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Equity incentives and earnings management: Evidence from the banking industry

Qiang CHENG
Singapore Management University, qcheng@smu.edu.sg

Terry Warfield

Minlei YE

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Equity Incentives and Earnings Management: Evidence from the Banking Industry*

Qiang Cheng
qcheng@bus.wisc.edu
University of Wisconsin-Madison

Terry Warfield**
twarfield@bus.wisc.edu
University of Wisconsin-Madison

Minlei Ye
minlei.ye@sauder.ubc.ca
Sauder School of Business
University of British Columbia

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Abstract

We examine the relationship between equity incentives and earnings management in the banking industry. By focusing on this regulated industry and using industry-specific earnings management proxies, we provide evidence on the impact of regulation on earnings management arising from CEOs' equity incentives. We find that bank managers with high equity incentives are more likely to manage earnings, but only when capital ratios are closer to the minimum regulatory capital requirements. This finding indicates that in the banking industry, potential regulatory intervention induces, rather than mitigates, earnings management arising from equity incentives.

** Corresponding Author:
Wisconsin School of Business
975 University Avenue
Madison, WI 53706-1323
608-262-1028

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I. INTRODUCTION

This paper investigates the relationship between managers' equity incentives and earnings management in a regulated industry – the banking industry. Prior research has established a link between equity incentives and earnings management, as well as the occurrence of earnings restatement in non-regulated industries. Managers' equity incentives, arising from stock-based compensation and stock/option ownership, can induce earnings management in the hope of increasing stock prices and the value of their equity holdings. For example, Cheng and Warfield (2005) find that managers with high equity incentives sell more shares after earnings announcements and are more likely to report earnings that meet or just beat analysts' forecasts. Bergstresser and Philippon (2006) find that equity incentives are positively correlated with abnormal accruals. Burns and Kedia (2006) find that incentives to misreport earnings increase with the sensitivity of CEO's option holdings to stock price, and Efendi et al. (2007) find that options in the money are an important determinant of the likelihood of earnings restatement.

These studies generally exclude financial institutions and utilities primarily because managers in these regulated industries may have different motivations to manage earnings due to regulation (Burgstahler and Eames 2003). Thus, it is unclear from prior research whether managers with high equity incentives are more likely to manage earnings in regulated industries. We address this omission by investigating the equity incentive-earnings management link in banks.[1]

Banks are critical components of the economy, have great influence on financial

[1] Financial institutions include banks, non-depository credit institutions, security and commodity brokers, insurance, real estate and holding companies, and other investment offices. This paper focuses on commercial banks because the extent of earnings management can be more precisely measured. We exclude regulated utilities from our analyses due to lack of more precise earnings management measures and we exclude insurance companies due to data availability requirements, which result in a small sample.

markets, and have been at the center of the recent credit crisis (Eavis 2008). Thus, it is important to investigate whether earnings management incentives prevalent in other industries exist in this regulated industry. Compared to prior studies, which are based on pooled samples drawn from non-regulated industries, we can measure earnings management activities more accurately in the banking industry. Use of a more accurate measure in a single industry mitigates bias arising from measurement errors and their effects on tests of earnings management.

In addition, by examining the link from equity incentives to earnings management for banks, we are able to provide insights into the effects of regulatory intervention on earnings management arising from equity incentives. For banks, regulatory authorities establish minimum capital requirements and increase monitoring of banks with low capital ratios, sometimes intervening in the operations of banks with inadequate capital and even to the point of dismissing management (Beatty et al. 1995). Given recent corporate scandals leading to various reforms to curb earnings management (e.g., Sarbanes-Oxley Act of 2002), it is important to understand the potential mitigating role of regulation on earnings management.

While the potential regulatory intervention likely influences earnings management incentives, the direction of regulatory intervention effects is ambiguous. On the one hand, managers have incentives to engage in earnings management to avoid regulatory intervention (Collins et al. 1995; Beatty et al. 2002; Liu and Ryan 2006). When the likelihood of regulatory intervention is high, bank managers are subject to two possible costs: (1) lower compensation / job security and (2) lower value of their holdings of the bank's stock and option, the latter of which is naturally related to the level of these managers' stock/option holdings.

Bank managers can increase capital as well as earnings through upward earnings management, such as by decreasing loan loss provisions and/or by increasing realized security gains. If the incentives to avoid regulatory attention are strong and more so when managers have high equity incentives, we expect that the association between equity incentives and earnings management exists in regulated industries and is enhanced when the likelihood of regulatory intervention is high.

On the other hand, the likelihood for earnings management to be detected is high when regulators do intervene. Because the costs of engaging in earnings management are substantial, managers might not engage in earnings management in the first place. If this is the case, we would expect the relation between equity incentives and earnings management to be weaker in regulated industries, particularly when potential regulatory attention is mounting. Therefore, the extent to which regulation mitigates earnings management arising from equity incentives is an empirical question.[2]

In this paper, we first investigate the overall relation between equity incentives and earnings management in banks and then examine how regulatory intervention affects this relation. As in prior research, we focus on chief executive officers (CEOs). Our measure of equity incentives includes CEOs' *stock and option holdings*; it comprises unexercisable options, exercisable options, and stock ownership. Thus, it includes, but it is not limited to, stock-based compensation (newly granted options are included in unexercised options.) To measure earnings management in banks, we follow prior research, decomposing loan loss provision into nondiscretionary and discretionary components and using the discretionary component as the proxy for earnings

[2] Note that the main objective of regulatory intervention in the banking industry is not to detect earnings management. However, when capital ratios are close to the regulatory minimums and banks are subject to potential regulatory intervention, their financial reporting is subject to enhanced scrutiny by regulators, investors, and the SEC. Thus, the likelihood of detection of earnings management is higher.

management. Decreasing the discretionary loan loss provision increases earnings and tier one capital.

Based on 600 bank-year observations in the period 1994-2005, we find that unlike in non-regulated industries, managers' equity incentives and earnings management are not positively correlated in the banking industry. However, when we partition the sample based on the likelihood of regulatory intervention, we find that the earnings management behavior varies with the likelihood of regulatory intervention. Specifically, we find that banks with low capital ratios – those likely subject to regulatory intervention – exhibit a significant relation between bank managers' equity incentives and earnings management. In contrast, for banks with high capital ratios, equity incentives are not correlated with earnings management.

In addition, we find that when bank CEOs have high equity incentives, they are more likely to manage earnings upward when capital ratios are low. For bank CEOs with low equity incentives and low capital ratios, we do not observe upward earnings management. Therefore, bank managers' incentives to engage in upward earnings management are strong only when both of the following two conditions are satisfied: (1) bank CEOs have high equity incentives so that their personal welfare is more strongly correlated with bank performance and (2) the capital ratio is closer to regulatory minimums.

To "close the loop" on the equity incentive – earning management link, we also examine bank managers' subsequent trading, conditional on equity incentives and the extent of regulatory scrutiny. We find that bank managers with higher equity incentives are more likely to sell in the next year. More importantly, we find that this positive relation is particularly strong for banks with low capital ratios. These results indicate that

when regulatory scrutiny is likely to be high, bank CEOs with high equity incentives are more likely to sell in order to reduce their exposure to the potential regulatory intervention, thereby inducing earnings management. When we link CEOs' future selling behavior directly to earnings management, we document a positive relation between earnings management and future sales for banks with low capital ratios. In contrast, bank CEOs with high equity incentives and lower regulatory scrutiny do not exhibit strong selling behavior and, as a result, do not manage earnings upward.

Our primary results are robust to controls for year fixed effects, to alternative proxies for potential regulatory attention, and to other proxies for earnings management. We also explore an alternative explanation for our results based on differences in equity incentives between banks that are subject to potential regulatory intervention and those that are not. That is, it is possible that differences in equity incentives, rather than the differential level of regulatory intervention, lead to the difference in results. However, our follow-up analysis indicates that the two groups do not differ in the level of equity incentives.

Our paper contributes to the literature by providing insights on how regulation affects earnings management incentives. While prior research has examined the impact of regulation on earnings management in general, our study is the first to examine earnings management arising from regulated CEOs' equity incentives. Recent events indicate that this is an important earnings management context, given the high proportion of CEO compensation tied to options or stocks.

Regulation is intended to monitor weak banks, thereby protecting investors, bank depositors, and the banking system; such regulation may deter managers from engaging in earnings management. However at the same time such regulation may induce

managers to manage earnings to avoid such regulatory intervention and its potentially negative impact on managers. Our evidence is consistent with the latter scenario, rather than the first. Our paper highlights the importance of both potential regulatory intervention and equity incentives in inducing earnings management in the bank setting.[3]

This paper also contributes to the earnings management literature in several other dimensions. First, this paper controls for potential cross-industry effects by investigating the relationship between equity incentives and earnings management within a single regulated industry. Firms in the same industry are more homogeneous, allowing industry factors to be held constant and thereby controlling for possible omitted correlated variables. Second, banks are of particular interest, because they represent the main financial institutions that prior earnings management research has excluded. While our sample is relatively small, (due to Execucomp data constraints which limits us to large banks included in the S&P1500) , the fact that we find evidence of upward earnings management in weak banks and some evidence of downward earnings management in strong banks indicates that low test power of a small sample is not a serious concern.[4] Even in this sample, our sample banks include the major banks playing a significant role in the U.S. economy (e.g., Bank of America, Wells Fargo, Mellon Financial, Wachovia, Washington Mutual).

