Prior literature lists the immediate access to capital and the diversification of funding sources as some of the main benefits of securitization. To the extent that banks with high levels of information uncertainty find it more difficult and/or costly to access other sources of capital, they may be more likely to undertake asset securitization transactions to finance their operations. Through securitization, banks may be able to lower their cost of capital by setting aside in a SPE a set of fairly homogenous assets that are easier to evaluate (i.e. less subject to information uncertainty) than the company as a whole.

To control for this possible endogeneity problem, we estimate the relation between securitization and information uncertainty in a simultaneous setting. We estimate the following two-equation system using 2SLS:

$$ABSD = b_0 + b_1*UNCERTAINTY + b_2*GROWTH + b_3* LIQUIDITY + b_4* BUSINESS + b_5* SIZE + b_6*MVLEV + b_7*STDRET + b_8*PROFIT + b_9* CHGOFF\_ONBS + b_{10}* NPL\_ONBS + e, \quad (3)$$

$$UNCERTAINTY = a_0 + a_1*ABSD + a_2*NETLNS + a_3* SIZE + a_4* PROFIT + a_5* MVLEV + a_6*STDRET (+a_7*PRICE + a_8*NASDAQ + a_9*TURNOVER) + a_{10}*FOLLOW + a_{11}*DERIVATIVE + a_{12}*CHGOFF\_ONBS + a_{13}* NPL\_ONBS + a_{14}*GAP + e, \quad (4)$$

Where:

GROWTH = growth rate of on-balance sheet and securitized loans at the end of quarter t
LIQUIDITY = loans to deposits ratio at the end of quarter t, and
BUSINESS = the ratio of total noninterest income to total interest income at the end of quarter t
All the other variables are defined as before.

In this system of equations, the UNCERTAINTY measure is defined as either the bid-ask spread or the analyst forecast dispersion. For equation (4), the variables included in parentheses are relevant only for the model where the bid-ask spread is used as the dependent variable. In the first stage, we use logistic regressions to model the banks' decision to securitize financial assets. For the first stage regressions, the independent variables consist of all the exogenous variables that affect either the decision to securitize or information uncertainty. In the second stage, the fitted probabilities from the first-stage logistic model (ABSD_HAT) are included as explanatory variables in the information uncertainty model.

To estimate the system of equations, we have to identify instruments that satisfy two conditions: (1) are important determinants of a bank's decision to securitize assets; (2) are less likely to be correlated with the residuals from the information uncertainty regressions. We use three instruments to proxy for the securitization activities: the growth rate of on-balance sheet and securitized loans (GROWTH), the loans to deposits ratio (LIQUIDITY) and the ratio of total noninterest income to total interest income (BUSINESS). The first two variables fall into the category of funding-related securitization motivations. We select these variables because prior research consistently finds strong support for the hypothesis that firms undertake securitization transactions to diversify their sources of funding (i.e., get access to new sources of liquidity). Banks with a high rate of asset growth and/or a high ratio of loans to deposit face high liquidity needs and thus, are more likely to use securitization as another source of financing (Karaoglu, 2005). We expect a positive association between our GROWTH and LIQUIDITY measures and a bank's decision to engage in securitization transactions.

We choose the ratio of total noninterest income to total interest income (BUSINESS) to capture cases where banks expanded their business models to non-traditional (non-interest) lines of business and in the process developed a greater level of sophistication and operational complexity. Banks with greater operational complexity are more likely to have the resources and the expertise necessary in setting up complex securitization programs, and thus, more likely to rely on securitization as a source of funding. In addition, following prior literature (Karaoglu, 2005; Bannier and Hansel, 2007), we also include in the determinants-of-securitization equation controls for credit risk (NPL_ONBS, CHGOFF_ONBS), leverage (MVLEV), size (SIZE) and performance (PROFIT).

Table 3 presents the first and second stage regression estimates for our equation of interest, equation (4). Model 1 and Model 2 use the effective bid-ask spread and analyst forecast dispersion as proxies for information uncertainty, respectively. In these models, the securitization measure is the predicted value (ABSD_HAT) of the dichotomous securitization variable from the first stage regression. For both Models 1 and 2, we find that coefficient for the predicted value of the securitization variable is positive and statistically significant at $p<0.01$. The findings indicate that, after controlling for endogeneity, our empirical findings provide support for the hypothesis that securitizing banks have higher information uncertainty (specifically, higher bid-ask spreads and analysts' forecast dispersion) compared to non-securitizing banks. Untabulated Hausman tests reject the null hypothesis of no endogeneity for both our measures of information uncertainty. The coefficient of ABSD_HAT in Table 3 indicates that firms with securitized assets on average have effective spreads that are 0.0057 higher than the spreads of non-securitizing firm. This increase is of economic significance relative to the average effective spreads of 0.0126.

We note that the reliability of the inferences we can draw based on the 2SLS analysis is highly dependent on using good instruments for the two-equation system estimation. Following Larcker and Rusticus (2008), we use some diagnostic tests to examine the appropriate choice of instruments for our system of equations. First, we examine the correlation between the endogenous variables (ABSD and Recourse Proxies) and the instrument variables (ABSD_HAT, SEC). These correlations are high ranging from 39.49% to 73.44% for different model specifications, and statistically significant at p-values <0.01. Second, we conduct over-identification tests and find that for the regressions where we use the bid-ask spreads as a proxy for information uncertainty the over-identifying restriction test does not reject the appropriateness of the instruments. For the analysts' forecast dispersion regressions, over identification tests indicate that two instruments (i.e., growth and business diversification) are weak instruments. When we eliminate these variables and re-run our analysis, our findings are very similar with the results tabulated in the paper.[15] These tests mitigate the concern that we use weak instrumental variables in our 2SLS specifications.

