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Corporate governance and earnings management at large U.S. bank holding companies ☆

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ABSTRACT

This paper examines whether corporate governance mechanisms affect earnings and earnings management at the largest publicly traded bank holding companies in the United States. We first find that performance, earnings management, and corporate governance are endogenously determined. Thus, OLS estimation can lead to biased coefficients and a simultaneous equations approach is used. We find that CEO pay-for-performance sensitivity (PPS), board independence, and capital are positively related to earnings and that earnings, board independence, and capital are negatively related to earnings management. We also find that PPS is positively related to earnings management. Finally, PPS and board independence are positively related and the relationship is bidirectional. While both PPS and board independence are associated with higher earnings, our results indicate that more independent boards appear to constrain the earnings management that greater PPS compels.

1. Introduction

Accountants and financial economists have recognized for years that firms use latitude in accounting rules to manage their reported earnings in a wide variety of contexts. Healy and Wahlen (1999) conclude in their review article on this topic that the evidence is consistent with earnings management "to window dress financial statements prior to public securities offerings, to increase corporate managers' compensation and job security, to avoid violating lending contracts, or to reduce regulatory costs or to increase regulatory benefits."[1] Since then, evidence of earnings management has only mounted. For example, Cohen et al. (2004) find that earnings management began to increase steadily around 1997, peaking in 2002. Performance-based compensation (e.g., option and stock) emerged as a particularly strong predictor of aggressive accounting behavior in these years (see Gao and Shrieves, 2002; Cohen et al., 2004; Bergstresser and Philippon, 2006; Cheng and Warfield, 2005).

While there is an extensive literature on opportunistic earnings management in response to specific incentives to achieve one result or another, research looking at the impact of corporate governance on earnings management is quite limited. The few papers

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[1] At the extreme, earnings management has resulted in some widely-reported accounting scandals involving Enron, Merck, WorldCom, and other major U.S. corporations. Congress responded to the spate of corporate scandals that emerged after 2001 with the Sarbanes–Oxley Act passed in June 2002. Sarbanes–Oxley requires public companies to make sure their boards' audit committees have experience with applying generally accepted accounting principles (GAAP) to estimates, accruals, and reserves.

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that address these issues (e.g., Klein (2002) and Warfield et al. (1995)) focus more on the magnitude than the direction of earnings management, and thus shed little light on the ability of these variables to offset the one-sided incentive of management to increase reported earnings that results from stock and option-based compensation.[2] More recently, Cornett et al. (2008) examine the impact of incentive-based compensation and corporate governance on firm performance in light of potential earnings management. They find that incentive-based compensation has a significant impact on financial performance as measured by reported earnings. However, once earnings are adjusted for discretionary accruals the link between compensation and performance disappears. In contrast, the estimated impact of corporate governance variables on performance more than doubles when discretionary accruals are removed from measured profitability.

This study examines earnings management at publicly traded commercial bank holding companies in the United States and particularly how corporate governance mechanisms affect earnings management. For all but the worst performing banks, a bank's management has discretion with respect to the size of loan loss provisions as well as realized security gains and losses recorded in any period. Thus, during periods of low profit in other areas of the bank, management can smooth earnings by delaying reporting loan losses and increasing the realization of securities gains. Management discretion in these areas implies that management of commercial bank earnings can impact a bank's performance, cash flows, market value, and capital adequacy. Indeed, despite monitoring and oversight by regulators a bank's reported loan loss provisions and realized securities gains and losses are largely under the control of its managers. Rather than unwaveringly smoothing earnings, managers can use discretion to attain their own goals (i.e., to increase performance based compensation) by putting constant upward pressure on reported earnings, which runs counter to regulators' desires (i.e., earnings management can be used to artificially inflate reported capital adequacy ratios).

We study earnings management at publicly traded U.S. commercial bank holding companies during the 1994 through 2002 period.[3] In particular, we look at the interactions between firm performance, corporate governance mechanisms, and earnings management. We also examine whether the various corporate governance mechanisms and earnings management tools are chosen jointly or independently from each other. To do this, we model the interactions of firm governance, earnings management, and firm performance in a simultaneously determined system of equations that accounts for endogeneity.[4] As noted earlier, the interaction of earnings management and corporate governance has been examined by Cornett et al. (2008). However, this study did not include bank holding companies. Adams and Mehran (2003) and Macey and O'Hara (2003) find systematic differences between the governance of banking and manufacturing firms and highlight the point that governance structures are industry specific. Thus, the results found in this paper for banks may very well be different than those found for nonbanks.

We first find that performance, earnings management, and governance mechanisms are endogenously determined. Thus, OLS estimation, which does not take into account endogeneity, can lead to biased coefficients. Therefore a simultaneous equations approach is used. We find that performance, board independence, and capital are related to earnings management. Specifically, banks with high levels of income and capital record more loan losses and fewer securities gains and vice versa. Thus, we find evidence of earnings smoothing. Also, an independent board of directors is associated with higher levels of loan losses and fewer securities gains recorded. Thus, independent boards constrain earnings management used to inflate earnings. Further, CEO pay sensitivity is related to earnings management. That is, when pay-for-performance is high managers record fewer loan loss provisions and realize more securities gains.

We find that higher levels of earnings management, CEO pay-for-performance sensitivity, board independence, and capital are all associated with higher reported earnings. As expected, we find that earnings management increases earnings. Additionally, banks that tie CEO pay to firm performance perform better. Further, a strong board of directors is associated with high levels of performance and banks with high levels of capital experience high levels of performance. These results suggest that stronger CEO ties to stock ownership and greater monitoring by boards of directors improve operating performance.

Finally, we find that CEO pay-for-performance and board independence are positively related. Higher pay-for-performance leads to increased oversight by more independent boards and independent boards increase the pay-for-performance sensitivity of the CEO. Interestingly, both pay-for-performance and board independence increase earnings, but more independent boards appear to constrain the earnings management that greater PPS compels.

The remainder of the paper is organized as follows. Section 2 reviews the literature on earnings management and reviews internal corporate governance mechanisms shown to be important in other contexts. Section 3 describes the data and methodology. Section 4 describes the empirical results and Section 5 concludes the paper.

[2] When options are issued, one could argue that managers have an incentive to manage earnings downward so that the exercise price is low. However, in this paper, we concentrate on exploring management's incentives to increase earnings so as to increase personal wealth.

[3] The data analyzed in this study contain a period during which the U.S. economy saw a short recession, from 2001 through 2002. We find our results consistent through both non-recessionary periods and the recession of the early 2000s. We note, however, that the recession experienced in the U.S. and worldwide in the late 2000s (that started in December 2007) is unlike any other beyond the Great Depression. Thus, while we find that our results hold through a mild recession and through non-recessionary periods, we have not determined whether our results are robust to more extreme economic downturns. This remains to be tested after the current situation is resolved.

[4] Demski (2003) describes a web of corporate governance that involves a diverse set of players including auditors, boards of directors, analysts and investment bankers, regulators, managers, and attorneys and investors. We directly assess the bidirectional relationships between managers and boards of directors by including CEO pay-for-performance (PPS) and board independence in our system of equations. We account for regulatory oversight by including a capital adequacy measure as an endogenous variable and by including firm size as an exogenous variable in the system. We control for board of director stock ownership, market expectations, audit committee independence and oversight, and analysts' oversight with various exogenous and instrumental variables throughout the system.

2. Earnings management and corporate governance

The Securities and Exchange Commission (SEC) has the authority to set accounting procedures for financial reporting by publicly traded firms. However, in most cases the SEC has designated the Financial Accounting Standards Board (FASB) as the organization responsible for setting standards of financial accounting and reporting. The principles for financial accounting established by the FASB are primarily concerned with the measurement of a firm's net income over a given period. Accordingly, the FASB focuses on losses expected to result from events during a given period and explicitly excludes the expected effect of future events.

In the case of commercial banks, loan loss provisions are a main tool used by management to manage earnings. Loan loss provisions are an expense item listed on the income statement reflecting management's current period assessment of the level of future loan losses. As managers increase loan loss provisions net income decreases, while a decrease in the recording of loan loss provisions increases net income. Loan loss provisions are intended to capture expected future losses that will occur if a borrower does not repay the bank in accordance with a loan contract. Commercial bank regulators view accumulated loan loss provisions, the loan loss allowance account on the balance sheet, as a type of capital that can be used to absorb losses during bad times. If a bank's loan loss allowance balance exceeds its expected loan losses, the bank can absorb more unexpected losses without failing and imposing losses on the Federal Deposit Insurance Corporation (FDIC). Conversely, if a bank's loan loss allowance is less than expected losses, the bank's equity capital will be reduced when and if the expected loan losses materialize. This implies that the bank's capital ratio can overstate its ability to absorb unexpected losses.

In contrast to the FASB, commercial bank regulators use a more conservative and future oriented view of the use of loan loss allowances that better serves their goal of maintaining the safety and soundness of banks. This perspective differs from that of the FASB in that it recommends maintaining a loan loss allowance balance greater than expected losses during a given period. Thus, regulators' conservative view would have banks holding larger loan loss reserves than might be optimal. While the recording of loan loss reserves might be viewed by the market as a safer investment and thus would increase firm value, this conservative view of regulators means that bank managers should overestimate loan loss provisions beyond the optimal point for expected losses during good times to build up the loan loss allowance and the bank's equity cushion against future loan losses. Inflating loan loss provisions by an amount that is greater than expected losses lowers net income and thus, bank performance. When manager's compensation is based on firm performance, managers would be reluctant to adhere to regulators' views. Consequently, banks would not build up their loan loss allowance during good times, which could put the safety and soundness of the bank, and at the extreme, the entire financial system, in jeopardy during bad times. Thus, monitoring and oversight of extreme levels of earnings management by regulators in the commercial banking industry is critical.[5]

In addition to loan loss provisions, prior research has found that banks manage their earnings through the realization of security gains and losses (see Beatty et al., 1995, 2002). Unlike loan loss provisions, security gains and losses are a relatively unregulated and unaudited discretionary management action. If mangers choose to sell an investment security to increase or decrease earnings, it is unlikely that auditors, regulators, or shareholders will subsequently take issue with the decision. Thus, realized security gains and losses represent a second way that management can smooth or manage earnings.

