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Deregulation and the Relationship Between Bank CEO Compensation and Risk-Taking

Elijah Brewer III, William Curt Hunter and William Jackson III

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by

Elijah Brewer III
Research Department, 11th Floor
230 S. LaSalle Street
Federal Reserve Bank of Chicago
Chicago, Illinois 60604-1413
(312)-322-5813
E-mail ebrewer@frbchi.org

William Curt Hunter
Dean and Distinguished Professor of Finance
School of Business
University of Connecticut
2100 Hillside Road, Unit 1041
Storrs, CT 06269-1041

and

William E. Jackson III
Kenan-Flagler Business School
Campus Box 3490
McColl Building
University of North Carolina
Chapel Hill, North Carolina 27599-3490
(919)-962-3214
E-mail wej3@unc.edu

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Abstract

Deregulation and the relationship between bank CEO compensation and risk-taking

The deregulation of the banking industry during the 1990s provides a natural (public policy) experiment for investigating how firms adjust their executive compensation contracts as the environment in which they operate becomes relatively more competitive. Using the Riegle-Neal Act of 1994 as a focal point, we investigate how banks changed the equity-based component of bank CEO compensation contracts. We also examine the relationships between equity-based compensation and risk, capital structure, and investment opportunity set. Consistent with theoretical predictions, we find that after deregulation, the equity-based component of bank CEO compensation increases significantly on average for the industry. Additionally, we find that more risky banks have significantly higher levels of equity-based compensation, as do banks with more investment opportunities. But, more levered banks do not have higher levels of equity-based CEO compensation. Finally, we observe that most of these relationships become more powerful in our post-deregulation period.

1. Introduction

As Kole and Lehn (1999) point out, our understanding of the dynamics of corporate governance structures is very limited. We do not know very much about how the governance structures of firms change in response to systemic changes in their operating environments.[1] The ability of a firm to adjust to changes in its environment is critical to its survival. However, it is common for researchers to presume that the firms that survive in competitive markets simply possess optimal governance structures and not consider how those structures came into existence (Kole and Lehn, 1999). As a firm's operating environment changes, especially if the new environment is more competitive, the firm either adapts its governance structures accordingly, or the firm exits the market.

This is the essence of competition. As firms fight for profits, the competitive paradigm makes some very clear predictions about outcomes. That is, strong performers will pass the market test and therefore survive, while weak performers should shrink, exit, or sell out. This transfer of market share from underperformers to more successful firms is a critical part of the process. However, as Stiroh and Strahan (2003) point out, this stylized picture is not always the reality. Regulations and other barriers to entry can, and often do, protect inefficient firms, limit entry and exit, and overall prevent the natural consequences of the competitive process.

[1] Bliss and Rosen (2001) are among the first to examine how changes in firm's operating environment could have an impact on the structure of CEO compensation. They examine the relationship between mergers and CEO compensation during 1986-1995, a period marked by frequent mergers and systemic changes in banks operating environment. They find that size--no matter how acquired--adds to CEO compensation both in cash and equity forms of compensation. In addition, they find that banks where CEOs receive more equity-based compensation (restricted shares and option grants) are less likely to acquire other banks. The implication is that equity-based compensation tends to provide incentive for bank CEOs to engage in activities that are value-enhancing.

Until the Riegle-Neal Act of 1994, restrictions on interstate banking were still fairly common in the U.S. These restrictions served to shield some banks from outside competition and thus created many small distinct banking markets (Stiroh and Strahan, 2003).

However, the deregulation associated with the Riegle-Neal Act served to increase the trend of interstate acquisitions and statewide branch banking. This created a more competitive environment by allowing banks to enter new markets and challenge incumbent banks. Stiroh and Strahan (2003) document that this type of deregulation of banking markets allowed high performing banks to increase their market share at a much faster pace after the deregulation. Thus, these competitive reallocation effects will transfer assets to better performers after deregulation.

In this paper, we use the deregulation of the U.S. banking industry as a reference point to examine changes in the incentive contracts of bank CEOs. We consider deregulation to be an exogenous shock that changes the fundamental relationships that prescribe the optimal executive compensation contract. Thus, we consider the deregulation of the banking industry during the 1990s to provide a natural experiment for investigating the dynamics of corporate governance structures (Becher, Campbell, and Frye, forthcoming).

Like Macey and O'Hara (2003), we focus on executive compensation and banks for two reasons. First, banks play a major monitoring role themselves that supposedly helps mitigate the agency problems optimal executive compensation contracts are developed to resolve. And, second, because of the special liquidity production function banks perform and the provision of fixed-rate deposit insurance by bank regulators, banks

may face a more complex set of agency problems than other firms (John, Saunders, and Senbet, 2000). Thus, a better understanding of executive compensation in banking may provide deep and insightful inferences about optimal executive compensation contracts in many other industries, or organizational settings.

The remainder of the paper is organized as follows. Section 2 provides some background on executive compensation. Section 3 presents our set of hypotheses and discusses the theoretical (and empirical) executive compensation literature that informs our hypotheses. Section 4 describes the data and methodology. Our empirical results are reported in section 5. And, section 6 summarizes the findings and offers conclusions.

2. Background

Chief executive officer (CEO) compensation has recently come under increased public and congressional scrutiny. The use of equity-based compensation (i.e., stock options and restricted stock) to motivate executives has been a major focus of this debate. The resulting concerns have led to demands for greater transparency in executive stock option programs and, possibly, to elimination of the programs altogether. Those calling for the elimination of stock options claim that they are a poor way to measure an executive's contribution to firm performance. This claim, however, is inconsistent with the empirical research literature on executive compensation. Murphy (1985) and Jensen and Murphy (1990) find a positive and statistically significant relationship between the level of pay and performance.[2] In this article, we examine the relationship between the

[2] While they find a positive and statistically significant relationship between the pay of top-level executives and firm performance, Jensen and Murply (1990) indicate that the sensitivity of pay per dollar change in shareholder wealth is small for an occupation in which incentive pay is expected to play an important role. The pay-performance sensitivity for CEOs varies by size of the firm. For CEOs in firms in the top half of their sample (ranked by market value), the pay-performance sensitivity is $1.85 per $1,000 change in shareholder wealth, while for CEOs in firms in the bottom half of their sample, the pay-performance sensitivity is $8.05 per $1,000.

structure of CEO compensation and banking organizations' financial characteristics from 1992 to 2000. Over this nine-year period, a number of regulatory changes have afforded banking organizations a greater degree of managerial discretion and incentive to use equity-based compensation.[3] Deregulation increases the CEO's investment opportunity set and could make it difficult for shareholders to evaluate the executive's actions, thus exaggerating the information asymmetry problems between executives and shareholders. In such an atmosphere of greater degree of managerial discretion, there is no assurance that the self-interested behavior of CEOs will conform to that expected by shareholders.