The remainder of the paper is organized as follows. Section II discusses related studies and develops the hypothesis about equity incentives and earnings management in

[3] However, we caution that the results might not apply to other regulated industries. For example, while also regulated, insurance companies are largely regulated at the state level and one might argue that the level of scrutiny is different between insurance companies and banks, likely leading to different results if one were to study similar questions in insurance companies.

[4] To phrase differently, the common problem of a small sample and low power is insignificant findings, which are difficult to interpret. This is not the case in our study. Another problem of a small sample is that the findings might not generalize to the population. While our findings do not necessarily apply to private banks and small public banks, we include most of the banks in the S&P1500, an important part of the financial system.

banks. We also discuss the impact of potential regulation intervention on such earnings management in Section II. Section III describes the sample and data. Section IV presents the research design and empirical results. Section V presents additional and sensitivity analyses, and Section VI concludes.

II. PRIOR RESEARCH AND HYPOTHESES

Below we first discuss prior bank earnings management research, followed by a discussion of prior research on the relationship between equity incentives and earnings management. We then discuss how regulation might affect earnings management induced by equity incentives. We state our hypotheses at the end of this section.

Bank Earnings Management

Bank earnings management is a significant part of the general earnings management literature. Bank earnings management is unique in two dimensions. First, one can examine unique earnings management incentives, such as regulatory monitoring. Second, one can develop more accurate earning management proxies in the bank setting because of the relatively homogeneous sample composition. We discuss earnings management proxies in Section III, and below we provide a very brief summary of prior studies on bank earnings management, organized by earnings management incentives.[5]

Bank regulators use capital ratios to measure bank capital adequacy and to identify weak banks. As a result, banks with low capital ratios are likely to increase capital ratios via accruals (e.g., loan loss provisions) or real activities (e.g., security gains or losses) in order to avoid regulatory intervention. Prior research (e.g., Moyer 1990; Beatty et al. 1995; Ahmed et al. 1999) provides strong evidence consistent with this hypothesis. For

[5] We do not intend to provide a comprehensive review of the literature. We focus mainly on studies that relate to ours. For example, we do not discuss studies examining the signaling incentive of earnings management (e.g., Wahlen 1994; Beaver and Engel 1996).

example, Kim and Kross (1998) find that banks with low capital ratios record lower loan loss provisions.

Some banks also have incentives to reduce earnings volatility by decreasing earnings in years with unexpectedly strong performance and increasing earnings in years with weak performance. A smoother stream of earnings might help reduce the information asymmetry between managers and outside investors and avoid potential scrutiny from regulators, the SEC, or market participants (Beatty and Harris 1999; Beatty et al. 2002; Liu and Ryan 2006). The majority of prior studies (e.g., Collins et al. 1995; Schrand and Wong 2003; Kanagaretnam et al. 2004; Liu and Ryan 2006) find evidence consistent with managers smoothing earnings via the loan loss provision and recognizing security gains and losses.

Tax expenses represent a significant cost to banks. Prior research also finds that banks manage the timing of security gains and losses to reduce the overall tax burden, including both state and federal tax (e.g., Beatty et al. 1995; Collins et al. 1995; Beatty and Harris 2001). Warfield and Linsmeier (1992) find that the market valuation of security gains and losses is consistent with tax management.

Prior research on earnings management in banks generally does not explicitly consider the impact of managers' personal wealth and we are not aware any study that examines the impact of managers' equity incentives on earnings management in banks. This paper addresses this issue, because equity incentives are an important form of executive compensation and, as discussed in the next section, prior research examining non-regulated industries indicates that equity incentives have an important impact on earnings management.

Equity Incentives and Earnings Management

Goldman and Slezak (2006) develop an agency model in which stock-based compensation is described as a double-edged sword. It can motivate managers to exert productive effort, but at the same time it can also induce managers to divert valuable firm resources to misrepresent performance. Option holdings and stock ownership are different ways for managers to become owners, thereby mitigating the agency costs associated with the separation of ownership and control (Warfield et al. 1995). However these ownership benefits can be dissipated if managers sell shares upon grant or exercise of their options. Prior research (Ofek and Yermack 2000; Cheng and Warfield 2005; Bergstresser and Philippon 2006) finds that managers with higher equity incentives are more likely to sell shares to reduce their exposure to the idiosyncratic risk of the firm. Such selling is induced because managers' wealth is overly sensitive to their firms' short-term stock price. This sensitivity can create incentives to engage in earnings management in order to increase short-term stock prices and the value of the shares managers plan to sell (Jensen 2005).

Prior research provides evidence supporting the relation between equity incentives and earnings management. Using stock-based compensation and stock ownership data over the 1993-2000 time period, Cheng and Warfield (2005) document that managers with high equity incentives, which include all option and stock holdings, are more likely to report earnings that meet or just beat analysts' forecasts. Using a similar sample period, Bergstresser and Philippon (2006) find a positive relation between discretionary accruals and equity incentives.

To summarize, prior research finds that managers with high equity incentives are more likely to engage in earnings management relative to those with low equity

incentives.[6] However, prior research has not examined the equity incentive-earnings management relation in financial institutions due to their regulated status and unique accounting practices. If the above argument can be extended to the banking industry, we expect to find a similar relation between earnings management and equity incentives. However, the earnings management effects are likely influenced by potential regulatory intervention. While financially strong banks – banks with better performance and higher capital – may behave more like firms in non-regulated industries, the behavior of weak banks – banks likely subject to regulatory intervention – is affected by potential regulatory intervention.[7] We next discuss how regulation might affect this relation.

The Impact of Regulation

Regulation provides monitoring and disciplining of the management in banks. A bank whose balance sheet looks too risky to regulators faces considerable pressure to make operational changes and possibly replace management (Demsetz and Lehn 1985). Under the capital requirements for banks by the Federal Deposit Insurance Corporation Improvement Act of 1991 (FDICIA), Tier I capital must exceed 4% of risk-weighted assets and total capital must exceed 8% of risk-weighted assets. If a bank's capital is at or below the minimum capital level, the bank cannot issue more deposits or invest in additional loans (Ahmed et al. 1999). The response by bank regulators to the sub-prime lending crisis, including capital-induced lending constraints, illustrates the importance of

[6] There is also a line of research studying the impact of equity incentives on the likelihood of earnings restatements. See Burns and Kedia (2006) and Efendi et al. (2007) for examples. One benefit of examining earnings restatements is that it is likely subject to less measurement error problems relative to studies that focus on earnings management. The drawback is that inferences from examining restatements are not as generalizable compared to those based on broader measures of earnings management.

[7] Strong banks are not immune to regulation effects. A strong bank can become a weak bank in a general economic downturn. Anticipating such outcomes, strong banks might engage in earnings smoothing. Indeed, Liu and Ryan (2006) find that banks smooth earnings over business cycles.

these regulatory measures.[8]

Banks are subject to a stringent regulatory environment. First, banks are subject to *uniform* federal oversight by the Federal Reserve and the Federal Deposit Insurance Corporation (FDIC).[9] Second, bank regulators receive quarterly call report data from banks and they conduct periodic (surprise) on-site examinations of banks to ensure that they comply with various bank regulations. Third, regulators' examinations go beyond the capital requirements; they examine the quality of the investment and loan portfolios and the adequacy of loan loss provisions. This last point is especially important in our setting, because we use these provisions as our earnings management proxy.

In this paper, we investigate whether such regulatory monitoring influences equity incentive-motivated earnings management. Once regulatory intervention occurs, the company's financial reporting is subject to enhanced scrutiny by regulators, investors, and the SEC. Thus, earnings management is more likely to be detected and the corresponding cost to managers can be substantial. It thus follows that regulatory intervention can deter managers with high equity incentives from engaging in earnings management in a sensitive period, when heightened regulatory intervention is probable.[10]

Indeed some prior studies suggest that when a firm begins to perform poorly, interested parties may increase monitoring of management. In the presence of intense monitoring, incentives and opportunities for accruals management may decline. For

[8] The recent takeover of troubled thrift Indymac Bank provides a good illustration of this scenario (Paletta et al. 2008). See also Eavis (2008) and Storey (2008).

