

Asleep at the Wheel (Again)? Bank Audits During the Lead-Up to the Financial Crisis*

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1. Introduction

During the financial crisis of 2008–2009, several prominent financial institutions collapsed without any advance warning from their auditors. This has led some observers to question if auditors failed to incorporate into their audit judgments and/or reports the likely implications of auditee exposure to well-known systemic risks (e.g., Bajaj and Creswell 2008; Richard 2008; Sikka 2009; IAG 2011). However, other observers have noted that extant institutional arrangements (accounting and audit reporting rules) constrained auditors' ability to issue public warnings, even though auditors did recognize and respond to the audit risk implications of deteriorating market conditions (CAQ 2010; Seidman 2011; Doty 2011). In this study, we treat the crisis as a natural economic experiment that unfolded in several distinct stages and exploit the varying audit risk implications of the different stages to provide the first large-scale empirical evidence on these two alternative perspectives of auditor conduct during the lead-up to the crisis.

Determining if auditors recognized and responded to the audit risk implications of the events of 2006 and 2007 (i.e., during the period leading up to the crisis) is important for several reasons. Theoretically, auditors are expected to be attentive to audit risks stemming from contemporary events (AU 560).¹ The extent to which auditors actually do so in practice, however, is not presently well understood. The only evidence to date on this issue comes from Erickson, Mayhew, and Felix Jr. (2000), who study a single audit failure during a past crisis.² Our study contributes the first large-sample evidence on this aspect of auditor conduct. Our study also has implications for two contemporary policy issues. One,

* Accepted by Steve Salterio. We thank the editor, two anonymous reviewers, A. Rashad Abdel-Khalik, Charlie Kahn, Anne Farrell, Ann E. Gabriel, Mark Kohlbeck, Justin Leiby, Mark Peecher, Paul Polinski, Jaideep Shenoy, Ira Solomon, William F. Wright, Bob Ramsey, Theodore Sougiannis, Dave Ziebart, and seminar participants at the University of Illinois, University of Kentucky, Ohio University, and Tulane University for valuable feedback on earlier versions of the paper.

1. Professional standards require auditors to consider all events up to the signing date when rendering an audit opinion for a given auditee fiscal year (cf. AU 560). Therefore, auditors are expected—under extant professional standards—to be responsive to the risk implications of events that have already occurred. However, they are not expected to predict the future course of events.
2. In a study of savings and loan audits conducted during the 1980s Savings and Loan crisis, Hill, Ramsay, and Simon (1994) find audit fees (and, by extension, audit attention) to be associated with measures of auditee business risk. However, they do not investigate the central question of interest in Erickson et al. (2000) or in our study: did auditors recognize and respond to *changes in risk due to contemporary (macroeconomic) shocks*? Our focus on auditor responses to macroeconomic shocks, which usually are not pre-announced and for which the auditor usually has little guidance as to the appropriate response, also differentiates our study from prior research on auditor responses to regulatory shifts (i.e., pre-announced events with a usually known and often explicitly stipulated desired response). We discuss these issues in detail in section 2.

recently adopted risk assessment standards for public company audits require auditors to take into account the auditee's business environment, including larger macroeconomic factors (PCAOB 2010). Evidence from audits conducted using business-risk approaches from a time period just before the formal adoption of the new standards can be informative about future auditor performance under the new standards. Two, some users have recently called for audit reports to provide insight on "how changes in the economy might affect a company's future financial performance or condition" (PCAOB 2011, 7–8). For such reports to yield the intended benefits, auditors first must be able to recognize the entity-level implications of macroeconomic shocks. Our study presents evidence on their ability to do so.

Our central thesis is as follows: even when existing institutional arrangements are flawed and preclude advance public warning, if auditors recognize and respond (via a mix of strategic labor allocations and increased risk premiums) to the shifts in audit risk posed by changes in the auditee's business environment, audit fees can be expected to vary in tandem with those risk shifts. Using fiscal year 2005 bank audit engagements as a pre-crisis benchmark, we focus on bank audit engagements conducted during the period leading up to the financial crisis (fiscal years 2006 and 2007) to present evidence on this thesis.³ Specifically, we expect the shocks to U.S. housing and mortgage-backed securities markets during 2006 and 2007 to affect audit risks associated with banks' (i) loan origination, (ii) loan distribution, and (iii) investment activities as follows.

Loans originated and held on the bank's books (i.e., owned by the bank) give rise to *retention* risk exposure, including interest rate, prepayment, and default risks. Of these, the principal audit risk is loan default risk; the other two risks essentially reflect opportunity losses for the loan originator and are a relatively more remote concern to the auditor. Prior literature (cf. Wahlen 1994; Ryan 2007) suggests that, during times of rising housing prices and low default rates (e.g., as in 2005), loan loss risk can readily be estimated from the size of the bank's nonperforming loan portfolio and the bank's historical loss experience. In such times, therefore, the size of a bank's nonperforming loan portfolio generally is a significant driver of audit attention to loan retention risks. When economic conditions worsen, however, as they did in 2006 and 2007, nonperforming loan balances usually exhibit a significant increase because overdue mortgage loans, which must be reclassified as nonperforming under banking rules, increase. During such times, nonperforming loan balances are less accurate predictors of loan losses on *collateralized* mortgage loans, and audit attention is more likely to focus on assessing loan charge-offs, which also requires an examination of collateral adequacy.

In contrast to loan origination activities, banks' loan distribution activities, including loan sales or securitizations, create *distribution support* risk. Loan distribution frees up bank capital for further lending and improves return on equity, but it introduces adverse-selection risk (risk of losses from low quality loan originations) between loan originators and buyers. To mitigate this risk, loan securitizers offer a variety of credit enhancements (e.g., loan performance guarantees and retained first-loss positions in securitizations) that reduce the buyer's expected loss but expose the securitizer to distribution support risk. We use banks' retained interests in mortgage loan securitizations as a measure of their distribution support risks (Chen, Liu, and Ryan 2008; Barth, Ormazabal, and Taylor 2012). Given the housing market and mortgage loan performance in 2005, these risks may or

3. We use the time lines from Ryan (2008) and Federal Reserve (2010) to align crisis-related events with auditee fiscal years. We focus on banks because they constitute a homogeneous group of auditees and material financial statement line items with audit risks that would have been affected by the events of the crisis. We focus on the 2006–2007 period because of the recent criticisms of auditors for failing to warn of impending auditee failure pertaining to the economic shocks that occurred during this period.

may not be perceived as material by auditors. However, as housing market conditions and loan performance deteriorate during 2006 and 2007, we expect these risks to be significant drivers of audit attention.

The third major class of misstatement risks, *investment* risk, stems from banks' holdings of securities issued by other entities. U.S. bank capital adequacy rules make it less expensive for banks to hold a dollar of assets in the form of certain mortgage-backed securities rather than as mortgage loans (e.g., Herring 2007; Jablecki 2009; Bhat, Frankel, and Martin 2011). Many banks, therefore, engage in regulatory arbitrage by selling or securitizing their loan obligations, and buying and holding mortgage-backed securities instead. Shocks to markets for these securities (such as those occurring in 2006 and 2007) can be expected to exacerbate audit risks associated with banks' investments in nonagency mortgage-backed securities.⁴ Further, the 2006 and 2007 securities market shocks also can be expected to raise the audit risks emanating from banks' holdings of all types of illiquid financial instruments (Level 3 assets as defined under SFAS 157). Data on banks' holdings of such assets are first available only for fiscal year 2007, so in that year, we expect these assets to be significant drivers of audit attention as well.⁵

The empirical evidence we document is consistent with auditors recognizing and responding to evolving macroeconomic conditions: during 2005–2007, audit attention appears to shift in line with the unfolding economic shocks. Notably, as we expect for retention risks, charge-offs play a substantially more salient role in driving audit fees in 2006 and 2007 than they do in 2005, while the explanatory power of nonperforming loan balances, which was significant in 2005, falls off in the later years. Also as expected, distribution support risks are significant drivers of audit fees. Their salience increases over time: the coefficient in 2007 is substantially greater than in 2005. Investment risk measures are salient drivers of audit fees in 2006 and 2007 but not in 2005: investments in nonagency mortgage-backed securities are the significant driver in 2006, while in 2007 the significant driver is Level 3 assets, a measure not available for earlier years.

Overall, as the crisis evolved, the shifts in association between the cross-sectional variation in bank business-risk exposure and bank audit fees strongly suggest that auditors were cognizant of and responded to the entity-level implications of crisis-related events.⁶ Our principal inferences are unaffected by alternative estimation, sample selection, and variable definition choices.

Besides offering the first large-scale empirical evidence on auditor risk responsiveness, our findings have three key implications. First, the absence of advance warnings of auditee failure during the lead-up to the most recent financial crisis more likely reflects the limitations of current accounting and auditing rules rather than auditor failure to either understand or attend to escalating risk and/or deteriorating macroeconomic conditions. Second, the implementability of risk-based audit approaches that have recently been incorporated into U.S. public company auditing standards rests on auditors' ability to recognize and respond to emergent shifts in audit risk. Our findings suggest that U.S. auditors possess the ability to implement such audit approaches. Third, U.S. auditing

4. Holdings of agency-backed securities are, by contrast, not expected to increase audit risk during this period because they are guaranteed by government agencies and, thus, pose no material default risk.

5. Disclosures pertaining to Level 3 assets were mandated by Statement of Financial Accounting Standards No. 157 (FASB 2008) for fiscal years beginning after November 15, 2007. We, therefore, hand-collected end-of-2007 Level 3 asset balances from reconciliations of the beginning and end-of-quarter holdings of these assets provided in banks' first-quarter 2008 10-Q filings.

6. Tracking shifts in auditor attention across a sequence of exogenous economic shocks (natural experiments) also helps mitigate concerns about causal identification (Cameron and Trivedi 2005, 35–37).

regulators are presently considering expanding the scope of the auditor's report to incorporate information about the impact of shocks to the auditee's business environment on the auditee's financial statements. Our findings suggest that U.S. auditors possess the necessary understanding of the auditee's business environment to discharge such a reporting responsibility.

While our findings provide strong evidence that auditors were able to identify and respond to the macroeconomic shocks to banks' business environment, our inferences about auditor conduct during the financial crisis are subject to limitations. First, without a benchmark of the appropriate auditor response (i.e., the optimal coefficient loadings), the evidence does not speak to the *adequacy* of auditor responses. Second, without audit labor usage data (not publicly available in the United States), the response we document cannot be further decomposed into distinct labor usage and risk-premium components.

We present the rest of the paper as follows. In section 2, we provide background information, review both prior and contemporaneous related research, and spell out our predictions. In section 3, we describe the sample and the research method. We present results in section 4 and concluding comments in section 5.

2. Background, related prior research, and expectations

Auditor risk responsiveness and the debate on auditors' role during the financial crisis

In the period leading up to the financial crisis, many companies and financial institutions collapsed abruptly, without any warning from their auditors.⁷ This apparent failure of auditors to forewarn investors has rekindled interest in the topic of auditors' ability to recognize and respond to the entity-level implications of macroeconomic shocks. Extant empirical evidence on this topic is inconclusive. On one hand, in a large-sample study of bank audit engagements conducted during the Savings and Loan crisis, Hill et al. (1994) find audit fees and, by implication audit attention, to be associated with cross-sectional variation in auditee riskiness.⁸ On the other hand, Erickson et al. (2000) report that the auditor's failure to consider the impact of the deregulation of thrifts on the auditee's business was the leading cause of the Lincoln Savings and Loan audit failure during the 1980s S&L crisis. Collectively, these findings can be read as evidence that while auditors were sensitive to levels of auditee bankruptcy and litigation risk during the 1980s S&L crisis, they were *insensitive* to the risk implications of *changes* in the auditee's business and economic environment, that is, of macroeconomic shocks.

Partly in response to such audit failures, business-risk auditing (BRA) approaches evolved in the 1990s and emphasized the need for auditors to consider the client's business environment during audit risk assessment and audit procedure planning (e.g., Cushing, Graham, Palmrose, Rousey, and Solomon 1995; Bell, Marrs, Solomon, and Thomas 1997; KPMG 1999; Lemon, Tatum, and Turley 2000; Knechel 2007; Peecher, Schwartz, and Solomon 2007). Recent risk assessment standards issued by both the American Institute of Certified Public Accountants (AICPA) and the Public Company Accounting Oversight Board (PCAOB) endorse this view and require auditors to obtain an understanding of a

7. For instance, the PCAOB points out that auditors issued going-concern opinions in only two out of the ten largest bankruptcies of the financial crisis (PCAOB 2011). However, Sharp (2010) reports that UK auditors withheld going-concern opinions for a number of banks, with tacit regulatory/governmental assurances of a bail-out for distressed banks, and McKenna (2010) questions whether similar behavior occurred in the United States as well. In our sample of 283 banks, none received going-concern opinions in 2005, 2006, or 2007.

8. As noted earlier, Hill et al. (1994) do not investigate year-to-year changes in the pricing of their audit risk measures. Consequently, their analysis does not directly speak to auditor responsiveness to shifts in (shocks to) auditee riskiness.

company and its environment, including industry, regulatory, and other external factors (AICPA 2006; PCAOB 2010).⁹

The extent to which auditors display such an understanding on actual audit engagements is not presently well understood. Some recent experimental research (e.g., Peecher et al. 2007) indicates that auditors find it difficult to develop such an understanding, especially in situations characterized by dynamic shifts in the macroeconomic environment (Brewster 2011). However, large-sample empirical evidence on this topic is lacking, primarily because events that trigger rapid shifts in auditee business environment and auditee-level business risks are extremely rare. In this paper, we treat the rapid shift in banks' business environment in the lead-up to the 2008–2009 financial crisis as a natural experiment and investigate whether bank auditors recognized and responded to the auditee-level implications of rapid changes in their client's business environment.

In addition to the theoretical question of auditors' ability to recognize and respond to macroeconomic changes in the auditee's business environment, our analyses shed light on two contrasting perceptions of the role of auditors during the recent financial crisis. The first view, the "asleep at the wheel" thesis, is that auditors failed in the discharge of their duties. For instance, in a report entitled *The Watchdog that Didn't Bark... Again*, the Institutional Advisory Group (IAG) of the PCAOB argues that:

The recent financial crisis presented auditors, and by extension the Sarbanes-Oxley Act audit reforms, with their first big test since these reforms were put into place. By any objective measure, they failed that test. (IAG 2011)

Similar views are reflected in many articles both in academic literature (e.g., Sikka 2009) and in the business press (e.g., Bajaj and Creswell 2008; Richard 2008). For instance, in his article entitled *Where were auditors as companies collapsed?*, Richard (2008) notes that the risks inherent in both subprime lending and debt securitizations were well-known and that, since at least 1999, regulators explicitly require that banks' loan and lease loss reserves take into account systemic risks. Given this background, Richard argues, the lack of advance warning from auditors of impending auditee collapse indicates that auditors failed to incorporate the likely implications of auditee exposure to well-known systemic risks into their audit judgments and/or reports.