Equity-based compensation contracts that give the executive a share in the outcome of his actions could encourage executives to expend efforts to take actions that are expected by shareholders (Prendergast, 2002). To some extent the incentive to use equity-based compensation contracts increased in the 1990s with the relaxation of state and federal restrictions on banks' activities. For example, the Reigle-Neal Interstate Banking and Branching Efficiency Act of 1994 allows banks to branch interstate by consolidating existing out-of-state bank subsidiaries or by acquiring banks or individual branches through mergers and acquisitions.[4] Brook, Hendershott, and Lee (1998) claim that a more active takeover market can help solve the agency problems inherent in the separation of ownership and control in publicly traded corporations because both explicit and implicit takeover threats can motivate CEOs to take actions that maximize

[3] Smith and Watts (1992) argue that the degree of managerial discretion is inversely related to the degree of regulation.

[4] Prior to the Reigle-Neal Act, federal and state laws prevented banks from expanding across state lines (with some exceptions). One exception was that a banking organizations could conduct interstate banking operations through "nonbank banks"--those that do not meet the definition of a bank. Banks are commonly defined as institutions that both accept demand deposits and make commercial loans. The Reigle-Neal Act allows bank holding companies to acquire banks in any state, effective September 29, 1995, and allows mergers between banks located in different states beginning June 1, 1997. Unless states individually opt out of this branching authority or choose to adopt an earlier starting date.

shareholder value. On the other hand Stein (1988) shows that the combination of information asymmetries between CEOs and investors and takeover threats could make a CEO's optimal investment strategy myopic, causing him to take actions that may not conform to that expected by shareholders.

Brook, Hendershott, and Lee (1998) find large positive abnormal returns for banking organizations around the adoption of the Reigle-Neal Act. They estimate that these abnormal returns equate to about an $85 billion increase in the market value of equity for the banking industry. This result is consistent with the notion that a more active takeover market made possible by the Reigle-Neal Act is perceived by shareholders as providing net benefits because it encourages CEOs to maximize shareholder value.

Beginning in 1987, the Board of Governors of the Federal Reserve System began to permit banking organizations to form separately capitalized security subsidiaries to underwrite corporate debt and equity securities under the Section 20 provisions of the Banking Act of 1933 (i.e., the Glass-Steagall Act). However, these subsidiaries' revenue could not amount to more than 5 percent (increased later to 10 percent and then 25 percent) of the total revenue generated by the banking organization. The Financial Services Modernization Act of 1999 (Gramm-Leach-Bliley Act), extends this authority and allows banks, securities firms, and insurance companies to be owned by the same holding company. Product deregulation expands the investment opportunities for banking organizations. Concerns about the relationship between risk and performance produced Glass-Steagall. If these concerns are valid when commercial banking organizations have both banking and underwriting subsidiaries, we expect to see changes in performance and

compensation that is tied to this performance. For example, Cornett, Ors, and Tehranian (2002) find that the accounting- and market-based performance of banking organizations that established Section 20 subsidiaries increased significantly more than banking organizations that did not have Section 20 subsidiaries. Thus, it appears that the initial alliances between commercial banking and investment banking have resulted in significant positive performance changes, and these changes could alter the optimal structure of CEO pay.[5]

Despite the extensive research devoted to chief executive officers' pay and performance, there are only a few studies addressing these issues in the banking industry. Banking is an industry in which regulation plays a major role, so moves to relax these regulations may have a significant impact on the relationship between CEO pay and performance. For example, Crawford, Ezzell, and Miles (1995) and Hubbard and Palia (1995) find that bank CEOs' pay-performance sensitivity has increased significantly due to deregulation in the banking industry. Furthermore, Houston and James (1995) compare bank CEOs pay-performance with non-bank CEOs' pay-performance. They find that bank CEOs have lower pay-performance sensitivity than non-bank CEOs. Barro and Barro (1990) find that bank CEOs' pay-performance sensitivity diminishes with CEOs experience. All of these studies, however, use data from periods well before the deregulatory events considered in this study.

This study adds to the growing literature on bank CEO compensation by

[5] Fields and Fraser (1999) provides evidence whether banking organizations that have Section 20 subsidiaries have pay-performance compensation schemes that are like those used by investment banks. They find that pay-performance sensitivities for those banks once they begin securities underwriting are very similar to the sensitivities of non-Section 20 organizations.

investigating the impact of banking deregulation on executive incentive compensation contracts. In particular, we ask three questions: First, does equity-based compensation as a fraction of total compensation increase in the post-Reigle-Neal deregulatory environment? Second, does equity-based compensation as a fraction of total compensation increase or decrease with risk, leverage, and growth opportunities? And, third, does equity-based compensation as a fraction of total CEO compensation increase for banking organizations with Section 20 subsidiaries?

3. Testable hypotheses

The theoretical literature suggests that the structure of CEO compensation should be a function of the firm risk, leverage, size, and growth opportunities (John and John, 1993; Aggarwal and Samwick, 1999; John, Saunders, and Senbet, 2000; Hermalin and Wallace, 2001; Prendergast, 2002). It is well known that because shareholders hold residual claims on earnings, their interests will often diverge from those of creditors of the firm. Shareholders will have incentives to purchase some projects with negative net present values if the increase in the shareholders' option value from accepting these projects is sufficient enlarged. This is because shareholders keep all the gains if the investments are winners, and they share the losses with creditors if the investments are losers. Because of this option-like payoff for shareholders, especially of highly levered firms, a CEO compensation structure that is relatively more equity-based may better serve to align the interest of the CEO with that of the firm's shareholders.

