Auditor Choice and the Consistency of Bank Accounting: are Some Auditors Stricter than Others When Assessing the Value of a Bank's Loan Portfolio?

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The financial crisis of 2008 presents a natural experiment in which to study the impact of auditor choice on the loan fair-value disclosures of bank holding companies (BHCs). Using a sample of the largest 100 U.S. BHCs from 2007-2010, we examine the differences between banks' disclosed fair value and book value of loans as a function of auditor choice, while controlling for banks' relative financial condition. We find that being audited by Deloitte results in a more negative and statistically significant difference in the fair-value gap of bank loans relative to being audited by a non-Big-4 auditor.

INTRODUCTION

During the 2008-2010 financial crisis, banks and other financial institutions were overburdened with underperforming loans, most of which were reported at historical, amortized cost on their balance sheets.[1] Under the accounting standards at that time, and under current standards, banks are allowed to report their loan portfolios at historical amortized cost net of a loan loss reserves, so long as they have the intent and ability to hold those loans to maturity. These "held-for-investment" loans differed from "held-for-sale" loans, which must be reported on the balance sheet at the lower of cost or fair value, and for which changes in fair value are recognized in net income. Regardless of how loans are treated in the financial statements, SFAS 107, *Disclosures about Fair Value of Financial Instruments* (Financial Accounting Standards Board [FASB] 1991, now codified in ASC 825-10) requires banks to disclose the fair value of loans in the footnotes of their annual financial statements.

Many critics argue that had banks been required to recognize unrealized losses in their held-for-investment loan portfolios, their financial condition would have been much clearer to investors, and thus some of the shock of the crisis may have been averted. Others argue that the determination of fair value is inherently subjective, given that there are no active markets for most bank loans, and loan fair values must therefore be estimated, most often as exit values (the amount for which the loan could be sold), using a variety of inputs (Cantrell, et al., 2014). This subjectivity calls into question the reliability and usefulness of loan fair-value estimates relative to historical cost measures.[2]

Those opposed to the recognition of fair value changes in banks' loan portfolios also argue that the financial crisis would have been much worse had banks been required to recognize the difference between the book value and fair value of held-for-investment loans, by further depressing earnings, and drastically reducing bank capital. During the financial crisis, many of the nation's banks found themselves carrying a

majority of their assets at historical costs that exceeded estimates of their fair value, but were not required to recognize these fair-value gaps in net income.

For many of the nation's largest banks, moreover, these fair-value gaps were quite large. For example, as of 12/31/2008, Bank of America disclosed that the book value of its loans exceeded fair value by $44.6 billion; Wells Fargo $14.2 billion; and Regions Financial Corp. $13.2 billion. There was much variability in these fair-value gaps, with many banks reporting fair value of loans within 1 percent of their book value (Weil, 2009).

The role of auditors in valuing banks' held-for-investment loan portfolios has received much attention in the wake of the financial crisis. While the estimation of loan fair value is the responsibility of management, it is the responsibility of the external auditors to examine and attest to these estimations, and if necessary, challenge management when an estimate of fair value is believed to be inaccurate.[3]

In 2009, it was revealed in the financial press that banks audited by Deloitte and Ernst & Young (hereafter EY) reported larger differences between the disclosed fair value and book value of loans than did banks that were audited by other accounting firms (Rapoport, 2009). We surmise that these differences may be due to differences in audit quality among the Big-4 accounting firms. If loans currently reported as held-for-investment are eventually required to be reported on the balance sheet at fair value, auditors would play an influential role in the determination of bank regulatory capital.

The purpose of this study, therefore, is to examine the effects of a bank's choice of auditor on the difference between the book value and fair value of its loan portfolio, while controlling for the bank's relative financial condition. In doing so, we seek to answer the question of whether a bank's choice of auditor can influence the degree to which fair values differ from book values in its loan portfolio. We believe the financial crisis of 2008 presents a natural experiment to test this premise. Using a sample of the largest 100 U.S. bank holding companies as measured by total assets for the years 2007-2010, we examine the differences between banks' disclosed fair value and book value of loans as a function of auditor choice (Ernst & Young, Deloitte, KPMG, or PricewaterhouseCoopers), first using non-Big-4 auditors and then KPMG as the benchmark group.

Fair values of loans for banks with more risky loan portfolios may be more difficult to determine than those of banks that choose to carry a high-quality loan portfolio, and therefore any observed auditor effect may be due to estimation error. Also, management of less healthy banks may have an incentive to understate unrealized losses in their loan portfolios (Beatty, et al., 1995; Collins, et al., 1995). Thus, in order to determine if an observed auditor effect is simply due to an audit firm having a less-healthy group of bank clients, we control for overall loan credit quality and bank regulatory risk. We further control for bank lending emphasis, as banks with a higher proportion of net assets in the form of loans may have a greater incentive to overstate the fair value of their loans. Lastly, we control for bank size, as bank size has been found to be positively associated with measurement error in the reported fair value of loans (Eccher, et al., 1996).