2.1. Opportunistic earnings management

The opportunistic earnings management literature largely originated with Healy (1985) who concludes that managers use accruals to strategically manipulate bonus income.[6] For example, managers can smooth earnings by deferring income through accruals when an earnings target for a bonus plan cannot be reached or when bonuses have already reached maximum levels, and can accelerate income in other periods.[7] However, when reported earnings are between the upper and lower bounds set by performance based contracts and performance based compensation is more sensitive to reported earnings, executives may persistently manage earnings upward rather than smoothing earnings intertemporally.

More recent work focuses on the use of earnings management to affect stock prices, and with it, managers' wealth.[8] Option and restricted stock compensation is a particularly direct route by which management can increase its wealth by inflating stock prices. Indeed, evidence that such compensation is associated with higher degrees of earnings management is prevalent. Gao and Shrieves (2002), Bergstresser and Philippon (2006), Cohen et al. (2004), and Cheng and Warfield (2005) all find that the use of discretionary accruals and earnings management is more common at firms where top management compensation is more closely

[5] Our sample includes relatively healthy banks during a relatively prosperous period. Thus, this is not likely the case in our study.

[6] Schipper (1989) identifies both internal and external incentives for earnings management. We focus our attention on internal incentives.

[7] Guidry et al. (1999) use data from businesses' unit level rather than firm level and find evidence consistent with Healey's bonus manipulation effects. Gaver et al. (1995), who study discretionary accruals rather than total accruals, also conclude that earnings are managed, but to smooth income rather than manipulate bonuses. Goel and Thakor (2003) outline theoretical circumstances upon which earnings management (in the form of earnings smoothing) creates value for shareholders. In their model, the higher the volatility of the underlying stock, the greater the incentive informed investors have to gather information and profit at the expense of liquidity traders. Thus, earnings smoothing by managers reduces volatility in an effort to protect uninformed investors. Finally, Holthausen et al. (1995) also conclude that managers may use accruals to shift earnings over time with the goal of maximizing long-term bonus income.

[8] For example, Teoh et al. (1998a,b) find that firms with more aggressive accrual policies prior to IPOs and SEOs tend to have poorer post-issue stock price performance than firms with less aggressive accounting policies. Their results suggest that earnings management inflates stock prices prior to the IPO or SEO. Similarly, DuCharme et al. (2004) find that managers artificially prop up earnings prior to stock offers in an effort to maximize the net benefit of a stock offering to existing shareholders at the expense of new shareholders. They find that, subsequent to stock offers, returns are negatively related to the abnormal accruals of the firms. Finally, Beneish and Vargus (2002) find that periods of abnormally high accruals, which inflate earnings, are associated with increases in insider sales of shares and that after the "event period" stock returns tend to be poor.

tied to the value of stock in general and options more particularly. Burns and Kedia (2003) show that firms whose CEOs have large option positions are more likely to file earnings restatements.

As earnings management applies to banking, previous studies have found that banks use loan loss provisions and securities gains and losses to manage earnings and capital levels. However, results on the direction of earnings management are mixed. Specifically, Beatty et al. (1995) find no relation between loan loss provisions and earnings while Collins et al. (1995) find a positive relation. Scholes et al. (1990) find that capital positions play a role in banks' willingness to realize gains on municipal bonds. Collins et al., Beaver and Engel (1996), and Ahmed et al. (1999) find that discretionary accruals are negatively related to capital, while Beatty et al. find that discretionary accruals are positively related to capital. Wahlen (1994) shows that managers increase discretionary loan loss provisions when they expect future cash flows to increase. Finally, Beatty et al. (2002) find that relative to private banks, public banks are more likely to use loan loss provisions and realized securities gains and losses to eliminate small earnings decreases. Thus, opportunistic earnings management by banks does indeed appear to be accomplished through the recording of loan loss provisions and the realization of securities gains and losses. Indeed, earnings management can be used to discreetly smooth earnings over time or to eventually and indiscreetly take a "big bath" (i.e., report one drastic earnings decline after hiding many smaller declines in previous years).[9] We formalize the earnings smoothing hypothesis:

H1. Ceteris paribus, lower levels of reported earnings (i.e., earnings before extraordinary items and taxes (EBEIAT)) lead to higher levels of earnings management (EM).

2.2. Corporate governance mechanisms

Corporate governance variables have been shown in other contexts to affect firm behavior. Such variables include pay-for-performance sensitivity, board independence, and capital versus debt financing. A bank's use of a governance mechanism is determined by the relative benefits and costs of each as they align the interests of managers with those of shareholders. Thus, it is likely that governance mechanisms are not independent, but are endogenously chosen to maximize firm performance. We discuss these next.

2.3. CEO's pay-for-performance sensitivity

The relation between pay-for-performance sensitivity in the manager's compensation contract and shareholder wealth has been well documented in the finance literature. For example, when CEO compensation is tied to the price of the firm's stock (either through compensation in the form of stock or stock options), firm value has been found to increase. Jensen and Murphy (1990a) find that CEO wealth increases by $3.25 per $1,000 increase in shareholder wealth. Jensen and Murphy (1990b) suggest that the level of pay alone is not important in resolving the agency issues between the CEO and the firm's shareholders. Rather, what is crucial is the strength of the pay-for-performance relationship. That is, in order to induce CEOs to maximize shareholder wealth, boards should construct compensation contracts that are performance or stock price oriented.[10]

When a large portion of a CEO's total compensation is composed of incentive-based stock options, as mentioned above, executives can seek to engage in earnings management. As a result, ceteris paribus, higher CEO stock based incentive pay likely encourages the use of earnings management to improve the apparent performance of the firm and ultimately the CEO's personal wealth, which leads to the hypothesis:

H2. Ceteris paribus, higher levels of CEO pay-for-performance sensitivity (PPS) lead to higher levels of earnings management (EM).

2.3.1. Board independence

2.3.1.1. Percent of independent outside directors on the board. There is considerable literature regarding the effect of the composition of the board of directors (i.e., inside versus outside directors) on firm performance. Boards dominated by outsiders are arguably in a better position to monitor and control managers (Dunn (1987)). Outside directors are independent of the firm's manager, and in addition bring a greater breadth of experience to the firm (see Firstenberg and Malkiel, 1980; Vance, 1983). A number of studies have linked the proportion of outside directors to financial performance and shareholder wealth (see Brickley et al., 1994; Byrd and Hickman, 1992; Subrahmanyan et al., 1997; Rosenstien and Wyatt, 1990). These studies consistently find better stock returns and operating performance when outside directors hold a significant percentage of board seats. Consequently, if outside directors on the board enhance monitoring they should also be associated with lower use of earnings management to inflate earnings.

2.3.1.2. Board size. Jensen (1993) argues that small boards are more effective in monitoring a CEO's actions, as large boards have a greater emphasis on "politeness and courtesy" and are therefore easier for the CEO to control. Yermack (1996) also concludes that small boards are more effective monitors than large boards. These studies suggest that the size of a firm's board should be

[9] See Demski (1998) and Arya et al. (1998).

[10] As it pertains to banking, Minnick et al. (2008) have found that banks whose CEOs have higher pay-for-performance sensitivity are less likely to engage in value reducing acquisitions. Further, following acquisitions, banks with high PPS experience greater improvement in their operating performance as measured by ROA.

Table 1
Call report availability for the largest 100 bank holding companies between 1994 and 2002.

Year	BHCs
1994	95
1995	88
1996	79
1997	73
1998	59
1999	55
2000	52
2001	47
2002	46

This table presents post-1993 year-end availability of call report data for a sample of large bank holding companies (BHCs). The original sample is the 100 largest BHCs based on 1993 year-end book value of total assets. Data are retrieved from the Chicago Federal Reserve's Web-site.

positively related to earnings management. If small boards lead to more effective monitoring in a firm they should also be associated with less earnings management.

It should be noted that boards of directors at commercial banks are generally larger than those of other firms. Baysinger and Zardkoohi (1986) suggest that boards of regulated firms such as banks have more symbolic directors than boards of less regulated firms. They interpret these findings as evidence that boards are a more important governance structure in less regulated firms than in regulated firms. Many of these directors perform functions related to product market differences, liability concerns, or even regulatory concerns that might lead to differences in board composition from industrial firms. For example, Agrawal and Knoeber (2001) find that outside directors play a political role by providing advice and insight into the workings of government or by acting to influence the government directly. Such skills can come from prior participation in government and thus knowledge of procedures as well as friendships with important decision-makers, or experience dealing with government as an adversary in administrative or legal proceedings. Thus, rather than service intended to reduce agency conflicts, these outside directors are selected based on their political usefulness and may have less of an impact on earnings management. Considering both board composition and board size we hypothesize:

H3. Ceteris paribus, greater board oversight as measured by board independence (BI) (defined below) leads to lower levels of earnings management (EM).

2.3.2. Capital ratio

Jensen (1986) argues that, for a firm with excessive free cash flow, leverage reduces the firm's overinvestment in negative net present value projects. That is, high levels of leverage increase the likelihood of bankruptcy and can force the firm to incur direct and/or indirect bankruptcy costs and/or make managers underinvest in positive net present value projects because of asymmetric information problems (see Bradley et al., 1984; Myers and Majluf, 1984). Further, external agents, such as leverage buyout firms, can use high levels of debt to acquire the equity of a firm and change sub-optimal managerial behavior. Thus, leverage is both an internal and external governance mechanism. By using less capital (i.e., more leverage) shareholders can limit a manager's ability to invest in negative net present value projects and instead force the manager to distribute the firm's free cash flow to shareholders. However, bank equity capital is heavily regulated. Indeed, when capital levels are low relative to regulatory standards required to be considered well-capitalized, managers have incentives to avoid writing off bad loans and to realize more securities gains in order to prop up capital levels. Further, executives can smooth earnings downward intertemporally only when banks are considered well-capitalized. This leads us to hypothesize:

H4. Ceteris paribus, lower levels of capital (CAP) lead to higher levels of earnings management (EM).