While shareholders have incentives to increase risk and leverage, there are offsetting costs that weigh against these incentives. Jensen and Meckling (1976) suggest that CEOs receive private benefits from control of the firm. Because a CEO has an

undiversifiable stake in the firm that employs her human capital, she has an incentive to reduce risk in order to protect this stake (Jin, 2002). In addition, the firm's creditors (depositors) will require compensation for bearing increased risk and higher leverage in the form of a higher return on their funds, or restrict the amount of their investment, or both. Thus, the willingness of CEOs to invest in negative net present value (NPV) projects is held in check by their desire to protect their undiversified stake in the firm and the concern of creditors for the safety of their funds. This suggests that a CEO compensation structure that is relatively less equity-based can serve as a commitment device to hold in check the willingness of CEO to invest in negative NPV projects (John and Qian, 2003). This suggests that the creditors of firms with relatively low capital levels will tend to prefer CEO compensation structures that are relatively less equity-based.

However, if the creditors operate under the protection of a federal deposit insurance system, then one element of this restraint will be negated. Since depositors' funds are insured, depositors do not have any incentive to impose discipline on the use of their funds. The deposit insurer, as the guarantor of deposits, serves the role of creditor to the banking organization. So long as a greater premium is not charged for bearing risk, or covenants are not imposed to prevent excessive risk-taking, banking organizations will use deposits to engage in riskier activities than would otherwise be possible. Merton (1977) develops a framework for analyzing the cost of deposit insurance and evaluating the deposit insurer's liability. Buser, Chen, and Kane (1981) indicates that providing deposit insurance at less than its market value provides federally insured depository institutions with a subsidy. The subsidy is equal to the difference between the cost of

deposits in the absence of deposit insurance and the cost of insured deposits including the deposit insurance assessment.

Many researchers, including Merton (1978), Kane (1985), and Brickley and James (1986), have indicated that a federally insured depository institution has, in addition to the tangible assets on the balance sheet, a valuable "intangible" asset in the form of access to underpriced, fixed-premium deposit insurance. The capitalized value of the subsidy is imbedded in the firm's common stock price. As long as the premium charged for insurance is less than the amount needed to compensate the deposit insurer for the exposure to risk, then expansion into riskier activities may enhance a banking organization common stock returns because risk-taking is subsidized. This behavior is referred to as the *Moral Hazard hypothesis* in Houston and James (1995) and the *FDIC hypothesis* in Crawford, Ezzell, and Miles (1995). The *Moral Hazard/FDIC hypothesis* predicts that CEOs of banking organizations with higher risk will receive a higher proportion of their overall compensation in the form of equity-based pay. This is because increased risk increases the value of the executive's equity position. On the other hand, this hypothesis predicts that executives of banking organizations with low risk will have a higher proportion of overall compensation in the form of cash-based pay. This is because such executives are like fixed-claimants. Thus, increased risk will increase their exposure to financial distress without an offsetting increase in expected benefits.

The effect of geographic and product deregulation on bank CEO's compensation structure depends on which activities are permitted, which activities banking organizations invest in, how these activities mix with other assets, and how the activities are managed. Allowing banking organizations to expand geographically and into

investment banking activities expands the efficient risk/return frontier available to firms. The expanded efficient risk/return frontier provides banking organizations' CEOs with more growth opportunities. Smith and Watts (1992) suggest that a CEO's actions are less readily observable if the firm has more growth opportunities. It is probably reasonable to assume that a firm's CEO knows more than shareholders and outside board members about the firm's projects and prospects. The greater is the investment opportunities that are available to CEOs the more difficult it will be to observe their investment choices. In such an atmosphere of asymmetry, there is no assurance that the self-interest behavior of the CEO will conform to that expected by shareholders. To align the interest of the CEO with that of shareholders, the firm could tie managerial compensation to the effect of the CEO's action on firm value. Equity-based compensation contracts giving CEOs a share of the outcome of their actions encourage them to explore newer investment opportunities to increase the possibility of large payoffs (Prendergast, 2002). The conjecture that greater growth opportunities are correlated with relatively more equity-based compensation is referred to as the *contracting hypothesis* by Smith and Watts (1992).

The above arguments give rise to the following five hypotheses:

H1: Equity-based compensation as a fraction of total compensation (*EBC*) increases with performance. This hypothesis tests the contracting hypothesis of Smith and Watts (1992). Empirical studies relate compensation to performance because of the incentive effects of pay on managerial actions (e.g., Jensen and Murphy, 1990; and Mehran, 1995).

H2: *EBC* increases (or decreases) with financial leverage. This provides a test of the Moral Hazard hypothesis. Increases in financial leverage can lead to lower EBC because it may prevent managers from taking poor projects.

H3: *EBC* increases (decreases) with risk. Like *H2*, this provides a test of the Moral Hazard Hypothesis. Holmstrom and Milgrom (1987) suggest that EBC for a risk-averse manager should be inversely correlated with firm risk.

H4: *EBC* is higher in the post-deregulation environment.

H5: *EBC* is higher for banking organizations with relatively more activities/revenue from Section 20 subsidiaries.

In the next two sections, we develop a methodology and test these hypotheses.