Our study contributes to the literature by answering the question of whether some auditors during the financial crisis were stricter than others when assessing the fair value of banks' held-for-investment loan portfolios. Fair-value disclosures of loan portfolios are important, as they can affect how investors view a bank's loan portfolio (and, by extension, a bank's overall risk and performance). Moreover, fair-value gaps could have a detrimental effect on banks' regulatory capital in the future, if the FASB eventually changes banks' accounting for loans held-for-investment and require them to carry these loans on their balance sheets at fair value instead of amortized historical cost.[4,5] Our findings contribute to the literature by shedding light on the role of the audit function in determining fair-value estimates of banks' loan portfolios.

PRIOR STUDIES AND HYPTHESES

Audit Quality and Financial Reporting

The observed fair-value gaps in banks' loan portfolios during the financial crisis may have been a function of auditor choice, since higher quality auditors may have been stricter with banks with regards to

their estimates of loan fair values. The results of prior studies are consistent with the notion that auditor size (Big 6, 5, or 4 auditor) is associated with higher quality audits, and consequently higher earnings quality (as measured, typically, by the level of discretionary accruals). Becker et al. (1998) argues that Big-6 auditors' superior education and training enables them to better detect and curb earnings management, and thereby protect their professional reputations. Specifically, they find that the discretionary accruals of the clients of non-Big-6 audit firms are higher on average than the discretionary accruals reported by clients of Big-6 auditors. Francis et al. (1999) finds that although clients of Big-6 audit firms have higher total accruals, they report lower discretionary accruals, consistent with the assertion that Big-6 auditors constrain earnings management behavior. Krishnan (2003), moreover, argues that larger audit firms have greater resources and expertise with which to detect earnings management and have an incentive to protect their reputation due to their relatively large client base. Similarly, DeAngelo (1981) argues that audit quality is not independent of audit firm size, and that auditors with a larger client base have 'more to lose' and therefore resist clients' pressure to manage earnings.

While most prior studies of audit quality have focused on the differences between Big-4 and non-Big-4 audit firms, other studies have questioned the assumption of the homogeneity of audit quality among large audit firms. Buuren (2008) examines the assumption of homogeneity of audit quality (measured using an "Auditor Conservatism Ratio") among and within large audit firms, and finds significant audit quality differences among large audit firms, primarily due to partner effects. Additionally, Wiebe (2008) finds PwC and EY clients were more compliant with goodwill disclosure requirements than KPMG and Deloitte clients.

Other studies have examined differences in audit quality within the largest audit firms. Francis and Yu (2009), for instance, consider the effects of Big-4 office size (as measured by fees from SEC registrants) on abnormal (discretionary) accruals. They find less aggressive earnings management behavior from clients in larger offices, and larger offices are more likely to issue going-concern opinions. Along the same lines of considering differences within the largest audit firms, Ittonen et al. (2013) examine the association between the gender of the firm's audit engagement partner and abnormal accruals, and find that firms with female engagement partners are associated with smaller abnormal accruals. These studies suggest that factors that differ within (and perhaps among) the Big-4 audit firms can impact financial reporting behavior.

In the banking industry, auditor industry expertise has been shown to play a monitoring role in constraining managers' ability to manage earnings (DeBoskey and Jiang 2012). In theory, we might expect higher quality audits to be associated with larger fair-value gaps during the financial crisis, as auditors that are stricter with their clients would be less willing to accept managements' overestimations (i.e., upwardly biased estimates) of loan fair values.

Prior Studies of Loan Fair Value versus Book Value

Most of the prior literature that examines loan fair values has focused on the value relevance of the fair value disclosures required by SFAS 107 (FASB 1991). These studies typically regress market value of equity divided by book value of equity on fair value versus book value differences of individual assets and liabilities, and have mixed results (Barth, et al., 1996; Eccher, et al., 1996; Nelson, 1996). Furthermore, they find evidence of measurement error and discretion in loan fair values (Barth et al., 1996; Eccher, et al., 1996). In perhaps the most recent study of loan fair values, Cantrell et al. (2014) find that net historical loan costs is a better predictor of credit losses than reported loan fair value.

In a study that focuses on the reliability of banks' fair value of their loan portfolios, Nissim (2003) finds that banks manage the disclosed fair value of their loan portfolio. He finds that the overstatement of loan fair values is negatively related to regulatory capital, asset growth, liquidity, and gross book value of loans, and positively related to the change in the rate of credit losses. These findings suggest that banks overstate fair value of loans to affect market assessment of their risk and performance. We contribute to this line of research by examining the effect of auditor choice (i.e., between individual Big-4 and non-Big-4, and among Big-4 firms) on differences between disclosed fair value and book value of loans during the 2008 financial crisis.

Hypotheses

Based on the above discussion, we test the following hypotheses:

H1: *Ceteris paribus,* the choice of a Big-4 auditor (PwC, KPMG, EY, or Deloitte) versus one of the non-Big-4 audit firms is associated with banks' fair value gap for loans held for investment.