[9] Since 1991, banks have been subject to the provisions of the Federal Deposit Insurance Corporation Improvement Act (FDICIA - http://thomas.loc.gov/cgi-bin/query/z?c102:S.543.ENR:). FDICIA was enacted to address the thrift industry crisis. It recapitalized the Bank Insurance Fund of the Federal Deposit Insurance Corporation (FDIC), expanded the authority of banking regulators to seize undercapitalized banks, revised deposit insurance coverage to link the premiums banks pay for FDIC insurance to their financial strength, and required bank regulators to intervene in restructuring banks and thrifts that fail to meet minimum capital requirements. No such Federal law exists for other industries.

[10] While there is no literature on direct regulatory actions against management, because regulatory screens for increased scrutiny are based on accounting measures that are affected by accounting judgments related to loan loss reserves, at a minimum, regulators exercise an indirect monitoring of earnings management.

example, DeAngelo et al. (1994) find that managers of troubled companies deliberately reduce reported earnings for contractual renegotiations with lenders, unions, government, and/or management.

At the same time, the cost of regulatory scrutiny can also induce managers to manage capital or earnings in order to avoid regulatory intervention. Regulatory intervention is costly to the companies and particularly to managers. Specifically, the potential cost of regulatory intervention to bank CEOs could include (1) lower compensation and potentially the loss of their job, (2) decreased value of option/stock ownership due to the decrease in stock price.[11] Accordingly, managers of regulated companies have incentives to exercise discretion over accruals to meet the regulatory requirements. In this regard, Ahmed et al. (1999) found that loan loss provisions are used for capital management; decreasing loan loss provisions can increase capital ratios as well as earnings. Beatty et al. (2002) document that public banks are more likely to manage earnings to avoid earnings declines compared to private banks. Liu and Ryan (2006) suggest that banks smooth income over the business cycle.[12]

These results suggest that accrual manipulation can postpone regulatory intervention, sometimes for an extended period. As a result, bank CEOs can possibly avoid the cost of regulatory intervention, which likely includes (1) lower compensation and/or job security and (2) lower value of their holdings of the bank's stock and stock-related assets. While the former is probably independent of the level of equity incentives, the latter is a positive function of the size of stock/option portfolio. Thus, CEOs with

[11] For example, if a bank does not maintain enough capital, regulators may limit/curtail lending and/or require the bank to raise additional capital. See Miller (2008) for discussion of the recent example of Washington Mutual in this regard.

[12] Prior research finds similar results in other regulated industries. For example, Gaver and Paterson (2004) find insurance firms manage loss reserves to avoid violating the Insurance Regulatory Information System (IRIS) ratios that are used by regulators for solvency assessment.

higher equity incentives (i.e., more stock and options) stand to lose more in the event of regulatory intervention. Even the likelihood of regulator intervention can adversely affect the bank's stock price and the CEOs' stock/option holdings. As a result, bank CEOs with high equity holdings have stronger incentives to manage earnings in order to avoid regulatory intervention.

Due to these opposing forces, the impact of regulatory intervention on earnings management arising from equity incentives is ultimately an empirical question. Accordingly, our hypothesis is non-directional:

H1: Earnings management is associated with managers' equity incentives in the banking industry.

To better capture the impact of regulatory intervention, our second hypothesis examines whether the equity incentive / earnings management relation varies with the extent of regulatory intervention. Regardless of the direction of the effect of regulatory scrutiny, the effect of regulation on equity incentives induced earnings management will be stronger when the likelihood of regulatory intervention is higher.[13] If regulation induces earnings management, we expect to find a more positive, or less negative, relation between earnings management and equity incentives. However, if regulation mitigates earnings management through increased monitoring, we expect to find a less positive relation between earnings management and equity incentives. Given the ambiguity of any regulatory effects, the second hypothesis is also non-directional:

[13] As documented below, bank manager equity incentives are smaller relative to other industries. Prior bank compensation research documents a relatively weak pay-performance link for banks, which is attenuated when bank managers are monitored less (given more discretion). Furthermore, although equity incentives are low, banks with higher equity pay do exhibit more risk-seeking behavior (see Crawford et al. 1995; Houston and James 1995; and Magnan and St-Onge 1997). Thus, as shown in John et al. (2000), equity incentives could substitute for regulatory capital based monitoring. However, such benefits could be dissipated by equity incentive induced earnings management. While bank managers may have earnings-based bonus plans, we do not examine these incentives, because such tests require bonus plan details (Healy 1985). We leave the study of bonus effects for future research.

H2: The relation between earnings management and equity incentives varies depending on the level of regulatory scrutiny.

III. SAMPLE AND DATA

Table 1 describes the sample selection process. The sample period is constrained mainly by the availability of CEO stock-based compensation from ExecuComp and industry-specific accrual measures at the time of data collection. The initial sample of banks includes all bank-years included in ExecuComp for the period from 1994 to 2005.[14] Requiring data to calculate discretionary loan loss provision, CEO equity incentives, and control variables results in a final sample of 600 firm-year observations from 81 distinct banks (65 commercial banks and 15 saving institutions). However, our sample includes many major banks playing an important role in the U.S. economy, such as Bank of America, Wells Fargo, Mellon Financial, Wachovia, and Washington Mutual. The samples used in the analyses vary in size due to additional data restrictions. In summary, due to data availability of equity incentives, our sample firms are restricted to banks that belong to the S&P1500; as a result, our sample banks are larger and more profitable than other banks and our results may not be generalized to other banks.

[Insert Table 1 here]

Equity incentives

We consider five equity incentive elements: option grants in the current period, unexercisable options, exercisable options, restricted stock grants, and stock ownership. We also aggregate these measures together and calculate the total equity incentives. Thus,

[14] As discussed below, our main proxy for earnings management is discretionary loan loss provisions. To estimate discretionary loan loss provisions, we need current and one-year ahead change in nonperforming assets (NPA). Since NPA is only available since 1993, and up to year 2006 at the time of data collection, we can only calculate the necessary changes in NPA for the period 1994-2005.

our equity incentive measure is a comprehensive one; it includes, but is not limited to, stock-based compensation. Because the potential benefit of increasing short-term stock prices, if any, is shared by all shareholders (whether non-CEO shareholders realize it or not), the benefit enjoyed by CEOs is thus proportional to the ratio of equity incentive measures in shares to total outstanding shares. Accordingly, we deflate all equity incentive measures (in shares) by total outstanding shares of the firm. Cheng and Warfield (2005) argue that this measurement is appropriate and find that using alternative measures leads to the same inferences.

Table 2 reports the descriptive statistics on CEO equity incentive measures for the banks. As indicated in the table, option grants are on average 0.141 percent of outstanding shares. Unexercisable options (excluding option grants) average 0.121 percent. Exercisable options average 0.548 percent. Ownership averages 1.045 percent. As in other industries in this time period, the mean restricted stock grant is small, only 0.011 percent, and the median is zero. The sum of all these elements, total equity incentive, is on average 1.88 percent and has a median of 0.89 percent.

[Insert Table 2 here]

Panel B of Table 2 reports correlations between equity incentive measures. Option grants are significantly correlated with exercisable options and stock ownership. Unexercisable options and exercisable options are significantly positively correlated with each other and with ownership. These significant correlations indicate the importance of including all elements of equity incentives in the analyses; otherwise, the inferences on a specific element (such as the occurrence of option grants) might be biased.[15]

[15] In a sensitivity test, we investigate the impact of individual components of equity incentives. The results are consistent with the main results but generally weaker. This is likely driven by the smaller variation in individual components compared to total equity incentives.

Earnings Management Measure: Discretionary Loan Loss Provision

Following prior research, we measure the extent of earnings management in banks using discretionary loan loss provision.[16] Specifically, as in Beaver and Engel (1996), we use the residual from the following regression model as an estimate of the discretionary component of the loan loss provision (*LLP*):

$$LLP_{i,t} = \gamma_0(1/GBV_t) + \gamma_1 CO_{i,t} + \gamma_2 \Delta LOAN_{i,t} + \gamma_3 \Delta NPA_{i,t} + \gamma_4 \Delta NPA_{i,t+1} + z_{i,t},$$

where GBV_t is net book value of common equity plus total allowance for loan losses; CO_t is loan charge-offs; $\Delta LOAN_t$ is change in total loans ($LOAN_t$-$LOAN_{t-1}$); $\Delta NPA_{i,t}$ is the most recent change in nonperforming assets (NPA_t-NPA_{t-1}); and $\Delta NPA_{i,t+1}$ is one-period-ahead change in nonperforming assets. All variables are deflated by GBV_t. These factors have been shown to affect the level of loan loss provision (e.g., Beaver and Engel 1996).

Specifically, current net charge-offs can provide information about future net charge-offs, which can then affect expectations of the collectibility of current loans. The level of nonperforming assets is an indicator of default risk. Naturally, the magnitude of uncollectable loans increases with the size of loans outstanding. Since the provision is an expense for a period of time, the changes of loans and nonperforming assets are included instead of the level variables. One-year-ahead change in nonperforming assets is used to proxy for information that management has as of year *t* about the default exposure of loans that is not reflected in the other explanatory variables.