4. Methodology and data

A. Methodology

To develop a test of the above hypotheses regarding the impact of banking firm's financial characteristics on *EBC*, we specify the following regression model, similar to Houston and James (1995):

$$EBC_{j,t} = \alpha_0 + \alpha_1 PERFORMANCE_{j,t-1} + \alpha_2 LEVERAGE_{j,t-1} + \alpha_3 RISK_{j,t-1} + \alpha_4 SIZE_{j,t-1} + \varepsilon_{j,t} \quad \textbf{(1)}$$

where $PERFORMANCE_{j,t-1}$ is a measure of a banking organization's market- or accounting-based performance and is captured by two variables: the market value of equity divided by the book value of equity and net income divided by total assets; $LEVERAGE_{j,t-1}$ is a measure of a banking organization's leverage and is captured by two variables: one minus the book value of equity divided by the book value of total assets and total deposits divided by total assets; $RISK_{j,t-1}$ is the variance of daily stock return

within a year; $SIZE_{j,t-1}$ is the value of total assets divided by 1000; and $\varepsilon_{j,t}$ is an error term.[6]

In the above specification a positive α_1 implies that *EBC* increases with growth opportunities; a positive α_2 that *EBC* increases with financial leverage; a positive (negative) α_3 that *EBC* increases (decreases) with risk; and a positive α_4 that *EBC* increases with the size of the banking firm.

Risk Hypothesis

Regulation in banking has traditionally focused on controlling risk-taking by imposing minimum capital requirements and by limiting banks' asset and liability choices. However, the FDIC Improvement Act of 1991 (FDICIA) expanded regulatory oversight and included the compensation policies toward senior management. Houston and James (1995) suggest that FDICIA was in response to a direct recognition by regulators that compensation contracts in banking be structured to provide CEOs with excessive risk-taking incentives to exploit the provision of fixed-rate deposit insurance. And John, Saunders, and Senbet (2000) develop a model in which executive compensation contracts serve to mitigate the moral hazard problem inherent in bank regulation. Implicitly, they suggest that optimal bank executive compensation contracts may be a substitute for regulation.

Nonetheless, the sign of the relationship between risk and incentive compensation as yet is still hotly debated in the literature. For example, in most agency models, such as Aggarwal and Samwick (1999), the outcome is a negative relationship between risk and

[6] Most previous work on executive compensation has generally used one of two functional forms to estimate the relationship between compensation and firm size (Murphy, 1998, has a discussion of the different approaches). The first approach is to regress the dollar value of compensation on the dollar value

incentive compensation. However, Prendergast (2002) argues that risk (or uncertainty) has another impact on incentive compensation that may lead to a positive correlation between incentive compensation and risk. Prendergast (2002) suggests that uncertain environments result in relatively more delegation of responsibilities, and that this delegation of responsibilities in turn generates an environment in which incentive compensation is based relatively more on outputs. Thus, uncertainty and incentive pay are positively related.

In the only other empirical study of incentive based bank CEO compensation that includes a control variable for risk, Houston and James (1995) report no significant relationship between risk and incentive compensation. However, their data is from the 1980s. And, the banking industry today is far different from that of the 1980s.

Based on the conflicting theoretical evidence, we have no priors about the sign of our risk measure.

The Deregulation Hypothesis

To investigate the impact of deregulation on *EBC*, our specification includes an indicator variable DEREG as a variable measuring the period after the passage of Reigle-Neal Interstate Banking and Branching Efficiency Act in 1994. The coefficient on DEREG summarizes the impact of deregulation on *EBC*, allowing us to investigate whether geographical deregulation provided incentives for banking organizations to use relatively more equity-based compensation. To measure the effect on *EBC* of allowing banking organizations to expand into investment banking activities, our specification also includes a variable to capture the activities of Section 20 subsidiaries. Since, Section 20

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of firm size. The second approach is to regress the log of compensation on the log of size. Murphy says that there is no theoretical reason to prefer one approach to the other.

subsidiaries generate noninterest revenue we capture this activity isolating traditional noninterest revenue and nontraditional noninterest revenue. Traditional noninterest revenue is income from fiduciary activities plus service charges on deposit accounts. Nontraditional sources of noninterest revenue are all other noninterest revenue (e.g., income from Section 20 activity).

Permitting banking organizations to engage in investment banking activities using Section 20 subsidiaries expands their efficient risk/return frontier. The expanded efficient risk/return frontier provides banking organizations' CEOs with more growth opportunities. Thus, one may interpret the coefficient on nontraditional noninterest revenue as capturing how past Section 20 activities are reflected in CEO compensation structure.

To account for each of the above factors, an expanded model is used. We write the expanded model as an equation (2):

$$EBC_{j,t} = \alpha_0 + \alpha_1 PERFORMANCE_{j,t-1} + \alpha_2 LEVERAGE_{j,t-1} + \alpha_3 RISK_{j,t-1} + \alpha_4 SIZE_{j,t-1} + \alpha_5 NONTRADNOINT_{j,t} + \alpha_6 TRADNOINT_{j,t-1} + \alpha_7 DEREG_t + \varepsilon_{j,t} \quad \textbf{(2)}$$

$NONTRADNOINT_{j,t-1}$ is nontraditional sources of noninterest revenue (e.g., income from Section 20 activity); $TRADNOINT_{j,t-1}$ is traditional sources of noninterest revenue (e.g., fees from deposit services); and $DEREG_t$ is a Reigle-Neal binary variable that is equal to one after 1996, zero otherwise.

The use of equity-based compensation increased during the sample period. To incorporate this dynamic effect, we estimated pooled cross-sectional time series regression equations. Equation (2) is estimated with firm fixed-effects.

B. Data

The data used in this paper are for 100 banking organizations whose compensation data was found in Standard & Poor's Compustat ExecuComp database. These compensation data are based on each banks' publicly filed proxy statements. The data include measures of short-term compensation, such as base pay and annual bonus; and measures of long-term compensation, such as long-term incentive plans, restricted stock, and the value of options granted (using an approximation of the Black-Scholes option pricing method). Accounting data used in this study was obtained from bank holding company *(BHC) Y9* reports. The Center for Research in Security Prices (CSRP) database provides the stock market data. Our sample contains 621 firm-year observations. Equity-based compensation is measured as the value of option grants plus the value of restricted stock grants divided by the sum of salary, bonus, the value of option grants, and the value of restricted stock grants.