H2: *Ceteris paribus,* the choice of a Big-4 auditor (PwC, KPMG, EY, or Deloitte) is associated with banks' fair value gap for loans held for investment

METHODOLOGY

Our sample period covers the years 2007-2010, and thus captures the period just before and after the financial crisis. We collect data on the top 100 U.S. bank holding companies (BHC) as measured by total assets.[6] We obtain SFAS 107 disclosures of loan fair value and book value directly from each bank's SEC filings (form 10-K). Data for our independent variables is obtained from the Consolidated Financial Statements for Holding Companies (FRY9C). The hand collected SFAS 107 disclosures were cross checked by each researcher for accuracy.

The dependent variable in our study is the difference between disclosed loan fair value and net historical cost, deflated by net historical cost (GAP_BV):

$$GAP\_BV = \text{Fair-value gap} = (\text{Fair value of loans} - \text{Book value of loans}) / \text{Book value of loans}$$

Thus, when fair value is below book value, GAP_BV will be negative. A negative value is thus "bad" (i.e., fair value is less than book value) and a positive value is "good" (i.e., fair value is greater than book value). For audit firms whose clients have relatively more negative fair value gaps, *ceteris paribus*, that may be because they are stricter with their clients than other auditors when it comes to valuing their loan portfolios.

We use auditor indicator variables to determine the partial effect of audit firm choice on the fair-value gaps. We examine each of the Big-4 audit firms versus non-Big-4, using the entire sample (n=400), and a sample where fair-value gap is negative (n=180).[7] We then restrict the sample to banks audited by the Big-4 only, and test for the partial effect of being audited by Deloitte, PwC, or EY, using KPMG as a benchmark (n=293).[8] We then examine banks audited by the Big-4 only and where fair-value gap is negative (n=124). Lastly, we test for auditor effects using two separate samples: one from the crisis period (2008 and 2009) and one from the non-crisis period (2007 and 2010). The coefficients on our auditor indicator variables measure the difference in the fair value gap for each auditor, on average, holding all else constant. For example, if the coefficient on Deloitte is negative, that suggests that Deloitte clients will, on average, have a smaller (or more negative) fair value gap, holding all else constant. We interpret a more negative coefficient as an indication that the auditor is more stringent with its clients with regards to their assessment of the fair value of their loan portfolio.

Poor credit quality may give bank managers a reason to overstate fair value disclosures, and pressure auditors to accept these overstatements. To determine if differences between the disclosed fair value and book value of loans is due to differences in audit quality between Big-Four and non-Big-4 audit firms, or due to differences among Big-4 firms, or simply due to some banks having a lower quality loan portfolio, we control for the credit quality of a bank's loan portfolio. Consistent with Nissim (2003), we define credit quality as the sum of nonaccrual loans and loans over 90 days delinquent but still accruing interest, divided by the book value of loans. Although nonperforming loans are considered relatively nondiscretionary, their measurement requires judgement and can vary across banks (Beaver, et al., 1989; Griffin and Wallach, 1991). Thus, we partially control for the effects of management discretion by controlling for banks' nonperforming loans.

We also control for bank size, as larger banks are more likely to invest in less frequently traded assets or assets for which there is greater information asymmetry, resulting in greater measurement error in the

estimation of their fair values (Nissim, 2003; Eccher, et al., 1996). We use total assets as a measure of bank size.

Banks with a greater emphasis on lending in their operations would have a greater incentive to overstate the fair value of their loan portfolio, given that changes in the portfolio would have a greater impact on bank capital. We therefore control for lending emphasis, defined as the book value of loans divided by total assets. We further control for bank risk, using bank tier-1 capital ratio. The tier-1 capital ratio has been used in the prior literature as a proxy for balance sheet strength. We control for tier-1 capital ratio because we expect less healthy banks to be more likely to overstate loan fair values (Nissim, 2003; Jin, et al., 2011). We also control for bank profitability, since management's incentive to overstate loan fair value estimates may be related to its incentive to manage earnings. We use return on assets (ROA) as a measure of bank profitability. Lastly, we control for the years 2008-2010, using 2007 (the pre-crisis year) as the benchmark. We test the following models:

$$GAP\_BV_{j,t} = \alpha_j + \beta_1\,PWC_{j,t} + \beta_2 E\&Y_{j,t} + \beta_3 DELOITTE_{j,t} + \beta_4 KPMG_{j,t} + \beta_5 QUALITY_{j,t} +$$
$$(1) \qquad\qquad\qquad \beta_6 TOTASSET_{j,t} + \beta_7 LENDEMP_{j,t} + \beta_8 TIER1RBR_{j,t} + \beta_9 ROA_{j,t}$$
$$+ \beta_{10}D2008_j +$$
$$\beta_{11}D2009_j + \beta_{12}D2010_j + e_{j,t}$$

$$GAP\_BV_{j,t} = \alpha_j + \beta_1\,PWC_{j,t} + \beta_2 E\&Y_{j,t} + \beta_3 DELOITTE_{j,t} + \beta_4 QUALITY_{j,t} + \beta_5 TOTASSET_{j,t} +$$
$$(2)$$
$$\beta_6 LENDEMP_{j,t} + \beta_7 TIER1RBR_{j,t} + \beta_8 ROA_{j,t} + \beta_9 D2008_j + \beta_{10}D2009_j +$$
$$\beta_{11}D2010_j + e_{j,t}$$