Table 3, Panel A presents results of the regression used to estimate discretionary loan loss provision (*DLLP*). The regression is estimated using *all* banks with required data from Bank Compustat and Compustat North America-industry annual file in the

[16] While the allowance has a direct impact on the capital level, which affects whether a bank is subject to potential regulatory scrutiny, loan loss provisions are more subject to management discretion than other components of allowance (e.g., beginning balance, loan charge offs).

period of 1994 to 2005. We use all banks with data in the estimation period to mitigate any effects arising from our sample selection, particularly the requirement on CEO equity incentives. In a sensitivity tests, we also estimate DLLP using our sample only and the results are qualitatively similar. The regression results are consistent with those in Beaver and Engel (1996).

Panel B reports descriptive statistics on DLLP. Negative (positive) DLLP implies upward (downward) earnings management. While both the mean and median of DLLP are very small by construction, the cross-sectional variation is substantial: loan loss provision as a percent of equity is understated by 0.57 percent at the 25th percentile but overstated by 0.35 percent at the 75th percentile.

Proxies for Potential Regulatory Intervention

Following prior research, we use the level of capital ratio to capture the likelihood of regulatory intervention in banks. We obtain the risk-adjusted capital ratio-tier 1 (*CAP_Tier1*) and the risk-adjusted capital ratio-total (*CAP_Total*) from Compustat.[17] Not surprisingly, the capital ratios in the sample are all above the regulatory minimums requirement: the minimum *CAP_Tier1* in our sample is 5.22% and minimum *CAP_Total* is 8.50%. The mean and median of *CAP_Tier1* are 9.93 percent and 9.39 percent, and the mean and median of *CAP_Total* are 13.26 percent and 12.43 percent. We construct a dummy variable, *DCAP*, to indicate whether a bank is close to regulatory intervention for tests of H2: If the capital ratio is in the bottom quartile of the sample, we assign *DCAP* to

[17] Tier 1 capital includes book value of equity, qualifying non-cumulative perpetual preferred stock, and minority interest in equity accounts of subsidiaries (net of goodwill and other intangible assets). Total capital further includes loan loss reserves, perpetual preferred stock, hybrid capital instruments, perpetual debt, mandatory convertible debt securities, term subordinated debt, and intermediate preferred stock.

be 1; otherwise *DCAP* is zero.[18] (The first quartile of *CAP_Tier1* and *CAP_Total* in the sample is 8.01 percent and 11.39 percent.) In the main analyses, we use Tier 1 capital ratio and in a sensitivity test, we use the total capital ratio to construct the DCAP dummy variable.[19]

IV. EMPIRICAL RESULTS

We first report the overall association between equity incentives and earnings management (H1) and then report the impact of potential regulatory intervention on the association of equity incentives and earnings management (H2). We continue with a discussion of additional tests and potential alternative explanations.

Equity Incentives and Earnings management

To test H1, we regress discretionary loan loss provisions on equity incentives and control variables, as follows:

$$\begin{aligned} DLLP_{i,t} &= \gamma_0 + \beta EI_{i,t} \\ &\quad + \gamma_1 EBTP_{i,t} + \gamma_2 CAP\_Tier1_{i,t} + \gamma_3 Size_{i,t} + \gamma_4 Tax_{i,t} + \varsigma_{i,t} \end{aligned} \tag{1}$$

Negative (positive) coefficients on equity incentive measures indicate that bank managers with high equity incentives engage in upward (downward) earnings management. We include income before tax and loan loss provision (*EBTP*), risk-adjusted tier-1 capital ratio (*CAP_Tier1*), firm size (*Size*), and tax (*Tax*) in the regression. These variables are

[18] We also define DCAP based on the yearly distribution of CAP_Tier1 and find similar results. One disadvantage of this approach is that the sample size is small in some years. Also, regulators and investors likely use several years' data to evaluate whether a bank is "close" to the capital requirement; the overall sample distribution is good proxy for the historical distribution. The capital requirement did not change in our sample period.

[19] After 1990, loan loss reserve is not part of Tier 1 capital. Thus, a reduction of loan loss provision can increase earnings and Tier 1 capital by the after-tax amount of the reduction. Since loan loss reserve is still part of total capital, a one dollar reduction of loan loss provision reduces total capital by the tax rate times one dollar. See Ahmed et al. (1999) and Kim and Kross (1998) for more details. Given the opposite impact of loan loss provision changes on Tier 1 capital ratio and total capital ratios, we use Tier 1 capital ratio in the main tests and total capital ratio in a sensitivity test.

used to control for other incentives for discretionary behavior in loan loss provision reporting, as identified in prior research: to smooth reported earnings, to satisfy regulatory capital requirements, and to minimize taxes (Ahmed et al. 1999; Collins et al. 1995; Liu and Ryan 2006; Moyer 1990).[20]

The Appendix describes variable measurements, and Panel B of Table 3 provides the descriptive statistics, of these control variables. As shown in the table, the sample bank-years have on average earnings before tax and provisions of 23.6 percent of total assets, Tier1 capital of 9.9% of total assets. On average, the sample banks are quite large, with an average market value of $10 billion and a median of $2.3 billion. The average tax rate is 33.6%. Panel C provides descriptive statistics separately for banks with DCAP=1 and with DCAP=0. Compared to other banks, banks that are more likely to be subject to regulatory intervention have slightly lower levels of DLLP, similar performance, significantly lower Tier 1 capital ratio by construction, surprisingly high market value (and total assets) and higher tax rate, and similar equity incentives.

Panel D of Table 3 reports the correlation between discretionary loan loss provision, total equity incentives, and the control variables. As expected, DLLP is positively correlated with performance, capital requirement, and firm size. DLLP is marginally significantly correlated with total equity incentives and tax status. Equity incentives are lower for firms with better performance and larger size, and are higher for firms with more capital. Some of the correlations between control variables are significant, but none of them appears large enough to present collinearity problems.

[20] The results on variables of interest are the same when we control for year fixed effects and when we add non-linear terms of capital ratios.

Column (1) of Panel A of Table 4 reports the regression results of equation (1).[21] As indicated in the table, the coefficient on total equity incentives is not significantly different from zero. The coefficient is negative and the two sided p-value is 0.890. This implies that overall bank CEOs with high equity incentives are not more likely to manage earnings upward than those with low equity incentives. This insignificant result might be due to the conflicting effects of regulatory intervention on earnings management, as discussed earlier, and/or earnings management arising from equity incentives is not strong in the banking industry.

[Insert Table 4]

Control variables are in general significantly related to discretionary loan loss provisions. Banks with more net income before tax and loan loss provision tend to overstate loan loss provision, consistent with an earnings smoothing story. The capital requirement is not significantly correlated with DLLP. This result is different from that in prior research. Further investigation suggests that this is due to differences in samples. As mentioned above, our banks are relatively large due to the data requirement of equity incentives. When we estimate equation (1) without including equity incentives using all banks with data available, we find that banks with low capital ratios have lower discretionary loan loss provision (not tabulated). Inconsistent with the tax minimization prediction, we find banks which pay tax understate loan loss provision. Larger banks have lower discretionary loan loss provision.

To summarize, we find that unlike their counterparts in other industries, bank CEOs with higher equity incentives are not more likely to engage in upward earnings management. These results highlight the importance of examining regulated industries,

[21] The results are very similar if we use White-t statistics or if we use the Fama-MacBeth (1973) approach. Also, throughout the analyses, we exclude observations with student-t greater than 3. Not excluding outliers leads to similar results.

because non-regulated industry results may not generalize into regulated industries, possibly due to variation in the effect of regulation. Alternatively, the lack of significant results might due to the lack of power in the test. To distinguish between regulation and lack of power effects, below we examine whether firms that are more likely subject to regulatory intervention have different earnings management behavior from other banks.

The Impact of Potential Regulatory Intervention on the Extent of Earnings Management Arising from Equity Incentives

As discussed above, the relation between earnings management and equity incentives might be stronger for banks with relatively low capital ratios – banks subject to potential regulatory intervention. If regulation induces earnings management, CEOs with equity incentives might want to engage in upward earnings management to avoid regulatory intervention. On the other hand, the relation can be weaker for these banks if the potential regulatory attention deters earnings management, by increasing the likelihood of detecting earnings management practices. To capture this effect, we add an interaction of equity incentives (*EI*) and low capital ratio dummy (*DCAP*) based on risk-adjusted Tier1 capital to regression (1):

$$\begin{aligned} DLLP_{i,t} = {} & \gamma_0 + \beta_0 EI_{i,t} + \beta_1 DCAP + \beta_2 EI_{i,t} \times DCAP_{i,t} \\ & + \gamma_1 EBTP_{i,t} + \gamma_2 CAP\_Tier1_{i,t} + \gamma_3 Size_{i,t} + \gamma_4 Tax_{i,t} + \varsigma_{i,t} \end{aligned} \quad (2)$$

With this specification, the coefficient on *EI*, β_0, now captures the impact of equity incentive for banks with high capital ratios, and the coefficient on the interaction term, β_2, captures the incremental impact of equity incentives for banks with low capital ratios. A negative coefficient on the interaction term indicates that regulation strengthens the earnings management incentive arising from equity incentives; a positive coefficient indicates that regulation weakens the earnings management incentive.