V. THE IMPACT OF THE EXTENT OF RECOURSE ON INFORMATION UNCERTAINTY

So far, our empirical results indicate a positive association between securitization transaction and information uncertainty. Since the extent of recourse associated with securitized assets is

[15] In robustness tests, we include in our first stage regressions several other potential determinants of securitization: (1) a Herfindahl index of bank loan concentration as a measure of risk management, since banks with high loan concentration may engage in securitization transactions as way of diversifying their loan portfolio (i.e., as a risk management tool); (2) a bank's total risk-based capital ratio to proxy for the regulatory capital management motivation, since banks that are closer to the minimum capital threshold may more likely to engage in actions (such as securitization) that can provide capital relief; (3) an alternative measure of liquidity defined as the ratio of securities and trading assets to total assets. When we include these additional control variables our results are very similar to the results presented in the paper. However, over-identification tests suggest that these variable may be weak instruments (i.e., correlated with the residuals from our information uncertainty equations). Therefore, we do not include these variables in our main analysis.

critical in understanding the impact of securitization transactions on the originating bank, we examine next how the extent of recourse affects information uncertainty. In practice, various securitization transactions structures can differ substantially in the extent to which issuers retain the risks associated with the securitized assets, on a continuum from minimum to almost complete risk transfer. Given the complexity and diversity of possible securitization structures and the existence of both retained interests and implicit recourse, market participants face considerable uncertainty about the extent of recourse. Therefore, we expect the magnitude of possible recourse associated with securitized assets to be positively associated with bank-level information uncertainty.

Recourse Measures

Measuring the extent of risk transfer empirically is not an easy task. The same factors that make recourse difficult to assess from the market participants' point of view also make the extent of recourse difficult to measure empirically. In this study, we use five empirical proxies in an attempt to capture both implicit and explicit aspects of the extent of recourse. Our first recourse proxy is the magnitude of the asset-backed securities retained by the issuer with the purpose of credit enhancing the securitization transactions, and thus making the remaining asset-backed securities more attractive to outside investors. These retained asset-backed securities kept by the securitized bank on its balance sheet (hereafter referred to as retained interests - RET_INT) bear the first risk of loss on securitized assets, so that the senior asset backed securities sold to outside investors are better protected against credit risk.[16]

[16] Following prior literature (Chen et al, 2008) we measure retained interests as the sum of interest-only strips and subordinated asset-backed securities.

Second, we use the proportion of securitized assets to total bank assets (ABS) and the proportion of securitization income to total net income (SECINC) as proxies for the importance of securitization transactions relative to the other bank activities.[17] We argue that banks whose securitization transactions are an important source of financing and profitability are more likely to be concerned about preserving their repeated access to the securitization markets and thus, these banks are more likely to step in and offer voluntary support for some of their troubled securitization structures as a means of preserving their reputation in the market (Higgins and Mason, 2004; Cantor and Rouyer, 2000). In addition, although in every securitization transaction there is at least some degree of risk transfer, the magnitude of securitized assets relative to total assets can serve as an upper bound for the possible level of risk associated with the securitized assets. Thus, we use ABS and SECINC as two of our proxies of implicit recourse.

Third, we also use as proxies for implicit recourse two measures intended to capture the quality of the securitized assets, namely the magnitude of nonperforming securitized loans (NPL_SEC) and charge-offs associated with securitized loans (CHOFF_SEC). We expect these two measures to be positively correlated with the level of potential recourse, since lower quality securitized assets may more likely need future support from the securitization originating banks.

Matched Sample Design

To test our hypothesis that the extent of recourse regarding the securitized assets is positively associated with bank information uncertainty, we regress the two information uncertainty proxies (bid-ask spreads and analysts' forecast dispersion) on our measures of implicit recourse and

[17] Prior literature (e.g. Higgins and Mason, 2004) also uses the magnitude of the securitized assets to assess the importance of securitization for the originating bank and hence the probability of recourse.

retained interests and control variables. Our regressions are specified as follows (firm and year subscripts omitted):

$$SPREAD = a_0 + a_1*RECOURSE + a_2*NETLNS + a_3*PROFIT + a_4*MVLEV + a_5*SIZE + a_6*STDRET + a_7*PRICE + a_8*NASDAQ + a_9*TURNOVER + a_{10}*FOLLOW + a_{11}*DERIVATIVE + a_{12}*CHGOFF\_ONBS + a_{13}*NPL\_ONBS + a_{14}*GAP + e, \quad (5)$$

$$DISPERSION = b_0 + b_1*RECOURSE + b_2*NETLNS + b_3*PROFIT + b_4*MVLEV + b_5*SIZE + b_6*STDRET + b_7*FOLLOW + b_8*DERIVATIVE + b_9*CHGOFF\_ONBS + b_{10}*NPL\_ONBS + b_{11}*GAP + e, \quad (6)$$

Where:

RECOURSE is defined, in turn, as one of the following five variables:

ABS	= total securitized assets scaled by total assets at the end of quarter t;
SECINC	=securitization income and servicing fees scaled by total net income for quarter t
NPL_SEC	=total nonperforming securitized loans scaled by total assets at the end of quarter t
CHOFF_SEC	= total charge-offs for securitized loans scaled by total assets at the end of quarter t
RET_INT	=total retained interest from all asset securitizations scaled by total assets at the end of quarter t

All the other variables are defined as before.

Table 4 Panel A presents the distributional characteristics of these measures of recourse for the sub sample of banks with asset securitization transactions. On average, total securitized assets, nonperforming securitized loans, total charge-offs associated with securitized loans, and total retained interest account for 16.57%, 0.65%, 0.06%, and 0.14% of total assets, respectively.[18] Securitizing income include service fees account for 29.39% of net income for these banks. Table 4 Panel B presents the correlation tables for the sample of both securitizing and non-securitizing banks. The correlations between these proxies of implicit recourse and

[18] As shown in Panel A of Table 4, the distribution of these extent of risk transfer proxies is skewed. To assess the impact of skewness in the distribution of our securitization variables, we log transform our continuous securitization variables and rerun the multivariate regressions using the log transformations instead of the raw securitization measures. The empirical findings of this sensitivity analysis are very similar to the results tabulated in the paper.

retained interests are high, ranging from 0.375 (Spearman correlation between ABS and RET_INT) to 0.880 (Spearman correlation between ABS and NPL_SEC). These high correlations are not unexpected given out argument that all five measures proxy for the same underlying concept, the extent of recourse related to securitized assets. However, the results in Table 4 show that although highly correlated these five proxies do not perfectly overlap and they may capture different aspects of the extent of risk transfer.