where $GAP\_BV_{j,t}$ is banks' fair value gap for loans held for investment, defined as the difference between disclosed loan fair value and net historical cost, deflated by net historical cost; PWC, EY, DELOITTE and KPMG are separate auditor indicator variables; QUALITY is defined as the sum of nonaccrual loans and loans over 90 days delinquent but still accruing interest, divided by the book value of loans; TOTASSET is bank total assets; LENDEMP is bank lending emphasis, defined as the book value of loans divided by total assets; TIER1RBR is the bank's tier 1 capital ratio; ROA is bank net income divided by total assets; and D2008-D2010 are year indicator variables, using 2007 as the benchmark.

RESULTS

Descriptive Statistics

Descriptive statistics for the variables used in our analysis for the entire sample by year are reported in Table 1. We find large fair-value gaps during the financial crisis, with the largest gap of negative 16% of the book value of loans for both 2008 and 2009. The average fair-value gap for all 400 firm-year observations changes from a 2007 pre-crisis average of positive .70% to negative 1.24% in 2009. As expected, the average fair-value gap improves to negative .40% in 2010 as the crisis waned. These mean values mask the largest gaps in 2008 and 2009 that were approximately 16% of total loans for both years. Total assets grew throughout the period analyzed, although at a slower rate during and after the financial crisis. The change in assets from 2007 to 2008 was much larger at 18.67% than the increases from 2008 to 2009 of 0.78% and from 2009 to 2010 of 2.56%. On the other hand, our proxy for a bank's lending emphasis, the book value of loans as a percentage of total assets, steadily contracted over the entire period, declining from 64% to 56%.

Not surprisingly we also see deterioration in the quality of bank loan portfolios. Our measure is the amount of non-accruing loans plus loans that are past due for 90 days or longer, divided by the book value of total loans. The deterioration continues throughout the period reviewed, with the highest ratio of 5.25% occurring in 2010. Earnings followed a similar intuitive pattern. In 2007, return on assets (ROA) was

0.96% but fell to 0.03% in 2008 and to a negative -0.04% in 2009 before returning to a positive 0.37% in 2010.

Finally, we note that the tier-1 risk-based capital ratio steadily improved over the 2007–2010 period. This is not surprising either. As bank loan portfolios deteriorated, it was necessary to build up bank capital ratios to prevent excessive concern by bank depositors and other creditors. In addition, bank regulators were worried about bank failures and the impact on the federal safety net. Losses of the safety net are ultimately paid for by the country's taxpayers. The regulators primary response was to insist on banks raising more capital.

TABLE 1
DESCRIPTIVE STATISTICS YEARS 2007-2010[a]

Variable (n=100)	2007	2008	2009	2010
gap_bv				
Mean	0.007	-0.0047	-0.0124	-0.004
Std. Dev	0.0111	0.0414	0.0365	0.0306
Min	-0.0099	-0.1581	-0.156	-0.1294
Max	0.0414	0.0649	0.0671	0.0646
totasset				
Mean	8.53E+07	1.01E+08	1.02E+08	1.05E+08
Std. Dev	3.19E+08	3.61E+08	3.69E+08	3.79E+08
Min	846400	1496455	1634700	2090187
Max	2.19E+09	2.18E+09	2.23E+09	2.27E+09
lendemp				
Mean	0.6401	0.6307	0.589	0.564
Std. Dev	0.1651	0.1673	0.1674	0.1606
Min	0.0446	0.0411	0.0516	0.0525
Max	0.8467	0.8726	0.9596	0.8176
quality				
Mean	0.0128	0.027	0.0499	0.0525
Std. Dev	0.0261	0.0483	0.0863	0.0831
Min	0.0001	0	0.0025	0.0013
Max	0.2493	0.4567	0.8423	0.7758
ROA				
Mean	0.0097	0.0003	-0.0004	0.0037
Std. Dev	0.0041	0.0205	0.0166	0.0131
Min	-0.0047	-0.1618	-0.0768	-0.069
Max	0.0196	0.0178	0.0332	0.0195
tier1rbr				
Mean	10.1439	11.7688	12.7913	13.8367
Std. Dev	2.0598	2.0212	2.5727	3.3046
Min	6.79	7.71	4.88	7.64
Max	18.46	20.25	20.76	30.98

[a] GAP_BV is banks' fair value gap for loans held for investment, defined as the difference between disclosed loan fair value and net historical cost, deflated by net historical cost; TOTASSET is bank total assets; LENDEMP is bank lending emphasis, defined as the book value of loans divided by total assets;

QUALITY is defined as the sum of nonaccrual loans and loans over 90 days delinquent but still accruing interest, divided by the book value of loans; ROA is bank net income divided by total assets; and TIER1RBR is the bank's tier 1 capital ratio.