3. Data and methodology

3.1. Data

The sample examined in this study includes the largest bank holding companies (BHCs) head-quartered in the United States and operating during the 1994 through 2002 period. We begin with the 100 largest BHCs as ranked by 1993 year-end book value of total assets. Asset sizes of the largest BHCs as well as all accounting and merger data used throughout the study are obtained from Bank Holding Company Performance Report (FRY-9) and merger databases found on the Chicago Federal Reserve's Web-site.[11] Table 1 lists the number of BHCs with Call Report data available by year. Due to mergers only 46 of the top 100 BHCs operating in 1994 exist as independent entities in 2002.[12] We begin our analysis with a total of 593 bank years.

[11] FRY-9 data are accessed via Wharton Research Data Services (WRDS).
[12] Of the 54 sample BHCs that were acquired, 47 were acquired by BHCs in the sample, five were acquired by foreign firms not in the sample, and two were acquired by U.S. BHCs not in the sample. All banks were free from financial distress at the time of merger. Further, there were no failures among any of the sample banks.

Table 2
Definitions of variables used in the paper.

Earning and earnings management variables
EBEIAT = earnings before extraordinary items and after taxes to total assets
DLLP = discretionary loan loss provisions as a percent of total assets
DRSGL = discretionary realized security gains and losses as a percentage of total assets
EM = earnings management as a percent of total assets = DRSGL − DLLP

Corporate governance variables
PPS = the one year lag of the pay-performance sensitivity of the CEO = value of annual option grants / (value of annual option grants + annual salary + annual bonus + annual other income)
BI = board independence = (1 / board size) * [unaffiliated directors / (inside directors + affiliated directors)]
INDI = the percentage of directors who are insiders
AFDI = the percentage of directors who are affiliated with the BHC
UNDI = the percentage of directors who are unaffiliated with the BHC
BDSIZ = the number of directors
CAP = the Tier 1 capital ratio

Bank holding company control variables
DOWN = the percentage of total shares outstanding owned by directors other than the CEO
MEET = the number of board meetings per year
DUAL = a dummy variable equal to one if the CEO is also the chairman of the board and zero otherwise
MKBK = the year-end market value of equity divided by the year-end book value of equity
CAR= the one-year cumulative abnormal common stock returns based on market model estimates
SIZ = the year-end book value of assets (in billions of dollars)

Instrumental variables
HHI = the Herfindahl–Hirschman Index (HHI) (added as the instrumental variable for EBEIAT)
AUDSIZE = the size of the audit committee (added as an instrumental variable for EM)
AUDMEET = the number of the audit committee meetings per year (added as an instrumental variable for EM)
ANALYST = the number of I/B/E/S analyst estimates for the company (added as an instrumental variable for EM)
ΔLOANPORT = the change in the composition of the loan portfolio = (ΔC&I Loans + ΔConsumer Loans − ΔReal Estate Loans) / Total Loans (added as an instrumental variable for CAP)
CEOAGE = the age of the CEO (added as an instrument for PPS)
CEOTEN = the number of years since CEO assumed the position of CEO (added as an instrument for PPS)
CEONOM = a dummy variable equal to one if CEO is on the nominating committee, or zero if not (added as an instrument for BI)

This table provides variable definitions used in the regression analysis. Data are obtained from Bank Holding Company Performance Reports (FRY-9), the Chicago Fed's merger databases, the Center for Research in Securities Prices (CRSP), ExecuComp, and proxy statements.

While it is true that we examine earnings management at only the very largest banks in the U.S. these banks hold the vast majority of industry assets. For example, at the beginning of the sample period, the banks evaluated in our paper hold 79.33% of all bank assets in the U.S. By the end of the sample period, with the reduced sample size, the banks evaluated in our paper hold 65.65% of all U.S. bank assets. Thus, earnings management at sample banks represents the operations of the vast majority of the U.S. banking industry based on dollar value of industry assets. Consequently, these banks command great interest among investors and regulators. Moreover, this sample is interesting precisely because these banks are relatively stable. Prior studies have shown that earnings management is more prevalent in poorly-performing firms (see Cohen et al., 2004; Kothari et al., 2005) and that models of discretionary accruals are least reliable when applied to firms with extreme financial performance (Dechow et al., 1995). Further, since these banks are in good health, they are subject to less monitoring by regulators. Thus, the sample banks can use loan loss provisions to manage earnings with little concern that regulators will limit these activities. Indeed, for these healthy banks the board is the more active monitor of earnings management activities. We look at earnings management in "normal" times and on the degree to which measured performance of the largest banks is affected by that management. The fact that these firms are all free of financial distress allows us to evaluate the use of loan loss provisions and securities gains and losses as a way of managing normal earnings flows rather than their use as a last ditch effort to save the bank from failure. Further, this is a conservative sample-selection choice in that the 100 largest banks should be a relatively difficult sample in which to find heavy use of earnings management.

3.1.1. Earnings management

To analyze earnings management at the sample banks we first define earnings as earnings before extraordinary items and after taxes to total year-end assets (EBEIAT). To manage earnings then is to manage EBEIAT.[13] Table 2 lists and defines all of the variables

[13] EBEIAT offers several advantages over Tobin's *q*, an alternative measure of firm performance. Whereas Tobin's *q* reflects growth opportunities (and, more generally, expectations of the firm's prospects in future years) through the impact of these factors on market value, EBEIAT is a more focused measure of current performance. For example, the Tobin's *q* of a poorly performing firm might be inflated by expectations of a premium bid in a corporate takeover. Regressions of Tobin's *q* on institutional ownership are more susceptible to endogeneity problems if institutions are attracted to growth stocks or chase recent stock-market winners. These sorts of considerations do not affect EBEIAT as a measure of financial performance since operating performance is not tied to stock prices.

Table 3
Summary statistics for large bank holding companies between 1994 and 2002.

	Mean	Median	Std Dev	Minimum	Maximum	Total
Panel A: descriptive statistics on earnings and earnings management variables						
EBEIAT (%)	1.246	1.212	0.400	−0.384	3.684	536
DLLP (%)	0.005	0.000	0.151	−0.461	0.733	536
DRSGL (%)	−0.001	−0.007	0.054	−0.206	0.202	536
EM (%)	−0.005	−0.002	0.161	−0.761	0.453	536
Panel B: descriptive statistics on corporate governance variables						
PPS	0.41	0.39	0.24	0.00	0.80	416
BI	0.18	0.14	0.13	0.00	0.93	514
INDI (%)	16.49	15.38	8.97	4.17	85.71	514
AFDI (%)	15.87	14.29	11.74	0.00	53.33	514
UNDI (%)	67.64	68.75	18.99	0.00	93.33	514
BDSIZ	16.38	16	5.47	6	31	514
CAP (%)	7.78	7.58	1.42	3.47	17.30	536
Panel C: descriptive statistics for control variables						
DOWN (%)	4.00	1.84	7.05	0.02	60.82	514
MEET	8.33	8	3.39	4	18	514
MKBK (X)	2.46	2.18	1.41	0.87	8.54	425
CAR (%)	0.21	1.22	28.77	−66.95	114.88	588
SIZ (billions $)	62.11	20.55	125.24	3.50	1,097.19	593
DUAL (CEO = Chair)	92 no	422 yes				
Panel D: descriptive statistics for instrumental variables						
HHI	975.72	851.90	587.62	123.22	4759.91	536
AUDSIZE	5.19	5	1.66	0	13	518
AUDMEET	5.00	5	1.98	0	12	500
ANALYST	16.21	16	9.12	0	41	536
ΔLOANPORT (%)	−0.95	−0.94	7.57	−35.32	31.00	536
CEOAGE (yrs)	56.26	56	12.83	32	76	514
CEOTEN (yrs)	6.55	5	5.57	0	26	438
CEONOM	246 no	268 yes				

Data are obtained from Bank Holding Company Performance Reports (FRY-9) databases, the Chicago Fed's merger databases, the Center for Research in Securities Prices (CRSP), ExecuComp, and proxy statements. The sample begins with the 100 largest BHCs measured by 1993 year-end total assets. Because of mergers, only 46 BHCs remain in 2002.

used in the paper. Table 3 reports descriptive statistics on the variables. Panel A of Table 3 reports descriptive statistics for EBEIAT. The average level of EBEIAT for the sample banks is 1.246%, the minimum is −0.384%, and the maximum is 3.684%. In banks, the level of EBEIAT is driven predominately by the performance of the loan portfolio. The amount of loans over 90 days past due and still accruing interest and the amount of loans no longer accruing interest are observable measures of the current loans in jeopardy of default. Recording loan loss provisions to reflect the level of these "bad" loans reflects management of the normal, or nondiscretionary, loan loss provisions of the bank. Thus, with banks there is an opportunity to manage earnings through discretionary actions in the recording of loan loss provisions.

The case of banking is special in that each bank manager's basis for judgment with respect to accruals is subject to periodic review by regulators.[14] As such, loan loss provisions are the combination of both a nondiscretionary component, that part of loan loss provisions that brings loan loss allowances to an acceptable level, and a discretionary portion which is seemingly closely regulated. Gunther and Moore (2003) find that while there are many instances of regulator mandated revisions in loan loss provisions, only six in their study involve banks with over $500 million in total assets and only four involve banks that are publicly traded. As stated above, the banks in our sample are healthy and are therefore subject to less regulatory scrutiny. Thus, the loan loss provisions at the very largest BHCs, those analyzed in this study, appear on the surface to be tacitly allowed and indeed certified by regulators as subsequent revisions are not mandated.