Column (2) in Panel A of Table 4 reports the regression results. The coefficient on the interaction of equity incentives and the low capital ratio dummy, *DCAP,* is significantly negative, suggesting that the relation between equity incentives and earnings management is more negative for banks that have relatively low capital ratios compared to other banks. Since a negative correlation indicates upward earnings management, this result indicates that equity incentives are more likely to induce upward earnings management when banks are closer to capital ratio requirement violations.

The bottom of the table presents the net relation between equity incentives and earnings management for banks with low capital ratios. While the association between total equity incentives and loan loss provision is significantly positive for banks with relatively high capital ratios, it is significantly negative for banks with relatively low capital ratios. This suggests that equity incentives induce downward earnings management in banks with relatively high capital ratios, but upward earnings management in banks with relatively low capital ratios. That is, bank managers with high equity incentives appear to be conservative in accounting estimates when capital ratios are high, but they are more likely to manage earnings upward in bad times, possibly to avoid regulatory intervention. These opposite effects lead to an insignificant relation for the full sample as reported in Column (1) of Table 4, Panel A.

Another interesting result is that DCAP has a significantly positive coefficient, indicating that banks with low equity incentives are more conservative in financial reporting when they are subject to regulator intervention. This result is similar to that in DeAngelo et al. (1994), who find that managers of troubled companies deliberately reduce reported earnings for contractual renegotiations with lenders, unions, government, and/or management. However, the significant negative coefficient on the interaction term

indicates the response to potential regulatory intervention changes with CEO equity incentives: they become more aggressive, or at least less conservative, when equity incentives and regulatory scrutiny are high.

To formally test the impact of potential regulatory intervention on the earnings management in banks with different levels of equity incentives, we use decile ranks of equity incentives with value between 0 and 1, rather than the raw measures, and re-estimate equation (2) in column (3) of Panel A in Table 4. The coefficient on DCAP thus captures the impact of DCAP on DLLP when total equity incentives are in the bottom decile. A positive coefficient (0.420, p=0.007) indicates that for banks with lower equity incentives , those close to regulatory intervention have higher loan loss provision than those that are not close to regulatory intervention. The sum of the coefficients on DCAP and on EI x DCAP capture the effect of DCAP on DLLP for banks with equity incentives in the top decile (when ranked EI=1). As shown in the bottom of the table, the impact of DCAP is significantly negative for banks with equity incentives in the top decile. The sum of the coefficients is -0.497, which is significantly different zero at the 0.005 level. This suggests that when bank CEOs have high equity incentives, they are more likely to manage earnings upward when the capital ratio is low, exactly opposite to the behavior of bank CEOs with low equity incentives in the same situation (low capital ratio).

We hypothesize that bank managers reduce loan loss provisions to increase earnings and thus reduce the likelihood of regulatory intervention. Presumably, the level of earnings performance can affect the results documented above. To check whether this is the case, we add interaction between earnings performance variable (EBTP) with the interaction term between equity incentives and DCAP to equation (2). We also add the interaction between EBTP and both equity incentives and DCAP.

We report the results in Panel B of Table 4 (Column (1) with raw measures of equity incentives (*EI*) and Column (2) with decile ranks of equity incentives). The coefficient on *EBTP*×*EI*×*DCAP* is significantly positive in both regressions, indicating the negative impact of *EI*×*DCAP* on DLLP is weaker when earnings are higher, or stronger when earnings are lower. That is, the regression results confirm the above conjecture: the incentive to decrease the loan loss provision in case of high equity incentives and potential regulatory intervention is stronger for banks with poor earnings performance and weaker for banks with strong earnings performance.[22]

Overall, the association between equity incentives and earnings management is enhanced in banks by potential regulatory intervention, indicating a stronger incentive to avoid such intervention. While regulation may be designed to monitor weak banks and protect depositors, investors, and the banking system, it may also introduce incentives for managers to engage in earnings management to avoid such regulatory intervention. Our analyses indicate that the bank managers' incentives to engage in upward earnings management are strong only when both of the following two conditions are satisfied: (1) bank CEOs have high equity incentives so that their personal welfare is more strongly correlated with bank performance and (2) the capital ratio is close to regulatory minimum.

V. Additional and sensitivity analyses

Equity Incentives, Future Trading, and Earnings Management

Future insider trading has been identified as the underlying link between equity incentives and earnings management in other industries (e.g., Cheng and Warfield 2005; Bergstresser and Philippon 2006). In this section, we investigate whether future insider

[22] Our controls for performance and the related interaction variables should also address the concern that the documented results are driven by any potential relation between equity incentives and bank performance.

trading serves a similar role in our setting. Specifically, we investigate whether future insider trading increases with CEO equity incentives in the banking industry and whether earnings management varies with future insider trading, which can be considered an ex-post measure of managers' incentives to manage earnings and to increase stock prices.

We collect executive trading data from the SEC ownership reporting system data file (Form 3, 4, 5). Following prior research (e.g., Ke et al. 2003), we regard individuals with titles "Chairman of board," "CEO," "President" as CEOs, and we measure CEO trading as net sales:

Net sales = Open market sales - (Open market purchases + Options exercised)

We scale net sales in dollars by the firm's market value at the end of fiscal year t.[23]

We investigate CEOs' net sales in the year after earnings announcement. Net sales, on average, are approximately $1.763 million and represent about 0.068 percent of the firm's market value for bank-years with CEO trading transactions. We assume net sales to be zero for bank-years without CEO trading transactions. We exclude five observations with missing earnings announcement dates; this assumption is appropriate to the extent that the coverage of the database is complete. In a sensitivity test, we include these five observations assuming that their earnings announcement dates are three months after the fiscal year end, and obtain similar results.

We use the following equation to examine the relationship between equity incentives (*EI*) and future trading (*NetSale*):

$$NetSale_{i,t+1} = \gamma_0 + \beta\, EI_{i,t} + \gamma_1 Size_{i,t} + \gamma_2 Growth_{i,t} + \gamma_3 \mathrm{Ret}_{i,t} + \xi_{i,t+1} \quad (3)$$

[23] The deflated net sale measure is a function of (1) the ratio of net sales in shares to total outstanding shares, and (2) stock returns from trading dates to the fiscal year end. Thus, using the market value as the deflator is consistent with using outstanding shares to scale equity incentives. Using logarithm transformations does not affect the inferences.

Variable measurements are described in the Appendix. If more equity incentives lead to increases in future sales by managers, then we expect to observe positive coefficients on *EI*. We include several control variables that might affect future insider selling in the regression so that β captures the relation between equity incentives and "abnormal" selling. Lakonishok and Lee (2001) find that insiders in large firms sell more shares, although in a smaller proportion to market value. Rozeff and Zaman (1998) find that insiders in growth firms sell more shares. Prior returns are included to control for contrarian trading behavior by insiders; insiders tend to sell more shares after high stock returns (Lakonishok and Lee 2001).

The regression results are reported in Panel A of Table 5. Consistent with results for other industries, we find that total equity incentives exhibit a significant and positive coefficient, suggesting that bank CEOs with high equity incentives are more likely to sell in the next year. More importantly, however, when we introduce the regulation effect by adding DCAP and its interaction term with equity incentives, we find that this positive relation is driven by banks with low capital ratios. That is, for banks with low capital ratios, net selling is positively correlated with equity incentives (p=0.001), as reported in the bottom of the table, but the relation is not significant for banks with high capital ratios (p=0.309). This insider trading result fits well with the earnings management results reported in Table 4.

[Insert Table 5 here]

The results on control variables are similar to those in prior research. Size has a significantly negative coefficient in one specification, but not in the other. The coefficient on *Growth* (book to market ratio) is significantly negative as expected. Stock return has positive significant coefficients in both regressions, suggesting that insiders tend to sell

more shares after high stock returns.

Overall, these results suggest that equity incentives lead to future trading, although only when the capital ratio is low, and this trading is likely the fundamental reason for earnings management. Since as researchers, we cannot observe net sales ex ante, we use equity incentives to capture this effect. However, bank CEOs likely know the magnitude of the selling and prepare financial reporting accordingly. Although the ex post measure of net sales capture managers' ex ante incentive with error, as the ultimate transaction price might change, we investigate whether net sales are correlated with earnings management.

To this end, we replace equity incentives in equations (1) and (2) with net sales and report the results in Panel B of Table 5. We find that *NetSale* is significantly and negatively correlated with DLLP, implying that managers who sell most shares in the future are more likely to understate loan loss provisions in order to increase reported earnings. Consistent with the results above, we find that this result is driven by banks with low capital ratios. When we examine regulation effects in column (2), we find that *NetSale* is insignificantly correlated with *DLLP* for banks with high capital ratios, but *NetSale*×*DCAP* has a negative coefficient. The bottom of the table reports the net effect of net sales for banks with low capital ratios: the net effect is negative and significant at the 0.033 level. That is, when the capital ratio is low and potential regulatory intervention is high, bank CEOs who are going to sell more are taking less loan loss provision than their counterparts expected to sell less. (Due to the negative correlation between the coefficient on *NetSale* and *NetSale* ×*DCAP*, the net effect is significant although neither of the two variables have coefficients significantly different from zero.)