Results for the Full Sample

Table 2 reports our main test results for Model 1 using the full sample (400 firm-year observations). We find that being audited by Deloitte results in more negative and statistically significant difference in the fair-value gap of bank loans relative to being audited by a non-Big-4 firm (p.=0.03). The coefficient estimate for return on assets (ROA) is highly significant and positive (p.= 0.000), suggesting that better performing, more profitable banks have healthier loan portfolios, or, alternatively, that they have better models for valuing their loans. The coefficient for total assets (TOTASSET) is also highly significant and negative (p.=0.000), which is not surprising given that the largest banks had the most unfavorable fair-value gaps during the financial crisis. Our year 2009 indicator variable (D2009) is also statistically significant and negative (p.=0.02), consistent with the expectation that banks' fair-value gaps would be more negative during the financial crisis. Thus, we find that banks' fair-value gaps are a function of auditor choice, while controlling for banks' relative size and financial health and performance.

Table 2 also reports the results of Model 1 but limits the sample to only observations for which the fair-value gap (GAP_BV) is negative (n=180).[9] Although doing so reduces the sample to only 180 observations, Ramsey's (1969) Regression Specification Error Test (RESET), a general test for functional form misspecification, indicates that Model 2 is correctly specified.[10] We again find that being audited by Deloitte is very significant and negative (p.= 0.005). We now find that being audited by EY is also statistically significant and negative (p.= 0.04). The coefficient estimate for return on assets (ROA) is again statistically significant (although much less so) and positive (p.= 0.03). Our year control variables for 2008 and 2009 are significant and negative. However, our measure of size (TOTASSET) is no longer significant. These results suggest that among the population of banks with negative fair-value gaps, the negative gap is primarily a function of auditor choice, financial performance, and the financial crisis (year).

TABLE 2
ESTIMATION RESULTS MODEL 1[a]

$$GAP\_BV_{j,t} = \alpha_j + \beta_1 PWC_{j,t} + \beta_2 E\&Y_{j,t} + \beta_3 DELOITTE_{j,t} + \beta_4 KPMG_{j,t} + \beta_5 QUALITY_{j,t}$$
$$+ \beta_6 TOTASSET_{j,t} + \beta_7 LENDEMP_{j,t} + \beta_8 TIER1RBR_{j,t} + \beta_9 ROA_{j,t} + \beta_{10} D2008_j$$
$$+ \beta_{11} D2009_j + \beta_{12} D2010_j + e_{j,t}$$

Variables	Full Sample	Full Sample (negative fair-value gap)
DELOITTE (auditor=Deloitte)	-.0155*	-.0312**
	(.0072)	(.0108)
EY (auditor=EY)	-.0060	-.0141*
	(.0044)	(.0068)
KPMG (auditor=KPMG)	.0058	.0052
	(.0039)	(.0064)
PwC (auditor=PwC)	.0058	.0110
	(.0071)	(.0107)
QUALITY (loan quality)	-.0242	-.0028
	(.0272)	(.0348)
TOTASSET (total assets)	-1.61e-11***	-7.00e-12
	(4.99e-12)	(6.91e-12)

LENDEMP (lending emphasis)	**-.0188**	**.0014**
	(.0116)	**(.0200)**
TIER1RBR (tier-1 ratio)	**-.0010**	**-.0005**
	(.0006)	**(.0010)**
ROA (return on assets)	**.5310***	**.3084***
	(.1109)	**(.1402)**
D2008 (year 2008 indicator)	**-.0049**	**-.0214***
	(.0046)	**(.0087)**
D2009 (year 2009 indicator)	**-.0114***	**-.0183***
	(.0048)	**(.0083)**
D2010 (year 2010 indicator)	**-.0045**	**-.0131**
	(.0050)	**(.0086)**
Number of observations	**400**	**180**
	$R^2 = 0.1260$	**$R^2 = 0.1374$**
F Statistic	**$F = 5.80***$**	**$F = 3.38***$**
RESET	**$F = 7.25***$**	**$F = 2.39$**

ᵃ Standard errors beneath the coefficients.

*significant at the 0.05 level;
**significant at the 0.01 level;
***significant at the 0.001 level

Results for the Sample Limited to Banks Audited by a Big-4 Audit Firm

Table 3 reports our main test results for Model 2, which restricts the sample to only banks audited by one of the Big-4 audit firms, using KPMG as a benchmark (n=293). We obtain similar results from this restricted sample. Deloitte and EY are both statistically significant and negative (p.=0.003 and 0.004 respectively), suggesting that relative to KPMG, Deloitte and EY are stricter with their bank clients.[11] Total assets (TOTASSET) and return on assets (ROA) are again highly significant, providing evidence that even when restricting our sample to banks audited by the Big-4, the fair-value gap still becomes more negative as a bank's total assets increase, and more positive as profitability increases.

Table 3 also reports the results of Model 2 while limiting the sample to only observations for which the fair-value gap (GAP_BV) is negative (n=124).[12] We find that limiting the sample to Big-4 auditors and negative fair-value gaps yields similar results, and that RESET again indicates that the model is correctly specified.[13] Return on assets (ROA) and D2009 are no longer statistically significant. These results suggest that among Big-4 client banks, negative fair-value gaps are no longer a function of financial performance, leaving only auditor choice and the financial crisis as critical determinants.