In addition to loan loss provisions, prior research has found that banks manage earnings through the realization of security gains and losses (see Beatty et al., 1995, 2002). Realized security gains and losses are a relatively unregulated and unaudited discretionary management action. If mangers choose to sell an investment security to increase or decrease earnings it is unlikely that auditors, regulators, or shareholders will subsequently take issue with the decision. Thus, realized security gains and losses represent a second way that management can smooth or manage earnings.

The challenge is to quantify a measure of discretionary loan loss provisions (DLLP) and discretionary realized securities gains and losses (DRSGL), or more specifically, a measure of earnings management (EM). We follow the Beatty et al. (2002) model to

[14] Managerial judgment must be based on a "reviewable record" as noted in the Chicago Federal Reserve's Call Report dictionary in its description of Item 4230: Provision for Loan and Lease Losses. The objective of the item is said to "… bring the balance in 'Allowance for Loan and Lease Losses (3123)' to an adequate level…"

estimate discretionary loan loss provisions and run fixed-effects OLS regressions fixing each time-region combination for a total of 72 (nine years × eight regions) α_{tr} terms. Also, as in Beatty et al. (2002), we use Cook's (1977) distance criterion to remove influential observations from the sample. Specifically, we use the following regression model:

$$\begin{aligned} \text{LOSS}_{it} = {} & \alpha_{tr} + \beta_1 \text{LASSET}_{it} + \beta_2 \text{NPL}_{it} + \beta_3 \text{LLR}_{it} + \beta_4 \text{LOANR}_{it} + \beta_5 \text{LOANC}_{it} + \beta_6 \text{LOAND}_{it} + \beta_7 \text{LOANA}_{it} \\ & + \beta_8 \text{LOANI}_{it} + \beta_9 \text{LOANF}_{it} + \varepsilon_{it}, \end{aligned} \tag{1}$$

where:

i = bank holding company identifier;
t = year (1994 to 2002);
r = U.S. Department of Commerce defined region index;
LOSS = loan loss provisions as a percentage of total loans;
LASSET = the natural log of total assets;
NPL = nonperforming loans (includes loans past due 90 days or more and still accruing interest and loans in nonaccrual status) as a percentage of total loans;
LLR = loan loss allowance as a percentage of total loans;
LOANR = real estate loans as a percentage of total loans;
LOANC = commercial and industrial loans as a percentage of total loans;
LOAND = loans to depository institutions as a percentage of total loans;
LOANA = agriculture loans as a percentage of total loans;
LOANI = consumer loans as a percentage of total loans;
LOANF = loans to foreign governments as a percentage of total loans;
ε = error term.

The discretionary component of loan loss provisions is the error term from this regression.[15] However, because our measure of earnings management (defined below) is standardized by total assets we transform the error term and define our measure of discretionary loan loss provisions (DLLP_{it}) as:

$$\text{DLLP}_{it} = (\varepsilon_{it} \times \text{LOANS}_{it}) / \text{ASSETS}_{it}, \tag{2}$$

where:

LOANS = total loans;
ASSETS = total assets.

To find discretionary realized security gains and losses, we again follow Beatty et al. (2002). We run fixed-effects OLS regressions by fixing each year for a total of nine α_t terms. Again we use Cook's (1977) distance criterion to remove influential observations from the sample. Specifically, our measure of realized security gains and losses (RSGL_{it}) is:

$$\text{RSGL}_{it} = \alpha_t + \beta_1 \text{LASSET}_{it} + \beta_2 \text{URSGL}_{it} + \varepsilon_{it}, \tag{3}$$

where:

i = bank holding company identifier;
t = year (1994 to 2002);
RSGL = realized security gains and losses as a percentage of total assets (includes realized gains and losses from available-for-sale securities and held-to-maturity securities);
LASSET = the natural log of total assets;
URSGL = unrealized security gains and losses (includes only unrealized gains and losses from available-for-sale securities) as a percentage of total assets;
ε = error term.

The discretionary component of realized security gains and losses (DRSGL_{it}) is the error term from the model. Panel A of the Appendix A summarizes the variables used to find discretionary and nondiscretionary accruals, Panel B reports descriptive statistics for all variables in Eqs. (1)–(3), and Panel C presents the results of the regressions in Eqs. (1) and (3).

Finally, we define earnings management such that higher levels of earnings management increase earnings and vice versa. Note that higher levels of loan loss provisions decrease earnings while higher levels of realized securities gains and losses increase earnings. Accordingly, we define earnings management as:

$$\text{EM}_{it} = \text{DRSGL}_{it} - \text{DLLP}_{it}. \tag{4}$$

[15] It should be noted that the model residuals contain all misspecifications and all models are at best approximations.

High levels of EM amount to underreporting loan loss provisions and higher levels of realized securities gains, which, ceteris paribus, increase income. Low levels of EM, which are often negative, suggest that loan loss provisions are over-reported and fewer security gains are realized, which decreases operating income.[16]

Panel A of Table 3 reports descriptive statistics for the variables in Eq. (4). The average level of earnings management, EM, for the sample banks is −0.005% (−0.001% of which is from discretionary realized security gains and losses from which 0.005 from discretionary loan loss provisions is subtracted). The minimum EM is −0.761% and the maximum is 0.453%. Note that while the average level of EM during the nine-year sample period is close to zero, the range in this measure shows that large banks indeed manage earnings.[17]

3.1.2. Corporate governance data

Having defined earnings and earnings management, we next look at control variables that could explain variations in the measures. Panel B of Table 3 presents summary statistics on corporate governance variables used in the paper. The focus of this study is not only to identify earnings management in banks, but to identify governance mechanisms that effectively align executive decisions with shareholder interests such that earnings are managed to maximize the value of the bank and thus shareholder wealth. As the board of directors represents the shareholders, we examine board characteristics to identify important corporate governance mechanisms. Board of director data are obtained from BHC proxy statements available in the LEXIS/NEXIS database. We use proxy statements for each year to obtain board size and board composition (i.e., the number of insiders, affiliated outsiders, and unaffiliated outsiders on the board). CEO stock and options ownership data come from ExecuComp.

3.1.2.1. CEO pay-for-performance sensitivity. First, we require a measure of the sensitivity of CEO wealth to firm performance. A natural measure of the sensitivity of CEO wealth to firm performance would compare the value of option holdings to other compensation. Indeed, option holdings have been used as a proxy for incentives to manage earnings in several studies (see for example, Bergstresser and Philippon, 2006; Cheng and Warfield, 2005; Cohen et al., 2004). Because option holdings are skewed, however, the ratio of option holdings to other compensation could contain extreme outliers. As in Mehran (1995), we re-scale this variable by computing the ratio of option holdings to the sum of these holdings plus other compensation. This ratio is similar to Bergstresser and Philippon's (2006) measure of incentive to manage accruals and is constrained to lie between 0 and 1. The PPS for our sample averages 0.41, ranging from 0.00 to 0.80.[18]

We lag our measure of pay-for-performance sensitivity by one year. The lag on the CEO pay-for-performance sensitivity variable eliminates a simpler form of reverse causality. Because compensation is tied to firm performance and the value of options is linked to the stock price, management compensation is a direct function of contemporaneous operating performance. Using lagged pay-for-performance sensitivity enables us to measure the impact of incentive structures on performance measures uncontaminated by the impact of current performance on compensation.

3.1.2.2. Board of director independence. CEO pay-for-performance sensitivity is not the only variable with the potential to influence earnings at banks. While the CEO pay sensitivity may be important, so to is the composition of the board. Members of the boards of directors are divided into three categories: inside directors, affiliated directors, and unaffiliated directors. Inside directors (INDI) are defined as the number of directors who are BHC or bank executives and any director who was an executive officer of the bank and who is currently serving as chairman of the board of directors divided by the total number of board members. Panel B of Table 3 reports that the average percentage of inside directors is 16.49, the minimum is 4.17%, and the maximum is 85.71%. Affiliated directors (AFDI) are those directors who have relationships with the bank listed in the proxy statement beyond loans made in the normal course of business divided by board size.[19] The average percentage of affiliated board members is 15.87, the minimum is 0.00, and the maximum is 53.33. Unaffiliated directors (UNDI) are those directors who have no discernable association with the bank other than the directorship.[20] The average percentage of unaffiliated board members is 67.64, the minimum is 0.00, and the maximum is 93.33. While inside and affiliated board members are expected to be more easily influenced by the CEO than outside board members, the average board is clearly dominated by outsiders. If, as previous research has shown, outside directors on the board enhance monitoring, they would also be associated with less earnings management.

[16] Clinch and Magliolo (1993) suggest that it may not be appropriate to combing discretionary loan losses and discretionary securities gains and losses into a single earnings management variable. Accordingly, we also perform our tests using discretionary loan loss provisions and, separately, discretionary securities gains and losses as our measure of earnings management. Our conclusions are robust to these alternate specifications of disaggregated earnings management with a few minor exceptions; i) EBEIAT, as an independent variable, does not significantly affect discretionary securities gains and losses, ii) size, as an independent variable, does not significantly affect discretionary securities gains and losses, and iii) discretionary securities gains and losses, as an independent variable, do not significantly affect CEO pay-for-performance or board independence. Results are available from the authors upon request.

[17] Strategic time-shifting of income results in high earnings management in some periods and low earnings management in others. However, using a time period common to our study, Bergstresser and Philippon (2006) document a strong secular increase in accruals, suggesting a one-sided incentive to raise reported earnings, consistent with a systematic and increasing bias toward inflation of earnings rather than simple transfers of earnings across time. We examine both signed and absolute earnings management and find no difference in our conclusions. Results are available from the authors on request.

[18] We also ran our analysis using a PPS measure that did not include the CEO's regular compensation. The results and conclusions of the paper with this alternate specification did not change.

[19] Examples of relationships include lawyers who perform legal services for the bank, property owners who lease property to the bank, directors with family relationships to insiders, and instances where the bank CEO sits on the board of directors of a company run by a bank director.

[20] Independent outside directors are directors listed in proxy statements as managers in an unaffiliated non-financial firm, managers of an unaffiliated bank or insurance company, retired managers of another company, lawyers unaffiliated with the firm, and academics unaffiliated with the firm.