Tables 5 and 6 present the results of estimating equations (5) and (6) using a sample of securitizing and non-securitizing banks matched by size, intrinsic risk and quarter. The findings in Table 5 generally support our hypothesis that the extent of recourse regarding securitized assets is positively associated with bank-level information uncertainty. Consistent with our expectations, the two proxies for the importance of securitization transactions in the overall portfolio of bank activities (ABS and SECINC) have positive statistically significant coefficients in both the spread and the analyst forecast regressions. These results suggest that the greater the importance of securitization to a bank's financing and profitability and thus, the higher the possibility of voluntary (implicit) support offered by the bank to its troubled securitization structures, the greater the information uncertainty faced by market participants.

With respect to our measures of securitized loan quality (NPL_SEC and CHOFF_SEC), we find that, after controlling for other determinants of information uncertainty, the magnitude of nonperforming loans (NPL_SEC) is significantly positively associated with both bid-ask spreads and the analysts' forecast dispersion. However, the securitized loans charge-off measure (CHOFF_SEC) while statistically significant in the dispersion regression is insignificant at conventional levels in the spread regression. One possible explanation for this finding is that our matched sample specification lacks power due to the fact that securitizing banks are significantly

larger than the non-securitizing banks and requiring a sized-matched firm reduces considerably the number of available observations. When we use a matched sample specification, our sample size drops from 3,333 to 1.360 observations for the bid-ask spread regressions. The CHOFF_SEC variable may capture an aspect of recourse that is particularly relevant to financial analysts since analysts focus on net earnings and the charge-offs are a component of earnings. Therefore, even with limited power, the dispersion specification may be better suited than the spread regression to capture the aspect of recourse proxied by the securitized loans charge-off measure. Table 5 and 6 also show that our proxy for retained interests (RET_INT) is positively statistically significant in the dispersion regression (p-value < 0.01) but it is statistically insignificant in the spread regression.

Two-Stage Least Square Design

Although, the evidence in Tables 5 and 6 generally supports our hypothesis that the higher extent of recourse leads to higher levels of information uncertainty, one concern regarding the matched sample specification is that it lacks power and/or our results are affected by endogeneity. It is possible that banks with high levels of information uncertainty find it more difficult to access other sources of capital and therefore they may be more willing to offer recourse when undertaking asset securitization transactions to keep open their access to securitization markets. Paralleling our discussion in Section IV, we use the same three instruments (i.e., GROWTH, LIQUIDTY, and BUSINESS) and re-estimate equations (5) and (6) using a 2SLS specification. In the first stage, we model the magnitude of our extent of recourse proxies and in the second stage we focus on the relation between information uncertainty and

these recourse proxies, after replacing each endogenous explanatory variable with the predicted value from the first stage.

Table 7 and 8 present the results of the 2SLS estimation for equations (5) and (6). For both the bid-ask spread and the dispersion regressions, we find that coefficients for the predicted value of the recourse variables are positive and statistically significant at p-values <0.01 for all of our recourse measures. Thus, after controlling for endogeneity, our empirical findings provide support for the hypothesis that a larger extent of recourse (both implicit recourse and retained interests) is associated with higher bank-level information uncertainty.

VI. SUMMARY AND CONCLUSION

In this study, we investigate the effect of bank asset securitization on information uncertainty. Drawing on prior market microstructure and financial analyst literature, we use two proxies for firm information uncertainty: bid-ask spreads and analysts' forecast dispersion. We first compare the information uncertainty of securitizing and non-securitizing banks, after controlling for other determinants of information uncertainty. We then hypothesize that the extent of recourse associated with securitizations can lead to higher information asymmetry among investors with different access to information and different ability to process such information.

Our empirical findings indicate that banks that engage in securitization transactions have higher bid-ask spreads and analysts' forecast dispersion compared with banks that do not engage in this type of financing transactions. We also find that the empirical measures of the extent of recourse are positively associated with bank information uncertainty.

Our study contributes to the literature by investigating the implications of securitization transactions and securitization recourse on information uncertainty. This is an important economic consequence for firms, since prior literature finds that part of a firm's cost of capital arises from lack of precision of information and/or from information asymmetry between the firm and its shareholders, and information asymmetry among market participants.

This study is subject to at least two limitations. First, while we provide a discussion of the various reasons why securitizations may contribute to higher or lower information uncertainty for originating banks, we focus only on the net effect of these factors and do not attempt to distinguish among different reasons in our empirical tests. Second, our study focuses on single type of participants in the securitization markets namely, banks. To the extent that some aspects of the securitization transactions are substantially different in other industries, we may not be able to generalize our findings.

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Appendix A – Variable definition

SPREAD	= average of daily effective bid-ask spreads during quarter t, where the effective bid-ask spread is measured as two times the absolute value of the difference between daily ending trading price and the average of the ask and bid scaled by the average of bid and ask (from TAQ consolidated trades and consolidated quotes files);
DISPERSION	= analysts' one-year ahead forecast dispersion calculated in the middle of the second month during quarter t, where dispersion is measured as standard deviation of forecasts scaled by mean of forecasts (from IBES summary file);
$ABSD_t$	= indicator variable that takes the value of one if a firm has any securitized assets at the end of quarter t, and zero otherwise;
NETLNS	= total loans, net of the allowance for loan and lease losses plus customers' liabilities on outstanding acceptances scaled by total assets at end of quarter t;
PROFIT	= the ratio of net income to total assets at the end of the quarter t;
MVLEV	= the ratio of total liability to book value of equity at the end of quarter t;
SIZE	= the log of total assets at the end of quarter t;
STDRET	= return volatility measured as the standard deviation of daily returns during quarter t;
PRICE	= price per share at the end of quarter t;
NASDAQ	= dummy variable that takes the value of one if a firm is listed on the NASDAQ, and zero if the firm is listed on the NYSE or the AMEX;
TURNOVER	= average daily turnover during quarter t, where turnover is measured as trading volume scaled by market capitalization at the end of each day (from CRSP daily stock file);
FOLLOW	= log of one plus the number of analyst following measured in the middle of the last month during quarter t (from the IBES summary file); if a firm is not covered by analysts $FOLLOW_t$=0,
DERIVATIVES	=total notional amount of derivative contracts scaled by total assets at the end of quarter t;
CHGOFF_ONBS	=charge-offs on balance sheet loans scaled by total assets at the end of quarter t;
NPL_ONBS	=past due on balance sheet loans scaled by total assets at the end of quarter t (where the past due loans equal loans past due 30 through 89 days plus loans past due 90 days or more), and
GAP	=absolute value of the difference between assets and liabilities expected to reprice within the next twelve months scaled by total assets at the end of quarter t.
ABS	= total securitized assets scaled by total assets at the end of quarter t;
SECINC	=securitization income and servicing fees scaled by total net income for quarter t
NPL_SEC	=total nonperforming securitized loans scaled by total assets at the end of quarter t
CHOFF_SEC	= total charge-offs for securitized loans scaled by total assets at the end of quarter t
RET_INT	=total retained interest from all asset securitizations scaled by total assets at the end of quarter t
GROWTH	= growth rate of on-balance sheet and securitized loans at the end of quarter t
LIQUIDITY	= loans to deposits ratio at the end of quarter t, and
BUSINESS	= the ratio of total noninterest income to total interest income at the end of quarter t