TABLE 3
ESTIMATION RESULTS MODEL 2
(SAMPLE LIMITED TO BANKS AUDITED BY A BIG-4 AUDIT FIRM)[a]

$$GAP\_BV_{j,t} = \alpha_j + \beta_1\,PWC_{j,t} + \beta_2E\&Y_{j,t} + \beta_3DELOITTE_{j,t} + \beta_4QUALITY_{j,t} + \beta_5TOTASSET_{j,t} +$$
$$\beta_6LENDEMP_{j,t} + \beta_7TIER1RBR_{j,t} + \beta_8ROA_{j,t} + \beta_9D2008_j + \beta_{10}D2009_j + \beta_{11}D2010_j + e_{j,t}$$

Variables	Audited by Big-4 firm only	Audited by Big-4 firm only (negative fair-value gap only)
DELOITTE (auditor=Deloitte)	-.0218**	-.0359**
	(.0072)	(.0117)
EY (auditor=EY)	-.0123**	-.0201*
	(.0042)	(.0077)
PwC (auditor=PwC)	-.0006	.0065
	(.0069)	(.0114)
QUALITY (loan quality)	-.0302	-.0254
	(.0288)	(.0389)
TOTASSET (total assets)	-1.82e-11***	-9.19e-12
	(5.22e-12)	(7.85e-12)
LENDEMP (lending emphasis)	-.0349*	-.0233
	(.0135)	(.0274)
TIER1RBR (tier-1 ratio)	-.0013	-.0004
	(.0008)	(.0013)
ROA (return on assets)	.4885***	.2054
	(.1322)	(.1756)
D2008 (year 2008 indicator)	-.0085	-.0277*
	(.0055)	(.0118)
D2009 (year 2009 indicator)	-.0109	-.0153
	(.0058)	(.0112)
D2010 (year 2010 indicator)	-.0037	-.0110
	(.0059)	(.0115)
Number of observations	293	124
	$R^2 = 0.1378$	$R^2 = 0.1468$
F Statistic	F = 5.24***	F = 2.92**
RESET	F = 8.81***	F = 2.22

[a] Standard errors beneath the coefficients.

*significant at the 0.05 level;
**significant at the 0.01 level;
***significant at the 0.001 level

Results for the Crisis versus Non-Crisis Periods: Full Sample

We conclude our analysis with a comparison of the results of Models 1 and 2 using separate samples for the crisis (2008 and 2009) and non-crisis (2007 and 2010) periods, with the non-crisis period serving as a falsification test. In doing so, we seek to answer the question of whether our results are similar between the crisis and non-crisis period, when the probability of a negative fair-value gap is likely very different. Tables 4 and 5 present the results of this analysis.

Table 4 presents the results of Model 1 for the crisis (2008 and 2009) and the non-crisis periods (2007 and 2010). For the crisis period, we obtain similar results to the results reported in Table 2. During the crisis period, being audited by Deloitte or EY results in a more negative fair-value gap, on average, relative to non-Big-4 audit firms. Not surprisingly, the coefficient on Deloitte is much larger than the coefficient reported in Table 2 (-.0395 vs. -.0155) and is highly significant. The coefficient for EY is also statistically significant and negative. Also not surprisingly, we find that lending emphasis (LENDEMP) is now statistically significant and negative, suggesting that during the crisis period, banks with a greater emphasis on lending had more negative fair-value gaps relative to banks with fewer loans. Looking at the results from the non-crisis period in Table 4, we see that only return on assets is statistically significant and positive. Apparently, size, auditor choice, and lending emphasis have no impact on loan fair-value gaps during the non-crisis years of 2007 and 2010.

TABLE 4
ESTIMATION RESULTS MODEL 1: CRISIS (2008 & 2009) VERSUS
NON-CRISIS (2007 & 2010) YEARS[a]

$$GAP\_BV_{j,t} = \alpha_j + \beta_1\,PWC_{j,t} + \beta_2E\&Y_{j,t} + \beta_3DELOITTE_{j,t} + \beta_4KPMG_{j,t} + \beta_5QUALITY_{j,t}$$
$$+ \beta_6TOTASSET_{j,t} + \beta_7LENDEMP_{j,t} + \beta_8TIER1RBR_{j,t} + \beta_9ROA_{j,t} + \beta_{10}D2008_j$$
$$+ \beta_{11}D2009_j + \beta_{12}D2010_j + e_{j,t}$$

Variables	Crisis Period (2008 & 2009)	Non-Crisis Period (2007 & 2010)
DELOITTE (auditor=Deloitte)	-.0395***	.0080
	(.0120)	(.0075)
EY (auditor=EY)	-.0158*	.0040
	(.0074)	(.0047)
KPMG (auditor=KPMG)	.0071	.0049
	(.0065)	(.0041)
PwC (auditor=PwC)	.0048	.0078
	(.0119)	(.0074)
QUALITY (loan quality)	-.0580	.0131
	(.0431)	(.0313)
TOTASSET (total assets)	-2.74e-11***	-4.88e-12
	(8.19e-12)	(5.27e-12)
LENDEMP (lending emphasis)	-.0480*	.0067
	(.0197)	(.0120)
TIER1RBR (tier-1 ratio)	-.0021	-.00008
	(.0012)	(.0006)
ROA (return on assets)	.4596**	.6671***
	(.1483)	(.1847)
D2009 (year 2009 indicator)	-.0058	--------
	(.0052)	--------
D2010 (year 2010 indicator)	--------	-.0067