Others, however, argue that auditor failure to issue advance warnings of auditee collapse reflects structural limitations of existing accounting and auditing rules rather than a systematic failure on the auditor's part. The Center for Audit Quality (CAQ), a group affiliated with the U.S. public accounting profession, asserts that "auditors generally carried out their role effectively during the crisis and appropriately reached audit opinions within the context of the applicable accounting and auditing frameworks" (CAQ 2010). Financial Standards Accounting Board (FASB) Chairman Leslie Seidman has testified that ambiguous accounting standards permitted reporting games and regulatory arbitrage (Seidman 2011). On a similar note, PCAOB Chairman James Doty has testified that the crisis calls into question "the very nature of the auditor's reporting model, which has not significantly changed in more than 60 years" (Doty 2011). Reflecting these concerns about limitations imposed by existing institutional arrangements and regulations, the PCAOB has since issued an exposure draft listing several proposed modifications to the current

9. It is important to note that public company auditing standards applicable during the financial crisis did not explicitly require auditors to consider the impact of an auditee's environment on its financial statement risks. The AICPA standard (AU 314) was effective for periods beginning on or after December 15, 2006, but was applicable only to *private* company audits. The PCAOB risk assessment standard (Auditing Standard No. 12), which is applicable to public company audits was first proposed on October 21, 2008, and is effective for audits of fiscal years beginning on or after December 15, 2010.

auditor reporting model. One modification suggested by users is to require audit reports that provide insights on “how changes in the economy might affect a company’s future financial performance or condition” (PCAOB 2011, 7–8).

As noted earlier, evidence on auditor responses to emergent macroeconomic shocks can speak to the debate on auditor risk responsiveness during the most recent financial crisis. Such evidence—from a time period during which business-risk audit approaches had been widely adopted but not yet mandated—also can provide insights about the likely usefulness of auditing standards introduced after the crisis. Finally, evidence on auditor ability to recognize and respond to economic shocks can inform the policy debate on modifications of the current audit report.

Related prior research

We also build upon, extend, and complement two key streams of research. One stream involves the determinants of audit attention and audit fees. A second stream addresses the role of key information intermediaries during the financial crisis.

Auditor attention and bank audit fees

Following Simunic (1980), a substantial and long-standing literature documents that the primary drivers of auditor attention for U.S. public company audit engagements are auditee size, complexity, and risk (e.g., Davis, Ricchiute, and Trompeter 1993; O’Keefe, Simunic, and Stein 1994; Stein, Simunic, and O’Keefe 1994; Bell, Landsman, and Shackelford 2001; Johnstone and Bedard 2001; Fields, Fraser, and Wilkins 2004; Bedard and Johnstone 2004; Bell, Doogar, and Solomon 2008; Doogar, Sivadasan, and Solomon 2010; Kanagaretnam, Krishnan, and Lobo 2010). This literature establishes that audit fees are primarily a function of audit labor usage and mix (i.e., the proportion of different ranks of audit labor used) (O’Keefe et al. 1994; Bell et al. 2001, 2008). A third key finding is that engagements conducted under business-risk audit approaches evidence a small but significant fee premium (after controlling for both audit labor usage and mix) for higher risk auditees (Bell et al. 2008).¹⁰ We build on this literature by positing that, were auditors to have recognized and responded to the events of the crisis, any labor usage, labor mix, or fee premium changes would be reflected in a shift in the pattern of cross-sectional association between bank audit fees and key measures of banks’ risk exposures.

As previously noted, our study also builds on prior research on bank audit engagements during the 1980s S&L crisis (Erickson et al. 2000; Hill et al. 1994). Like Erickson et al. (2000), we focus on auditor responsiveness to shocks to the auditee’s industry and business environment. Our incremental contribution relative to their study is to present large-sample archival evidence on this question from a later period when business-risk audit approaches had been widely adopted. Our study also differs in three key respects from Hill et al. (1994), who investigate whether or not bank auditors priced certain key audit risks during the S&L crisis. First, they focus on establishing a significant association between auditee business risks and fees but do not hypothesize or test for *changes* in that relationship during a period of rapidly evolving business conditions. By contrast, our study investigates the year-to-year changes in the pricing of the misstatement risks most likely to have been exacerbated by a particular stage of the macroeconomic crisis unfolding during the relevant audit year. Second, unlike Hill et al. (1994) who use aggregate entity-level measures of bank business risk (bankruptcy risk, total entity-level legal costs),

10. Because our objective is to ascertain whether or not auditors recognized and responded to elevated audit risks stemming from the market dislocations of 2005–2007, it does not matter if auditors responded by altering labor usage, labor mix, or engagement pricing. Data required to disentangle whether this response reflects increased labor use or a change in either the labor mix or in hourly rates is not available to us.

our analysis is based on a significantly more detailed (year-by-year, line-item-level) analysis of how contemporaneous macroeconomic shocks would have impacted the misstatement risk of specific financial statement assertions. We then use this assessment as a basis for directional predictions about the year-to-year *changes* in the salience of key risk indicators most pertinent to these specific line items. Third, the bank audit fee model we use is significantly more comprehensive (i.e., includes many more controls) than the model used by Hill et al. (1994).

Because banks are highly regulated and differ in the normal scope of their activities from industrial and commercial entities, a specialized literature has emerged on the pricing of bank audit engagements. Our study builds on and extends this literature. We augment existing bank audit fee models (e.g., Fields et al. 2004; Kanagaretnam et al. 2010) by incorporating several risk measures suggested by the contemporary banking literature that have not heretofore been used in bank audit fee models. In addition, our focus on auditor risk responsiveness to crisis-related events differs from—and complements—recent studies of bank auditor independence (Kanagaretnam et al. 2010) and a recent working paper that examines the impact of SFAS 157 adoption on bank audit fees (Ettredge, Xu, and Yi 2009).

In the same manner, our study of auditors' responses to changes in economic conditions relates closely to, but differs in key respects from, studies of auditor responses to regulatory changes (e.g., Raghunandan and Rama 2006; Doogar et al. 2010). Regulatory shifts are always pre-announced and the regulator usually explicitly or implicitly delineates the expected auditor response to the change. The shifts also are introduced in ways that allow auditors sufficient lead time to adjust their responses. The types of macroeconomic shocks we study, by contrast, occur imperceptibly or suddenly, are not foreshadowed by pronouncements, and leave the auditor's response unspecified. Thus, to respond to the class of shocks we study, the auditor must be capable of recognizing the implications of the shock on the audit task and must respond to the shock either by actively seeking external guidance or by exercising judgment. Evidence on this aspect of auditor conduct is sparse at best.

The role of key institutions and intermediaries before and during the crisis

The roles of policymakers, governmental and government-sponsored enterprises (hereafter GSEs), and various regulatory agencies before and during the crisis have been widely studied (e.g., Baily, Litan, and Johnson 2008; Calomiris 2008; Gorton 2008; OFHEO 2008; Shiller 2008; Jaffee 2010).¹¹ Related, Barth et al. (2012) examine the response of market intermediaries such as credit-rating agencies and bond market participants to loan securitization-related risks during the crisis. We supplement these studies by presenting the first investigation of auditor responses to the events during the lead-up to the crisis.

Our study also differs from and complements research by Desai, Rajgopal, and Yu (2012), who investigate whether or not information intermediaries, including auditors, could *foresee* the coming financial crisis. To investigate this hypothesis, Desai et al. (2012)

11. The enterprises are the Government National Mortgage Association (Ginnie Mae, a government-owned corporation), and The National Mortgage Association of Washington (Fannie Mae) and The Federal Home Loan Mortgage Corporation (Freddie Mac), both of which are investor-owned government-sponsored enterprises (104 Stat. 1388-607, Sec. 13112; and 2 U.S.C. 622(8)). Fannie and Freddie are treated as "instrumentalities of the federal government, rather than as fully private entities" (CBO 2003) and their obligations perceived as effectively (albeit not formally) guaranteed by the U.S. Federal Government (CBO 2001, 2003). Securities issued or guaranteed by all three entities are priced as if they have minimal default risk (Staff Report 2003). In September 2008, after incurring heavy crisis-related losses, both Freddie Mac and Fannie Mae were placed under government conservatorship (U.S. Treasury 2008).

use pooled estimations for the period 2005–2007 and test whether information intermediaries respond to a set of *leading* indicators of financial crises. Our focus on auditor risk responsiveness, by contrast, leads us to investigate the impact of each year’s shocks on auditors’ contemporaneous *responses* to those shocks. In tests reported in the online tables, we establish that the difference in our conclusions from those of Desai et al. (2012) stem from the use of pooled vs. annual regressions and variations in our respective model specifications by (i) replicating their findings in our data using a pooled estimate for 2005–2007 (Table S.1.1),¹² (ii) replicating our findings using annual estimation of their model (Table S.1.2),¹³ and (iii) verifying that the inclusion of their variables does not subsume our principal findings (Table S.1.3).¹⁴ Overall, the differences in findings between Desai et al. (2012) and our study speak to the potential of pooled research designs to mask transient effects such as contemporaneous responses of economic agents in dynamically evolving environments, particularly during periods of rapid change such as the financial crisis.

Expectations

The discussion in this section is based largely on (i) our reading of the extensive literature that examines the banking industry, especially during the period leading up to the financial crisis, and (ii) the experience of one author who, during the period under study, served as a manager of bank audits for an industry-leading Big 4 audit firm.

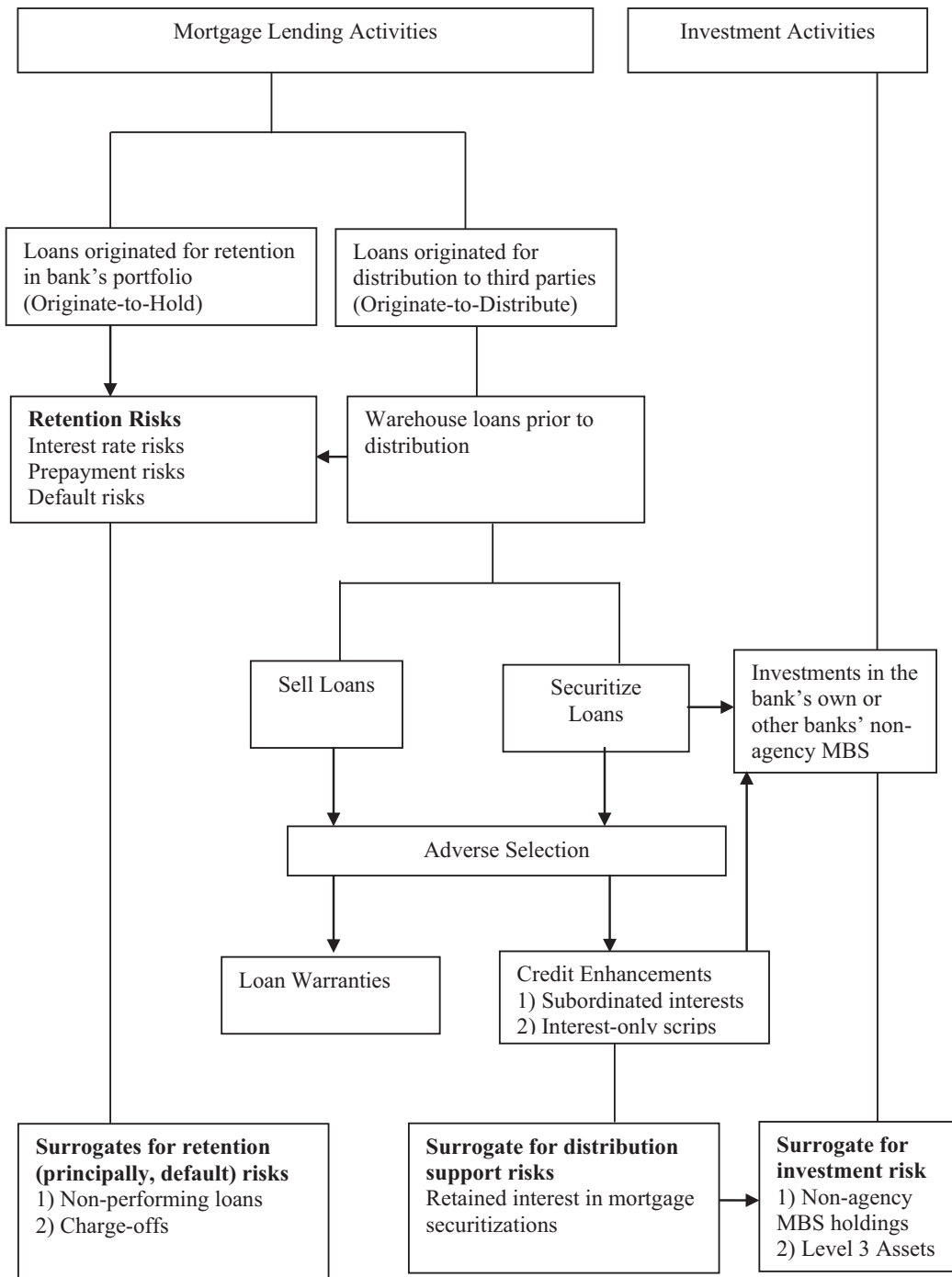
As previously explained, we expect the key drivers of audit risk on bank audit engagements to be banks’ loan origination, loan distribution, and investment risks. We expect audit fees to covary with auditee exposure to these risks as each type of risk becomes a salient driver of audit attention. In the rest of this section, we explain the link between these activities and audit risk.

Housing loans originated by U.S. banks can be classified into two categories. The first category is loans made with intent to hold as part of the bank’s investment portfolio (OTH or originate-to-hold loans). The other category is loans made with intent to “distribute” (OTD or originate-to-distribute loans) either via direct sale or securitization. The interest income and fees from retained loans flow directly to a bank’s income but expose the bank to loan retention risks (including interest rate, pre-payment, and default risks). Moreover, retained loans also reduce a bank’s risk-weighted assets and limit its ability to lend.

The distribution of loans (via sale or securitization) enables banks to derecognize those loans from their books, freeing up capital for further lending and improving bank profitability (Lea and Chiquier 1999, 2009; HUD 2006).¹⁵ OTD loans, however, create significant adverse-selection risk because default risks are shifted from loan originators (whose choice of screening standards determines loan quality) to the buyers of the loans

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12. Please see supporting information, “Table S.1.1: Determinants of bank holding company (BHC) audit fees in the years 2005–2007” (combined sample analysis replicating Desai et al. (2012) analysis and our model) as an addition to the online article.
 13. Please see supporting information, “Table S.1.2: Determinants of bank holding company (BHC) audit fees in the years 2005–2007” (replicating our year-wise analyses using the Desai et al. (2012) model) as an addition to the online article.
 14. Please see supporting information, “Table S.1.3: Determinants of bank holding company (BHC) audit fees in the years 2005–2007” (replicating our constant sample analysis by including the Desai et al. (2012) variables in our model) as an addition to the online article.
 15. The OTD model has emerged as the dominant mode of U.S. housing finance due to the primarily fixed-rate, long-term nature of U.S. housing loans (Carr 1992). The securitization boom of the 1970s transformed the U.S. housing finance market by replacing the traditional portfolio lending model—in which a single lender originated, serviced, funded, and bore the entire investment risk associated with these long-term loans—with the disintermediated “Originate-To-Distribute” model. The OTD model is better suited to housing finance than the portfolio model because capital market participants are better equipped than banks to bear the interest rate and duration risks of long-term loans (HUD 2006; Lea and Chiquier 2009).