Board size (BDSIZ) is the number of directors on the board. For the sample banks, the mean board size is 16.38, the minimum is 6, and the maximum is 31. All else equal, larger boards are expected to be more easily dominated by CEOs and smaller boards are expected to have a constraining effect on executive behavior. We follow Brick et al. (2006) and combine board composition and board size into a composite measure of board independence (BI). That is, our specification of BI is the inverse of board size times the ratio of the number of unaffiliated directors to the number of affiliated and inside directors. Smaller boards and/or boards with more unaffiliated directors increase BI. Thus, a higher level of BI is associated with boards of directors that are less dominated by the CEO. The mean level of board independence is 0.18, the minimum is 0.00, and the maximum is 0.93.

3.1.2.3. Capital adequacy. Finally, the capital position of the bank can also play an important role in earnings and earnings management. By using less capital (i.e., more leverage) shareholders can limit a manager's ability to invest in negative net present value projects and instead force the manager to distribute the firm's free cash flow to shareholders. Further, a poorly capitalized bank is subject to increased oversight by federal regulators, which suggests that the opportunity of earnings management is minimized. In contrast, a better capitalized bank experiences less scrutiny by regulators and can more easily manage earnings. The Tier 1 capital ratio (CAP), common stockholders equity plus qualifying perpetual preferred stock divided by risk-weighted assets,[21] is used to measure the capital position of the sample banks. The average CAP of the sample banks is 7.78%, well over the 5% required by regulators to be well-capitalized. Thus, the banks in our sample are generally considered well-capitalized which implies less regulatory scrutiny and a relatively greater chance of discretionary earnings management by managers.

3.1.3. Control variables

Finally, we look at several bank specific variables that may explain variations in earnings management. These include ownership of the board of directors, the number of times per year the board meets, CEO/chair duality, the bank's market-to-book ratio, the lagged market-adjusted return of the firm, and the bank's size. Panel C of Table 3 presents summary statistics on these control variables.

3.1.3.1. Board of director stock ownership. Several studies argue that stock ownership by board members gives them an incentive to monitor managers carefully and thus helps resolve agency conflicts between directors and shareholders (see Brickley et al., 1988; Brown and Maloney, 1999). However, as with the CEO, when board members own stock they could be more likely to approve or allow the use of earnings management to improve the apparent performance of the firm and, consequently, board members' personal wealth. Indeed, as suggested by Demski (1998) and Arya et al. (1998), increased stock ownership by board members can be a mechanism through which owners tacitly encourage discretion in reported earnings. As reported in Table 3, the boards of directors in the sample banks, excluding any ownership by the CEO, own (DOWN) an average of 4.00% of the bank's stock, the minimum value is 0.02%, and the maximum is 60.82%.

3.1.3.2. CEO/chair duality. In about 80% of U.S. companies the CEO is also the chairman of the board (Brickley et al. (1997)). CEO/chair duality concentrates power in the CEO's position, potentially allowing for more management discretion. The dual office structure also permits the CEO to effectively control information available to other board members and thus impedes effective monitoring (Jensen, 1993). Consequently, if CEO/chair duality impedes effective monitoring, it could be associated with higher levels of earnings management. We define CEO/chair duality (DUAL) as a dummy variable equal to one if the CEO is also the board chair and zero otherwise. Of the 514 firm years for which this information is available 422 CEOs are also the board chair while 92 CEOs are not. By almost a five to one margin CEOs are given dual titles at the largest banks in the U.S. during the 1994 through 2002 period.

3.1.3.3. Number of board meetings per year. Vafeas (1999) finds that a greater level of involvement and oversight by the board of directors is characteristic of firms that are value maximizers for their owners. Specifically, he finds that a greater number of board meetings per year are associated with increased firm performance. Pertinent to this study, previous findings suggest that if frequent board meetings lead to more effective monitoring in a firm they would also be associated with less earnings management. The average number of board meetings for the banks in our sample is 8.33 per year.

3.1.3.4. Market-to-book ratio of equity. Managers of growth firms often receive stock and stock options as part of their compensation packages. That is, shareholders generally desire to share the risks of growth with top executives. The market-to-book ratio of equity (MKBK) is a common proxy of growth prospects used in the corporate finance literature and is used as such in this paper. MKBK is defined as the total year-end market value of equity of the bank (from ExecuComp) divided by the total year-end book value of equity (from Bank Company Performance Reports). The average MKBK ratio for sample banks, reported in Panel C of Table 3, is 2.46 times. On average sample banks trade for approximately two-and-a-half times their book value of equity.

[21] Risk-weighted assets are the bank's on- and off-balance-sheet assets whose values are adjusted for approximate credit risk.

3.1.3.5. Lagged market-adjusted return. We calculate and include as a right-hand side variable in the regressions the lagged market-adjusted return of the firm (i.e., the one-year cumulative abnormal common stock returns (CARs)). Increased expectations for improvements in future operating performance will result in a positive market-adjusted return. Thus, this variable helps control for already anticipated changes in performance. Data from the Center for Research in Securities Prices (CRSP) is collected to estimate CARs. The standard market model is used, with the CRSP equally-weighted index used as the market, to estimate the alpha and beta coefficients for each bank for each year using the three years prior monthly stock returns. Abnormal monthly stock returns are calculated using the estimates of alpha and beta. Finally, CARs are calculated from the abnormal monthly returns. The average CAR for sample banks is 0.21%.

3.1.3.6. Asset size. The asset size of the bank may play a role in the level of discretionary behavior of management. Larger banks are the most likely to be monitored by industry analysts. Similarly, while regulators are charged with maintaining the safety and soundness of the entire banking industry, they have at least some tendency to more closely scrutinize the largest institutions (i.e., those banks that have the potential to severely impact the industry and the overall economy should problems arise). With analysts and regulators evaluating their performance, large banks could be less likely to artificially inflate income using earnings management. The average year-end book value of total assets for the sample banks is $62.11 billion, ranging from $3.50 to $1097.19 billion.

3.2. Methodology

The variables analyzed are subject to potential simultaneity bias. For example, simultaneity can be a problem with CEO pay-for-performance sensitivity, performance, and earnings management. While CEO pay-for-performance can cause the manager to engage in more earnings management, which in turn affects bank performance, bank performance can affect the degree to which the CEO's pay-for-performance sensitivity is structured. Simultaneity can also be a problem in that in addition to influencing earnings management and thus firm performance, independent board members may chose to sit on the board of firms with less earnings management, which could by itself induce a correlation between this corporate governance variable and earnings management. Likewise, if independent board members are attracted to firms with superior performance, then a positive association between board independence and bank performance can be observed even if board independence is not directly beneficial to performance. Indeed, Bhagat and Jefferis (2002) suggest that researchers should account for the endogenous relationship between corporate governance, ownership, and performance as causality is bidirectional among the variables and complex interrelationships exist. Accordingly, our final hypothesis is:

H5. Earnings (EBEIAT), earnings management (EM), CEO pay-for-performance sensitivity (PPS), board independence (BI), and the Tier 1 capital ratio (CAP) are simultaneously determined.

Taking potential simultaneity into account, similar to Brick et al. (2006), we estimate two broad sets of regressions. First, we test for endogeneity in the performance, earnings management, capital level, pay-for-performance sensitivity, and board independence proxies. That is, we perform an OLS analysis in which each of these variables is used as the dependent variable and the other variables are independent variables along with other independent variables. We winsorize all variables at the top and bottom 1% of observations.[22]

We next perform a Durbin–Wu–Hausman test for endogeneity.[23] That is, the potential endogenous performance, earnings management, capital level, pay-for-performance sensitivity, and board independence variables are regressed separately on all exogenous variables in the system. The residual values obtained from each equation are then included as additional regressors in the original OLS regressions. If the test of endogeneity finds that performance, earnings management, capital level, pay-for-performance sensitivity, and board independence mechanisms are endogenous, OLS estimation, in which the endogenous regressors are correlated with the regression errors, is inappropriate as a test methodology. Accordingly, we would need to specify a simultaneous system of equations.

To address the simultaneity issue the second set of regressions is two-stage least square estimator (2SLS) regressions. For every endogenous variable we determine at least one variable (i.e., instrument) which is correlated with the endogenous variable but is exogenous to the structural equation. The system is properly identified as the number of exogenous variables excluded in each equation is no less than the number of endogenous variables included in each equation. The system of equations is as follows:

$$\mathrm{EBEIAT}_i = f(\mathrm{EM}_i, \mathrm{CAP}_i, \mathrm{PPS}_i, \mathrm{BI}_i, C, I_{\mathrm{EBEIAT}}, \mathrm{FIRM}_i); \tag{5}$$

$$\mathrm{EM}_i = f(\mathrm{EBEIAT}_i, \mathrm{CAP}_i, \mathrm{PPS}_i, \mathrm{BI}_i, C, I_{\mathrm{EM}}, \mathrm{FIRM}_i); \tag{6}$$

$$\mathrm{PPS}_i = f(\mathrm{EBEIAT}_i, \mathrm{EM}_i, \mathrm{CAP}_i, \mathrm{BI}_i, C, I_{\mathrm{PPS}}, \mathrm{FIRM}_i) \tag{7}$$

$$\mathrm{BI}_i = f(\mathrm{EBEIAT}_i, \mathrm{EM}_i, \mathrm{CAP}_i, \mathrm{PPS}_i, C, I_{\mathrm{BI}}, \mathrm{FIRM}_i); \tag{8}$$

$$\mathrm{CAP}_i = f(\mathrm{EBEIAT}_i, \mathrm{EM}_i, \mathrm{PPS}_i, \mathrm{BI}_i, C, I_{\mathrm{CAP}}, \mathrm{FIRM}_i); \tag{9}$$

[22] We also tried eliminating rather than winsorizing extreme data points and find that our results are robust to these variations.
[23] See Davidson and MacKinnon (2004, p.338).

where Eq. (5) is the endogenously determined firm performance equation, Eq. (6) is the endogenously determined earnings management equation, Eq. (7) is the endogenously determined pay-for-performance sensitivity equation, Eq. (8) is the endogenously determined board independence equation, and Eq. (9) is the endogenously determined capital level equation.