In sum, combined with results reported in Table 4, results in Table 5 indicate that

when the capital ratio is low, bank CEOs with high equity incentives are more likely to sell in order to reduce their exposure to the potential regulatory intervention, and this induces earnings management. When the capital ratio is high, bank CEOs with high equity incentives do not exhibit strong selling behavior and, as a result, do not manage earnings upward.

Using the Absolute Value of DLLP

In this section, we examine both the earnings management and subsequent selling tests, with the earnings management variable defined as the absolute value of LLP (|DLLP|). These tests are motivated by the possibility of downward earnings management, possibly to accomplish earnings smoothing. The results are reported in Table 6.

[Insert Table 6 here]

In model 1, we re-examine the relationship between equity incentives and earnings management (either upward or downward adjustments to LLP), and conditional on regulatory capital levels. Consistent with the earlier reported results, equity incentives and |*DLLP*| are positively correlated (albeit at a marginal significance level). Furthermore, the bank capital interaction results indicate that the earnings management incentives are strongest for banks with low capital ratios. For model 2, while *NetSale* is not correlated with |DLLP| for banks with high capital ratios, the relation is significantly positive for banks with low capital ratios. This result is consistent with the signed DLLP tests: earnings management appears in banks with low capital ratios, not for banks with stronger capital. Thus, these follow-up analyses corroborate the earlier reported results and support earnings management incentives in these regulated companies, especially for those most subject to regulatory scrutiny (low capital ratios).

Sensitivity Tests

We conduct a series of sensitivity tests to ensure that our results are robust.

Alternative proxies for potential regulatory attention

We examine whether the results of H2 are sensitive to alternative proxies for potential regulatory attention. Specifically, we define the indicator variable, *DCAP*, in two alternative ways. First, we use a size-based *CAP_Tier1* ratio to construct this dummy variable. Specifically, we rank all observations based on firm size and split the sample into three groups based on size. We then assign the dummy variable to be one for observations with *CAP_Tier1* in the bottom quartile within each size group, and zero otherwise. The creation of this variable controls for size effect; some might argue that large banks are "too big to fail" and the same capital ratio may imply different regulatory intervention for large banks than for small banks. Second, we define the indicator variable based on total risk-adjusted capital ratio. Table 7 reports the regression results based on these alternative proxies. The inferences are similar to those reported in Table 4: bank managers with high equity incentives are more likely to manage earnings (and capital) upward when potential regulatory attention is high.

[Insert Table 7 here]

Alternative proxies for earnings management

In a sensitivity test, we use discretionary allowance for loan loss as the proxy for earnings management and reexamine H1 and H2. Discretionary allowance for loan loss is large in magnitude and it is subject to managers' discretion due to the uncertainty around the estimation of loan losses and the inherent discretion in the accounting for the allowance (Beaver and Engel 1996). Based on untabulated tests, we find the results are

robust to this measure.[24]

Similar to Beatty et al. (2002), we also examined the use of discretionary realized security gains and losses (RSGL), as an earnings management proxy (both signed and in absolute value). In general the results for these tests are not significant at conventional levels. These weaker results may be expected given the loss of approximately 20 percent of the bank-year observations due to additional data constraints and the smaller magnitude of RSGL relative to LLP. In the subsample for which we have data on RSGL, the Q1-Q3 range for RSGL is 0.043 percent (of total assets) and the range for discretionary RSGL is 0.063%. In contrast, the Q1-Q3 range for discretionary loan loss provision is 0.926%, almost 15 times that of discretionary RSGL.

Alternative explanation for the results

An alternative explanation for the difference in the results between banks subject to potential regulatory intervention and other banks is that they might have different levels of equity incentives. For example, it is likely that banks with low capital ratios have higher CEO equity incentives than those with high capital ratios, leading to a significant coefficient on equity incentives for the former but an insignificant coefficient for the latter.

To investigate the validity of this alternative explanation, we compare the total equity incentives between firms subject to potential regulatory intervention and those which are not. We find that the mean of total equity incentives of banks with low capital ratios is 1.93 percent, and the mean of total equity incentives of banks with high capital

[24] We do not use this measure in the main test as we feel an income statement item based measure (i.e., discretionary loan loss provision) is better for capturing the earnings management behavior in a particular period, while the balance sheet based measure (i.e., discretionary allowance for loan loss) captures the accumulated earnings management up to the particular period. The former is better aligned with our theoretical argument.

ratio is 1.87 percent. The difference in the mean, 0.06, is not significantly different from zero. These insignificant differences in mean equity incentives suggest that the differences in earnings management behavior between firms subject to different levels of regulatory intervention is not due to different level of equity incentives, but due to the impact of regulatory intervention.

VI. CONCLUSION

In this paper, we examine the relationship between equity incentives and earnings management in a regulated industry – the banking industry. Prior studies of the relation between equity incentives and earnings management generally exclude financial institutions because managers in these industries may have different motivations to manage earnings due to regulation or other factors. Our research addresses this omission and provides insights into the effects of regulatory intervention on earnings management arising from equity incentives. Moreover, the more reliable measures of management's exercise of discretion over earnings can address the concern that the findings in prior studies are subject to bias arising from measurement errors.

We find that on average bank managers with high equity incentives are not more likely to manage earnings upward, but we find a positive association between equity incentives and upward earnings management in banks with potential regulatory intervention, indicating a stronger incentive to avoid such intervention through earnings management. As in other industries, the underlying link between equity incentives and earnings management is future trading. We find that bank managers with higher equity incentives are more likely to sell in the next year and that this positive relation is primarily driven by banks with low capital ratios. When we directly link CEOs' future selling behavior to earnings management, we find a positive relation between earnings

management and future sales for banks with low capital ratios. In contrast, bank CEOs with high equity incentives and lower regulatory scrutiny do not exhibit strong selling behavior and, as a result, do not manage earnings upward.

Overall, our findings highlight the complexity of the interaction between regulation, equity incentives, and earnings management, as well as the unintended consequences of regulatory intervention. Managers have incentives to engage in upward earnings management when they have high equity incentives and when potential regulatory intervention is high. While regulation may be intended to monitor weak firms and protect investors, depositors, and other stakeholders, such regulation may introduce incentives for managers to engage in earnings management to avoid such regulatory intervention, particularly when executives with significant wealth tied up to the company's stock price.

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APPENDIX
Variable Measurement

A. Equity incentives

$EI_{i,t}$ is the sum of unexercisable options (including option grants), exercisable options, and ownership; it is measured in shares at the end of fiscal year *t*, scaled by the number of outstanding shares; we do not include restricted stock grants since they are very small.

B. Discretionary loan loss provision

$LLP_{i,t}$ = provision for loan losses;
$GBV_{i,t}$ = net book value of common equity, plus total allowance for loan losses;
$CO_{i,t}$ = loan charge-offs;
$\Delta LOAN_{i,t}$ = change in total loans (i.e., $LOAN_{i,t}$-$LOAN_{i,t-1}$);
$\Delta NPA_{i,t}$ = change in nonperforming assets (i.e., NPA_t-NPA_{t-1});
$\Delta NPA_{i,t+1}$ = one-period-ahead change in nonperforming assets (i.e., NPA_{t+1}-NPA_t);
$DLLP_{i,t}$ = discretionary provision for loan losses scaled by *GBV*, in percent;

C. Capital Ratios

$CAP\_Tier\ 1_{i,t}$ = risk-adjusted capital ratio – tier 1;
$CAP\_Total_{i,t}$ = risk-adjusted capital ratio – total;
$DCAP_{i,t}$ = 1 if $CAP\_Tier\ 1_{i,t}$ is in the bottom quartile of the sample, and 0 otherwise;

D. Factors affecting discretionary loan loss provision

$EBTP_{i,t}$ = net income before tax and loan loss provision;
$Size_{i,t}$ = natural logarithm of market value (in million dollars) at the end of fiscal year t;
$Tax_{i,t}$ = income tax expense, divided by net income before tax;

E. Future net sales

$NetSale_{i,t+1}$ = CEO's net sales (in dollars) in the year after the earnings announcement for fiscal year t, scaled by the market value at the end of fiscal year t, where net sales = open market sales - (open market purchases + options exercised);

F. Factors affecting future net sales

$Size_{i,t}$ = natural logarithm of market value (in million dollars) at the end of fiscal year t;
$Growth_{i,t}$ = the book-to-market ratio at the end of fiscal year t;
$Ret_{i,t}$ = buy and hold raw return in the 12 months prior to the earnings announcement for fiscal year t.