Figure 1 Risks associated with banks' lending and investment activities



Description:

This figure illustrates the sources of key risks associated with banks' mortgage lending and investment activities. It also illustrates the empirical surrogates we use to measure these risks.

or securitizations (Gorton and Pennacchi 1995; Calomiris 2008; Rajan, Seru, and Vig 2009; Keys, Mukherjee, Seru, and Vig 2010; Purnandam 2011).¹⁶ Until sold or securitized, OTD loans expose the originator to the same risks as retained loans.¹⁷ To offset their higher adverse-selection risks, the sale or securitization of OTD loans usually requires the originator to offer a variety of credit enhancements designed to reduce the buyers' risk of loss (e.g., loan performance guarantees or retained first-loss positions in securitizations), exposing the originator to distribution support risks.

Under bank capital adequacy rules, certain mortgage-backed securities are classified as being less risky than the underlying mortgage loans (Bhat et al. 2011). These rules motivate banks to free up capital for further lending (i.e., to increase leverage and boost return on equity) by substituting a dollar of mortgage loans on their balance sheets with a dollar of investment in mortgage-backed securities.¹⁸ This substitution reduces the bank's loan retention risk but increases investment risk. Figure 1 presents a schematic representation of these risks and their empirical surrogates (a topic we discuss further in section 3).

We expect the events of 2005–2007 to affect the audit risks associated with banks' retention, distribution support, and investment risk exposures as follows. Throughout 2005, U.S. housing prices kept increasing. Banks were readily able to originate and securitize high volumes of risky mortgage loans as these loans were collateralized by homes with rising prices (e.g., Demyank and Hemert 2011).¹⁹ By the end of 2005, in response to concerns about increasing credit risk concentrations stemming from risky mortgage loan originations and securitizations, the FASB issued a Statement of Position (SOP) on *High Risk Loan Products*.²⁰ Notwithstanding these emergent concerns, as of February 2006, the end of the fiscal year 2005 audit season, housing prices remained steady, mortgage default rates low (U.S. Federal Reserve 2010), and investor appetite for mortgage-backed securities robust (Calomiris 2008; Gordon and D'Silva 2008).

In light of these market conditions, we expect loan retention risks to be significant drivers of audit attention (and audit fees) in fiscal 2005 bank audit engagements. However, given the robustness of the market for mortgage-backed securities, we do not expect such an association between investment risk and audit fees. We expect that distribution support

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16. In addition to the *indirect* adverse-selection costs, loan distribution also involves *direct* intermediation costs (e.g., cost of obtaining legal services, underwriting and credit ratings together with marketing and distribution costs) that would not be incurred for OTH loans (e.g., Ashcraft and Schuermann 2008). These contracting costs reduce the relative profitability of OTD loans and primarily affect the *mix* of OTD and OTH loans held by a bank. For auditors, the magnitudes of these loans (loan volume) are the relevant drivers of audit attention, and we directly control for each type of loan volume in our analysis.
 17. The duration of this *warehousing* risk (i.e., the period from loan origination to disposition via sale or securitization) can vary from one to nine months (Gordon and D'Silva 2008; Rosen 2010).
 18. Replacing mortgage loans (more risky assets) with mortgage-backed securities (less risky assets) increases bank capital adequacy ratios and, hence, lending capacity. Investing in agency-backed securities offers lower investment risk (because the buyer is protected against defaults on the underlying mortgages), but yields lower returns than privately issued mortgage-backed securities. As a result, banks' investment portfolios usually consist of a mix of both agency and nonagency securities.
 19. Ashcraft and Schuermann (2008) report that mortgage loan origination (securitization) volumes increased about 20 percent (46 percent) between 2001 and 2006. While risky mortgage loan originations (securitizations) increased from about 32 percent (18 percent) of all mortgage loan originations (securitizations) in 2001 to about 58 percent (53 percent) in 2006, the fraction of risky loan originations retained (not securitized) by lenders dropped from about 65 percent in 2001 to about 30 percent in 2006.
 20. This SOP reiterated the FASB position, articulated earlier in SOP 94-6 *Disclosure of Certain Significant Risks and Uncertainty* (AICPA 1994), that uncertain positions must be disclosed if (i) it is reasonably possible that the estimate may change within the next 12 months or less, (ii) the effect of the change would be material, and (iii) the appropriate risk disclosures are a matter for auditors' professional judgment.

TABLE 1
Crisis timeline and predictions

| Audit year* | 2005 | 2006 | 2007 |
|------------------------|---|--|--|
| | <p>December 2005: FASB issues Statement of Position on High-Risk Loan Products (FASB 2005)</p> | <p>March 2006: Median price of single-family homes peak</p> <p>December 2006: Increase in residential mortgage charge-offs</p> <p>Owinit Mortgage Solutions (subprime lender) ceases operations</p> <p>February 2007: New Century announces restatement to correct errors (understatement) associated with accounting for loan repurchases</p> <p>HSBC announces loan impairments approximately 20% above analyst consensus</p> | <p>March 2007: New Century and Fremont General stop originating subprime loans</p> <p>Ameriquist lays off approximately half of its employees</p> <p>April 2007: New Century files for bankruptcy protection</p> <p>July 2007: Moody's and S&P downgrade large tranches of subprime loans</p> <p>August 2007: Citigroup acquires Ameriquist[†]</p> <p>October 2007: S&P 500 reaches high of 1576</p> <p>Merrill Lynch reports \$7.9 billion loss on subprime</p> <p>November 2007: SFAS 157 effective (FASB 2008)</p> <p>Citigroup discloses \$8–\$11 billion loss on subprime</p> <p>January 2008: Bank of America acquires Countrywide Financial[†]</p> |
| Predictions: | | | |
| (1) <i>NON_PERF</i> | (+) | NS | NS |
| (2) <i>CHRG_OFF</i> | NS or (+) | (+) | (+) |
| (3) <i>RETINT_MORT</i> | NS or (+) | (+) | (+) |
| (4) <i>NMBS</i> | NS | (+) | (+) |
| (5) <i>L3ASSETS</i> | | | (+) |

Notes:

Events listed are based on Ryan (2008) and Federal Reserve (2010), unless otherwise noted.

NS = not significant; (+) = positive and significant.

* An audit year spans March of that year through February of the following year, so as to include events prior to the signing date of the audit report for that fiscal year.

[†] Indicates that acquisition events are based on announcement date.

risk (primarily retained first-loss positions in mortgage securitizations) could either be a significant driver of audit attention or might not significantly impact auditor attention, depending on how auditors view the risk exposure stemming from this item (risks of a first-loss position, potentially offset by a robust housing market) early in 2006.

By mid-2006, however, housing prices began to weaken and by the end of 2006, default rates on risky mortgages started to rise.²¹ In February 2007, before most banks' fiscal 2006 audits had been completed, two prominent mortgage loan originators, New Century Financial and HSBC, disclosed that loan impairments and losses from securitization obligations would be much larger than expected (or previously reported). As a result of these announcements and mounting concerns over mortgage loan quality in general, we expect the association between audit fees and both retention and distribution support risks in fiscal 2006 bank audit engagements to be stronger than in 2005 engagements. Given the impact of current events on the pricing and liquidity of mortgage-backed securities, we also expect investment risks to be a significant driver of audit attention (and audit fees) in fiscal 2006 bank audit engagements.

Throughout 2007, housing prices continued to fall while mortgage delinquencies, defaults, and foreclosures increased. As a result, demand for mortgage-backed securities practically evaporated by mid-2007 (Gordon and D'Silva 2008) and significantly impaired the values of banks' investments in those securities. During the second half of 2007, concerns over the mortgage loan performance increased, triggering knock-on liquidation pressure in the market for mortgage-backed securities. By the end of 2007, many banks were forced to book substantial charge-offs on their loan portfolios, to significantly write up their support commitment obligations, and to write off substantial portions (if not all) of their risky holdings of mortgage-backed securities. Consequently, in fiscal 2007 bank audit engagements, we expect both retention and distribution support risks to continue to drive audit attention (and fees).

Significant events in the period leading up to the financial crisis (2005–2007) are listed in Table 1. We tabulate our expectations by year in Table 1 and also discuss them in relation to our specific test variables in section 3.

3. Sample selection and research method

Sample selection

Our sample consists of all U.S. headquartered bank holding companies (BHCs) with a December 31st fiscal year-end and all necessary data available in:

1. the Wharton Research Data Services bank regulatory filing (FR Y-9C) data set,
2. the Standard & Poor's COMPUSTAT data set,
3. the Audit Analytics data set, and
4. the Centre for Research in Security Prices (CRSP) monthly data set.

To ensure homogeneity in the (unobserved) determinants of audit attention (audit labor usage, mix, and pricing), our sample includes only U.S.-based banks with a December 31 fiscal year-end. The restriction to U.S. banks eliminates potential confounds stemming from differences in auditee territorial origin. Our research design also involves predicting the impact of calendar time events on auditor conduct. Restricting attention to auditees with coterminous accounting periods enables us to better identify these impacts.

Over the time period we study, the set of banks that have all necessary data available changes, as banks exit and enter the sample for a variety of reasons.²² Therefore, using all available banks each year (the full sample) to assess year-to-year changes in auditor risk responsiveness introduces the possibility that our findings may be driven by changes in sample composition. Using the same set of banks in all years (constant sample), by con-

21. See Doms, Furlong, and Krainer (2007) for evidence that declining home prices were the most important driver of subprime mortgage delinquencies and foreclosures in 2006.

22. Banks exit the sample due to mergers or because their asset size falls below the regulatory threshold. They enter the sample because of mergers or organic growth that causes their asset sizes to exceed the threshold. Banks also may drop out of the sample in certain years if they have missing values for key model variables.

TABLE 2
Sample selection

| | |
|--|-----------|
| Total number of firm-year observations (bank holding companies, banks) available in the merged Bank Regulatory-COMPUSTAT-Audit Analytics-CRSP sample, with December 31 fiscal year-end, for which total assets and audit fees for years 2005–2007 (both inclusive) are available | 1,095 |
| Less: | |
| 1) Observations lacking requisite data for fee-model estimation | 61 |
| 2) Observations relating to bank holding companies that do not have all required data for each of the three years | 185 |
| Number of firm-year observations (<i>Bank Holding Companies</i>) available for analysis | 849 (283) |

trast, eliminates confounds stemming from sample composition but introduces survivorship bias (since failed firms are excluded from the analysis), potentially limiting the generalizability of the findings. In our setting, there were relatively few bank failures during 2005–2007; most of the sample attrition during this period happens between 2005 and 2006 due to a change in the size threshold for FR Y-89C filings. For this reason, we use the constant sample of 283 banks (for which we have all necessary data for all three years) to draw inferences about intertemporal shifts in audit attention. To shed light on the direction and likely magnitude of the survivorship bias, we also report, as part of the sensitivity analyses, our findings using the full sample (all banks for which we have all available data for at least one year during 2005–2007).

Table 2 provides key statistics on the constant sample selection process. As noted above, the final (constant) sample consists of 283 observations in each year.

Research method

Our inferences are based on the following bank audit fee model:

$$\begin{aligned}
 LAFEE = & \beta_0 + \beta_1 NON_PERF + \beta_2 CHRG_OFF + \beta_3 RETINT_MORT + \beta_4 NMBS \\
 & + \beta_5 L3ASSETS + \beta_6 LAT + \beta_7 TICAPR + \beta_8 BIG + \beta_9 STD_RET \\
 & + \beta_{10} EFFICIENCY + \beta_{11} SENSITIVE + \beta_{12} SAVINGS \\
 & + \beta_{13} INTANG + \beta_{14} MORT_SEC + \beta_{15} OTHER_AT + \beta_{16} IMPAIR \\
 & + \beta_{17} AFILER + \beta_{18} DELAY + \beta_{19} AUD_CHG + \varepsilon.
 \end{aligned} \tag{1}$$

The dependent variable, *LAFEE*, is the natural logarithm of the audit fee (*AFEE*) in constant 2005 U.S. dollars. The first five explanatory variables in Model (1) are test variables that proxy for banks' loan retention, distribution support, and investment risks. The fourteen other explanatory variables reflect engagement and auditor attributes that we also expect to influence audit fees. Of the nineteen variables used in Model (1), ten are common to the benchmark Fields et al. (2004) specification (two test measures, *NON_PERF* and *CHRG_OFF*, and the first eight "controls"), while the remaining nine are drawn from our reading of the banking or audit fee literatures and are relatively novel to bank fee analysis.²³ For expositional convenience, we present an intuitive discussion of each

23. Consequently, Model (1) builds upon but is more comprehensive than most extant bank audit fee models. Note, however, that this specification omits five variables used in Fields et al. (2004): *LOSS*, *TRANSACCT*, *SECURITIES*, *COMMLOAN*, and *MTGLOAN*. None of these variables are consistently significant in our analyses, and, collectively including these five variables does not discernibly improve model fit or materially alter our principal findings. Please see supporting information, "Table S.2. Determinants of bank holding company (BHC) audit fees in the years 2005–2007" (constant sample analysis including the Fields et al. (2004) variables excluded from the results reported in the paper) as an addition to the online article.

measure in the text and report formal definitions in Appendices 1 and 2. All continuous fee determinants are winsorized at a 1-percent level (one-tail for variables with a natural lower bound of zero, and two-tail otherwise).

Test variables and predicted relationships with audit fees

We use banks' nonperforming loan balances (*NON_PERF*) as a surrogate for retention risks during stable economic conditions, and loan charge-offs (*CHRG_OFF*) as a surrogate for auditor attention to retention risk on collateralized loans during unstable economic conditions. Under U.S. bank reporting regulations, loans past due for a certain period or loans placed on nonaccrual status must be classified as *nonperforming*. Most unsecured nonperforming loans are charged off as a loss after an additional holding period. By contrast, charge-offs on secured nonperforming loans involve valuation of collateral and write-off of any uncovered exposure. Nonperforming loan balances are, therefore, viewed as the primary driver of loan loss risk assessments in stable times, that is, when economic conditions are such that historical performance data can be used to reliably predict future default rates and loss magnitudes from the magnitudes of current nonperforming loan balances.

In economic downturns, however, even otherwise solvent borrowers may delay or stretch out their payments, causing nonperforming loan portfolio sizes to mechanically balloon. Many of these nonperforming loans pose little if any risk of loss as long as the borrowers are solvent. Further, the mix of defaulting loans could also change: as conditions worsen, collateralized loans may start defaulting at higher rates. Under these conditions, charge-offs (which require assessment of collateral value) become the salient driver of audit attention.²⁴ Given these relationships between economic conditions and retention risk measures, we expect nonperforming loan balances to be the primary driver of audit fees (and, by implication, of audit attention) for fiscal year 2005 audit engagements. For fiscal years 2006 and 2007, by contrast, we expect loan charge-offs to be the primary driver of audit fees. In panel A of Appendix 3, we provide an excerpt from the annual financial statement (10-K) footnote disclosures of M&T Bank Corporation for fiscal year 2007, which illustrates the crisis-related changes to charge-offs and nonperforming accounts.

From a bank auditor's point of view, the primary audit risks from banks' loan distribution support commitments pertain to the valuation of underlying credit enhancement obligations. These obligations are considered to pose high audit risk because their proper valuation and disclosure call for an assessment of the bank's potential liability exposure. We use banks' disclosures of retained interests in mortgage securitizations (*RETINT_MORT*) to proxy for this risk exposure. We expect retained interests to significantly drive audit fees in all years and to increase in salience as the crisis intensifies in 2006 and 2007. In panel B of Appendix 3, we provide securitization and distribution risk-related footnote disclosures of M&T Bank Corporation for fiscal year 2007 that highlight some of the issues discussed above.