To obtain our measures of *RISK*, we use daily stock market data. For each year in the sample period, estimates of the variance of each banking organization's equity returns are made using data covering the twelve-month period ending with the last month of the year. Financial leverage (*LEVERAGE*) is estimated as one minus the ratio of book market value of capital to total assets. We also use the ratio of total deposits to total assets as a measure of financial leverage because several of the components in the first measure of leverage are included in the regulatory definition of total capital. PERFORMANCE is captured by two measures: *TOBINQ,* computed as the ratio of market to book value of the firm's equity, and ROA, computed as the ratio of net income to total assets. *SIZE* is total assets divided by 1000. Thus, the coefficient α_4 captures how

a million dollars change in total assets influences *EBC*.7 TRADNOINT is income from fiduciary activities plus fees from deposit services divided by total revenue. NONTRADNOINT is all other noninterest income divided by total revenue.

Table 1 provides a list of banking organizations authorized by the Board of Governors of the Federal Reserve System to engage in securities underwriting, the year such securities underwriting may be conducted through a Section 20 subsidiary, and the average asset over the sample period. The average size ranges between $4 and $337 billion over the 1992-2000 period.

CEOs are paid in many different ways. For some CEOs, salary accounts for only a small part of their compensation. Managers may also receive performance-related bonuses, restricted shares, and stock options. We want to test the relationship between managerial compensation, deregulation and Section 20 activity. We also want to distinguish between cash- and equity-based compensation, since the incentives for a manager to increase firm value depend on whether pay is related to such value creation. Following others such as Hubbard and Palia (1995), we break compensation into two parts: cash-based (salary plus bonus) and equity-based (value of newly granted restricted shares granted and stock options).

Table 2 shows that over the 1992-2000 period real average cash-based compensation ranges between $1.2 to $2 billion (reported in 1982-84 dollars) for banking organizations with Section 20 subsidiaries and between $580,000 and $708,000 for other organizations. Cash-based compensation represents between 25% and 63% of total new

7 We also included an asset growth variable in the empirical specifications. In none of the regression equations was this variable statistically significant. Thus, we do not report those results.

compensation for banking organizations with Section 20 subsidiaries and between 34% and 66% for other organizations. Compensation varies widely across banking organizations and time, which is not surprising since most of our banking organizations grew significantly over the sample period. Even after normalizing compensation for asset size, there is still a wide variation. For banking organizations with Section 20 subsidiaries, total compensation ranges from $0.0564 to $0.1366 per thousand dollars of assets, while cash compensation ranges from $0.0353 to $0.0434 per thousand dollars of assets. For other banking organizations, total compensation ranges from $0.1284 to $0.2689 per thousand dollars of assets, while cash compensation ranges from $0.0848 to $0.1094 per thousand dollars of assets.

Figure 1 presents additional information on how the compensation structure has changed over the 1992 and 2000 sample period. Equity-based compensation as percent of direct compensation is reported for both banking organizations with Section 20 subsidiaries and those without Section 20 subsidiaries. Three findings are worth noting. First, equity-based compensations as a percent of direct compensation (*EBC*) is increasing over the years: in 1992, *EBC* was 30%; that percentage was about 53% by 2000. Banking organizations with Section 20 subsidiaries tend to have on average higher *EBC* than other firms. In fact, over our sample period, average equity-based compensation as a percent of direct compensation was 49% for Section 20 banking organizations and 37% for non-Section 20 firms. Third, in the period after 1994, it appears that *EBC* at non-Section 20 firms is increasing at a slightly faster rate than that at Section 20 banking organizations. For example, *EBC* of Section 20 banking organizations average 55.72 percent over the 1995-2000 period, about 15.15 percent

more than over the 1992-1994 period; *EBC* of non-Section 20 banking organizations average 41.97 percent over the 1995-200 period, about 17.02 more than over the 1992-1994 period. Thus, it appears that non-Section 20 firms are increasing the use of equity-based compensation at a faster rate than Section 20 firms.

5. Empirical results

We estimate equation (2) to examine the correlation between equity-based compensation and characteristics of banking organizations. Table 3 reports the summary statistics for the variables used in our regression specifications. Table 4 presents the results of these pooled cross-sectional time series regression using annual data from 1992 to 2000. Regression (1) of table 4 uses the market-to-book value ratio as the performance measure and the ratio of total deposit to total asset as the leverage measure to examine the correlates between equity-based compensation and the firm's financial characteristics.

The results in column (1) are is consistent with the results of prior research. Like Houston and James (1995), we find that *EBC* is significantly and positively correlated to the market-to-book value ratio. This result is consistent with the hypothesis that banking organizations with greater investment opportunities are more likely to rely on equity-based incentives. We also find a negative but insignificant correlation between leverage and *EBC*. The positive coefficient on the risk variable (measured by the variance of stock returns) suggests that equity-based incentives increase with the level of risk taking. *EBC* is positively but insignificantly correlated with a banking organization's size.

Column (2) reports the results using return on assets as the performance measure. This variable is positively correlated with *EBC*, but it is insignificant at the conventional levels. Column (3) reports the results using the market-to-book value ratio as the

performance measure, but one minus the ratio of book market value of capital to total assets as the leverage measure. Like the ratio of total deposits to total asset, this ratio is negatively, but insignificantly correlated with *EBC*. Column (4) replaces the market-to-book value ratio in column (3) with the return on assets. Again, this variable is not significantly correlated with *EBC*.

Overall, the Reigle-Neal indicator variable is positive, consistent with the increased use of equity-based incentives after the passage of Interstate Banking and Branching Efficiency Act in 1994. This is consistent with the findings of Kole and Lehn (1999) who study the impact of deregulation on the airline industry.

The variable capturing Section 20 activity, nontraditional noninterest revenue divided by total revenue, is positive and statistically significantly correlated with *EBC*, suggesting that CEOs of banking organizations with higher than average nontraditional noninterest revenue (e.g., from activities of Section 20 subsidiaries), on average, have significantly more equity-based compensation. Cornett, Ors, and Tehranian (2002) find that a banking organization's performance following the establishment of Section 20 subsidiaries improved relative to a control group of banking organizations that did not establish Section 20 subsidiaries. As indicated in figure 2, banking organization with Section 20 subsidiaries tend to have relatively more revenue from nontraditional noninterest sources. Since Section 20 activities generate nontraditional noninterest revenue, our results are consistent with the conjecture that CEOs of Section 20 banking organizations captured some of these gains in the form of higher equity-based compensation relative to CEOs of non-Section 20 firms.