Table 1 Sample Selection

This table describes the sample selection process for the sample used to test the relation between earnings management and equity incentives.

	Observations
Initial sample with data on CEO equity incentives from ExecuComp in the period 1994-2005 with the following SIC codes: 6020, 6035, 6036 [*]	1177
Less:	
Bank-years with missing components of equity incentives	69
Bank-years not covered in Bank Compustat	446
Bank-years with missing control variables (capital ratios, EBTP, size, tax)	62
Final sample used in the analyses	600

[*] These are the SIC codes covered in Bank Compustat. Bank Compustat also covers SIC codes 6021, 6022, and 6311, but ExecuComp does not have firms in these industries.

TABLE 2
Descriptive Statistics - Equity Incentives

The descriptive statistics are based on 600 bank-years with data available for equity incentives and discretionary loan loss provisions in the period 1994-2005. Equity incentive measures (in shares) are scaled by total outstanding shares of the firm.

Panel A: Descriptive statistics on CEOs' equity incentives

	Mean	Std.	Q1	Median	Q3
Option grants (%)	0.141	0.220	0.021	0.070	0.145
Unexercisable options (excluding option grants) (%)	0.121	0.345	0.000	0.050	0.139
Exercisable options (%)	0.548	0.711	0.105	0.286	0.645
Restricted stock grants (%)	0.011	0.035	0.000	0.000	0.007
Ownership (%)	1.045	1.723	0.112	0.321	1.265
Total equity incentives (EI) (%)	1.883	2.414	0.396	0.893	2.617

Panel B: Spearman and Pearson correlations between equity incentive measures
The lower triangle reports Spearman correlations and the upper triangle reports Pearson correlations.

	Option grants	Unexercisable options (excluding option grants)	Exercisable options	Ownership	Total equity incentives
Option grants		0.033	0.431	0.319	0.457
		(0.415)	(0.001)	(0.001)	(0.001)
Unexercisable options (excluding option grants)	0.045		0.130	0.143	0.280
	(0.274)		(0.001)	(0.001)	(0.001)
Exercisable options	0.480	0.162		0.417	0.665
	(0.001)	(0.001)		(0.001)	(0.001)
Ownership	0.315	0.104	0.490		0.937
	(0.001)	(0.011)	(0.001)		(0.001)
Total equity incentives	0.446	0.229	0.697	0.919	
	(0.001)	(0.001)	(0.001)	(0.001)	

TABLE 3
Descriptive Statistics - Discretionary Loan Loss Provision and Control Variables

Panel A reports the results of regression used to estimate discretionary loan loss provision. Panels B and C report descriptive statistics of the 600 firm-years with data on equity incentives and discretionary loan loss provisions in the period 1994-2005. Please see the Appendix for variable measurement.

Panel A: Estimation of discretionary loan loss provision (DLLP)

DLLP refers to the residual of the following regression:

$$LLP_{i,t} = \gamma_0(1/GBV_t) + \gamma_1 CO_{i,t} + \gamma_2 \Delta LOAN_{i,t} + \gamma_3 \Delta NPA_{i,t} + \gamma_4 \Delta NPA_{i,t+1} + z_{i,t}.$$

Please see the Appendix for variable measurement. All variables are deflated by GBV_t. The regression is estimated using all banks with required data from Bank Compustat and Compustat North America-industry annual in the period of 1994 to 2005. There are 4,962 number of observations and the adjusted R-square is 0.853.

	$1/GBV_t$	$CO_{i,t}$	$\Delta LOAN_{i,t}$	$\Delta NPA_{i,t}$	$\Delta NPA_{i,t+1}$
Coefficients	0.097	1.006	0.005	0.080	0.017
t-statistics	12.36	135.53	27.15	15.76	3.65

Panel B: Descriptive statistics of DLLP and control variables

	Mean	Std.	Q1	Median	Q3
DLLP (%)	-0.096	1.198	-0.573	-0.087	0.353
EBTP	0.236	0.066	0.191	0.235	0.277
CAP_Tier1	9.927	3.163	8.005	9.385	11.300
Market value (in millions)	10,030	21,584	975	2,303	9,339
Size (log of market value)	8.015	1.472	6.882	7.742	9.142
Tax	0.336	0.047	0.318	0.339	0.360

Panel C: Descriptive statistics by DCAP

	Financially weak banks (banks with DCAP=1)		Financially strong banks (banks with DCAP=0)		t-stat for the difference
	Mean	Median	Mean	Median	in means
DLLP (%)	-0.219	-0.217	-0.055	-0.067	-1.45
EBTP	0.237	0.232	0.235	0.236	0.30
CAP_Tier1	7.077	7.235	10.877	10.235	-14.91
Market value (in millions)	13,036	4,747	9,029	2,060	1.97
Size (log of market value)	8.374	8.465	7.895	7.631	3.49
Tax	0.354	0.348	0.331	0.335	5.31
Total equity incentives (%)	1.930	0.707	1.867	0.945	0.28

TABLE 3 (cont'd)

Panel D: Spearman and Pearson correlation between variables used in correlation
The lower triangle reports Spearman correlations and the upper triangle reports Pearson correlations.

	DLLP	Total equity incentives	EBTP	CAP_Tier1	Size	Tax
DLLP		0.047	0.255	0.020	-0.099	-0.120
		(0.246)	(0.001)	(0.621)	(0.015)	(0.003)
Total equity incentives	0.066		0.035	0.033	-0.427	0.025
	(0.105)		(0.388)	(0.413)	(0.001)	(0.536)
EBTP	0.279	-0.095		-0.102	0.202	-0.061
	(0.001)	(0.020)		(0.012)	(0.001)	(0.134)
CAP_Tier1	0.109	0.152	-0.040		-0.287	-0.087
	(0.008)	(0.001)	(0.329)		(0.001)	(0.033)
Size	-0.120	-0.556	0.225	-0.318		-0.149
	(0.003)	(0.001)	(0.001)	(0.001)		(0.001)
Tax	-0.086	0.125	-0.008	-0.164	-0.170	
	(0.035)	(0.002)	(0.853)	(0.001)	(0.001)	

TABLE 4
Equity Incentives and Earnings Management

This table reports the coefficients and the accompanying p-value of the following regression:

$$DLLP_{i,t} = \gamma_0 + \beta EI_{i,t} + \gamma_1 EBTP_{i,t} + \gamma_2 CAP\_Tier1_{i,t} + \gamma_3 Size_{i,t} + \gamma_4 Tax_{i,t} + \varsigma_{i,t} \quad (1)$$

$$DLLP_{i,t} = \gamma_0 + \beta_0 EI_{i,t} + \beta_1 DCAP + \beta_2 EI_{i,t} \times DCAP_{i,t} + \gamma_1 EBTP_{i,t} + \gamma_2 CAP\_Tier1_{i,t} + \gamma_3 Size_{i,t} + \gamma_4 Tax_{i,t} + \varsigma_{i,t} \quad (2)$$

DLLP is in percent. This regression is estimated using 600 firm-years with data available for equity incentives and discretionary loan loss provisions in the period 1994-2005. The p-value in parentheses is based on two-sided t-tests. Please refer to the Appendix for variable measurement. Column (3) uses the decile ranks of EI standardized to the range [0,1].

Panel A reports results from the regression estimation of equations (1) and (2). Panel B reports the results after adding to equation (2) the interaction terms between EBTP and three variables: EI, DCAP, and EI and DCAP.

Panel A: Tests of H1 and H2

	Overall effect of equity incentives (EI) (1)	The effect of EI conditional on DCAP - using raw measure of EI (2)	The effect of EI conditional on DCAP - using decile ranks of EI (3)
Intercept	0.825	1.090	1.137
	(0.072)	(0.018)	(0.022)
Total Equity Incentives (EI)	-0.004	0.038	0.167
	(0.838)	(0.046)	(0.289)
DCAP		0.246	0.420
		(0.037)	(0.007)
EI × DCAP		-0.178	-0.917
		(0.001)	(0.001)
EBTP	4.301	3.835	3.853
	(0.001)	(0.001)	(0.001)
CAP_Tier 1	0.000	-0.012	-0.012
	(0.986)	(0.391)	(0.410)
Size	-0.143	-0.162	-0.160
	(0.001)	(0.001)	(0.001)
Tax	-2.387	-2.209	-2.472
	(0.003)	(0.007)	(0.003)
N	584	585	586
Adj. R^2	0.116	0.135	0.117
Net effect of Equity Incentives for banks with low capital ratio			
$\beta_0 + \beta_2$		-0.139	-0.750
		(0.001)	(0.002)
Net effect of DCAP for banks with high equity incentives			
$\beta_1 + \beta_2$			-0.497
			(0.005)

TABLE 4 (cont'd)