Our primary surrogate for investment risk is banks' total holdings of higher risk, nonagency mortgage-backed securities (*NMBS*).²⁵ When the market for private

24. Furlong and Knight (2010) report that, during the crisis, real estate charge-offs accounted for 54 percent of all charge-offs compared to the previous high of approximately 40 percent in the early 1990s. Assessing collateral value on the increasing volume of defaulted residential mortgage loans became both more important and more difficult as the housing market became more depressed.

25. Nonagency mortgage-backed securities are privately issued securities not backed by a GSE; therefore, they are perceived by market participants as being more risky than agency-backed mortgage securities. As discussed earlier, during the time period we study, holdings of agency-backed securities would have been considered as having very low default risk (and, consequently, would have posed relatively little audit risk). Following Cheng, Hong, and Scheinkman (2010), we define *NMBS* to include pass-through and nonpass-through MBS, as well as commercial mortgage obligations and real estate mortgage investment conduits.

mortgage-backed securities is robust, as it was in 2005, nonagency mortgage holdings are expected to pose immaterial audit risk. As markets for these securities become troubled, as occurred in 2006 and 2007, we expect these holdings to become significant drivers of audit fees. In addition, for 2007, the first year for which such data are publicly available, we expect banks' end-of-year holdings of illiquid (Level 3) assets to require significant audit attention and, therefore, to materially affect audit fees. In panel C of Appendix 3, we provide footnote disclosures of M&T Bank Corporation for fiscal year 2007 that illustrate investment risks stemming from nonagency MBS holdings.

Two of these predictions are subject to the following caveat. Audit risks pertaining to both retained interests in mortgage securitizations and holdings of nonagency mortgage-backed securities primarily emanate from the valuations reported on the auditee's balance sheet. Should the values of these items be impaired, the risk of material overstatement of the reported values will decline and these two measures may not discernibly affect 2007 audit fees. As noted earlier, we lay out the year-wise predictions for our test variables in Table 1.²⁶

Control variables

The remaining fourteen variables in Model (1) speak to other engagement attributes that also can be expected to affect audit fees. The first eight control variables in Model (1) were identified by Fields et al. (2004) as significant determinants of bank audit fees. *LAT* is the natural logarithm of auditee total assets in thousands of constant 2005 U.S. dollars and is used as a proxy for bank size. *TICAPR* is the Tier 1 risk-based capital ratio, a measure of bank capital adequacy that is closely monitored by regulators and speaks to bank risk-taking and solvency.²⁷ *BIG* takes the value of 1 if the auditor is one of the Big 4 auditors, 0 otherwise, and speaks to differences in auditor cost structure or market power. *STD_RET* is the (lagged) annual standard deviation of auditee stock returns and speaks to overall bank riskiness as perceived by equity investors. *EFFICIENCY* is the ratio of total operating expenses to total revenues and is a measure of bank operating efficiency. *SENSITIVE* is a bank-specific measure of interest-rate sensitivity, a key determinant of bank performance. *SAVINGS* takes the value of 1 if the bank is a thrift or savings institution (SIC code 6035), 0 otherwise, and captures differences in the operating characteristics of commercial banks and thrift and savings bank. *INTANG* refers to intangibles, which are mostly composed of goodwill recorded while acquiring other institutions.

The last six variables in Model (1) represent additional determinants of audit fees that we identify from a reading of the banking, securitization, and (nonbank) audit fee literatures. Two of these variables capture salient aspects of banks' asset portfolio composition. *MORT_SEC*, which is the total residential mortgage securitizations expressed as a percentage of total assets, can be expected to influence audit labor usage and mix if auditors view asset securitizations as secured borrowings that pose recourse risk (as bondholders do in Barth et al. 2012). However, if auditors view securitizations as asset sales with no recourse risk (as credit-rating agencies do in Barth et al. 2012), this measure may not be systematically associated with audit fees. *OTHER_AT*, which represents other assets held by banks,

26. Our differential and time-varying predictions for key test variables require testing coefficients each year. As a result, it would not be useful in our research setting to use data reduction techniques to collapse these variables into a single bank audit risk factor. As noted earlier, we rely on the differential and time-varying nature of our predictions with respect to these key variables to address the identification problem (i.e., to reduce the risk that the observed pattern of findings is driven by some external, uncontrolled factors).

27. BHC regulatory filings report two capital ratios: a more-restrictive *Tier 1 risk-based capital ratio* and a less restrictive *total risk-based capital ratio*. The total risk-based capital adds back a portion of the loan loss allowance as part of available capital while Tier 1 capital ratio does not. Consequently, Tier 1 risk-based capital ratio better reflects *credit* risk.

can be expected to affect fees because these assets are unusual in nature and often pose complex valuation challenges.²⁸

The next three variables proxy for engagement risk factors that also can increase audit costs (and, therefore, fees). *IMPAIR*, which takes the value of 1 if the bank records an impairment of goodwill in the period and 0 otherwise, indicates extreme bank underperformance, which can exacerbate audit risk and affect both audit labor usage and mix. *AFILER*, which takes the value of 1 if the bank is an accelerated filer (i.e., has fiscal year-end market value of equity of over 75 million dollars and is subject to the more stringent internal control provisions of the Sarbanes-Oxley Act) and 0 otherwise, can be expected to affect audit fees due to the greater audit burdens imposed on these auditees by the Sarbanes-Oxley Act. *DELAY*, which shows the elapsed time in days from the balance sheet date to the date of issuance of the audit report, proxies for any extra audit effort devoted to the resolution of accounting and reporting complications that increases the duration of the audit (Hay, Knechel, and Wong 2006). Finally, *AUD_CHG*, which takes the value of 1 for initial audit engagements and 0 otherwise, captures the effects of any initial fee discounting (e.g., Bell et al. 2008).

All of the variables, with two exceptions, are defined so as to yield positive coefficients in an audit pricing model, such that higher levels of the variable induce greater or higher ranked labor usage and, therefore, greater fees. The first exception is *TICAPR*, our measure of bank capital adequacy. Although it speaks directly to bank solvency, *observed* values of this ratio are often—and somewhat counterintuitively—viewed as an indicator of bank riskiness.²⁹ In 2005 and 2006, prior to the advent of a general credit crisis and when bank solvency was not a salient concern, we expect higher values of this ratio to indicate greater auditee riskiness and to trigger higher audit attention. In 2007, with bank risk-taking at historical lows and concerns about bank solvency at a peak, we expect lower values of this ratio to indicate higher auditee riskiness with concomitant implications for its relationship with audit fees.³⁰ The second exception is *AUD_CHG*, which is expected to have a negative sign because of its interpretation as an initial fee discount.

4. Results

Sample description

Table 3 presents key statistics, by year, for variables used in the analysis. Four key features of the sample are worthy of note. First, the mean levels of retained interests (*RETINT_MORT*), nonagency MBS holdings (*NMBS*), and total mortgage securitizations (*MORT_SEC*) are each relatively stable over the three years. Second, nonperforming loans and charge-offs are about the same (approximately 0.60 percent of total loans and 15 percent of loan loss reserves, respectively) in 2005 and 2006. Third, the 2007 decline in loan performance and general bank healthiness is reflected in a 100 percent increase in nonperforming loan balances (from 0.56 percent of total loans in 2005 to 1.18 percent in 2007), a 50 percent increase in charge-offs (from 14.34 percent of loan loss reserves in 2005 to 21.80 percent in 2007), and a 250 percent increase in the frequency of goodwill impairments (*IMPAIR*) (from approximately 2 percent in 2005 and 2006 to 6 percent in 2007). Fourth, about 45 percent of our sample firms (51 percent in 2005 and 47 percent in 2006)

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28. In our sample, the average asset mix is 70 percent loans, 20 percent securities, and 10 percent other assets.
29. A higher Tier 1 capital ratio reduces return on equity, a key performance metric. Managers of banks pursuing aggressive growth often either choose to or, pursuant to the Bank Holding Company Act of 1956 (12 U.S.C. §1841, et seq., Appendix D IIa), are required to hold higher capital ratios. Prior research (cf. Fields et al. 2004; Ettredge et al. 2009), therefore, treats higher *observed* levels of Tier 1 capital ratios as a surrogate for bank riskiness and predicts fees to increase with observed levels of this ratio.
30. See Fields et al. (2004) for a discussion of the conditional interpretation of high *TICAPR* as a measure of risk and the theoretical ambiguity as to its expected sign in a bank audit fee model.

TABLE 3
Summary statistics (by year)

| Variable | 2005 | | | | | 2006 | | | | | 2007 | | | | |
|-------------------------------|-------|-------|-------|--------|--------|-------|-------|-------|-------|--------|-------|-------|-------|--------|--------|
| | Mean | SD | 50% | Min | Max | Mean | SD | 50% | Min | Max | Mean | SD | 50% | Min | Max |
| <i>AFEE (in \$ thousands)</i> | 1,400 | 5,200 | 330 | 42 | 52,000 | 1,400 | 5,300 | 330 | 38 | 51,000 | 1,400 | 5,500 | 350 | 36 | 60,000 |
| <i>LAFEE</i> | 12.85 | 1.25 | 12.72 | 10.65 | 17.76 | 12.88 | 1.20 | 12.69 | 10.54 | 17.75 | 12.92 | 1.21 | 12.75 | 10.48 | 17.91 |
| <i>NON_PERF</i> | 0.56 | 0.52 | 0.41 | 0.00 | 2.83 | 0.62 | 0.58 | 0.45 | 0.00 | 3.13 | 1.18 | 1.10 | 0.84 | 0.06 | 5.54 |
| <i>CHRG_OFF</i> | 14.34 | 18.28 | 9.74 | -94.36 | 97.01 | 15.18 | 17.73 | 10.94 | -7.40 | 91.00 | 21.80 | 22.64 | 16.40 | -63.06 | 117.70 |
| <i>RETINT_MORT</i> | 0.00 | 0.03 | 0.00 | 0.00 | 0.39 | 0.00 | 0.03 | 0.00 | 0.00 | 0.30 | 0.00 | 0.01 | 0.00 | 0.00 | 0.09 |
| <i>NMBS</i> | 0.35 | 1.31 | 0.00 | 0.00 | 7.85 | 0.31 | 1.24 | 0.00 | 0.00 | 9.62 | 0.33 | 1.22 | 0.00 | 0.00 | 8.04 |
| <i>L3ASSETS</i> | | | | | | | | | | | | | | | |
| <i>AT (in \$100 millions)</i> | 190 | 760 | 17 | 3 | 5,200 | 220 | 930 | 19 | 3 | 6,900 | 0.00 | 0.01 | 0.00 | 0.00 | 0.16 |
| <i>LAT</i> | 14.73 | 1.55 | 14.36 | 12.48 | 20.07 | 14.81 | 1.55 | 14.45 | 12.66 | 20.34 | 14.86 | 1.56 | 14.51 | 12.70 | 20.42 |
| <i>TICAPR</i> | 11.72 | 2.92 | 10.98 | 7.50 | 24.99 | 11.64 | 2.61 | 11.09 | 7.42 | 21.94 | 10.96 | 2.41 | 10.29 | 6.79 | 18.60 |
| <i>BIG</i> | 0.51 | 0.50 | 1.00 | 0.00 | 1.00 | 0.47 | 0.50 | 0.00 | 0.00 | 1.00 | 0.45 | 0.50 | 0.00 | 0.00 | 1.00 |
| <i>STD_RET</i> | 0.06 | 0.02 | 0.05 | 0.02 | 0.15 | 0.05 | 0.02 | 0.04 | 0.02 | 0.10 | 0.07 | 0.03 | 0.06 | 0.02 | 0.17 |
| <i>EFFICIENCY</i> | 0.61 | 0.13 | 0.60 | 0.34 | 1.32 | 0.61 | 0.10 | 0.61 | 0.36 | 0.96 | 0.64 | 0.11 | 0.63 | 0.38 | 0.97 |
| <i>SENSITIVE</i> | 0.12 | 0.17 | 0.12 | -0.33 | 0.65 | 0.08 | 0.16 | 0.08 | -0.63 | 0.65 | 0.07 | 0.17 | 0.07 | -0.52 | 0.49 |
| <i>SAVINGS</i> | 0.04 | 0.18 | 0.00 | 0.00 | 1.00 | 0.04 | 0.18 | 0.00 | 0.00 | 1.00 | 0.04 | 0.18 | 0.00 | 0.00 | 1.00 |
| <i>INTANG</i> | 0.02 | 0.02 | 0.01 | 0.00 | 0.08 | 0.02 | 0.02 | 0.02 | 0.00 | 0.08 | 0.02 | 0.02 | 0.02 | 0.00 | 0.09 |
| <i>MORT_SEC</i> | 0.84 | 4.76 | 0.00 | 0.00 | 38.81 | 0.85 | 5.22 | 0.00 | 0.00 | 38.81 | 0.63 | 3.43 | 0.00 | 0.00 | 23.48 |
| <i>OTHER_AT</i> | 0.03 | 0.01 | 0.03 | 0.01 | 0.08 | 0.03 | 0.01 | 0.03 | 0.01 | 0.08 | 0.04 | 0.01 | 0.03 | 0.01 | 0.07 |
| <i>IMPAIR</i> | 0.02 | 0.16 | 0.00 | 0.00 | 1.00 | 0.02 | 0.13 | 0.00 | 0.00 | 1.00 | 0.06 | 0.24 | 0.00 | 0.00 | 1.00 |
| <i>AFILER</i> | 0.87 | 0.33 | 1.00 | 0.00 | 1.00 | 0.89 | 0.31 | 1.00 | 0.00 | 1.00 | 0.89 | 0.31 | 1.00 | 0.00 | 1.00 |
| <i>DELAY</i> | 59.77 | 15.85 | 62.00 | 13.00 | 103.00 | 64.14 | 10.89 | 61.00 | 37.00 | 103.00 | 66.26 | 10.57 | 66.00 | 44.00 | 106.00 |
| <i>AUD_CHG</i> | 0.07 | 0.26 | 0.00 | 0.00 | 1.00 | 0.09 | 0.29 | 0.00 | 0.00 | 1.00 | 0.07 | 0.25 | 0.00 | 0.00 | 1.00 |
| <i>N</i> | 283 | | | | | 283 | | | | | 283 | | | | |

Notes:

This table reports summary statistics, by year, for the variables used in this study. For variable definitions, see Appendices 1 and 2.