6. Conclusion

One of the fundamental components of corporate governance is a well-designed CEO compensation package. However, very little attention has been paid to how executive compensation structures adjust to major public policy induced changes in firms operating environments.

This paper examines CEO equity-based compensation in the banking industry using 1992-2000 data. This time period captures perhaps the most significant deregulation that has ever occurred in the banking industry (Calomiris, 2000). Additionally, the use of equity-based compensation (i.e., stock options and restricted shares) to motivate executives has recently come under increased public and congressional scrutiny. The resulting concerns have led to demands for greater transparency in executive stock option programs and, possibly, to elimination of the programs altogether because they are claimed to be a poor way to measure an executive's contribution to firm performance. Over the nine-year period that we examine a number of regulatory changes have afforded banking organizations a greater degree of managerial discretion and incentive to use equity-based compensation. Deregulation increases the CEO's investment opportunity set and could make it difficult for shareholders to evaluate the executive's actions, thus exaggerating the information asymmetry problems between executives and shareholders. In such an atmosphere of greater degree of managerial discretion, there is no assurance that the self-interested behavior of CEOs will conform to that expected by shareholders (Prendergast, 2000). In addition, beginning in 1987, the Board of Governors of the Federal Reserve System began to permit banking organizations to form separately capitalized security subsidiaries to underwrite corporate

debt and equity securities under the Section 20 provisions of the Glass-Steagall Act. This deregulation expands the investment opportunities for banking organizations. In this paper, we document a positive correlation between the nontraditional noninterest sources of revenue, including revenue from Section 20 activity, and the use of equity-based compensation. This positive association is consistent with Smith and Watts (1992) conjecture that greater investment opportunities are correlated with relatively more equity-based compensation to align the interest of CEOs and shareholders. We also document a higher percentage of equity-based compensation in the period after the passage of the Reigle-Neal Interstate Banking and Branching Efficiency Act of 1994. Thus, banking organizations appear to respond to geographical deregulation by providing relatively more equity-based incentives to better align CEOs' incentives with those of shareholders. This is consistent with the theoretical argument of Prendergast (2002) and the empirical findings of Kole and Lehn (1999).

Further research will investigate how the fundamental relationships between equity-based compensation and risk, leverage, and investment opportunities changed after deregulation.

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Figure 1
The distribution of equity-based compensation as a percent of direct compensation by year

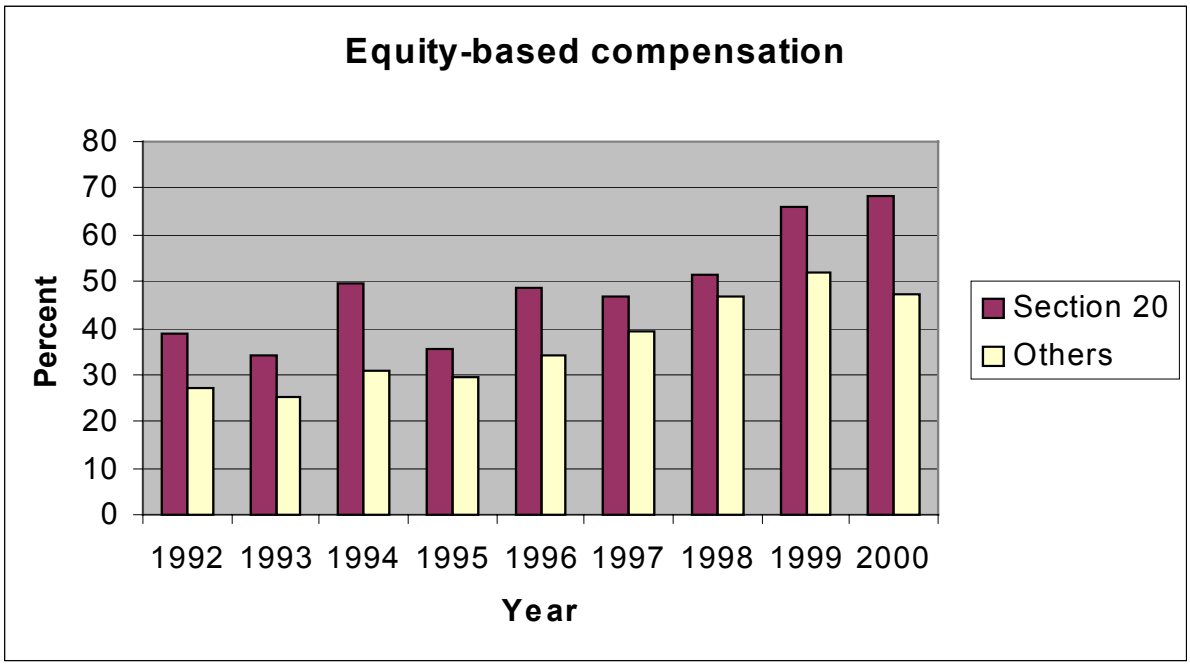
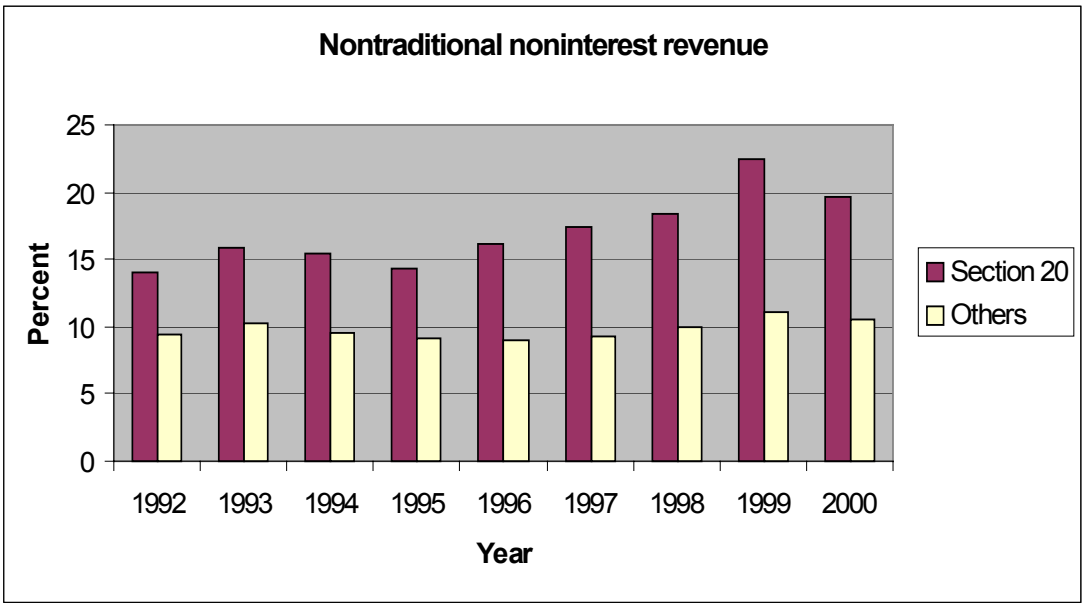