TABLE 1
Descriptive Statistics - Overall Sample
Distributional characteristics of the variables used in the multivariate analysis
(N=3,333)

VARIABLE	Mean	Median	Stddev	Q1	Q3
SPREAD	0.0126	0.0096	0.0113	0.0029	0.0192
ABSD	0.1833	0.0000	0.3870	0.0000	0.0000
NETLNS	0.6519	0.6680	0.1261	0.5821	0.7353
PROFIT	0.0062	0.0058	0.0045	0.0031	0.0090
MVLEV	10.8521	10.4699	2.8849	8.9674	12.3173
SIZE	7.7307	6.9929	2.0046	6.2597	9.0652
STDRET	0.0169	0.0158	0.0071	0.0117	0.0204
PRICE	27.5525	24.2800	15.3777	17.4000	33.4200
NASDAQ	0.6543	1.0000	0.0893	0.0000	1.0000
TURNOVER	0.0886	0.0633	0.0893	0.0332	0.1105
FOLLOW	1.1600	1.0986	1.1228	0.0000	2.0794
DERIVATIVE	0.3676	0.0000	1.8676	0.0000	0.0721
CHGOFF_ONBS	0.0022	0.0012	0.0030	0.0004	0.0027
NPL_ONBS	0.0085	0.0070	0.0072	0.0031	0.0116
GAP	0.1702	0.1517	0.1217	0.0671	0.2552
GROWTH	0.0360	0.0251	0.0636	0.0062	0.0520
LIQUIDITY	0.8950	0.9062	0.1810	0.7866	1.0080
BUSINESS	0.2867	0.1909	0.3182	0.1235	0.3219

Table 1 provides descriptive statistics for the variables used in our multivariate analysis. The descriptive statistics are computed using a comprehensive sample of banks with and without securitization transactions. See Appendix A for variable definition

TABLE 2
Multivariate Comparisons between Securitizing and Non-securitizing Banks-Matched Sample Specifications

		Model 1 Spread		Model 2 Dispersion	
	Predicted Sign	Coefficient	t-statistics	Coefficient	t-statistics
INTERCEPT	?	0.0240	(5.92)***	0.0359	(2.91)***
ABSD	+	0.0012	(2.04)**	0.0044	(1.68)*
NETLNS	?	-0.0003	(-0.14)	-0.0084	(-0.99)
PROFIT	?	-0.0601	(-0.90)	-0.3923	(-2.36)**
MVLEV	?	0.0001	(1.023)	0.0006	(1.98)*
SIZE	-	-0.0018	(-3.87)***	-0.0002	(-0.15)
STDRET	+	0.2431	(3.08)***	-0.0688	(-0.30)
PRICE	-	-0.0001	(-2.82)***	---	---
NASDAQ	+	0.0012	(1.37)	---	---
TURNOVER	_	-0.0231	(-3.49)***	---	---
FOLLOW	_	-0.0010	(-1.49)	-0.0070	(2.83)***
DERIVATIVE	+	0.0002	(0.97)	0.0002	(0.54)
CHGOFF_ONBS	+	-0.0693	(-0.69)	0.2382	(0.73)
NPL_ONBS	+	-0.0240	(-0.47)	0.2357	(1.20)
GAP	+	0.0024	(1.21)	-0.0062	(-0.68)
Adj-Rsquare			59.65%		17.14%
N			1,360		1,218

Table 2 presents multivariate analysis results from a regression of information uncertainty on an securitization indicator variable and controls. The regressions are estimated using a sample of securitizing banks matched by size, standard deviation of returns and quarter with non-securitizing banks. The dependent variable for Model 1 is the effective bid-ask spread. The dependent variable for Model 2 is the analysts' forecast dispersion. ***, ** and * denote statistical significance at 1%, 5% and 10%, respectively, based on two-tail tests. Standard errors are cluster-adjusted by firm and quarter following Petersen (2009). See Appendix A for variable definitions.

TABLE 3
Multivariate Comparisons between Securitizing and Non-securitizing Banks- 2SLS Specifications