TABLE 4
Determinants of bank holding company (BHC) audit fees in the years 2005–2007 (constant sample analysis using OLS estimation)

| Variable | 2005 | | | 2006 | | | 2007 | | |
|----------------------------|----------------|---------------|----------------|----------------|---------------|----------------|----------------|---------------|----------------|
| | P. sign (1) | Coeff. (2) | t-value (3) | P. sign (4) | Coeff. (5) | t-value (6) | P. sign (7) | Coeff. (8) | t-value (9) |
| Test variables | | | | | | | | | |
| <i>NON_PERF</i> | + | 0.105 | 2.02** | NS | -0.028 | -0.56 | NS | -0.030 | -1.12 |
| <i>CHRG_OFF</i> | +/NS | 0.004 | 2.42*** | + | 0.006 | 3.54*** | + | 0.004 | 3.37*** |
| <i>RETTINT_MORT</i> | +/NS | 0.839 | 1.37* | + | 1.772 | 1.96** | + | 3.726 | 1.55* |
| <i>NMBS</i> | NS | -0.003 | -0.12 | + | 0.043 | 2.10** | + | 0.032 | 1.04 |
| <i>L3ASSETS</i> | | | | | | | | 2.695 | 2.00** |
| Control variables | | | | | | | | | |
| <i>LAT</i> | + | 0.621 | 18.94*** | + | 0.614 | 21.06*** | + | 0.617 | 18.72*** |
| <i>TICAPR</i> | + | 0.004 | 0.41 | + | 0.009 | 0.99 | +/- | -0.010 | -0.69 |
| <i>BIG</i> | + | 0.389 | 6.44*** | + | 0.313 | 5.13*** | + | 0.343 | 5.78*** |
| <i>STD_RET</i> | + | 2.786 | 2.05** | + | 3.850 | 2.85*** | + | 2.290 | 2.70*** |
| <i>EFFICIENCY</i> | + | 1.120 | 4.78*** | + | 0.538 | 2.30** | + | 0.431 | 1.82** |
| <i>SENSITIVE</i> | + | 0.112 | 0.66 | + | 0.279 | 1.95** | + | 0.153 | 0.94 |
| <i>SAVINGS</i> | + | -0.228 | -1.85** | + | -0.245 | -2.75*** | + | -0.098 | -1.17 |
| <i>INTANG</i> | + | 3.525 | 2.41*** | + | 2.751 | 1.90** | + | 0.089 | 0.08 |
| Additional controls | | | | | | | | | |
| <i>MORT_SEC</i> | + | -0.003 | -0.72 | + | -0.008 | -2.06** | + | -0.014 | -1.47 |
| <i>OTHER_AT</i> | + | 1.506 | 0.60 | + | 4.039 | 2.08** | + | 4.577 | 2.23** |
| <i>IMPAIR</i> | + | 0.175 | 1.69** | + | 0.062 | 0.42 | + | 0.087 | 0.78 |
| <i>AFILER</i> | + | 0.253 | 3.30*** | + | 0.193 | 2.44*** | + | 0.230 | 2.76*** |
| <i>DELAY</i> | + | 0.006 | 3.62*** | + | 0.005 | 1.77** | + | 0.011 | 4.03*** |
| <i>AUD_CHG</i> | - | 0.033 | 0.31 | - | -0.003 | -0.04 | - | -0.268 | -1.76** |
| <i>CONSTANT</i> | + | 1.819 | 3.27*** | + | 2.266 | 3.96*** | + | 2.085 | 3.36*** |
| <i>N</i> | | 283 | | | 283 | | | 283 | |
| <i>Adj. R²</i> | | 0.90 | | | 0.90 | | | 0.90 | |

Notes:

This table reports results for the OLS regression estimation of Model (1). The sample consists of U.S. BHCs that (i) have a December 31 fiscal year-end, (ii) are included in the sample for all three years, and (iii) have the necessary data for estimating the audit fee model. The dependent measure is *LAFFEE* which is the natural logarithm of *AFEE* audit fees in thousands of 2005 U.S. dollars (Audit Analytics data item *audit_fees*). ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 level or better, respectively. Significance levels are based on one-tailed tests for directional predictions, and two-tailed tests otherwise. *t*-statistics are based on heteroscedasticity-corrected robust standard errors. For variable definitions, see Appendices 1 and 2.

are audited by a Big 4 auditor, and approximately 90 percent (87 percent in 2005) are accelerated filers.³¹

Main analyses

Table 4 reports ordinary least squares (OLS) estimates of Model (1) for auditee fiscal years 2005, 2006, and 2007. Columns (1), (4), and (7) of Table 4 report predicted signs of the coefficients for auditee fiscal years 2005, 2006, and 2007, respectively. Columns (2), (5), and (8) report coefficient estimates and columns (3), (6), and (9) the corresponding *t*-statistics based on heteroscedasticity-corrected standard errors. As preliminary, note that all of the control variables from the Fields et al. (2004) model, with the exception of *SAVINGS* in 2005 and 2006, are either significant in the expected direction or are not significant in each of the three years.³² Five of the six control variables (*OTHER_AT*, *IMPAIR*, *AFILER*, *DELAY*, and *CHG_AUD*) that we use to augment the Fields et al. (2004) model are significant in the predicted direction in at least one of the three years. Three of these variables (*OTHER_AT*, *AFILER*, and *DELAY*) are significant at the 5 percent level or better in two or more years and could be useful additions to current bank audit fee models. Finally, the sign of the coefficient on mortgage securitization (*MORT_SEC*) is consistently negative. While inconsistent with the predicted sign of this variable, this finding is consistent with the tenor of Barth et al.'s (2012) findings for the impact of total mortgage securitizations on credit ratings.

The key findings in Table 4 are as follows. Consistent with expectations, the 2005 coefficient on *NON_PERF* (0.105, $p < 0.05$) indicates that retention risk exposures were a significant driver of audit fees. The coefficient on *RETINT_MORT* (0.839, $p < 0.10$) indicates that distribution support risks also had a positive (albeit marginally significant) impact on fees. Finally, and also as expected, the coefficient on *NMBS*, our surrogate for investment risk, is not significant. Note also the significant and positive coefficient on *CHRG_OFF* (0.004, $p < 0.01$). Collectively, these findings are consistent with auditors attending to auditee loan retention and distribution support risks in 2005 audit engagements.

In fiscal year 2006, by contrast, *CHRG_OFF* (0.006, $p < 0.01$) is the primary driver of audit fees, while, consistent with our earlier discussion, *NON_PERF* is no longer significant. Also as expected, distribution support risk becomes more salient than in 2005, and investment risk starts to attract audit attention as well. The coefficient on *RETINT_MORT* (1.772, $p < 0.05$) is larger (and significant at the 5 percent level or better), while the coefficient on *NMBS* (0.043, $p < 0.05$) now is positive and significant.³³

Finally, in 2007, retention risk measures behave as in 2006 (and as expected): in Column (8), the coefficient on *NON_PERF* is insignificant, while that on *CHRG_OFF* (0.004, $p < 0.01$) is positive and significant. The coefficient on the distribution risk metric *RETINT_MORT* (3.726, $p < 0.10$) continues to be significant (also as expected) while that on the investment risk measures *NMBS* does not. The coefficient on assets valued using nonmarket inputs, *L3ASSETS* (2.695, $p < 0.05$) is positive and significant, indicating that

31. For variables that are common to both studies, the distributions reported in our study are very similar to those reported by Ettredge et al. (2009), whose period of study overlaps part of our period of study.

32. The sample contains only 10 observations per year pertaining to savings institutions. Consequently, the findings with respect to the coefficient of *SAVINGS* should be read with caution.

33. *F*-tests for equality of regression coefficients show that the 2006 coefficients on *NON_PERF* and *NMBS* are both significantly different from their 2005 values ($F_{(1,264)} = 6.92$, $p < 0.01$ and $F_{(1,264)} = 5.09$, $p < 0.05$, respectively). However neither *CHRG_OFF* nor *RETINT_MORT* are significantly different across the two years ($F_{(1,264)} = 1.30$, $p > 0.10$, and $F_{(1,264)} = 1.07$, $p > 0.10$, respectively). It is worthy of note that while the coefficient of *CHRG_OFF* does not change in magnitude from year to year, its significance level (ergo, its salience as a fee driver) does change. The economic interpretation is that, while audit fees (and, by implication, effort or risk premium) *per unit of CHRG_OFF* did not change across the years, the alignment between those factors and engagement-specific levels of *CHRG_OFF* did change.

auditors pay close attention to these items. The lack of significance of *NMBS* is consistent with the proposition that the value impairments on these securities recorded by many banks in 2006 and 2007 (see panel C, Appendix 3) may have effectively mitigated the likelihood of material overstatement in *reported NMBS* balances.³⁴

Collectively, the 2005, 2006, and 2007 results indicate, as expected, that auditor attention to various bank financial statement items varied in line with the changing risk profiles of those items.

Sensitivity analyses

Full sample analysis

As noted earlier, the constant sample analysis reported in Table 4 is susceptible to survivorship bias. To ascertain the sensitivity of the findings reported thus far to such bias, we report in Table 5 the results of estimating Model (1), using a sample of all U.S. banks with December 31 fiscal year-ends for which we could find at least one year of data (the full sample). Relaxing the constant sample restrictions increases the sample size (from 283 in Table 4) to 382 in 2005, 333 in 2006, and 319 in 2007. The noticeable sample size attrition in 2006 is partly due to a change in the auditee asset-size threshold (from \$150 million to \$500 million) for filing form FR Y-9C, the consolidated financial statement for BHCs.³⁵ The results reported in Table 5 are, with two exceptions, consistent with their Table 4 counterparts. The exceptions are the 2005 and 2006 coefficients on *RETINT_MORT*, which are positive and significant in Table 4 but are not significant in Table 5. Overall, the implications of these findings are consistent with the principal inferences from Table 4: auditor attention to various bank financial statement items varied in line with their changing risks.

Analysis for fiscal years 2008 and 2009

To forestall a general systemic crisis, starting in 2008, the U.S. Treasury and the Federal Reserve undertook a variety of unprecedented steps to prevent banks and financial institutions from failing. It is difficult to predict a priori how these steps, coupled with write-downs and adjustments already recorded in 2006 and 2007, would have affected auditors' perceptions of financial statement misstatement risk on bank audit engagements for fiscal year 2008 and later. However, to the extent that the findings for 2006 and 2007 reflect auditor responses to the events of those years, the overall pattern of auditor responses in 2008 and beyond should differ from the pattern for 2006 and 2007. Table 6 reports the results of extending our analysis to investigate this proposition, subject to the critical caveat that, for reasons just discussed, we posit no predictions about the 2008 and 2009 coefficients on model (test or control) variables.

Over the five-year period 2005–2009, sample attrition due to firm entry and exit is quite significant, and the constant sample for that period shrinks to only 250 banks.³⁶ By contrast, the full sample for 2008 and 2009 consists of over 310 banks in each year.³⁷ For

34. *F*-tests reveal that the 2007 coefficient on *NON_PERF* is significantly smaller ($F_{(1,263)} = 25.26, p < 0.01$) than its 2005 counterpart, while the coefficients on *CHRG_OFF* ($F_{(1,263)} = 0, p > 0.10$), *RETINT_MORT* ($F_{(1,263)} = 1.44, p > 0.10$), and *NMBS* ($F_{(1,263)} = 1.31, p > 0.10$) are not.

35. See http://www.federalreserve.gov/reportforms/ReportDetail.cfm?WhichFormId=FR_Y-9C.

36. The constant sample shrinks from 283 to 250 banks primarily because 29 banks drop out of the sample in the crisis period (16 banks in 2008 and 13 banks in 2009).

37. Despite the bank failures in 2008 and 2009, the full sample for 2008 and 2009 has a relatively high number of banks because (i) during the crisis, some financial institutions such as Morgan Stanley and Goldman Sachs Group converted to BHCs to qualify for government funding, and (ii) in February 2012, the Federal Reserve created a new RSSID-CIK link file that increased the number of banks in the database for years 2008 and 2009. However, because these links are not completely backfilled for earlier years or because these banks have missing values in one or more earlier years, they do not appear in the constant sample.

TABLE 5
Determinants of bank holding company (BHC) audit fees in the years 2005–2007 (full sample analysis using OLS estimation)

| Variable | 2005 | | | 2006 | | | 2007 | | |
|----------------------------|----------------|---------------|----------------|----------------|---------------|----------------|----------------|---------------|----------------|
| | P. sign (1) | Coeff. (2) | t-value (3) | P. sign (4) | Coeff. (5) | t-value (6) | P. sign (7) | Coeff. (8) | t-value (9) |
| <i>Test variables</i> | | | | | | | | | |
| NON_PERF | + | 0.090 | 1.94** | NS | -0.024 | -0.50 | NS | -0.028 | -1.07 |
| CHRG_OFF | +/NS | 0.003 | 1.63* | + | 0.005 | 2.86*** | + | 0.003 | 2.86*** |
| RETINT_MORT | +/NS | 0.586 | 1.01 | + | 1.104 | 1.09 | + | 3.961 | 1.57* |
| NMBS | NS | 0.009 | 0.39 | + | 0.045 | 2.37*** | + | 0.035 | 1.16 |
| L3ASSETS | | | | | | | | 3.318 | 2.28** |
| <i>Control variables</i> | | | | | | | | | |
| LAT | + | 0.605 | 20.33*** | + | 0.622 | 22.78*** | + | 0.606 | 18.83*** |
| TICAPR | + | -0.001 | -0.12 | + | 0.013 | 1.51* | +/- | -0.001 | -0.08 |
| BIG | + | 0.413 | 7.64*** | + | 0.336 | 5.90*** | + | 0.338 | 5.91*** |
| STD_RET | + | 3.226 | 2.75*** | + | 4.218 | 3.25*** | + | 2.376 | 2.90*** |
| EFFICIENCY | + | 0.892 | 3.86*** | + | 0.573 | 2.49*** | + | 0.667 | 2.74*** |
| SENSITIVE | + | 0.093 | 0.68 | + | 0.269 | 1.97** | + | 0.296 | 1.99** |
| SAVINGS | + | -0.186 | -1.81* | + | -0.154 | -1.71* | + | -0.157 | -2.35*** |
| INTANG | + | 4.111 | 3.16*** | + | 2.257 | 1.70** | + | 0.895 | 0.83 |
| <i>Additional controls</i> | | | | | | | | | |
| MORT_SEC | + | 0.000 | 0.01 | + | -0.003 | -0.56 | + | -0.016 | -1.59 |
| OTHER_AT | + | 3.645 | 1.55* | + | 5.642 | 3.00*** | + | 4.903 | 2.54*** |
| IMPAIR | + | 0.183 | 2.14** | + | 0.309 | 1.25 | + | 0.129 | 1.09 |
| AFILER | + | 0.212 | 3.18*** | + | 0.178 | 2.48*** | + | 0.241 | 3.29*** |
| DELAY | + | 0.005 | 3.91*** | + | 0.006 | 2.38*** | + | 0.008 | 2.80*** |
| AUD_CHG | - | 0.073 | 0.81 | - | -0.033 | -0.47 | - | -1.83** | -1.83** |
| CONSTANT | + | 2.221 | 4.48*** | + | 1.974 | 3.80*** | + | 2.181 | 3.60*** |
| N | | 382 | | | 333 | | | 319 | |
| Adj. R ² | | 0.90 | | | 0.89 | | | 0.89 | |

Notes:

This table reports results for the OLS regression estimation of Model (1). The sample consists of U.S. BHCs that have a December 31 fiscal year-end and the necessary data for estimating the audit fee model. The dependent measure is *LAFFEE* which is the natural logarithm of *AFEE* audit fees in thousands of 2005 U.S. dollars (Audit Analytics data item *audit_fees*). ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 level or better, respectively. Significance levels are based on one-tailed tests for directional predictions, and two-tailed tests otherwise. *t*-statistics are based on heteroscedasticity-corrected robust standard errors. For variable definitions, see Appendices 1 and 2.