	--------	(.0041)
Number of observations	200	200
	$R^2 = 0.1607$	$R^2 = 0.0957$
F Statistic	F = 4.81***	F = 3.11**
RESET	F = 1.87	F = 0.83

[a] Standard errors beneath the coefficients.

*significant at the 0.05 level;
**significant at the 0.01 level;
***significant at the 0.001 level

Results for the Crisis versus Non-Crisis Periods: Banks Audited by a Big-4 Audit Firm

Lastly, Table 5 presents the results of Model 2 for the crisis (2008 and 2009) and the non-crisis periods (2007 and 2010). Recall that Model 2 limits the sample to banks audited by one of the Big-4 auditors. Our results are similar to the results reported in Table 4. However, we now see much larger and more highly significant coefficients for Deloitte and EY, as well as for size (TOTASSET) and lending emphasis (LENDEMP). Interestingly, although still statistically significant, the coefficient on return on assets (ROA) is smaller. Results for the non-crisis period are very similar to those reported in Table 4: only return on assets is statistically significant and positive. We conclude that the effect of auditor choice is far more likely to impact banks' fair-value gaps during periods of financial turmoil than during periods of relative financial calm.

TABLE 5
ESTIMATION RESULTS MODEL 2 (SAMPLE LIMITED TO BANKS AUDITED BY A BIG-4 AUDIT FIRM): CRISIS (2008 & 2009) VERSUS NON-CRISIS (2007 & 2010) YEARS[a]

$$GAP\_BV_{j,t} = \alpha_j + \beta_1 PWC_{j,t} + \beta_2 E\&Y_{j,t} + \beta_3 DELOITTE_{j,t} + \beta_4 QUALITY_{j,t} + \beta_5 TOTASSET_{j,t} + \beta_6 LENDEMP_{j,t} + \beta_7 TIER1RBR_{j,t} + \beta_8 ROA_{j,t} + \beta_9 D2008_j + \beta_{10} D2009_j + \beta_{11} D2010_j + e_{j,t}$$

Variables	Audited by Big-4 firm only: Crisis Period (2008 & 2009)	Audited by Big-4 firm only: Non-Crisis Period (2007 & 2010)
DELOITTE (auditor=Deloitte)	-.0476***	.0029
	(.0120)	(.0073)
EY (auditor=EY)	-.0237***	-.0013
	(.0070)	(.0043)
PwC (auditor=PwC)	-.0030	.0018
	(.0117)	(.0070)
QUALITY (loan quality)	-.0726	.0179
	(.0453)	(.0339)
TOTASSET (total assets)	-3.09e-11***	-6.16e-12
	(8.59e-12)	(5.38e-12)
LENDEMP (lending emphasis)	-.0731**	-.0033
	(.0231)	(.0135)
TIER1RBR (tier-1 ratio)	-.0030	-.0003

	(.0016)	(.0007)
ROA (return on assets)	.3922*	.6894**
	(.1717)	(.2505)
D2009 (year 2009 indicator)	-.0011	--------
	(.0063)	--------
D2010 (year 2010 indicator)	--------	-.0060
	--------	(.0047)
Number of observations	146	147
	$R^2 = 0.1968$	$R^2 = 0.0545$
F Statistic	F = 4.95***	F = 1.94*
RESET	F = 1.77	F = 2.11

[a] **Standard errors beneath the coefficients.**

*significant at the 0.05 level;
**significant at the 0.01 level;
***significant at the 0.001 level

SUMMARY, CONCLUSIONS AND LIMITATIONS

Are some auditors stricter than others when assessing the value of a bank holding company's loan portfolio? Using a sample of the 100 largest BHCs in the U.S. and a period of time that includes the financial turmoil of the most recent banking crisis, 2007-2010, a time when the tension between BHCs and their auditors was most likely high, we find that the answer is yes.

Our results confirm the existence of large differences between the disclosed fair value and book value of loans during the financial crisis. As expected, we find that the average fair-value gap worsens after 2007, and then improves in 2010 as the crisis waned. In other words, and not surprisingly, we find a marked deterioration in the overall quality of banks' loan portfolios followed by significant improvement at the end of this period.