	Model 1 Spread		Model 2 Dispersion	
	First Stage	Second Stage	First Stage	Second Stage
INTERCEPT	-0.8838 (-16.54)***	0.0219 (12.58)***	-1.1423 (-13.71)***	0.0551 (7.80)***
GROWTH	0.2448 (3.28)***		0.3899 (3.57)***	
LIQUIDITY	0.5068 (10.75)***		0.9716 (14.48)***	
BUSINESS	0.3487 (19.15)***		0.2908 (14.50)***	
ABSD_HAT		0.0057 (4.65)***		0.0208 (5.51)***
NETLNS	-0.3463 (-4.74)***	0.0014 (1.25)	-0.7892 (-7.20)***	-0.0062 (-1.38)
SIZE	0.0800 (13.58)***	-0.0018 (-8.74)***	0.0737 (10.07)***	-0.0023 (-3.33)***
PROFIT	-0.4274 (-0.39)	-0.1965 (-6.46)***	0.1851 (0.12)	-0.5688 (-5.03)***
MVLEV	0.0003 (0.17)	0.0001 (2.17)**	-0.0060 (-2.40)**	0.0006 (3.13)***
STDRET	-0.2869 (-0.40)	0.4308 (21.51)***	3.7504 (2.86)***	0.0848 (0.84)
PRICE	0.0016 (3.99)***	-0.0001 (-7.31)***		
NASDAQ	0.0229 (1.79)*	0.0034 (9.50)***		
TURNOVER	0.2569 (4.36)***	-0.0176 (-10.48)***		
FOLLOW	-0.0114 (-1.40)	-0.0027 (-11.97)***	0.1147 (7.30)***	-0.0096 (-7.83)***
DERIVATIVE	0.0158 (5.47)***	0.0003 (3.91)***	0.0040 (2.00)**	0.0005 (2.98)***
CHGOFF_ONBS	-0.7366 (-0.40)	-0.0524 (-1.02)	-3.5949 (-1.37)	0.0344 (0.17)
NPL_ONBS	4.1295 (5.57)***	-0.0004 (-0.02)	3.8870 (3.03)***	0.0676 (0.68)
GAP	0.0525 (1.33)	0.0027 (2.41)**	0.0396 (0.65)	-0.0021 (-0.46)
Adj-Rsquare	53.66%	57.17%	59.77%	9.34%
N	3,333	3,333	1,803	1,803

Table 3 presents the first and second stage results from the two-stage least square estimation of the following system: $ABSD = b_0 + b_1*UNCERTAINTY + b_2*GROWTH + b_3*LIQUIDITY + b_4*BUSINESS + b_5*SIZE + b_6*PROFIT + b_7*MVLEV + b_8*STDRET + b_9*CHGOFF\_ONBS + b_{10}*NPL\_ONBS + e$, $UNCERTAINTY = a_0 + a_1*ABSD + a_2*NETLNS + a_3*SIZE + a_4*PROFIT + a_5*MVLEV + a_6*STDRET (+a_7*PRICE + a_8*NASDAQ + a_9*TURNOVER) + a_{10}*FOLLOW + a_{11}*DERIVATIVE + a_{12}*CHGOFF\_ONBS + a_{13}*NPL\_ONBS + a_{14}*GAP + e$. The dependent variable for Model 1 is the effective bid-ask spread. The dependent variable for Model 2 is the analysts' forecast dispersion. The variables in parentheses are not included in the dispersion regression. ***, ** and * denote statistical significance at 1%, 5% and 10%, respectively, based on two-tail tests. See Appendix A for variable definitions.

Table 4

Descriptive Statistics for the Extent of Recourse Measures

Panel A: Distributional characteristics of the extent of recourse variables

VARIABLE	Mean	Median	Stddev	Q1	Q3
ABS	0.1657	0.0389	0.2936	0.0113	0.1490
NPL_SEC	0.0065	0.0006	0.0137	0.0000	0.0045
CHGOFF_SEC	0.0006	0.0000	0.0014	0.0000	0.0002
SECINC	0.2939	0.0593	0.5825	0.0170	0.2754
RET_INT	0.0014	0.0004	0.0028	0.0000	0.0012

Panel B: Correlation table

Variables	ABS	NPL_SEC	CHGOFF_SEC	SECINC	RET_INT
ABS	1.00	0.94***	0.40***	0.57***	0.48***
NPL_SEC	0.88***	1.00	0.46***	0.57***	0.59***
CHGOFF_SEC	0.43***	0.57***	1.00	0.71***	0.73***
SECINC	0.58***	0.66***	0.51***	1.00	0.62***
RET_INT	0.38***	0.48***	0.47***	0.47***	1.00

Table 4 presents descriptive statistics for the extent of recourse measures used in our multivariate analysis. Panel A reports distributional characteristics computed using the sample of banks with asset securitization transactions. Panel B reports correlations between various extent of recourse variables computed based on a sample of securitizing and non-securitizing banks. Pearson (Spearman) correlations are presented above (below) the diagonal. ***, ** and * denote statistical significance at 1%, 5% and 10%, respectively, based on two-tail tests. See Appendix A for variable definitions.

TABLE 5

Bid-Ask Spread Regressions of the Impact of the Extent of Recourse on Information Uncertainty- Matched Sample Specifications

		Model 1	Model 2	Model 3	Model 4	Model 5
	Predicted Sign	ABS	NPL_SEC	CHGOFF_SEC	SECINC	RET_INT
INTERCEPT	?	0.0227 (5.79)***	0.0227 (5.70)***	0.0235 (5.71)***	0.0228 (5.62)***	0.0235 (5.85)***
RECOURSE MEASURE	+	0.0096 (3.50)***	0.1102 (1.85)*	0.2328 (0.52)	0.0069 (3.12)***	0.0012 (0.76)
NETLNS	?	-0.0005 (-0.21)	-0.0006 (-0.26)	-0.0005 (-0.22)	-0.0012 (-0.47)	-0.0011 (-0.41)
PROFIT	?	-0.0358 (-0.65)	-0.0568 (-0.93)	-0.0686 (-0.95)	-0.0387 (-0.64)	-0.0517 (-0.78)
MVLEV	?	0.0001 (1.62)	0.0001 (1.50)	0.0001 (0.36)	0.0001 (1.55)	0.0001 (1.06)
SIZE	-	-0.0016 (-3.67)***	-0.0016 (-3.82)***	-0.0018 (-3.95)***	-0.0016 (-3.81)***	-0.0017 (-3.95)***
STDRET	+	0.2244 (2.89)***	0.2310 (2.94)***	0.2398 (3.04)***	0.2292 (2.93)***	0.2289 (3.06)***
PRICE	-	-0.0001 (-3.28)***	-0.0001 (-2.79)***	-0.0001 (-2.34)**	-0.0001 (-2.64)***	-0.0001 (-2.41)**
NASDAQ	+	0.0018 (2.19)**	0.0017 (2.00)*	0.0014 (1.57)	0.0017 (1.95)*	0.0014 (1.56)
TURNOVER	–	-0.0267 (-4.47)***	-0.0245 (-4.22)***	-0.0201 (-2.81)***	-0.0248 (-4.19)***	-0.0208 (-2.83)***
FOLLOW	–	-0.0009 (-1.51)	-0.0009 (-1.50)	-0.0010 (-1.51)	-0.0009 (-1.54)	-0.0010 (-1.59)
DERIVATIVE	+	0.0003 (0.86)	0.0003 (1.11)	0.0006 (2.05)**	0.0002 (0.53)	0.0003 (0.69)
CHGOFF_ONBS	+	-0.1079 (-1.11)	-0.0970 (-0.97)	-0.0633 (-0.57)	-0.1299 (-1.33)	-0.0852 (-0.81)
NPL_ONBS	+	-0.0414 (-0.79)	-0.0180 (-0.31)	-0.0085 (0.14)	-0.0048 (-0.08)	0.0103 (0.17)
GAP	+	0.0022 (1.09)	0.0029 (1.44)	0.0029 (1.46)	0.0032 (1.63)	0.0034 (1.64)
Adj-Rsquare		61.24%	59.91%	59.27%	60.20%	59.49%
N		1,360	1,360	1,360	1,360	1,360