TABLE 6
Bank holding company (BHC) audit fee determinants, 2008–2009 full sample (Panel A) and 2005–2009 constant sample (Panel B), OLS estimation

| Variable | 2008 | | | 2009 | | |
|----------------------------|----------------|---------------|----------------|----------------|---------------|----------------|
| | P. sign (1) | Coeff. (2) | t-value (3) | P. sign (4) | Coeff. (5) | t-value (6) |
| <i>Test variables</i> | | | | | | |
| NON_PERF | | 0.037 | 2.390*** | | 0.016 | 1.19 |
| CHRG_OFF | | 0.000 | 0.070 | | 0.000 | 0.42 |
| RETINT_MORT | | 3.512 | 1.300* | | 2.419 | 1.34* |
| NMBS | | -0.001 | -0.040 | | -0.033 | -1.28 |
| L3ASSETS | | 1.762 | 0.700 | | 0.734 | 0.30 |
| <i>Control variables</i> | | | | | | |
| LAT | | 0.595 | 18.58*** | | 0.707 | 13.56*** |
| TICAPR | | 0.020 | 1.80** | | 0.050 | 4.60*** |
| BIG | | 0.380 | 6.37*** | | 0.325 | 4.57*** |
| STD_RET | | 0.261 | 0.52 | | 0.777 | 2.78*** |
| EFFICIENCY | | 0.529 | 2.68*** | | 0.451 | 2.78*** |
| SENSITIVE | | 0.358 | 2.68*** | | 0.313 | 1.86*** |
| SAVINGS | | -0.200 | -2.16** | | -0.204 | -2.12** |
| INTANG | | 0.790 | 0.61 | | -1.636 | -0.98 |
| <i>Additional controls</i> | | | | | | |
| MORT_SEC | | 0.000 | -0.04 | | -0.007 | -0.86 |
| OTHER_AT | | 4.380 | 2.48*** | | 3.640 | 2.29** |
| IMPAIR | | 0.036 | 0.52 | | 0.019 | 0.31 |
| AFILER | | 0.195 | 3.18*** | | 0.020 | 0.24 |
| DELAY | | 0.008 | 2.77*** | | 0.009 | 1.95** |
| AUD_CHG | | 0.023 | 0.36 | | -0.004 | -0.03 |
| CONSTANT | | 2.268 | 3.57*** | | 0.320 | 0.30 |
| N | | 311 | | | 319 | |
| Adj. R ² | | 0.90 | | | 0.91 | |

(The table is continued on the next page.)

TABLE 6 (continued)

| Variable | 2005 | | | 2006 | | | 2007 | | | 2008 | | | 2009 | | |
|----------------------------|-----------------------|------------|-------------|-------------|------------|-------------|-------------|------------|-------------|-------------|------------|-------------|-------------|------------|-------------|
| | P. sign (1) | Coeff. (2) | t-value (3) | P. sign (4) | Coeff. (5) | t-value (6) | P. sign (7) | Coeff. (8) | t-value (9) | P. sign (4) | Coeff. (5) | t-value (6) | P. sign (7) | Coeff. (8) | t-value (9) |
| | <i>Test variables</i> | | | | | | | | | | | | | | |
| NON_PERF | + | 0.105 | 1.76** | NS | -0.040 | -0.78 | NS | -0.052 | -1.70* | | 0.021 | 1.13 | | 0.030 | 2.55*** |
| CHRG_OFF | +/NS | 0.004 | 2.62*** | + | 0.006 | 3.77*** | + | 0.004 | 3.13*** | | 0.000 | 0.41 | | 0.000 | -0.45 |
| RETINT_ | +/NS | 0.813 | 0.88 | + | 1.666 | 1.77** | + | 3.440 | 1.13 | | 2.461 | 0.89 | | 2.924 | 1.57* |
| MORT | NS | 0.004 | 0.15 | + | 0.057 | 2.72*** | + | 0.046 | 1.37* | | -0.018 | -0.65 | | -0.027 | -0.81 |
| <i>L3ASSETS</i> | | | | | | | | | | | | | | | |
| <i>Control variables</i> | | | | | | | | | | | | | | | |
| LAT | + | 0.628 | 17.78*** | + | 0.621 | 19.21*** | + | 0.618 | 16.67*** | | 0.573 | 17.03*** | | 0.653 | 18.69*** |
| TICAPR | + | 0.005 | 0.50 | + | 0.014 | 1.38* | +/- | -0.003 | -0.18 | | 0.010 | 0.88 | | 0.035 | 4.15*** |
| BIG | + | 0.408 | 6.35*** | + | 0.320 | 4.97*** | + | 0.319 | 5.14*** | | 0.408 | 6.36*** | | 0.329 | 5.88*** |
| STD_RET | + | 2.755 | 1.86** | + | 4.288 | 2.95*** | + | 2.332 | 2.38*** | | 0.573 | 1.11 | | 0.807 | 2.44*** |
| EFFICIENCY | + | 1.194 | 4.90*** | + | 0.535 | 2.16*** | + | 0.469 | 1.91** | | 0.385 | 1.65** | | 0.503 | 3.22*** |
| SENSITIVE | + | 0.000 | 0.00 | + | 0.225 | 1.42* | + | 0.071 | 0.41 | | 0.338 | 2.11** | | 0.239 | 1.59* |
| SAVINGS | + | -0.226 | -1.84* | + | -0.217 | -2.20** | + | -0.101 | -1.19 | | -0.172 | -1.70* | | -0.231 | -2.00** |
| INTANG | + | 3.013 | 1.74** | + | 1.865 | 1.16 | + | 0.038 | 0.03 | | 0.305 | 0.22 | | -1.612 | -0.94 |
| <i>Additional controls</i> | | | | | | | | | | | | | | | |
| MORT_SEC | + | -0.004 | -0.71 | + | -0.008 | -1.95* | + | -0.012 | -1.24 | | 0.000 | 0.00 | | -0.006 | -0.73 |
| OTHER_AT | + | 0.962 | 0.34 | + | 3.088 | 1.43* | + | 4.586 | 2.05** | | 4.271 | 2.17** | | 3.225 | 1.88** |
| IMPAIR | + | 0.175 | 1.67** | + | 0.102 | 0.70 | + | 0.042 | 0.32 | | 0.048 | 0.63 | | -0.020 | -0.34 |
| AFILER | + | 0.231 | 2.64*** | + | 0.149 | 1.77** | + | 0.219 | 2.50*** | | 0.124 | 1.76** | | 0.041 | 0.64 |
| DELAY | + | 0.006 | 3.60*** | + | 0.003 | 0.94 | + | 0.008 | 2.70*** | | 0.004 | 1.23 | | 0.005 | 1.80** |
| AUD_CHG | - | 0.051 | 0.45 | - | -0.043 | -0.55 | - | -0.234 | -1.48* | | 0.008 | 0.12 | | 0.038 | 0.49 |
| CONSTANT | + | 1.665 | 2.82*** | + | 2.286 | 3.65*** | + | 2.228 | 3.19*** | | 3.093 | 4.80*** | | 1.575 | 2.47*** |
| N | | 250 | | | 250 | | | 250 | | | 250 | | | 250 | |
| Adj. R ² | | 0.89 | | | 0.89 | | | 0.90 | | | 0.90 | | | 0.92 | |

Notes:

This table reports results for the OLS regression estimation of Model (1). The sample consists of U.S. BHCs that have a December 31 fiscal year-end and the necessary data for estimating the audit fee model for all years 2005–2009. The dependent measure is *LAFEE* which is the natural logarithm of *AFFEE* audit fees (in thousands of 2005 U.S. dollars (Audit Analytics data item *audit_fees*)). ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 level or better, respectively. Significance levels are based on one-tailed tests for directional predictions, and two-tailed tests otherwise. We do not make explicit predictions for 2008 and 2009. However, for consistency with previous years' analyses, *t*-tests are based on one-tailed tests (the predicted sign is treated as positive) except for *TICAPR* and *AUD_CHG*. *t*-statistics are based on heteroscedasticity-corrected robust standard errors. For variable definitions, see Appendices 1 and 2.

this reason, we focus the 2008–2009 analysis primarily on the full sample and present those results in Table 6, panel A. For comparability, and because the constant sample in this case is different from the sample used in Table 4, we also report the constant sample results for the 2005–2009 period in panel B.

Overall, the pattern of findings reported in panel A of Table 6 are quite different from the pattern for the full sample in 2006 and 2007 reported in Table 5. Descriptively, and similar to the findings in Table 5 for the year 2005, nonperforming loans are significant drivers of audit fees in 2008. As in 2007, retained interest in mortgage securitizations influence audit fees in 2008 and 2009.³⁸ However, Level 3 assets do not have an impact on audit fees in 2008 or 2009, though they were significant drivers of audit fees in 2007. Ex post, this association is not too surprising: 2008 was the first year that banks were required to make extensive financial statement disclosures about their holdings of such assets and novel disclosures of such complexity can reasonably be expected to trigger substantial additional audit effort in the year in which they are initiated. Overall, although the underlying samples are not strictly comparable for the reasons just highlighted, the results reported in Table 6, panel A provide further reassurance that the results in Table 5 most likely represent auditor responsiveness to the macroeconomic shocks of 2006 and 2007.

In Table 6, panel B, the only significant test variables are *L3ASSETS* in 2008 and *NON-PERF* and *RETINT_MORT* in 2009. This pattern is quite different from that observed for the 2006 and 2007 constant sample, increasing our confidence that the shifts in audit attention documented in 2006–2007 do not represent an underlying trend. These findings offer an interesting contrast to panel A in that the sample in panel B includes a smaller set of engagements representing only those banks that survive though the entire five-year sample period. Panel B indicates that, given all the loan charge-offs, asset write-downs, and divestitures of banks' riskiest investment securities (facilitated in large part by TARP) that had already occurred by the end of 2008, the only significant driver of financial statement misstatement risk on 2008 bank financial statements was that associated with *L3ASSETS*.

The findings for 2009, in contrast to those for 2008, are more consistent with “business as usual” for banks: with the peak of the crisis having passed, and with housing and credit markets settling into a new (albeit recessionary) equilibrium, the key drivers of audit attention revert to an assessment of the risks of nonperforming loans (*NON_PERF*) and retained interests in mortgage securitizations (*RETINT_MORT*). Interestingly, *L3ASSETS* are not significant attention drivers in 2009, consistent with auditors initially auditing these disclosures in 2008, but not allocating significant incremental attention to these disclosures in subsequent years.

Least absolute deviation estimation and other model perturbations

To ascertain the impact of influential observations on our inferences, we also estimate Model (1) using least absolute deviation (LAD) estimation (cf. Chen et al. 2008), a procedure that down-weights the effect of influential observations on coefficient estimates. The results of this estimation, reported in Table 6, are broadly consistent with those reported earlier. In Table 7, the 2005 coefficient on *CHRG_OFF* and the coefficients on *RETINT_MORT* for 2005 and 2006 (all significant in Table 4) are no longer significant. The 2007 coefficient on *NMBS* (not significant in Table 4) is positive and significant in Table 7. Notwithstanding these differences, which indicate some coefficient sensitivity to

38. The continued influence of *RETINT_MORT* in 2008–2009 is consistent with loan repurchase obligations triggered by misrepresentations during the loan origination process that continued to plague banks as late as 2010 (Barr 2010). The decline in the 2008–2009 influence of Level 3 assets, significant in 2007, likely reflects the general exodus from illiquid assets (facilitated, as noted earlier, in large part by TARP).

TABLE 7

Bank holding company (BHC) audit fee determinants (2005–2007 constant sample, least absolute deviation (LAD) estimation)

| Variable | 2005 | | | 2006 | | | 2007 | | |
|-------------------------------|-------------------|---------------|------------------------|-------------------|---------------|------------------------|-------------------|---------------|------------------------|
| | P. sign (1) | Coeff. (2) | <i>t</i> -value (3) | P. sign (4) | Coeff. (5) | <i>t</i> -value (6) | P. sign (7) | Coeff. (8) | <i>t</i> -value (9) |
| Test variables | | | | | | | | | |
| <i>NON_PERF</i> | + | 0.126 | 1.56* | + | -0.011 | -0.13 | + | -0.011 | -0.23 |
| <i>CHRG_OFF</i> | + | 0.002 | 1.03 | + | 0.006 | 2.15** | + | 0.003 | 1.58* |
| <i>RETINT_MORT</i> | + | 0.475 | 0.37 | + | 0.928 | 0.54 | + | 6.395 | 1.77** |
| <i>NMBS</i> | + | -0.015 | -0.47 | + | 0.068 | 1.94** | + | 0.065 | 1.62* |
| <i>L3ASSETS</i> | | | | | | | + | 3.468 | 1.49* |
| Control variables | | | | | | | | | |
| <i>LAT</i> | + | 0.614 | 14.73*** | + | 0.575 | 11.76*** | + | 0.558 | 10.25*** |
| <i>TICAPR</i> | + | 0.015 | 1.04 | + | 0.004 | 0.21 | +/- | -0.001 | -0.05 |
| <i>BIG</i> | + | 0.390 | 3.97*** | + | 0.354 | 3.54*** | + | 0.373 | 3.51*** |
| <i>STD_RET</i> | + | 2.552 | 1.31* | + | 2.879 | 1.20 | + | 2.549 | 1.48* |
| <i>EFFICIENCY</i> | + | 1.071 | 3.32*** | + | 0.363 | 0.85 | + | 0.490 | 1.09 |
| <i>SENSITIVE</i> | + | 0.455 | 1.93** | + | 0.279 | 1.10 | + | 0.187 | 0.69 |
| <i>SAVINGS</i> | + | -0.162 | -0.77 | + | -0.233 | -1.04 | + | -0.145 | -0.64 |
| <i>INTANG</i> | + | 4.722 | 2.00** | + | 3.024 | 1.38* | + | 0.995 | 0.47 |
| Additional controls | | | | | | | | | |
| <i>MORT_SEC</i> | + | -0.008 | -1.11 | + | -0.011 | -1.55 | + | -0.020 | -1.43 |
| <i>OTHER_AT</i> | + | 0.930 | 0.28 | + | 3.674 | 1.09 | + | 4.957 | 1.35* |
| <i>IMPAIR</i> | + | 0.130 | 0.54 | + | -0.052 | -0.21 | + | 0.051 | 0.28 |
| <i>AFILER</i> | + | 0.228 | 1.77** | + | 0.255 | 1.81** | + | 0.296 | 1.84** |
| <i>DELAY</i> | + | 0.005 | 1.86** | + | 0.005 | 1.12 | + | 0.007 | 1.54* |
| <i>AUD_CHG</i> | - | 0.021 | 0.14 | - | -0.017 | -0.12 | - | -0.105 | -0.67 |
| <i>CONSTANT</i> | + | 1.837 | 2.60*** | + | 2.994 | 3.17*** | + | 2.933 | 2.72*** |
| <i>N</i> | | 283 | | | 283 | | | 283 | |
| Pseudo. <i>R</i> ² | | 0.68 | | | 0.68 | | | 0.69 | |

Notes:

This table reports results for the LAD regression estimation of Model (1). The sample consists of U.S. BHCs that (i) have a December 31 fiscal year-end, (ii) are included in the sample for all three years, and (iii) have the necessary data for estimating the audit fee model. The dependent measure is *LAFEE* which is a natural logarithm of *AFEE* audit fees in thousands of 2005 U.S. dollars (Audit Analytics data item *audit_fees*). ***, **, and * indicate significance at the 0.01, 0.05, and 0.10 level or better, respectively. Significance levels are based on one-tailed tests for directional predictions, and two-tailed tests otherwise. *t*-statistics are based on heteroscedasticity-corrected robust standard errors. For variable definitions, see Appendices 1 and 2.

influential observations, the overall tenor of the results of the LAD estimation is consistent with those from the earlier analyses.