Panel B: Analyses conditional on firm performance

	The effect of EI conditional on DCAP - using raw measure of EI	The effect of EI conditional on DCAP - using decile ranks of EI
Intercept	1.185	0.978
	(0.012)	(0.063)
Total Equity Incentives (EI)	0.214	1.378
	(0.001)	(0.015)
DCAP	0.469	1.456
	(0.279)	(0.017)
EI × DCAP	-0.501	-3.507
	(0.001)	(0.001)
EBTP	4.842	6.074
	(0.001)	(0.001)
EBTP × EI	-0.731	-5.038
	(0.003)	(0.026)
EBTP × DCAP	-0.747	-4.041
	(0.655)	(0.087)
EBTP × EI × DCAP	1.413	11.066
	(0.001)	(0.004)
CAP_Tier 1	-0.012	-0.015
	(0.388)	(0.286)
Size	-0.169	-0.170
	(0.001)	(0.001)
Tax	-3.046	-3.263
	(0.001)	(0.001)
N	587	586
Adj. R^2	0.144	0.132

TABLE 5
Equity Incentives, Net Sales, and Earnings Management

Panel A: Equity incentives and net sales

This table reports the results from regressing CEOs' net sales (%) in the one year period after earnings announcements on equity incentives and control variables:

$$NetSale_{i,t+1} = \gamma_0 + \beta EI_{i,t} + \gamma_1 Size_{i,t} + \gamma_2 Growth_{i,t} + \gamma_3 \text{Ret}_{i,t} + \varsigma_{i,t} \quad (3)$$

$$NetSale_{i,t+1} = \gamma_0 + \beta_0 EI_{i,t} + \beta_1 DCAP_{i,t} + \beta_2 EI_{i,t} \times DCAP_{i,t} + \gamma_1 Size_{i,t} + \gamma_2 Growth_{i,t} + \gamma_3 \text{Ret}_{i,t} + \varsigma_{i,t} \quad (4)$$

The estimation of this regression is based on 595 bank-years with data available in the sample period 1994-2005. The p-values in parentheses are based on two-sided t-tests. Please refer to the Appendix for variable measurement.

	Predicted Signs	Overall effect of equity incentives (1)	The effect of equity incentives conditional on DCAP (2)
Intercept	?	0.129	0.069
		(0.003)	(0.111)
EI	+	0.008	0.003
		(0.001)	(0.309)
DCAP	?		-0.066
			(0.001)
EI × DCAP	?		0.061
			(0.001)
Size	+	-0.010	-0.001
		(0.016)	(0.806)
Growth	-	-0.052	-0.078
		(0.083)	(0.011)
Stock returns	+	0.031	0.046
		(0.080)	(0.009)
N		595	595
Adj. R^2		0.051	0.230
Net effect of Equity Incentives for banks with low capital ratio			
$\beta_0 + \beta_2$ for total equity incentives			0.064
			(0.001)

Panel B: Net sales and earnings management

This table reports the results from regressing discretionary loan loss provisions (%) on CEOs' net sales (%) in the year after earnings announcements and control variables:

$$DLLP_{i,t} = \gamma_0 + \beta_0 NetSale_{i,t+1} + \beta_1 DCAP_{i,t} + \beta_2 NetSale_{i,t+1} \times DCAP_{i,t} + \gamma_1 EBTP_{i,t} + \gamma_2 CAP\_Tier\ 1_{i,t} + \gamma_3 Size_{i,t} + \gamma_4 Tax_{i,t} + \varsigma_{i,t} \quad (5)$$

This regression is estimated based on 595 bank-years with data available in the sample period 1994-2005. The p-value in parentheses is based on two-sided t-tests. Please refer to the Appendix for variable measurement.

	Overall effect of equity incentives (1)	The effect of equity incentives conditional on DCAP (2)
Intercept	0.880	0.896
	(0.046)	(0.043)
NetSale	-0.208	0.058
	(0.081)	(0.802)
DCAP		0.016
		(0.876)
NetSale × DCAP		-0.360
		(0.180)
EBTP	4.287	4.304
	(0.001)	(0.001)
CAP_Tier 1	0.001	-0.001
	(0.941)	(0.972)
Size	-0.153	-0.154
	(0.001)	(0.001)
Tax	-2.330	-2.351
	(0.004)	(0.005)
N	595	595
Adj. R^2	0.117	0.117
Net effect of NetSale for banks with low capital ratio		
$\beta_0 + \beta_2$		-0.302
		(0.030)

Table 6
Sensitivity Tests of H2: Using the absolute value of DLLP

$$ABS(DLLP)_{i,t} = \gamma_0 + \beta_0 EI_{i,t} + \beta_1 DCAP + \beta_2 EI_{i,t} \times DCAP_{i,t} + \gamma_1 EBTP_{i,t} + \gamma_2 CAP\_Tier1_{i,t} + \gamma_3 Size_{i,t} + \gamma_4 Tax_{i,t} + \varsigma_{i,t} \quad (6)$$

$$ABS(DLLP)_{i,t} = \gamma_0 + \beta_0 NetSale_{i,t+1} + \beta_1 DCAP_{i,t} + \beta_2 NetSale_{i,t+1} \times DCAP_{i,t} + \gamma_1 EBTP_{i,t} + \gamma_2 CAP\_Tier1_{i,t} + \gamma_3 Size_{i,t} + \gamma_4 Tax_{i,t} + \varsigma_{i,t} \quad (7)$$

ABS(DLLP) is the absolute value of DLLP and it is in percent. This regression is estimated using 600 firm-years with data available for equity incentives, net sales, discretionary loan loss provisions, and control variables in the period 1994-2005. The p-value in parentheses is based on two-sided t-tests. Please refer to the Appendix for variable measurement.

	Using Equity Incentives (1)		Using Net Sales (2)	
	Overall effect of equity incentives	The effect of equity incentives conditional on DCAP	Overall effect of net sales	The effect of net sales conditional on DCAP
Intercept	0.363	0.275	0.584	0.562
	(0.281)	(0.421)	(0.068)	(0.077)
EI	0.041	0.026		
	(0.001)	(0.070)		
EI × DCAP		0.062		
		(0.017)		
Net Sales			0.289	-0.178
			(0.001)	(0.285)
Net Sales × DCAP				0.635
				(0.001)
DCAP		-0.091		-0.055
		(0.292)		(0.459)
EBTP	-0.217	-0.166	-0.144	-0.180
	(0.603)	(0.694)	(0.728)	(0.663)
CAP_Tier 1	-0.024	-0.020	-0.026	-0.025
	(0.007)	(0.053)	(0.004)	(0.014)
Size	-0.016	-0.003	-0.029	-0.027
	(0.470)	(0.879)	(0.137)	(0.174)
Tax	1.925	1.816	1.747	1.830
	(0.001)	(0.003)	(0.003)	(0.002)
N	585	586	580	580
Adj. R^2	0.054	0.058	0.052	0.066
Net effect of Equity Incentives or Net Sales for banks with low capital ratio				
$\beta_0 + \beta_2$		0.088		0.457
		(0.001)		(0.001)

Table 7
Sensitivity Tests of H2: Alternative Proxies for Regulatory Intervention

This table reports the coefficients and the accompanying p-value of the estimation of regression (3) using two alternative proxies for regulatory intervention:

$$DLLP_{i,t} = \gamma_0 + \beta_0 EI_{i,t} + \beta_1 DCAP_{i,t} + \beta_2 EI_{i,t} \times DCAP_{i,t} + \gamma_1 EBTP_{i,t} + \gamma_2 CAP\_Tier1_{i,t} + \gamma_3 Size_{i,t} + \gamma_4 Tax_{i,t} + \varsigma_{i,t} \quad (2)$$

DLLP is in percent. The indicator variable for potential regulatory intervention, *DCAP*, is defined as follows:

- Column (1): *DCAP* is 1 for banks with Tier1 capital ratio in the bottom quartile of the corresponding size group, where size groups are classified based on the quartiles of market value each year;
- Column (2): *DCAP* is 1 for banks with total capital ratio in the bottom quartile of the sample distribution each year.

This regression is estimated using 600 bank-years with data available in the sample period 1994-2005. The p-value in parentheses is based on two-sided t-tests. Please refer to the Appendix for variable measurement.

	Proxies for regulatory intervention	
	Low size-adjusted Tier 1 capital ratio	Low total capital ratio
	(1)	(2)
Intercept	0.918	0.940
	(0.052)	(0.046)
EI	0.018	0.008
	(0.393)	(0.667)
DCAP	0.180	0.097
	(0.133)	(0.389)
EI × DCAP	-0.086	-0.074
	(0.013)	(0.040)
EBTP	4.160	4.314
	(0.001)	(0.001)
CAP_Tier 1	-0.002	-0.003
	(0.900)	(0.830)
Size	-0.152	-0.150
	(0.001)	(0.001)
Tax	-2.438	-2.540
	(0.004)	(0.002)
N	600	600
Adj. R^2	0.116	0.116
Net effect for low capital ratio banks		
$\beta_0 + \beta_2$	-0.068	-0.066
	(0.021)	(0.044)