Figure 2
The distribution of noninterest revenue by year

Traditional noninterest revenue is income from fiduciary activities plus service charges on deposit accounts. Nontraditional noninterest revenue is all other noninterest revenue.

A. Nontraditional noninterest revenue



B. Traditional noninterest revenue

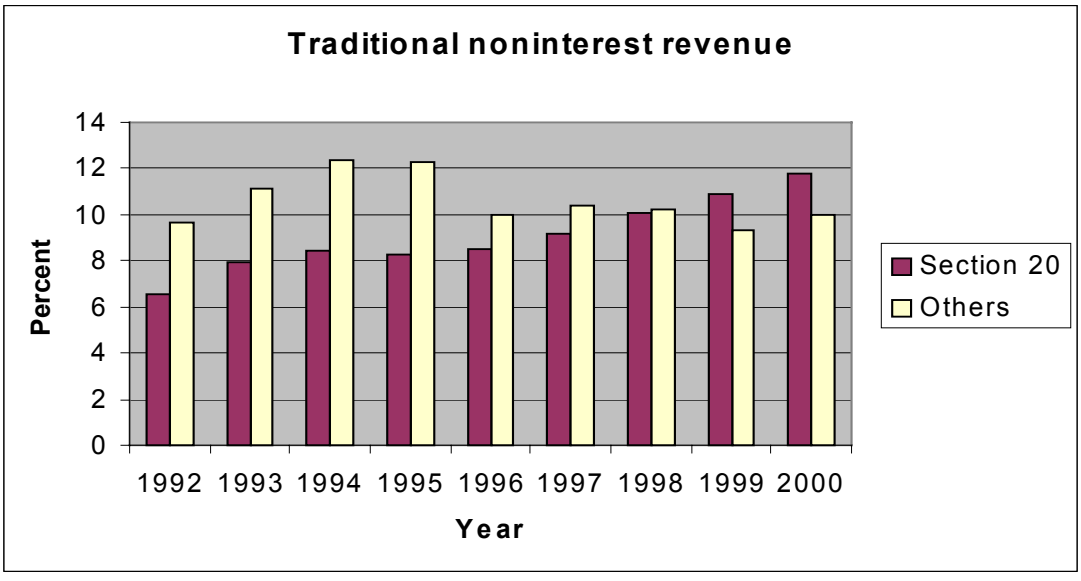


Table 1
Bank holding companies with Section 20 subsidiaries

	Initial Order	Average total assets (billion of dollars)
Bankers Trust New York Corporation	4/87	108
Citicorp	4/87	254
J.P. Morgan & Company	4/87	198
Chase Manhattan Corporation	5/87	438
Chemical New York Corporation	5/87	161
PNC Financial Corporation	7/87	71
First Interstate Bancorp	10/87	53
Bank of Boston Corporation	8/88	53
First Chicago Corporation	8/88	56
Fleet/Norstar Financial Group	10/88	97
Huntington Bancshares Incorporated	11/88	24
Barnett Banks, Inc.	1/89	40
NationsBank Corporation	5/89	159
Southtrust Corporation	7/89	62
First Union Corporation	7/89	149
Norwest	12/89	121
Banc One Corporation	7/90	149
Dauphin Deposit Corporation	6/91	5
Synovus Financial Corporation	9/91	10
BankAmerica Corporation	3/92	229
National City Corporation	2/94	70
SunTrust Banks Inc.	8/94	62
First of America Bank Corporation	10/94	23
Mellon Financial Corporation	4/95	47
Bank of New York Co Inc.	6/96	69
KeyCorp	2/96	81
Corestates Financial Corporation	8/97	33
BB&T Corporation	9/97	46

Table 2 Deregulation and CEO compensation

This table reports means for various components of CEO compensation for banking organizations with Section 20 subsidiaries. All data are from ExecuComp. The p-value reports the significance of the difference between the two sample means. All dollar values are in thousands; and converted to 1982-84 dollars using the Consumer Price Index for All urban Consumer (CPI-U). Total cash compensation is the sum of salary and bonus. Total equity-based compensation is the sum of the value of stock options granted and stock shares granted. Total compensation is the sum of total cash compensation and total-equity based compensation. The percentage of equity-based compensation (EBC) is total equity-based compensation divided by total compensation.