To summarize, the three sets of results (OLS constant sample, OLS full sample, and LAD constant sample) support the notion that auditors attended to the entity-level risk implications of the macroeconomic shocks leading up to the global financial crisis. First, for loan retention risks, auditor attention focused primarily on nonperforming loans in 2005 but changed to charge-offs in 2006 and 2007. Second, for risks associated with loan

distribution activities, auditor attention increased over the time period, with significant auditor attention in 2006 and 2007. Finally, for risks emanating from banks' investment activities, auditors attended to *NMBS* risks in 2006 and attended to the risks of hard-to-value assets (*L3ASSETS*) in 2007. We also conducted several additional analyses (untabulated) to verify that these inferences are (i) robust to inclusion of additional variables used in contemporary studies such as Desai et al. (2012) as well as to the inclusion of measures such as Allowance for Loan Losses (*ALL*) and (ii) that the significance of our test variables is not driven by collinearity with other model variables.

5. Summary and conclusions

We empirically investigate U.S. bank auditor conduct during the period leading up to the most recent financial crisis. We use the rapid shifts in banks' business environment during this period to present the first large-sample evidence on auditors' ability to recognize and respond to macroeconomic shocks to the auditees' business environment. Our study also contributes evidence relevant to the debate on the auditors' role in the recent crisis. Our findings suggest that the lack of advance warning from auditors about impending auditee failure during the lead-up to the crisis is best understood as reflecting the limitations of existing regulation and accounting and auditing institutions rather than as auditor inattention or inability to respond to escalating risk.

Three noteworthy policy implications follow from our findings. First, the risk-based audit approaches in use during the period leading up to and including the financial crisis (which recently have been incorporated into public company auditing standards) appear to have facilitated auditor ability to recognize and respond to audit risks emanating from changes in the auditee's business environment. Second, proposals to enhance the content of the auditor's report may be a step in the right direction: auditors appear to possess sufficient understanding of the auditee and its environment to provide a richer, more complete report on the auditee's business, and its attendant risks. A third implication, and one that (to our knowledge) has not been discussed before, is that bank auditors' knowledge of current industry conditions and business practices can be tapped by regulators to spot and better handle incipient banking crises. Specifically, bank regulators should periodically consult bank auditors to stay informed about emergent risks in the banking sector.

Appendix 1

Variable definitions

| Variable name | Description |
|-----------------|---|
| <i>AFEE</i> | Audit fees (in thousands of 2005 U.S. dollars (Audit Analytics data item <i>audit_fees</i>)) |
| <i>LAFEE</i> | Natural logarithm of <i>AFEE</i> audit fees (in thousands of 2005 U.S. dollars (Audit Analytics data item <i>audit_fees</i>)) |
| <i>NON_PERF</i> | Nonperforming assets (loans greater than 90 days past due or on nonaccrual status) as a percentage of total loans, computed as $[(\text{BHCK5526} + \text{BHCK5525})/(\text{BHCK2122} + \text{BHCK2123})] \times 100$ |
| <i>CHRG_OFF</i> | Amount of loans charged off by the bank as uncollectible as a percentage of loan loss reserves, computed as $[(\text{BHCK4635} - \text{BHCK4605})/(\text{BHCK3123})] \times 100$ |

(The appendix is continued on the next page.)

Appendix 1 (continued)

| Variable name | Description |
|--------------------|---|
| <i>RETINT_MORT</i> | Retained residual interests from residential mortgage securitizations as a percentage of total assets $[(\text{BHCKB712} + \text{BHCKC393} + \text{BHCKC400} + \text{BHCKB726})/\text{BHCK2170}] \times 100$ |
| <i>NMBS</i> | Nonagency mortgage-backed securities as a percentage of total assets $[(\text{BHCK1710} + \text{BHCK1713} + \text{BHCK1734} + \text{BHCK1736} + \text{BHCK3536}) \times 100]/(\text{BHCK2170})$ |
| <i>AT</i> | Total assets (BHCK2170) in 2005 U.S. dollars (hundred millions) |
| <i>LAT</i> | Natural logarithm of total assets (AT) |
| <i>TICAPR</i> | Tier 1 capital ratio (BHCK7206) |
| <i>L3ASSETS</i> | Assets valued using Level 3 inputs scaled by total assets (2007 values hand collected from opening balances reported in year 2008) |
| <i>BIG</i> | Takes the value of 1 if the company is audited by one of the Big 4 auditors (Deloitte LLP, Ernst & Young LLP, KPMG LLP, and Pricewaterhouse Coopers LLP), and 0 otherwise (auditor identity is from Audit Analytics data item auditor_fkey) |
| <i>STD_RET</i> | Standard deviation of prior-year (12 months) returns (from CRSP) |
| <i>EFFECIENCY</i> | Metric for BHC operating efficiency, computed as $(\text{BHCK4135} + \text{BHCK4217} + \text{BHCK4092})/(\text{BHCK4079} + \text{BHCK4107} - \text{BHCK4073})$ |
| <i>SENSITIVE</i> | Metric for BHC interest-rate sensitivity, computed as $(\text{BHCK3197} - \text{BHCK3296} - \text{BHCK3298})/\text{BHCK2170}$ |
| <i>SAVINGS</i> | Takes the value of 1 if the BHC is classified as a savings bank (SIC 6035 or SIC 6036), and 0 otherwise |
| <i>INTANG</i> | Intangibles (scaled by total assets), which are mostly composed of goodwill recorded while acquiring other institutions, computed as $(\text{BHCK3163} + \text{BHCK0426})/\text{BHCK2170}$ |
| <i>MORT_SEC</i> | Total residential mortgage securitizations as a percentage of total assets $(\text{BHCKB705}/\text{BHCK2170}) \times 100$ |
| <i>OTHER_AT</i> | Other assets (scaled by total assets) computed as $\text{BHCK2160}/\text{BHCK2170}$ |
| <i>IMPAIR</i> | Takes the value of 1 if goodwill impairment (BHCKC216) is greater than 0, and 0 otherwise |
| <i>AFILER</i> | Takes the value of 1 if market value of equity (COMPUSTAT) at the end of the fiscal year exceeds \$75 million, and 0 otherwise |
| <i>DELAY</i> | Elapsed time, in days, from the balance sheet date to the date of issuance of the audit report (audit report date from Audit Analytics auditor opinion database) |
| <i>AUD_CHG</i> | Takes the value of 1 for the first year of an audit engagement, and 0 otherwise |

Notes:

See Appendix 2 for BHCK definitions.

Appendix 2

Bank holding company (BHCK) variable definitions

| Line item | Description |
|-----------|---|
| BHCK0426 | Other intangible assets |
| BHCK1710 | Fair value of mortgage-backed securities (MBS) and other held-to-maturity pass-through securities |
| BHCK1713 | Fair value of MBS and other available-for-sale pass-through securities |
| BHCK1734 | Fair value of all other held-to-maturity MBS (including collateralized mortgage obligations (CMOs), real estate mortgage investment conduits (REMICS), and stripped MBS) |
| BHCK1736 | Fair value of all other available-for-sale mortgage-backed securities (including CMOs, REMICS, and stripped MBS) |
| BHCK1752 | Equity securities that do not have readily determinable fair values (at historical cost) |
| BHCK2122 | Total loans and leases, net of unearned income |
| BHCK2123 | Unearned income on loans |
| BHCK2160 | Other assets, total |
| BHCK2170 | Total assets |
| BHCK3123 | Allowance for loan and lease losses |
| BHCK3163 | Goodwill |
| BHCK3196 | Earning assets that are repriceable or mature within one year |
| BHCK3296 | Interest-bearing deposit liabilities that reprice or mature within one year |
| BHCK3298 | Long-term debt that reprices within one year |
| BHCK3536 | Trading assets—All other MBS |
| BHCK4073 | Total interest expense |
| BHCK4079 | Total noninterest income |
| BHCK4092 | Other noninterest expense |
| BHCK4107 | Total interest income |
| BHCK4135 | Salaries and employee benefits |
| BHCK4217 | Expenses of premises and fixed assets |
| BHCK4605 | Recoveries on allowance for loan and lease losses |
| BHCK4635 | Charge-offs on allowance for loan and lease losses |
| BHCK5525 | Total loans, leasing financing receivables and debt securities, and other assets—past-due 90 days or more and still accruing |
| BHCK5526 | Total loans, leasing financing receivables and debt securities, and other assets—Nonaccrual |
| BHCK7206 | Tier 1 risk-based capital ratio |
| BHCKB705 | Outstanding principal balance of assets sold and securitized with servicing retained or with recourse or other seller-provided credit enhancements (1–4 family residential loans) |
| BHCKB712 | Credit enhancing interest-only strips (1–4 family residential loans) |
| BHCKB726 | Reporting institution's unused commitments to provide liquidity to securitization structures (1–4 family residential loans) |
| BHCKC216 | Goodwill impairment losses |
| BHCKC393 | Subordinated securities and other residual interests (1–4 family residential loans) |
| BHCKC400 | Standby letters of credit and other enhancements (1–4 family residential loans) |

Appendix 3**M&T Bank Corporation (CIK 0000036270)
Excerpts from Form 10-K for Fiscal Year 2007*****Panel A: Description of retention risks—charge-offs and nonperforming loans***

The Company had \$1.2 billion of Alt-A residential real estate loans in its held-for-investment loan portfolio at December 31, 2007. Lower real estate values and higher levels of delinquencies and charge-offs contributed to increased losses in that portfolio during 2007, which led to an assessment of the Company's accounting practices during the fourth quarter as they relate to the timing of the classification of residential real estate loans as nonaccrual and when such loans are charged off. Residential real estate loans previously classified as nonaccrual when payments were 180 days past due now stop accruing interest when principal or interest is delinquent 90 days. The excess of such loan balances over the net realizable value of the property collateralizing the loan is now charged off when the loans become 150 days delinquent, whereas previously the Company provided an allowance for credit losses for such amounts and charged-off loans upon foreclosure of the underlying property. The impact of the acceleration of the classification of residential real estate loans as nonaccrual resulted in an increase in nonperforming loans of \$84 million at December 31, 2007 and a corresponding decrease in loans past-due 90 days and accruing interest. As a result of that acceleration, previously accrued interest of \$2 million was reversed and charged against income. Included in the \$114 million of net charge-offs for 2007 were \$15 million resulting from the change in accounting procedure. The declining residential real estate values also contributed to specific allocations of the allowance for credit losses related to two residential real estate builders and developers during the fourth quarter of 2007. Considering these and other factors as discussed herein under the heading "Provision for Credit Losses," the Company significantly increased the provision for credit losses in 2007 to \$192 million, compared with \$80 million in 2006.

Panel B: Description of distribution support risks associated with securitizations

In December 2007 and 2005, the Company securitized approximately \$948 million and \$126 million, respectively, of one-to-four family residential mortgage loans in guaranteed mortgage securitizations with FNMA. The Company recognized no gain or loss on the transactions as it retained all of the resulting securities. Such securities were classified as investment securities available for sale. The Company expects no material credit-related losses on the retained securities as a result of the guarantees by FNMA.

In prior years, the Company transferred approximately \$1.9 billion of one-to-four family residential mortgage loans to qualified special-purpose trusts in nonrecourse securitization transactions. In exchange for the loans, the Company received cash, no more than 88 percent of the resulting securities, and the servicing rights to the loans. All of the retained securities were classified as investment securities available for sale. The qualified special-purpose trusts are not included in the Company's consolidated financial statements. Because the transactions were nonrecourse, the Company's maximum exposure to loss as a result of its association with the trusts is limited to realizing the carrying value of the retained securities and servicing rights. The combined outstanding principal amount of mortgage-backed securities issued by the qualified special-purpose trusts was \$631 million at December 31, 2007 and \$732 million at December 31, 2006. The principal amount of such securities held by the Company was \$539 million and \$627 million at December 31, 2007 and 2006, respectively. At December 31, 2007 and 2006, loans of the trusts that were 30 or more days delinquent totaled \$15 million and \$14 million, respectively. Credit losses, net of recoveries, for the trusts in 2007 and 2006 were insignificant. There were no signifi-

cant repurchases of delinquent or foreclosed loans from the trusts by the Company in 2007 or 2006. Certain cash flows between the Company and the trusts were as follows:

| | Year ended December 31 | |
|--|------------------------|-----------|
| | 2007 | 2006 |
| | (In thousands) | |
| Principal and interest payments on retained securities | \$124,469 | \$173,207 |
| Servicing fees received | 1,864 | 2,223 |

A summary of the fair values of retained subordinated interests resulting from the Company's residential mortgage loan securitization activities follows. Although the estimated fair values of the retained subordinated interests were obtained from independent pricing sources, the Company has modeled the sensitivity of such fair values to changes in certain assumptions as summarized in the table below. These calculated sensitivities are hypothetical and actual changes in the fair value may differ significantly from the amounts presented herein. The effect of a variation in a particular assumption on the fair values is calculated without changing any other assumption. In reality, changes in one factor may result in changes in another which may magnify or counteract the sensitivities. The changes in assumptions are presumed to be instantaneous. The hypothetical effect of adverse changes on the Company's retained capitalized servicing assets at December 31, 2007 is included in note 7.

| | Fair value | Weighted-average prepayment speed (dollars in thousands) | Weighted-average discount rate | Annual expected credit defaults |
|---|------------|--|-----------------------------------|---------------------------------------|
| Retained subordinated interests: | | | | |
| As of securitization date | \$91,705 | 23.81% | 7.68% | .09% |
| As of December 31, 2007 | 53,160 | 10.82% | 7.36% | .11% |
| Impact on fair value of 10% adverse change | | \$(90) | \$(1,678) | \$(149) |
| Impact on fair value of 20% adverse change | | (189) | (3,261) | (314) |

The subordinated retained securities do not have pro rata participation in loan principal prepayments for the first seven years of each securitization. The assumed weighted-average discount rate is 126 basis points higher than the weighted-average coupon of the underlying mortgage loans at December 31, 2007.

Panel C: Description of investment risks—nonagency mortgage-backed securities

The turmoil in the residential real estate market in 2007 also negatively affected the Company's investment securities portfolio. Three collateralized debt obligations were purchased in the first quarter of 2007 for approximately \$132 million. The securities are backed largely by residential mortgage-backed securities (collateralized by a mix of prime, midprime and subprime residential mortgage loans) and are held in the Company's available-for-sale portfolio. Although these securities were highly rated when purchased, two of the three securities were downgraded by the rating agencies in late-2007. After a thorough analysis,

management concluded that the impairment of the market value of these securities was other than temporary. As a result, the Company recorded an impairment charge of \$127 million (\$78 million after tax effect, or \$.71 of diluted earnings per share) in the fourth quarter of 2007. The impairment charge reduced the Company's exposure to collateralized debt obligations backed by residential mortgage securities to approximately \$4 million.