The control variables (C) used in the regressions represent firm characteristics and are described in Section 3.1.3. They include the fraction of shares owned by all directors (DOWN), CEO/chair duality (DUAL), the number of board meetings per year (MEET), the market-to-book ratio (MKBK), the one-year lagged market-adjusted returns (CAR), and the natural log of total assets (ln(SIZ)). I_{EBEIAT}, I_{EM}, I_{CAP}, I_{PPS}, and I_{BI}, defined below in Section 3.2.1., are the instrumental variables that affect only each equation and not the other equations.

We estimate pooled time-series cross-sectional regressions allowing for firm fixed-effects.[24] This methodology effectively allows each firm to have its own intercept in each regression and thus captures omitted variables that might affect each firm's aggressiveness towards managing earnings. This methodology gives a cleaner and more precise estimate of the impact of the explanatory variables. Accordingly, FIRM is a unique identifier for each bank holding company that allows each firm to have its own intercept in the regression.

3.2.1. Instrumental variables

3.2.1.1. Performance (I_{EBEIAT}). The Herfindahl–Hirschman Index (HHI) is used as an instrument for firm performance. The HHI is a widely used measure of banking market concentration and is measured as the sum of squared deposit shares of all banks in the state. Thus, the greater the value of HHI, the less competition in the state and the more profitable would be the bank. As reported in Panel D of Table 3, the mean value for HHI is 975.72, ranging from 123.22 to 4,759.91.

3.2.1.2. Earnings management (I_{EM}). Demski (2003) demonstrates that auditors and analysts play at least some roll in governing corporations. Accordingly, we use the size of the audit committee (AUDSIZE), the number of times per year the audit committee meets (AUDMEET), and the number of I/B/E/S analysts that follow the bank (ANALYST) as instruments for earnings management. The larger the audit committee and the more frequently the committee meets the greater the monitoring of the CEO.[25] Similarly, the greater the number of I/B/E/S analysts that follow the bank the more closely is the CEO monitored. Consequently, as these groups enhance monitoring they will be associated with lower earnings management. For our sample banks, the audit committee contains an average of 5.19 (ranging between 0 and 13) members who meet an average of 5 (ranging from 0 to 12) times per year.[26] An average of 16.21 (ranging from 0 to 41) analysts follow the bank.[27]

3.2.1.3. Pay-for-performance (I_{PPS}). Following Palia (2001) and Brick et al. (2006) we use CEO age and CEO tenure as instruments for the pay-for-performance sensitivity of the CEO. Managerial ability is unknown to shareholders when a CEO is in their early years, but shareholders learn more about this ability and do not need high pay-for performance sensitivity as the CEO gets older. Additionally, as the CEO gets older and/or has a longer tenure, deviation from expected performance is more likely from random events and less likely from unknown managerial ability. Indeed, Murphy (1986) and Barro and Barro (1990) find CEO pay-for-performance sensitivity and CEO tenure to be negatively related. We use proxy statements for each year to obtain CEO age and CEO tenure. As reported in Panel D of Table 3, the mean value for CEO age is 56.26, ranging from 32 to 76 years. The mean value of CEO tenure is 6.55 year, ranging 0 to 26 years.

3.2.1.4. Board independence (I_{BI}). Following Brick et al. (2006), we use a dummy variable (CEONOM) equal to one if the CEO is a member of the nominating committee or if there is no nominating committee and zero otherwise as an instrument for board independence. We posit that when the CEO is on the nominating committee, which selects nominees for board positions, the board of directors is less independent. Thus, this instrument will be correlated with board of director independence, but is not subject to reverse feedback from short-term variations in either earnings management or expected operating performance. As reported in Panel D of Table 3, the CEO is on the nominating committee for 268 of the 514 firm years and is not on the nominating committee for the remaining 246 firm years.

3.2.1.5. Capital adequacy (I_{CAP}). Changes in the composition of the bank's loan portfolio are used as the instrumental variable for capital adequacy. Under the capital adequacy rules prevailing during our sample period, 100% of the face value of business and

[24] The standard errors in the 2SLS procedure are properly corrected (see Murphy and Topel, 1985; Gujarati, 2003; Wooldridge, 2002).

[25] In 2002, the Sarbanes–Oxley Act increased audit committees' responsibilities and authority and raised membership requirements and committee composition to include more independent directors. Specifically, the audit committee is required to provide independent oversight into the firm's accounting and financial reporting. Committee members are required to be financially literate and at least one member must meet the "financial expert" requirements of Sarbanes–Oxley. We note that since the last year of our sample period is 2002, there is greater potential for variations in audit committee characteristics in our sample period than post Sarbanes–Oxley.

[26] One bank does not have an audit committee for four of the five years it is included in the sample and one bank reports no meetings for one year. AUDSIZ is coded zero in these cases.

[27] We use one-year analyst estimates of EPS as of December. Two banks (three firm years) do not have analyst estimates for December and one bank is not in the I/B/E/S database. ANALYST is coded zero in these cases.

Table 4
OLS regressions of performance, earnings management, capital adequacy, governance, and board independence for a sample of large bank holding companies over the period 1994–2002.

Dependent variables	EBEIAT	EM	PPS	BI	CAP
Independent variables					
EBEIAT		−3.0954 (−2.94)***	3.1483 (2.88)***	1.7946 (2.48)**	1.6432 (2.46)**
EM	4.1506 (3.61)***		−4.8823 (−3.18)***	2.8925 (2.53)**	3.3107 (2.69)***
PPS	1.4842 (5.16)***	1.7807 (6.15)***		2.1169 (2.98)***	−1.3108 (−1.62)
BI	0.0679 (4.41)***	−0.0588 (−3.79)***	0.0996 (2.51)**		0.0192 (0.48)
CAP	0.3753 (6.05)***	−0.1726 (−2.79)***	−0.5705 (−1.19)	0.9707 (1.51)	
Fraction of shares owned by all directors	0.0981 (3.88)***	0.1221 (2.32)**	0.4756 (3.14)***	−0.0788 (−2.28)**	−0.8277 (−2.51)**
CEO duality dummy	−0.0044 (−0.80)	0.0168 (2.69)***	−0.0173 (−1.16)	−0.0283 (−2.48)**	−0.0251 (−2.54)**
Number of board meetings per year	0.0012 (0.24)	−0.0004 (−0.22)	0.0065 (0.51)	0.0011 (0.19)	0.0072 (0.69)
Market-to-book ratio	0.0095 (4.15)***	0.0087 (2.95)***	0.0103 (1.56)	0.0050 (1.01)	−0.0111 (−2.60)**
Market-adjusted returns-lagged on year	0.0013 (0.21)	−0.0041 (−0.60)	0.0098 (0.90)	0.0057 (0.79)	0.0088 (0.45)
Natural log of size	0.0014 (0.97)	−0.0106 (−3.29)***	0.0151 (2.87)***	−0.0022 (−1.32)	−0.0082 (−2.70)
HHI	0.0096 (2.83)***				
Audit committee size		−1.7464 (−2.79)***			
Number of audit committee meetings per year		−2.1921 (−2.88)***			
Number of I/B/E/S analysts		−1.4424 (−3.27)***			
CEO age			−0.0084 (−3.78)***		
CEO tenure			−0.0279 (−4.84)***		
CEO on nominating committee				−1.2696 (−2.69)***	
(ΔC&I Loans + ΔConsumer Loans − ΔR.E. Loans) / Total Loans					−3.8683 (−2.83)***
Firm *F*-value	11.29***	11.68***	12.58***	10.73***	9.94***
Durbin–Wu–Hausman *F*-test for endogeneity	5.80***	4.98***	8.85***	5.91***	7.44***
Adj-R^2	50.8	49.9	50.2	47.7	49.1

This table presents the test for endogeneity in the performance, earnings management, pay-for-performance sensitivity, board independence, and capital level proxies. That is, we perform an OLS analysis in which each of these variables is used as the dependent variable and the other variables are the independent variables (along with other independent variables). We perform a Durbin–Wu–Hausman test for endogeneity. That is, the potentially endogenous performance, earnings management, pay-for-performance sensitivity, board independence variables, and capital level are regressed separately on all exogenous variables in the system. The residual values obtained from each equation are then included as additional regressors in the original OLS regressions. Column 1 is the regression for bank performance, Column 2 the regression for earnings management, Column 3 examines corporate governance using the CEO's pay-performance sensitivity, Column 4 uses board independence, and Column 5 uses the bank's capital ratio. We winsorize extreme observations of each variable. *t*-values are shown in parentheses.
**Significant at better than the 5% level.
***Significant at better than the 1% level.

consumer loans must have capital backing, yet only 50% of the face value of real estate loans must have capital backing. Thus, as business and consumer loans increase relative to real estate loans capital adequacy falls. We calculate the ratio:

$$\Delta LOANPORT = (\Delta C\&I\ Loans + \Delta Consumer\ Loans - \Delta Real\ Estate\ Loans) / Total\ Loans. \quad (10)$$

As ΔLOANPORT increases risk-weighted assets (i.e., the denominator of the capital ratio) increase and the capital ratio decreases. As reported in Panel D of Table 3, the mean value of this ratio is −0.95% and it ranges from −35.32% to 31.00%.

4. Results

4.1. OLS regressions

We first present results using cross-sectional OLS regressions without addressing the endogeneity issue. The purpose of these regressions is to demonstrate that the performance, earnings management, and corporate governance mechanisms are statistically related even in simple OLS. We then perform a Durbin–Wu–Hausman test to see if endogeneity exists, which could lead to potentially biased coefficients. Table 4 presents the results of the OLS regressions. Regression 1 in Table 4 shows the results using performance (EBEIAT) as the dependent variable. Regression 2 uses earnings management (EM) as the dependent variable. Regression 3 uses pay-for-performance sensitivity (PPS) as the dependent variable. Regression 4 uses board independence (BI) as the dependent variable. Finally, Regression 5 uses capital adequacy (CAP) as the dependent variable.