Table 5 presents multivariate analysis results from regressions of various extent-of-recourse measures on bid-ask spreads. The recourse measure for Model 1 is the proportion of securitized assets to total on-balance sheet assets. The recourse measures for Model 2 and Model 3 are the proportion of nonperforming loans and charge-offs associated with securitized loans. The recourse measures for Model 4 and Model 5 are the proportion of securitization income to total net income and the amount of retained interests. ***, ** and * denote statistical significance at 1%, 5% and 10%, respectively, based on two-tail tests. Standard errors are cluster-adjusted by firm and quarter following Petersen (2009). See Appendix A for variable definitions.

TABLE 6
Analysts' Forecast Dispersion Regressions of the Impact of the Extent of Recourse on Information Uncertainty- Matched Sample Specifications

		Model 1	Model 2	Model 3	Model 4	Model 5
	Predicted Sign	ABS	NPL_SEC	CHGOFFSEC	SECINC	RET_INT
INTERCEPT	?	0.0362 (2.77)***	0.0343 (2.51)**	0.0336 (2.74)***	0.0359 (2.92)***	0.0280 (2.23)**
RECOURSE MEASURE	+	0.0138 (1.80)*	0.3399 (2.07)**	2.2648 (2.50)**	0.0118 (4.52)***	1.6020 (3.35)***
NETLNS	?	-0.0096 (-1.19)	-0.0090 (-1.10)	-0.0121 (-1.73)*	-0.0133 (-2.42)**	-0.0115 (-1.93)*
PROFIT	?	-0.3108 (-1.88)*	-0.2947 (-1.78)*	-0.2706 (-1.43)	-0.0686 (-0.40)	-0.2519 (-1.35)
MVLEV	?	0.0007 (2.09)**	0.0007 (2.15)**	0.0006 (2.60)**	0.0006 (2.12)**	0.0007 (2.23)**
SIZE	-	-0.0004 (-0.31)	-0.0004 (-0.32)	-0.0000 (-0.03)	-0.0006 (-0.55)	0.0003 (0.25)
STDRET	+	-0.0739 (-0.33)	-0.0931 (-0.43)	-0.0659 (-0.28)	-0.0928 (-0.41)	-0.0888 (-0.40)
FOLLOW	-	-0.0063 (-2.72)***	-0.0058 (-2.52)**	-0.0064 (-2.90)***	-0.0050 (-2.74)***	-0.0060 (-2.85)***
DERIVATIVE	+	0.0004 (1.04)	0.0004 (1.05)	0.0002 (0.47)	0.0001 (0.45)	0.0000 (0.10)
CHGOFF_ONBS	+	0.1028 (0.31)	0.0486 (0.15)	-0.1851 (-0.54)	-0.2632 (-0.69)	-0.1146 (-0.30)
NPL_ONBS	+	0.2389 (1.27)	0.2119 (1.13)	0.3513 (2.00)*	0.3255 (2.15)**	0.3018 (1.81)*
GAP	+	-0.0037 (-0.39)	-0.0022 (-0.23)	-0.0008 (-0.10)	0.0001 (0.02)	-0.0010 (-0.12)
Adj-Rsquare		17.51%	18.83%	17.31%	21.91%	20.32%
N		1,218	1,218	1,218	1,218	1,218

Table 6 presents multivariate analysis results from regressions of various extent-of-recourse measures on the analysts' forecast dispersion. The recourse measure for Model 1 is the proportion of securitized assets to total on-balance sheet assets. The recourse measures for Model 2 and Model 3 are the proportion of nonperforming loans and charge-offs associated with securitized loans. The recourse measures for Model 4 and Model 5 are the proportion of securitization income to total net income and the amount of retained interests. ***, ** and * denote statistical significance at 1%, 5% and 10%, respectively, based on two-tail tests. Standard errors are cluster-adjusted by firm and quarter following Petersen (2009). See Appendix A for variable definitions.

TABLE 7
Bid-Ask Spread Regressions of the Impact of the Extent of Recourse on Information Uncertainty - 2SLS Specifications