References

- American Institute of Certified Public Accountants (AICPA). 1994. *Statement of Position 94-6: Disclosure of certain significant risks and uncertainties*. Durham, NC: AICPA.
- American Institute of Certified Public Accountants (AICPA). 2006. *Statement of auditing standards 109 (AU section 314): Understanding the entity and its environment and assessing the risks of material misstatement*. Durham, NC: AICPA.
- Ashcraft, A. B., and T. Schuermann. 2008. Understanding the securitization of subprime mortgage credit. Federal Reserve Bank of New York, Staff Report No: 318.
- Baily, M. N., R. E. Litan, and M. S. Johnson. 2008. The origins of the financial crisis. Fixing Finance Series, Paper 3. Initiative on Business and Public Policy at Brookings.
- Bajaj, V., and J. Creswell. 2008. A lender failed. Did its auditor? *The New York Times*, April 13.
- Barr, A. 2010. Loan repurchases are a \$10 billion problem for big banks. *The Wall Street Journal*. Available online at <http://www.marketwatch.com/story/banks-10-billion-problem-loan-repurchases-2010-02-03>, retrieved September 15, 2012.
- Barth, M., G. Ormazabal, and D. J. Taylor. 2012. Asset securitizations and credit risk. *The Accounting Review* 87 (2): 423–48.
- Bedard, J. C., and K. M. Johnstone. 2004. Earnings manipulation risk, corporate governance risk, and auditors planning and pricing decisions. *The Accounting Review* 79 (2): 277–304.
- Bell, T. B., F. O. Marrs, I. Solomon, and H. Thomas. 1997. *Auditing organizations through a strategic systems lens*. Montvale, NJ: KPMG LLP.
- Bell, T. B., W. R. Landsman, and D. A. Shackelford. 2001. Auditors' perceived business risk and audit fees: Analysis and evidence. *Journal of Accounting Research* 39 (1): 35–43.
- Bell, T., R. Doogar, and I. Solomon. 2008. Audit labor usage and fees under business risk auditing. *Journal of Accounting Research* 46 (4): 729–60.
- Bhat, G., R. Frankel, and X. Martin. 2011. Panacea, Pandora's box, or placebo: Feedback in bank mortgage-backed security holdings and fair value accounting. *Journal of Accounting and Economics* 52 (2–3): 153–73.
- Brewster, B. 2011. How a systems perspective improves auditor knowledge acquisition and performance in analytical procedures. *The Accounting Review* 86 (3): 915–44.
- Calomiris, C. W. 2008. The subprime turmoil: What's old, what's new and what's next. Paper prepared for presentation at the Federal Reserve Bank of Kansas City's Symposium, "Maintaining stability in a changing financial system."
- Cameron, C., and P. K. Trivedi. 2005. *Microeconometrics: Methods and applications*. New York, NY: Cambridge University Press.
- Carr, J. H. 1992. Editor's note. *Journal of Housing Research* 3 (1), v–vii.
- Centre for Audit Quality (CAQ). 2010. Comment letter on the European commission's green paper on audit policy: Lessons from the crisis. Available online at thecaq.org/newsroom/pdfs/CAQ-CommentLetter_ECGreenPaper.pdf, retrieved September 15, 2012.
- Chen, W., C. Liu, and S. Ryan. 2008. Characteristics of securitization that determine issuers' retention of the risk of the securitized assets. *The Accounting Review* 83 (5): 1181–215.
- Cheng, I. H., H. Hong, and J. Scheinkman. 2010. Yesterday's heroes: Compensation and creative risk-taking. NBER Working paper No. 16176. Cambridge, MA: NBER.
- Congressional Budget Office (CBO). 2001. *Federal subsidies and the housing GSEs*. Washington, DC: CBO.

- Congressional Budget Office (CBO). 2003. *The effect of repealing Fannie Mae's and Freddie Mac's SEC exemptions*. Washington, DC: CBO.
- Cushing, B. E., L. E. Graham, Z.-V. Palmrose, R. S. Rousey, and I. Solomon. 1995. Risk orientation, in Auditing practice, research and education: A productive collaboration. In *American Institute of Certified Public Accountants and The American Accounting Association*, ed. T. B. Bell, and A. M. Wright, 11–54, New York, NY: AICPA.
- Davis, L., D. Ricchiute, and G. Trompeter. 1993. Audit effort, audit fees, and the provision of non-audit services to audit clients. *The Accounting Review* 68 (1): 135–50.
- Demyank, Y. S., and O. V. Hemert. 2011. Understanding the subprime mortgage crisis. *Review of Financial Studies* 24 (6): 1848–80.
- Desai, H., S. Rajgopal, and J. Yu. 2012. Did information intermediaries see the warning signals of the banking crisis from leading indicators in banks' financial statements? Working paper, Southern Methodist University.
- Doms, M., F. Furlong, and J. Krainer. 2007. Subprime mortgage delinquency rates. Federal Reserve Bank of San Francisco working paper no. 33.
- Doogar, R., P. Sivadasan, and I. Solomon. 2010. The regulation of public company auditing: Evidence from the transition to AS5. *Journal of Accounting Research* 48 (4): 795–814.
- Doty, J. R. 2011. Statement before the United States Senate Committee on Banking, Housing and Urban Affairs Subcommittee on Securities, Insurance and Investment hearing on the role of the accounting profession in preventing another financial crisis. Available online at http://pcaobus.org/News/Speech/Pages/04062011_DotyTestimony.aspx, retrieved September 15, 2012.
- Erickson, M. B., W. Mayhew, and W. L. Felix, Jr. 2000. Why do audits fail? Evidence from Lincoln Savings and Loan. *Journal of Accounting Research* 38 (1): 165–94.
- Ettredge, M., Y. Xu, and H. Yi. 2009. Fair value measurements, auditor industry expertise, and audit fees: Evidence from the banking industry. Working paper, University of Kansas.
- Federal Reserve Bank of St. Louis (Federal Reserve). 2010. The financial crisis: A timeline of events and policy actions. Available online at <http://timeline.stlouisfed.org/pdf/CrisisTimeline.pdf>, retrieved September 19, 2010.
- Fields, L., D. Fraser, and M. Wilkins. 2004. An investigation of the pricing of audit services for financial institutions. *Journal of Accounting and Public Policy* 23 (1): 53–77.
- Financial Accounting Standards Board (FASB). 2005. *FASB staff position no: SOP 94-6-1 terms of loan products that may give rise to a concentration of credit risk*. Norwalk, CT: FASB.
- Financial Accounting Standards Board (FASB). 2008. *Fair value measurements. Statement of Financial Accounting Standards No. 157*. Stamford, CT: FASB.
- Furlong, F., and Z. Knight. 2010. Loss provisions and bank charge-offs in the financial crisis: lessons learned. Federal Reserve Board of San Francisco Economic letter, Number 16. Available online at <http://www.frbsf.org/publications/economics/letter/2010/el2010-16.html>, retrieved September 15, 2012.
- Gordon, B., and A. D'Silva. 2008. Hedges in the warehouse: The banks get trimmed. Federal Reserve Bank of Chicago. Letter no. 249.
- Gorton, G. B. 2008. The subprime panic. NBER Working paper no. 14398. Cambridge, MA: National Bureau of Economic Research.
- Gorton, G., and G. Pennacchi. 1995. Banks and loan sales: Marketing nonmarketable assets. *Journal of Monetary Economics* 35 (3): 389–411.
- Hay, D., W. Knechel, and N. Wong. 2006. Audit fees: A meta-analysis of the effect of supply and demand attributes. *Contemporary Accounting Research* 23 (1): 141–91.
- Herring, R. 2007. The rocky road to implementation of Basel II in the United States. *Atlantic Economic Journal* 35 (4): 411–29.
- Hill, J. W., R. J. Ramsay, and D. T. Simon. 1994. Audit fees and client business risk during the S&L crisis: Empirical evidence and directions for future research. *Journal of Accounting and Public Policy* 13 (3): 185–203.

- HUD. 2006. Evolution of the U.S. housing finance system. Economic Development Publications 39032, HUD USER, Economic Development. U.S. Department of Housing and Urban Development.
- Investor Advisory Group (IAG). 2011. "Report from the working group on: Lessons learned from the financial crisis." PCAOB. Available online at http://pcaobus.org/News/Events/Pages/03162011_IAGMeeting.aspx, retrieved September 15, 2012.
- Jablecki, J. 2009. The impact of Basel I capital requirements on bank behavior and the efficacy of monetary policy. *International Journal of Economic Sciences and Applied Research* 2 (1): 16–35.
- Jaffee, D. M. 2010. Reforming the U.S. mortgage market through private market incentives. Working paper, University of California at Berkeley. Available online at <http://research.stlouisfed.org/conferences/gse/Jaffee.pdf>, retrieved September 15, 2012.
- Johnstone, K. M., and J. C. Bedard. 2001. Engagement planning, bid pricing, and client response in the market for initial attest engagements. *The Accounting Review* 76 (2): 199–220.
- Kanagaretnam, K., G. Krishnan, and G. Lobo. 2010. An empirical analysis of auditor independence in the banking industry. *The Accounting Review* 85 (6): 2011–46.
- Keys, B. J., T. Mukherjee, A. Seru, and V. Vig. 2010. Did securitization lead to lax screening? Evidence from subprime loans. *Quarterly Journal of Economics* 125 (1): 307–62.
- Knechel, R. W. 2007. The business risk audit: Origin, obstacles and opportunities. *Accounting, Organizations and Society* 32 (4–5): 383–408.
- KPMG. 1999. *The financial statement audit: Why a new age requires an evolving methodology*. Montvale, NJ: KPMG.
- Lea, M., and L. Chiquier. 1999. Providing long-term financing for housing: The role of secondary markets. Report, Office of Development Studies, United Nation Development Programme. Available online at <http://www.microfinancegateway.org/sites/default/files/mfg-en-paper-providing-long-term-financing-for-housing-the-role-of-secondary-markets-1998.pdf>, retrieved September 24, 2014.
- Lea, M., and L. Chiquier. 2009. *Housing finance policy in emerging markets*. Washington, DC: The World Bank.
- Lemon, W. M., K. W. Tatum, and W. S. Turley. 2000. *Developments in the audit methodologies of large accounting firms*. London, UK: Auditing Practices Board.
- McKenna, F. 2010. Big 4 Bombshell: "We Didn't Fail Banks Because They Were Getting A Bail-out." retheauditors.com.
- Office of Federal Housing Enterprise Oversight (OFHEO). 2008. Report to Congress. Available online at http://www.fhfa.gov/AboutUs/Reports/ReportDocuments/OFHEO_Report_Congress-2008.pdf, retrieved September 24, 2014.
- O'Keefe, T., D. Simunic, and M. Stein. 1994. The production of audit services: Evidence from a major public accounting firm. *Journal of Accounting Research* 32 (2): 241–61.
- Peecher, M. E., R. Schwartz, and I. Solomon. 2007. It's all about audit quality: Perspectives on strategic-systems auditing. *Accounting, Organizations and Society* 32 (4–5): 463–85.
- Public Companies Accounting Oversight Board (PCAOB). 2010. *Auditing Standard No. 12: Identifying and assessing risks of material misstatement*. Release No. 2010-004. Washington, DC: PCAOB.
- Public Companies Accounting Oversight Board (PCAOB). 2011. *Docket 034: Concept release on possible revisions to PCAOB standards related to reports on audited financial statements and related amendments to PCAOB standards*. Release No. 2011-003. Washington, DC: PCAOB.
- Purnandam, A. 2011. Originate-to-distribute model and the subprime mortgage crisis. *Review of Financial Studies* 24 (6): 1881–915.
- Raghunandan, K., and D. V. Rama. 2006. SOX Section 404 material weakness disclosures and audit fees. *Auditing: A Journal of Practice & Theory* 25 (1): 99–114.
- Rajan, U., A. Seru, and V. Vig. 2009. The failure of models that predict failure: Distance, incentives and defaults. Working paper, University of Chicago.

- Richard, P. J. 2008. Where were auditors as companies collapsed? *American Banker*, October 10.
- Rosen, R. J. 2010. The impact of the originate-to-distribute model on banks before and during the financial crisis. Federal Reserve Bank of Chicago Working paper no. 20. Available online at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1719612, retrieved January 15, 2011.
- Ryan, S. G. 2007. *Financial instruments and institutions: Accounting and disclosure rules*, 2nd ed. Hoboken, NJ: John Wiley and Sons, Inc.
- Ryan, S. G. 2008. Accounting in and for the subprime crisis. *The Accounting Review* 83 (6): 1605–38.
- Seidman, L. F. 2011. Testimony before the U.S. Senate Banking, Housing, and Urban Affairs Subcommittee on Securities, Insurance, and Investment on the role of the accounting profession in preventing another financial crisis. Available online at http://banking.senate.gov/public/index.cfm?FuseAction=Hearings.Testimony&Hearing_ID=0f533e5b-dc43-4fc2-a415-5df2ae8806da&Witness_ID=031e2c7a-24d6-48af-b2a1-84658682d119, retrieved September 15, 2012.
- Sharp, T. 2010. Big Four defend auditors' role. *The Herald* (Edinburgh), November 24. Available online at <http://www.heraldscotland.com/business/markets-economy/big-four-defend-auditors-role-1.1070428>, retrieved September 15, 2012.
- Shiller, R. 2008. *The subprime solution: How today's global financial crisis happened, and what to do about it*. Princeton: Princeton University Press.
- Sikka, P. 2009. Financial crisis and the silence of the auditors. *Accounting, Organizations and Society* 34 (6–7): 868–73.
- Simunic, D. A. 1980. The pricing of audit services: Theory and evidence. *Journal of Accounting Research* 18 (1): 161–90.
- Staff Report of the Task Force on Mortgage Backed Securities Disclosure. 2003. Enhancing disclosure in the mortgage backed securities market. Available online at <http://www.sec.gov/news/studies/mortgagebacked.htm>, retrieved September 15, 2012.
- Stein, M. T., D. A. Simunic, and T. B. O'Keefe. 1994. Industry differences in the production of audit services. *Auditing: A Journal of Practice and Theory* 13 (Supplement): 128–42.
- U.S., Treasury. 2008. Statement by Secretary Henry M. Paulson, Jr. on Treasury and Federal Housing Finance Agency Action to Protect Financial Markets and Taxpayers. Available online at <http://www.treasury.gov/press-center/press-releases/Pages/hp1129.aspx>. retrieved September 15, 2012.
- Wahlen, M. J. 1994. The nature of information in commercial bank loan loss disclosures. *The Accounting Review* 69 (3): 455–78.

SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article:

Table S.1.1. Determinants of bank holding company (BHC) audit fees in the years 2005–2007 (combined sample analysis replicating Desai et al. (2012) analysis and our model).

Table S.1.2. Determinants of bank holding company (BHC) audit fees in the years 2005–2007 (replicating our year-wise analyses using the Desai et al. (2012) model).

Table S.1.3. Determinants of bank holding company (BHC) audit fees in the years 2005–2007 (replicating our constant sample analysis by including the Desai et al. (2012) variables in our model).

Table S.2. Determinants of bank holding company (BHC) audit fees in the years 2005–2007 (constant sample analysis including the Fields et al. (2004) variables excluded from the results reported in the paper).

Appendix S1. Definitions for additional variables used in Tables S.1.1–S.2.