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Cash Compensation									
Section 20	1,221.63	1,655.34	1,363.28	1,379.91	1,685.10	2,025.98	1,729.28	1,919.58	2,005.21
Others	580.33	610.54	595.70	665.97	637.69	675.90	696.69	707.92	696.08
P-value	*0.0000*	*0.0010*	*0.0000*	*0.0008*	*0.0011*	*0.0003*	*0.0014*	*0.0019*	*0.0297*
Equity-based Compensation									
Section 20	993.56	1,120.08	1,860.83	809.42	1,715.90	2,546.85	2,326.85	4,187.67	6,046.35
Others	395.58	309.13	434.42	412.95	668.52	732.50	1,273.59	1,395.12	1,160.96
P-value	*0.0148*	*0.0259*	*0.0016*	*0.0097*	*0.0077*	*0.0117*	*0.0322*	*0.0149*	*0.0384*
Total Compensation									
Section 20	2,215.19	2,775.41	3,224.12	2,189.34	3,401.99	4,572.75	4,055.50	6,107.25	8,051.56
Others	975.91	919.67	1,030.11	1,078.92	1,306.21	1,408.48	1,970.28	2,103.04	1,857.04
P-value	*0.0013*	*0.0011*	*0.0002*	*0.0004*	*0.0003*	*0.0004*	*0.0029*	*0.0049*	*0.0177*
Compensation per thousand dollars of total assets									
Cash									
Section 20	0.0372	0.0434	0.0397	0.0353	0.0358	0.0401	0.0381	0.0389	0.0383
Others	0.0904	0.0966	0.0924	0.1058	0.1094	0.1090	0.0962	0.0919	0.0848
P-value	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0000*	*0.0002*	*0.0062*
Equity-based									
Section 20	0.0224	0.0222	0.0375	0.0211	0.0361	0.0517	0.0547	0.0859	0.0982
Others	0.0374	0.0437	0.0528	0.0641	0.1019	0.1100	0.1727	0.1449	0.1153
P-value	*0.0373*	*0.0301*	*0.1928*	*0.0053*	*0.0434*	*0.0443*	*0.0453*	*0.1987*	*0.6934*

Table 3 Deregulation and CEO compensation, continuation

	1992	1993	1994	1995	1996	1997	1998	1999	2000
Total									
Section 20	0.0596	0.0655	0.0772	0.0564	0.0729	0.0918	0.0929	0.1248	0.1366
Others	0.1284	0.1403	0.1452	0.1699	0.2113	0.2190	0.2689	0.2368	0.2002
P-value	*0.0000*	*0.0000*	*0.0002*	*0.0000*	*0.0003*	*0.0004*	*0.0063*	*0.0484*	*0.0305*
% EBC									
Section 20	38.70	34.26	49.79	35.61	48.58	46.58	51.30	66.02	68.32
Others	27.18	25.07	30.81	29.63	34.08	39.44	46.65	51.72	47.13
P-value	0.0109	0.0553	0.0001	0.2218	0.0068	0.2499	0.4761	0.0073	0.0025

Table 3
Summary statistics, selected accounting and market variables, 1992-2000

	Mean	Median	Standard deviation
Equity- based compensation	39.0006	38.1637	24.0766
Market-to-book value	2.0178	1.7319	1.4944
Net income divided by total assets)	1.0874	1.1398	0.4893
(One minus book capital divided by total assets)	92.2346	92.3582	1.4944
Deposit-to-total assets	72.9102	74.7226	11.0508
Standard deviation of stock returns	0.3307	0.2560	0.2808
Traditional noninterest revenue divided by total operating income	11.0754	9.3556	6.7235
Nontraditional noninterest revenue divided by total operating income	10.1985	8.2561	7.9325
Total assets	$41.4 billion	$17.6 billion	$66.0 billion

Table 4
Correlates between CEO's equity-based compensation and firm financial characteristics

This table reports the regression results of correlating EBC and banking organization's financial characteristics using the following equation:

$$EBC_{j,t} = \alpha_0 + \alpha_1 PERFORMANCE_{j,t-1} + \alpha_2 LEVERAGE_{j,t-1} + \alpha_3 RISK_{j,t-1} + \alpha_4 SIZE_{j,t-1} + \alpha_5 NONTRADNOINT_{j,t} + \alpha_6 TRADNOINT_{j,t-1} + \alpha_7 DEREG_t + \varepsilon_{j,t}$$

The dependent variable is the percentage of EBC for CEOs. The percentage of equity-based compensation (EBC) is total equity-based compensation divided by total compensation. $PERFORMANCE_{j,t-1}$ is captured by two variables: the market value of equity divided by the book value of equity and net income divided by total assets. $LEVERAGE_{j,t-1}$ is captured by two variables: one minus the book value of equity divided by the book value of total assets and total deposits divided by total assets. $RISK_{j,t-1}$ is the variance of daily stock return within a year; $SIZE_{j,t-1}$ is the value of total assets divided by 1000; $NONTRADNOINT_{j,t-1}$ is nontraditional sources of noninterest revenue (e.g., income from Section 20 activity); $TRADNOINT_{j,t-1}$ is traditional sources of noninterest revenue (e.g., fees from deposit services); $DEREG_t$ is a Reigle-Neal binary variable that is equal to one after 1996, zero otherwise; and $\varepsilon_{j,t}$ is an error term. Number of firm-year observations is 621. Numbers in parentheses below the coefficient estimates are t-statistics. The t-statistics are starred if the regression coefficients are significantly different from zero at the 10 (*), 5(**), and 1 (***) percent level.

	(1)	(2)	(3)	(4)
Performance measures				
Market-to-Book	4.7930 (3.79)***		5.1150 (4.01)***	
Net income-to-Total Assets		3.6737 (1.48)		3.6675 (1.46)
Leverage measures				
Deposit-to-Total Assets	-0.2052 (-1.03)	-0.2283 (-1.13)		
(One minus Book capital divided by total assets)			-1.2422 (-1.27)	-0.3674 (-0.37)
Risk	5.9650 (1.78)*	11.1052 (2.80)***	7.1981 (2.01)**	11.1762 (2.73)***
Size	0.00002 (0.43)	0.00001 (0.29)	0.00003 (0.75)	0.00002 (0.57)
Nontraditional noninterest revenue divided by total revenue	1.2515 (3.93)***	1.2893 (3.94)***	1.2831 (4.15)***	1.3774 (4.35)***
Traditional noninterest revenue divided by total revenue	-0.4271 (-0.84)	-0.0855 (-0.17)	-0.5976 (-1.16)	-0.1505 (-0.30)
Reigle-Neal binary	6.4521 (2.68)***	10.7818 (5.17)***	6.2703 (2.60)***	11.4107 (5.68)***
R-square	0.5261	0.5149	0.5266	0.5138