For our full sample, we find that being audited by Deloitte results in more negative (i.e., disclosed fair value is less than book value) and statistically significant difference in the fair-value gap of bank loans relative to being audited by a non-Big-4 firm. When limiting the sample to observations where the fair-value gap is negative, we again find that being audited by Deloitte results in a more negative and statistically significant fair-value gap. We obtain similar results when limiting our sample to only Big-4 auditors, using KPMG as a benchmark. When limiting the analysis to only banks audited by the Big-4, we find that being audited by either Deloitte or EY results in a more negative and statistically significant fair value gap, suggesting that relative to KPMG, Deloitte and EY are stricter with their bank clients when it comes to valuing their loan portfolios. We obtain similar results when limiting the sample to only banks audited by the Big-4 and having negative fair-value gaps.

Our results also establish the intuitive expectations that total assets (i.e. size), ROA (i.e. profitability), and the economic environment (i.e. the year) are important determinants of the fair-value gap. Finally, it should be noted that the entire issue of fair-value gaps will become much more important in the future if BHCs are ever required to fully recognize changes in these fair-value gaps in net income.

ENDNOTES

1. Loans reported at amortized cost make up a majority of bank assets. As of 3/31/2009, loans representing roughly two-thirds of total assets for the most of the 7,932 Federally insured banks in the U.S. were being reported at amortized cost (Rapoport 2010).
2. Banks rely on internal models when estimating loan fair values. As Rolf Winkler stated in the *Wall Street Journal* in 2009: "Regions Financial carries its loans at 34% above fair value. Citigroup carries its loans at no premium. This could mean Regions faced bigger losses down the road, or it could mean Citi's fair-value calculation is too charitable. More likely, it means both." (Winkler 2009).
3. Management has an incentive to upwardly bias the disclosed fair value of held-for-investment loans because users may use fair-value estimates to evaluate the bank's risk and performance. According to SFAS 107 (now ASC 825-10), "Information about fair value better enables investors, creditors, and other users to assess the consequences of an entity's investment and financing strategies, that is, to assess its performance. For example, information about fair value shows the effects of a decision to borrow using fixed-rate rather than floating-rate financial instruments or of a decision to invest in long-term rather than short-term instruments. Also, in a dynamic economy, information about fair value permits continuous reassessment of earlier decisions in light of current circumstances" (pg.11).
4. It was reported during the financial crisis that if Regions Financial Corps' $16.9 billion fair-value gap had been recognized on its balance sheet, regulatory Tier 1 capital would have been reduced by $13 billion. Other banks would have also seen economically significant reductions in Tier 1 capital.
5. In 2010, the FASB proposed that banks be required to report the fair value of loans on the balance sheet, with the changes in fair value flowing through other comprehensive income (FASB 2011). In 2013, the FASB decided to not change the existing requirements (FASB 2013). Most recently, the FASB has changed the way banks estimate their expected credit losses, moving from an incurred loss model to an expected loss model. Beginning in 2020, banks will be required to immediately recognize all expected credit losses on their loan portfolios. Under this new impairment model, banks must still disclose the fair value of their loan portfolios (which will likely be different from the amount expected to be collected). After 2020, we expect the role of the auditor to become even more important, as the new standard does not prescribe any methods to estimate current expected credit losses, but instead allows banks (and their auditors) to use considerable judgment in determining the appropriate methods for estimating expected credit losses and the fair value of their loan portfolios (FASB 2016(a); FASB 2016(b)).
6. We believe this to be a very representative sample, given that the top 100 BHCs represent approximately 90% of total banking assets in the U.S.
7. We initially examine the effect of a Big-4 vs. non-Big-4 auditor indicator variable (with controls) on banks' fair-value gaps. Results (untabulated) indicate no statistical significant difference between Big-4 (as a group) versus non-Big-4.
8. We designate KPMG as the benchmark auditor because of KPMG's traditional status as the banking and financial industry's expert auditor (this is also consistent with prior studies; see Kanagaretnam et al. (2009) and Fields et al. (2004)). Furthermore, in our pooled sample, KPMG is the market leader with 37% of client observations (market shares of the other firms in our sample are as follows: EY, 23%; PwC, 8%; Deloitte, 6%; non-Big-4, 26%).
9. The reduced sample consisting of only observations with a negative fair-value gap (n=180) is distributed across the years as follows: (2007) = 28; (2008) = 42; (2009) = 59; (2010) = 51. As expected, we see a greater number of banks with negative fair-value gaps during the height of the financial crisis.
10. RESET adds polynomials in the OLS fitted values from the estimated model to detect general kinds of functional form misspecification (Wooldridge 2003, pg.293). A lack of statistical significance (non-significance) suggests that the model is correctly specified.
11. Rapoport (2009) speculated that the sharper declines in loan fair values for Deloitte and EY clients relative to other accounting firms may have been due to Deloitte and EY having a relatively less healthy group of bank clients. Our findings test this assumption empirically and suggest that this is not the case. Rather, our results suggest that audit policies with regards to valuing bank loan portfolios vary among the Big-4 auditors, further suggesting that Big-4 auditors may directly affect the strength of banks' regulatory capital.
12. The reduced sample consisting of only observations from banks audited by the Big-4 and with a negative fair-value gap (n=124) is distributed across the years as follows: (2007) = 17; (2008) = 30; (2009) = 42; (2010) = 35.
13. Recall that a lack of statistical significance (non-significance) suggests that the model is correctly specified.

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