	Model 1 ABS		Model 2 NPL_SEC		Model 3 CHGOFF_SEC		Model 4 SECINC		Model 5 RET_INT	
	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
INTERCEPT	-0.1001 (-4.45)***	0.0181 (12.59)***	-0.0024 (-2.27)**	0.0177 (12.42)***	-0.0000 (-0.08)	0.0168 (11.84)***	0.0247 (0.54)	0.0169 (11.90)***	0.0001 (0.39)	0.0172 (12.06)***
GROWTH	0.2952 (9.39)***		0.0109 (7.52)***		0.0005 (4.13)***		0.2518 (3.94)***		0.0009 (2.95)***	
LIQUIDITY	0.3220 (16.23)***		0.0163 (17.92)***		0.0006 (7.78)***		0.5155 (12.78)***		0.0031 (15.89)***	
BUSINESS	0.1719 (22.43)***		0.0072 (20.40)***		0.0004 (13.86)***		0.2641 (16.96)***		0.0013 (17.84)***	
RECOURSE MEASURE_HAT		0.0099 (4.42)***		0.2082 (4.14)***		4.8399 (4.70)***		0.0064 (4.32)***		1.1280 (4.03)***
NETLNS	-0.2194 (-7.13)***	0.0009 (0.81)	-0.0120 (-8.50)***	0.0009 (0.76)	-0.0002 (-1.37)	0.0002 (0.14)	-0.4148 (-6.63)***	0.0013 (1.18)	-0.0025 (-8.39)***	0.0012 (1.06)
SIZE	-0.0115 (-4.64)***	-0.0013 (-8.30)***	-0.0008 (-6.92)***	-0.0012 (-8.06)***	-0.0000 (-3.13)***	-0.0012 (-8.14)***	-0.0148 (-2.93)***	-0.0013 (-8.40)***	-0.0002 (-6.41)***	-0.0012 (-8.01)***
PROFIT	-4.6515 (-10.15)***	-0.1517 (-4.64)***	-0.1712 (-8.13)***	-0.1627 (-5.08)***	-0.0266 (-14.99)***	-0.0694 (-1.66)*	-17.0430 (-18.30)***	-0.0893 (-2.21)**	-0.0482 (-10.86)***	-0.1453 (-4.30)***
MVLEV	-0.0030 (-4.33)***	0.0001 (2.73)***	-0.0002 (-5.21)***	0.0001 (2.76)***	-0.0000 (-6.76)***	0.0002 (3.69)***	-0.0057 (-4.03)***	0.0001 (2.83)***	-0.0000 (-5.06)***	0.0001 (2.81)***
STDRET	1.7621 (5.83)***	0.4121 (20.03)***	0.0891 (6.42)***	0.4118 (19.91)***	0.0025 (2.13)**	0.4167 (20.51)***	1.6678 (2.71)***	0.4194 (20.68)***	0.0058 (1.97)**	0.4244 (21.06)***
PRICE	0.0012 (7.33)***	-0.0001 (-7.56)***	0.0000 (5.63)***	-0.0001 (-7.32)***	-0.0000 (-0.65)	-0.0001 (-6.25)***	0.0008 (2.28)**	-0.0001 (-6.94)***	0.0000 (2.58)***	-0.0001 (-6.92)***
NASDAQ	-0.0356 (-6.58)***	0.0038 (10.31)***	-0.0019 (-7.45)***	0.0039 (10.27)***	-0.0001 (-3.54)***	0.0039 (10.40)***	-0.0739 (-6.73)***	0.0040 (10.38)***	-0.0001 (-2.52)**	0.0036 (10.01)***
TURNOVER	0.1062 (4.29)***	-0.0173 (-10.37)***	0.0065 (5.67)***	-0.0176 (-10.41)***	-0.0001 (-0.49)	-0.0159 (-9.76)***	0.2494 (4.95)***	-0.0178 (-10.48)***	0.0008 (3.44)***	-0.0171 (-10.27)***
FOLLOW	-0.0004 (-0.11)	-0.0027 (-12.21)***	0.0001 (0.82)	-0.0028 (-12.29)***	0.0000 (2.12)**	-0.0029 (-12.85)***	-0.0200 (-2.88)***	-0.0026 (-11.45)***	0.0001 (3.41)***	-0.0029 (-12.71)***
DERIVATIVE	-0.0046 (-3.79)***	0.0005 (5.71)***	-0.0001 (-2.27)**	0.0004 (5.50)***	0.0001 (14.21)***	0.0001 (0.87)	0.0110 (4.25)***	0.0004 (4.22)***	0.0001 (5.80)***	0.0003 (4.08)***

CHGOFF_ONBS	7.2442 (9.27)***	-0.1196 (-2.17)**	0.3384 (9.42)***	-0.1173 (-2.12)**	0.0578 (19.12)***	-0.3335 (-4.05)***	20.9810 (13.21)***	-0.1863 (-2.97)***	0.0855 (11.30)***	-0.1464 (-2.49)***
NPL_ONBS	1.9993 (6.40)***	0.0038 (0.18)	0.0864 (6.03)***	0.0041 (0.19)	0.0024 (1.97)**	0.0128 (0.62)	2.8521 (4.49)***	0.0038 (0.18)	0.0096 (3.16)***	0.0102 (0.49)
GAP	-0.0257 (-1.55)	0.0033 (3.00)***	-0.0022 (-2.82)***	0.0035 (3.24)***	-0.0003 (-4.34)***	0.0043 (3.88)***	-0.0834 (-2.48)***	0.0036 (3.28)***	-0.0006 (-3.52)***	0.0038 (3.43)***
Adj-Rsq	38.17%	57.14%	36.22%	57.11%	38.54%	57.18%	37.26%	57.13%	33.74%	57.10%
N	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333

Table 7 presents the first and second stage results from the two-stage least square estimation of the following system: RECOURSE_MEASURE= b_0 + b_1*SPREAD+b_2* GROWTH +b_3* LIQUIDITY+ b_4*BUSINESS +b_5* SIZE+b_6* PROFIT +b_7* MVLEV +b_8* STDRET +b_9* CHGOFF_ONBS + b_{10}* NPL_ONBS +e,

SPREAD = a_0 + a_1*RECOURSE_MEASURE +a_2*NETLNS+a_3* SIZE +a_4* PROFIT +a_5* MVLEV +a_6*STDRET+a_7*PRICE +a_8*NASDAQ+a_9*TURNOVER +a_{10}*FOLLOW +a_{11}*DERIVATIVE+ a_{12}*CHGOFF_ONBS+ a_{13}* NPL_ONBS + a_{14}*GAP +e,

The recourse measure for Model 1 is the proportion of securitized assets to total on-balance sheet assets. The recourse measures for Model 2 and Model 3 are the proportion of nonperforming loans and charge-offs associated with securitized loans. The recourse measures for Model 4 and Model 5 are the proportion of securitization income to total net income and the amount of retained interests. ***, ** and * denote statistical significance at 1%, 5% and 10%, respectively, based on two-tail tests. See Appendix A for variable definitions.