Broadly speaking, from Regression 1 in Table 4 we see that performance is significantly greater when earnings management is greater, when CEO pay-for-performance sensitivity is stronger, when board independence is high, and when the bank's capital level is higher. From regression 2, earnings management is significantly lower when the earnings are higher, when there is less pay-for-performance sensitivity for the CEO, when board independence is high, and when the bank's capital level is higher. From regression 3, pay-for-performance sensitivity is positively correlated with earnings and board independence, negatively related to earnings management, and not significantly related to leverage. From regression 4, board independence is

Table 5
Two-stage least squares regressions of performance, earnings management, capital adequacy, governance, and board independence for a sample of large bank holding companies over the period 1994–2002.

Dependent variable	EBEIAT	EM	PPS	BI	CAP
(Fitted) endogenous variables					
EBEIAT		−2.8203 (−2.84)***	2.8463 (2.81)***	1.9574 (2.89)***	1.7557 (2.80)***
EM	5.1854 (4.79)***		−4.2764 (−2.99)***	2.4906 (2.79)***	4.2998 (3.18)***
PPS	2.9788 (10.18)***	1.9963 (8.83)***		2.4874 (3.28)***	−3.7210 (−3.11)***
BI	0.0821 (5.24)***	−0.0774 (−4.19)***	1.1641 (2.89)***		0.0079 (0.38)
CAP	0.2965 (5.18)***	−0.1843 (−2.89)***	−0.6905 (−1.53)	0.5805 (0.95)	
Exogenous variables					
Fraction of shares owned by all directors	0.1102 (4.87)***	0.1483 (3.21)***	0.5207 (3.42)***	−0.0939 (−2.52)**	−0.7419 (−2.15)**
CEO duality dummy	−0.0032 (−0.56)	0.0263 (2.89)***	−0.0508 (−2.97)***	−0.0362 (−2.79)***	−0.0312 (−2.81)***
Number of board meetings per year	0.0008 (0.13)	−0.0004 (−0.10)	0.0031 (0.46)	0.0032 (2.25)**	0.0081 (0.73)
Market-to-book ratio	0.0076 (3.69)***	0.0092 (3.13)***	0.0251 (2.56)**	0.0075 (1.04)	−0.0109 (−2.50)**
Market-adjusted returns-lagged on year	0.0026 (0.49)	−0.0068 (−0.79)	0.0124 (1.40)	0.0044 (0.52)	0.0043 (0.44)
Natural log of size	0.0056 (1.35)	−0.0119 (−3.18)***	0.0182 (3.42)***	−0.0196 (−2.75)***	−0.0095 (−2.86)***
Instrumental variables					
HHI	0.0129 (3.45)***				
Audit committee size		−1.8805 (−2.91)***			
Number of audit committee meetings per year		−2.0805 (−2.75)***			
Number of I/B/E/S analysts		−1.5794 (−3.77)***			
CEO age			−0.0082 (−3.21)***		
CEO tenure			−0.0311 (−5.13)***		
CEO on nominating committee				−0.9842 (−1.82)*	
(ΔC&I Loans + ΔConsumer Loans − ΔR.E. Loans) / Total Loans					−3.2351 (−2.79)***
Firm *F*-value	10.79***	11.15***	11.99***	10.95***	10.32***
Adj-R^2	58.7	54.2	56.8	52.4	54.5

This table reports results of two-stage least square estimator (2SLS) regressions. For every endogenous variable we determine at least one variable (or instrument) which is correlated with this endogenous variable but exogenous to the structural equation. Column 1 is the regression for bank performance, Column 2 the regression for earnings management, Column 3 examines corporate governance using the CEO's pay-performance sensitivity, Column 4 uses board independence, and Column 5 uses the bank's capital ratio. We winsorize extreme observations of each variable. *t*-values are shown in parentheses.
*Significant at better than the 10% level.
**Significant at better than the 5% level.
***Significant at better than the 1% level.

positively related to earnings, earnings management, pay-for-performance sensitivity, and capital. Finally, from regression 5, we see that capital levels are significantly higher when earnings and earnings management are high.[28]

While the OLS results reported in Table 4 find many significant relations, if the performance, earnings management, and governance mechanisms are endogenously determined, OLS estimation can lead to biased coefficients. The second to last row of Table 4 provides the *F*-test of the Durbin–Wu–Hausman test on the null hypothesis that all of the residuals are jointly equal to zero. We see strong evidence that the null is rejected in all of the regressions. In all cases the *F*-statistic is significant at better then the 1% level and thus Hypothesis 5 is not rejected. That is, the results of the Durbin–Wu–Hausman tests in Table 4 confirm that there is endogeneity among the variables and a simultaneous equations approach should be used.

4.2. Two-stage least squares regressions

Table 5 presents regression results of the 2SLS regressions. The set up of Table 5 is similar to that of Table 4.

[28] We also ran the regressions in Table 4 with a dummy variable equal to 1 in 2001 and 2002, and 0 otherwise, to control for the effect of the recession of the early 2000s. The coefficient on this variable is negative and significant in regression 1 (EBEIAT, which suggests bank earnings were lower during the recession), positive and significant for regression 2 (EM, which suggests earnings management was higher during the two recession years), and negative and significant for regression 5 (CAP, which suggests bank capital ratios were lower during the recession). For the PPS and BI regressions, the recession dummy variable coefficients are positive but insignificant. Therefore, pay-for-performance sensitivity and board independence are not significantly different during the recessionary period of our sample. Further, the coefficients on all other variables saw virtually no change. Thus, our main results hold for the period of 2001 and 2002 in which the U.S. economy experienced a relatively short and small recession. While, admittedly, the recession of 2001 and 2002 is tiny in relation to the recession experienced in the U.S. starting in December 2007, we do find that our results are consistent through a mild recessionary period. Whether the results hold during the current recession cannot be tested as we have seen nothing comparable to the current situation. Thus, the generality of our results to a severe recessionary period remains to be examined.

4.2.1. Earnings

Consistent with Table 4 we find that higher levels of CEO pay-for-performance sensitivity, board independence, and capital are all associated with higher EBEIATs. The coefficients on these variables are all positive and highly significant. For example, in regression 1 the coefficient on the CEO's pay-for-performance sensitivity is 2.9788, significant at the 1% level. Thus, banks that tie the CEO's pay to the performance of the firm perform better. The coefficient on the board independence variable is 0.0821, significant at the 1% level. Thus, a strong board of directors is associated with high levels of performance. Finally, the coefficient on the Tier 1 capital ratio is 0.2965, significant at the 1% level. Thus, banks with high levels of capital also experience high levels of performance. These results suggest that stronger CEO ties to stock ownership and greater monitoring by boards of directors result in improved operating performance. The coefficient on the earnings management variable is 5.1854, significant at the 1% level. As expected, the regression coefficient confirms that lower discretionary loan loss provisions and higher discretionary realized securities gains increase the performance of the bank.

The control variables that are significant take the expected signs. For example, the fraction of shares owned by all directors is positively related to earnings (the coefficient is 0.1102, significant at 1%), and the market-to-book ratio is positively related to earnings (the coefficient is 0.0076, significant at 1%). Not surprisingly, banks with stronger ties between the board and stockholders and banks with high market-to-book ratios perform better. The instrumental variable HHI is positively and significantly related to performance. As the HHI increases the market in which the bank operates is less competitive. Accordingly and as expected, less competitive markets are associated with better performing banks. Finally, firm fixed-effects are significant at the 1% level with an *F*-statistic of 10.79.

4.2.2. Earnings management

Regression 2 in Table 5 reports that performance, board independence, and capital are negatively related to earnings management which leads us not to reject Hypotheses 1, 3, and 4. For example, in regression 2 the coefficient on EBEIAT, −2.8203, is significant at the 1% level. Thus, the smoothing hypothesis is supported. Note that, in the EBEIAT equation, higher earnings management increases earnings. However, the sign of the relationship changes in the EM equation when causality is reversed. The coefficient on the Tier 1 capital ratio is −0.1843, significant at the 1% level. Thus, high levels of income and capital provide a cushion that allows managers to write off bad loans and delay recognizing securities gains, but low levels of income and capital provide an incentive to delay writing off bad loans and increase the recognition of securities gains when feasible. The coefficient on the board independence variable is −0.0774, significant at the 1% level. Thus, independent boards of directors constrain the use of earnings management to inflate earnings. Further, regression 2 reports that CEO pay sensitivity is positively related to earnings management and we do not reject Hypothesis 2. The coefficient on PPS, 1.9963, is significant at the 1% level. Thus, when PPS is high managers under-report loan loss provisions and realize more securities gains.

The control variables that are significant take the expected signs. For example, the fraction of shares owned by all directors is positively related to discretionary accruals (the coefficient is 0.1483, significant at 1%) as are the CEO/chair duality dummy (the coefficient is 0.0263, significant at 1%) and the market-to-book ratio (the coefficient is 0.0092, significant at 1%). Not surprisingly, when the board holds a larger fraction of the firm's stock or when the CEO is also the board chair, the firm is more likely to engage in earnings management. Likewise, when a bank's market value is high relative to its book value the firm is more likely to have high levels of earnings management. Finally, earnings management at small banks is more pronounced. The coefficient on ln (SIZ), −0.0119, is significant at the 1% level.

The instrumental variables, AUDSIZE, AUDMEET and ANALYST, are negatively and significantly related to earnings management. As any of these instruments increases, monitoring of the bank increases and the bank is less likely to inflate income by underreporting loan losses and/or over reporting securities gains. Finally, firm fixed-effects are significant at the 1% level with an *F*-statistic of 11.15.