TABLE 8
Analysts' Forecast Dispersion Regressions f the Impact of the Extent of Recourse on Information Uncertainty - 2SLS Specifications

	Model 1 ABS		Model 2 NPL_SEC		Model 3 CHGOFF_SEC		Model 4 SECINC		Model 5 RET_INT	
	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage	First Stage	Second Stage
INTERCEPT	-0.0729 (-1.96)**	0.0360 (6.16)***	0.0021 (1.13)	0.0318 (5.49)***	0.0003 (0.95)	0.0280 (4.66)***	-0.2062 (-2.67)***	0.0351 (6.00)***	0.0014 (2.53)***	0.0275 (4.66)***
GROWTH	0.3626 (7.45)***		0.0141 (5.76)***		0.0013 (3.64)***		0.4417 (4.37)***		0.0019 (2.60)***	
LIQUIDITY	0.3419 (11.43)***		0.0203 (13.51)***		0.0017 (7.85)***		0.7175 (11.55)***		0.0072 (16.05)***	
BUSINESS	0.0920 (10.29)***		0.0037 (8.30)***		0.0009 (13.68)***		0.2538 (13.67)***		0.0021 (15.48)***	
RECOURSE MEASURE_HAT		0.0574 (5.56)***		1.3710 (6.67)***		5.3617 (3.62)***		0.0229 (4.94)***		2.9260 (5.63)***
NETLNS	-0.3486 (-7.14)***	-0.0036 (-0.80)	-0.0242 (-9.84)***	-0.0014 (-0.31)	-0.0009 (-2.58)***	-0.0056 (-1.23)	-0.4886 (-4.82)***	-0.0070 (-1.55)	-0.0068 (-9.23)***	-0.0038 (-0.84)
SIZE	0.0017 (0.53)	-0.0009 (-1.56)	-0.0003 (-2.04)**	-0.0007 (-1.31)	-0.0001 (-3.27)***	0.0002 (0.39)	0.0096 (1.42)	-0.0008 (-1.48)	-0.0003 (-6.76)***	0.0001 (0.26)
PROFIT	-11.0438 (-16.64)***	0.0838 (0.48)	-0.4868 (-14.59)***	0.1424 (0.86)	-0.1096 (-22.28)***	-0.0213 (-0.10)	-31.6562 (-22.97)***	0.1478 (0.74)	-0.1599 (-15.97)***	-0.0978 (-0.65)
MVLEV	-0.0078 (-7.07)***	0.0009 (4.38)***	-0.0005 (-8.85)***	0.0011 (5.12)***	-0.0001 (-8.53)***	0.0009 (3.77)***	-0.0061 (-2.64)***	0.0006 (3.25)***	-0.0001 (-8.45)***	0.0009 (4.29)***
STDRET	2.1001 (3.50)***	0.0339 (0.33)	0.1529 (5.20)***	-0.0454 (-0.43)	0.0158 (3.64)***	0.0723 (0.70)	3.9710 (3.27)***	0.0675 (0.66)	0.0423 (4.80)***	0.0420 (0.41)
FOLLOW	0.0156 (2.22)**	-0.0081 (-6.82)***	0.0005 (1.51)	-0.0076 (-6.42)***	0.0000 (0.85)	-0.0079 (-6.63)***	-0.0511 (-3.51)***	-0.0062 (-5.10)***	0.0002 (1.42)	-0.0077 (-6.50)***
DERIVATIVE	-0.0060 (-6.70)***	0.0009 (5.22)***	-0.0003 (-5.86)***	0.0009 (5.40)***	0.0000 (1.36)	0.0005 (3.19)***	0.0005 (0.27)	0.0005 (3.44)***	0.0000 (0.68)	0.0005 (3.37)***
CHGOFF_ONBS	12.0614 (10.30)***	-0.6899 (-2.92)***	0.6104 (10.37)***	-0.8405 (-3.56)***	0.1936 (22.31)***	-1.0627 (-2.96)***	39.2858 (16.15)***	-0.9288 (-3.36)***	0.2426 (13.73)***	-0.7578 (-3.13)***
NPL_ONBS	4.0181 (7.01)***	-0.0735 (-0.68)	0.2134 (7.41)***	-0.1639 (-1.48)	0.0094 (2.22)**	0.1315 (1.33)	1.4829 (1.25)	0.1281 (1.31)	0.0253 (2.92)***	0.0701 (0.71)

GAP	-0.0165 (-0.61)	-0.0003 (-0.07)	-0.0023 (-1.65)	0.0018 (0.39)	-0.0008 (-3.83)***	0.0038 (0.82)	-0.1557 (-2.76)***	0.0024 (0.53)	-0.0013 (-3.19)***	0.0025 (0.56)
Adj-Rsq	47.32%	9.37%	44.85%	10.04%	56.04%	8.47%	52.00%	9.04%	49.10%	9.41%
N	1,803	1,803	1,803	1,803	1,803	1,803	1,803	1,803	1,803	1,803

Table 8 presents the first and second stage results from the two-stage least square estimation of the following system: RECOURSE_MEASURE= b_0 + b_1*DISPERSION+b_2* GROWTH +b_3* LIQUIDITY+ b_4*BUSINESS +b_5* SIZE+b_6* PROFIT +b_7* MVLEV +b_8* STDRET +b_9* CHGOFF_ONBS + b_{10}* NPL_ONBS +e,
DISPERSION= a_0 + a_1*RECOURSE_MEASURE +a_2*NETLNS+a_3* SIZE +a_4* PROFIT +a_5* MVLEV +a_6*STDRET+a_7*FOLLOW +a_8*DERIVATIVE +a_9*CHGOFF_ONBS+ a_{10}* NPL_ONBS + a_{11}*GAP +e,
The recourse measure for Model 1 is the proportion of securitized assets to total on-balance sheet assets. The recourse measures for Model 2 and Model 3 are the proportion of nonperforming loans and charge-offs associated with securitized loans. The recourse measures for Model 4 and Model 5 are the proportion of securitization income to total net income and the amount of retained interests. ***, ** and * denote statistical significance at 1%, 5% and 10%, respectively, based on two-tail tests. See Appendix A for variable definitions.