4.2.3. Pay-for-performance sensitivity

Regression 3 in Table 5 reports that bank performance and board independence are positively related to CEO pay-for-performance sensitivity. The coefficient on EBEIAT, 2.8463, is significant at the 1% level. Not surprisingly, banks with higher income are likely to be those that tie the CEO's pay to performance. The coefficient on BI is 1.1641. Thus, banks that have a strong board are more likely to tie the CEO's pay to performance. Firms that do not use earnings management to inflate income tend to be those that tie the CEO's pay to performance. The coefficient on EM, −4.2764, is significant at the 1% level. Note that the sign is dependent upon the direction of causality. That is, higher CEO pay-for-performance increases earnings management, but firms with low levels of earnings management increase CEO pay-for-performance.

From the control variables, we see that the fraction of shares owned by all directors, the market-to-book ratio, and the size of the bank are positively related to the corporate governance variable, while the CEO/chair duality dummy is negatively related to the measure. Not surprisingly, when the board holds a larger fraction of a firm's stock they are more likely to tie the CEO's pay to performance. When the market values the bank highly relative to its book value the CEO's pay is more likely to be tied to performance and bigger banks are more likely to use CEO pay-for-performance contracts. Finally, when the CEO is also the board chair and thus has more control over the board, the bank is less likely to heavily weigh the compensation contract of the CEO towards pay-for-performance.

The instrumental variables, CEOAGE and CEOTEN are significantly negatively related to PPS. Older CEOs and CEOs with greater experience are less likely to operate under a pay-for-performance contract. Finally, firm fixed-effects are significant at the 1% level, with an *F*-statistic of 11.99.

4.2.4. Board independence

Regression 4 in Table 5 reports that bank performance, earnings management, and pay-for-performance sensitivity are all positively related to board independence. The coefficients on EBEIAT, 1.9574, on EM, 2.4906, and on PPS, 2.4874, are all significant at the 1% level. Thus, banks with higher performance and those that pay the CEO based on firm performance have stronger boards. Further, higher levels of earnings management lead to stronger boards. Again the sign of the EM coefficient is dependent upon the direction of causality. More board independence constrains earnings management, but high levels of earnings management lead to increased board oversight.

From the control variables we see that the fraction of shares owned by all directors, CEO/chair duality dummy, and the size of the bank are negatively related to board independence. Banks with strong boards do not need another monitoring mechanism in the form of shares owned by the board. They are also less likely to have power concentrated in the CEO's hands by assigning the CEO as the board chair. Larger banks tend to have larger boards, a characteristic which dilutes board independence. Finally, more active boards tend to become more independent boards. The instrumental variable, CEONOM is significantly negatively related to BI. When the CEO is on the board nominating committee, the board is ultimately less independent. Finally, firm fixed-effects are significant at the 1% level with an *F*-statistic of 10.95.

4.2.5. Capital ratio

Regression 5 in Table 5 reports that bank performance and earnings management are positively related to capital levels. The coefficients on EBEIAT, 1.7557, and on EM, 4.2998, are both significant at the 1% level. Not surprisingly, banks with higher income and higher earnings management have higher capital levels. Again, notice that the sign of the relationship between earnings management and an endogenous variable depends on the direction of causality. Lower capital levels lead to increased earnings management to inflate capital levels, while higher levels of earnings management lead to higher capital levels. Finally, regression 5 reports that CEO pay sensitivity is negatively related to the capital ratio. The coefficient on PPS, −3.7210, is significant at the 1% level. That is, when the CEO's performance is sensitive to the performance of the firm executives tend to increase leverage.

From the control variables, we see that the fraction of shares owned by all directors is negatively related to capital levels (the coefficient is −0.7419, significant at 5%), as are the CEO/chair duality dummy (the coefficient is −0.0312, significant at 1%), the market-to-book ratio (the coefficient is −0.0109, significant at 5%), and bank size (the coefficient is −0.0095, significant at 1%). Not surprisingly, when the board holds a larger fraction of the firm's stock or when the CEO is also the board chair, the firm is more likely to use less equity financing. Likewise, when a banks' market value is high relative to its book value the firm is holding less (book value) capital the capital ratio falls. Finally, larger banks are well known to hold less capital to finance their assets.

The instrumental variable, ΔLOANPORT, is significantly negatively related to the capital ratio. As the proportion of business and consumer loans in the bank's loan portfolio increases its risk-weighted assets increase and thus the capital ratio decreases. Finally, firm fixed-effects are significant at the 1% level, with an *F*-statistic of 10.32.

5. Conclusion

This paper examines earnings management at the largest publicly traded bank holding companies in the United States. Specifically, we look at the interactions between firm performance, corporate governance mechanisms, and earnings management. We also examine whether the various corporate governance mechanisms and earnings management tools are chosen jointly or independently from each other. The results suggest that corporate governance plays at least some role in earnings and earnings management at large U.S. banks. We find that performance, earnings management, and governance mechanisms are endogenously determined. Therefore, a simultaneous equations approach is used. We find that performance, board independence, and capital are negatively related to earnings management. Thus, banks with high levels of income and capital record more loan losses and fewer securities gains. Also, an independent board of directors is associated with higher levels of loan losses and fewer recorded securities gains. Further, CEO pay sensitivity is positively related to earnings management. Thus, when PPS is high managers record fewer loan loss provisions and more securities gains. While we find evidence of earnings smoothing, we also find that some corporate governance mechanisms (e.g., board independence) constrain earnings management whereas others (e.g., CEO pay-for-performance) induce it.

The results of the paper suggest that the governance structure at bank holding companies does indeed affect the actions of bank managers. Specifically, governance mechanisms that stress CEO pay-for-performance actually encourage the CEO to manage earnings, while those that stress board independence dampen the CEO's ability to manage earnings. Thus, as regulators define acceptable corporate governance standards and as stockholders set the corporate governance structure at banks, both should consider the collective effect of all governance mechanisms employed on the actions of banks' senior management rather than the impact of each governance mechanism individually.

Appendix A. Beatty et al. (2002) OLS regression models of loan loss provisions and realized security gains and losses for a sample of large bank holding companies over the period 1994–2002

This table provides variable definitions, summary statistics, and regression results for Beatty et al. (2002) OLS regression models explaining loan loss provisions and realized security gains and losses for a sample of large bank holding companies over the

period 1994–2002. Data are obtained from Bank Holding Company Performance Reports (FRY-9), the Chicago Fed's merger databases, the Center for Research in Securities Prices (CRSP), ExecuComp, and proxy statements. The following regressions are estimated:

$$\mathrm{LOSS}_{it} = \alpha_{tr} + \beta_1 \mathrm{LASSET}_{it} + \beta_2 \mathrm{NPL}_{it} + \beta_3 \mathrm{LLR}_{it} + \beta_4 \mathrm{LOANR}_{it} + \beta_5 \mathrm{LOANC}_{it} + \beta_6 \mathrm{LOAND}_{it} + \beta_7 \mathrm{LOANA}_{it} + \beta_8 \mathrm{LOANI}_{it} + \beta_9 \mathrm{LOANF}_{it} + \varepsilon_{it}$$

and

$$\mathrm{RSGL}_{it} = \alpha_t + \beta_1 \mathrm{LASSET}_{it} + \beta_2 \mathrm{UNGL}_{it} + \varepsilon_{it}.$$

Panel A: variables used to find discretionary and nondiscretionary accruals

LOSS = loan loss provisions as a percentage of total loans
NPL = nonperforming loans (loans past due 90 days or more and still accruing interest and loans in nonaccrual status) as a percentage of total loans
LLR = loan loss allowance as a percentage of total loans
LOANR = real estate loans as a percentage of total loans
LOANC = commercial and industrial loans as a percentage of total loans
LOAND = loans to depository institutions as a percentage of total loans
LOANA = agriculture loans as a percentage of total loans
LOANI = consumer loans as a percentage of total loans
LOANF = loans to foreign governments as a percentage of total loans
RSGL = realized security gains and losses (includes realized gains and losses from available-for-sale securities and held-to-maturity securities) as a percentage of total assets
URSGL = unrealized gains and losses (includes unrealized gains and losses from available-for-sale securities) as a percentage of total assets
LOANS = total loans (in billions of dollars)

Panel B: descriptive statistics on variables used to get discretionary and nondiscretionary accruals

	Mean	Median	Std Dev	Minimum	Maximum	Total
LOSS (%)	0.52	0.39	0.56	−2.14	4.67	593
NPL (%)	0.95	0.81	0.58	0.01	5.63	593
LLR (%)	1.75	1.59	0.63	0.86	7.06	593
LOANR (%)	45.60	46.88	16.61	0.01	79.64	593
LOANC (%)	24.67	23.43	10.44	0.75	59.96	593
LOAND (%)	1.22	0.11	3.36	0.00	33.82	593
LOANA (%)	0.74	0.32	1.19	0.00	9.80	593
LOANI (%)	19.10	17.25	13.99	0.42	96.98	593
LOANF (%)	0.20	0.00	0.62	0.00	5.54	593
RSGL (%)	0.02	0.01	0.10	−1.16	0.52	593
URSGL (%)	−0.05	−0.04	0.35	−3.53	1.06	593
LOANS (billions $)	34.18	12.49	60.02	1.47	480.79	593

Panel C: regression results

Independent variable	LOSS coefficient estimate (*t*-value)	RSGL coefficient estimate (*t*-value)
LASSET	0.0006	0.0001
	(5.02)***	(7.36)***
NPL	0.3328	
	(10.68)***	
LLR	−0.0017	
	(−0.06)	
LOANR	−0.0109	
	(−5.21)***	
LOANC	−0.0076	
	(−2.88)***	
LOAND	−0.0333	
	(−4.85)***	
LOANA	0.0625	
	(4.12)***	
LOANI	0.0047	
	(2.20)**	
LOANF	−0.0527	
	(−2.31)**	
UNGL		0.0008
		(0.07)
Bank-Years	563	562
Adjusted R^2	83.2	34.1

**Significant at the 5% level.
***Significant at the 1% level.

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