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THE DETERMINANTS OF EXECUTIVE COMPENSATION IN THE COMMERCIAL BANKING INDUSTRY

by

David A. Romer, B.S., M.B.A.

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Business Administration

COLLEGE OF ADMINSTRATION AND BUSINESS
LOUISIANA TECH UNIVERSITY

May 2006

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We hereby recommend that the dissertation prepared under our supervision by David A. Romer entitled The Determinants of Executive Compensation in the Commercial Banking Industry be accepted in partial fulfillment of the requirements for the Degree of Doctor of Business Administration - Finance

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ABSTRACT

The primary purpose of this study is to examine the viability of two basic theories of compensation to explain executive compensation in the banking industry. The two executive compensation motivation theories are sales/sales growth maximization and profit/shareholder wealth maximization. Overall, strong support is found for both theories. This research also seeks to significantly expand, compared to previous research, the number of banks investigated. This study succeeds, with over a four-fold increase in the number of banks analyzed, including over 330 banks not previously used in the literature. This investigation is further motivated by the paucity of banking studies on compensation and that recent banking compensation research ignores the sales/sales growth maximization theory.

This study tests three different definitions of CEO compensation. They are total compensation, annual cash compensation, and options awarded. The period of time under investigation is 1998-2004. The primary source of bank CEO compensation data is SNL Financial L.P., which breaks down compensation into its component parts of base salary, bonus, other cash compensation, non-cash compensation, and

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value of options granted. Standard and Poor's Research Insight (Compustat North America) provides the source for the various market-based and accounting-based performance measures used in this study. A one-way, fixed-effects, unbalanced panel model is used to analyze the data.

In summary, when using the entire data set, this study strongly supports the viability of both theories of CEO compensation for each of the three tested definitions of CEO pay. Next, the data set is split into larger banks, representative of bank samples of earlier research, and smaller banks, previously excluded from research. These two sub-samples of banks yielded very different pay-performance linkages when analyzing total pay and option pay. In general, for the larger banks, less support is found for the profit or shareholder wealth maximization theory. In this research, scale of operations dominates other linkages between pay and performance. Smaller banks show stronger linkages to pay than larger banks.

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DEDICATION

I dedicate this dissertation to the most wonderful person in my life, my wife, Gail H. Romer. Her unwavering support, encouragement, and especially her prayers are essential in making this accomplishment possible, and to the so very few that continued to believe in me.

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CHAPTER 1

INTRODUCTION

Background and Motivation

An executive compensation package should motivate the manager while aligning the manager's actions with the owner's (Fama, 1980). This need results from the condition that employee/managers serve as agents of atomistic owners, the shareholders, (Jensen & Meckling, 1976). In the banking industry, regulators monitor managerial behavior such that the need for shareholder monitoring might be lessened. Confirming evidence comes from Houston and James (1995) and Collins, Blackwell, and Sinkey (1995) who find that bank executive compensation may be explained, at least in part, by a bank's regulator-mandated investment opportunity set.

However, shareholders' and regulators' primary goals may differ. The Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991 is an example in which regulators may be pursuing one goal, safety, while owners prefer another goal, high returns. In such cases, owners will need to design incentive packages to align managers' interest with that of the owners, instead of the regulators.

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One technique that may achieve convergence of manager and owner interests is a "profit-sharing" plan through which executive compensation is contingent upon corporate financial performance (Harris & Raviv, 1979). For owners to successfully align owner and manager interests, linkages between observable performance variables and manager compensation must be determined. There are two basic executive compensation motivation theories, sales/sales growth maximization and profit/shareholder wealth maximization, which can be used to find these linkages.

The purpose of this study is to examine the viability of these two basic theories of compensation to explain executive compensation in the banking industry. Generally treated as competing theories, the two theories of executive compensation may in fact be complementary. The sales/sales growth maximization theory suggests that sales revenue growth is the primary managerial objective because it leads to a larger firm, resulting in an increase in prestige and perk consumption for management (see Baumol, 1959, 1962 and 1967). Under sales/sales growth maximization, managers seek job security, perks, and prestige ahead of maximizing shareholders' wealth and, as such, a positive relationship exists between compensation and sales.

The profit/shareholder wealth maximization theory holds that competitive market forces plus the structure of compensation contracts align managers' and shareholders' interests. Thus, firms not

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using compensation structures encouraging profit/shareholder wealth maximization would be prone to be less efficient and more susceptible to failure. Accordingly, there should be a positive relationship between executive compensation and bank performance/shareholder wealth.

Statement of Problem

It is only during the period from the early 1960s through the 1980s that compensation research explicitly tests both the profit/shareholder wealth maximization and sales/sales growth maximization theories. Results for both theories are mixed, with perhaps slightly more support for the profit/shareholder wealth maximization theory. The greatest deficiencies in studies during this period are that the definition of total compensation includes only cash components and only one study includes any banks. Moving through the 1990s to the present, options, stock, and other fringe benefits are also incorporated into the definition of total compensation. However, during this later period tests of the sales/sales growth maximization theory are dropped. Studies on banks do not appear until the early to middle 1990s, by which time none explicitly include variables to test the sales/sales growth maximization theory. Results of research using banks during this period are mixed for the profit/shareholder wealth maximization theory. Results often differ solely on what variable is included in the statistical model, accounting-based or market-based. Non-banking studies tend to use market-based measures of changes

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in shareholder wealth with greater frequency as the decade passes. Accounting-based variables are used less frequently but do not disappear altogether. A weakness of most bank studies is the relatively small data sets that are used.

Objectives

From the preceding paragraphs, the first objective of the current study is established. The first objective of this study is to utilize the two theories, profit/shareholder wealth maximization and sales/sales growth maximization, to explain total CEO compensation in the banking industry. This objective is relevant because: 1. there is a paucity of banking studies on compensation, 2. the recent banking studies only include one of the compensation theories, 3. it is time to revisit the sales/sales growth maximization theory, which just disappears from the compensation literature in the early 1990s, 4. previous studies yield mixed results over all periods of time for both non-banks and banks, and 5. continued deregulation of the banking industry is often said to make banks look more like non-banks.

Because each of the two compensation theories may only explain a portion of total compensation, the second objective of the current study is to analyze the two theories in relation to individual components or subsets of components of compensation. The major components of total compensation are base salary, bonus, other cash compensation, non-cash compensation and value of options granted.

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Previous research defines total compensation in many different ways; however, further analysis of the various components of compensation is generally omitted.

The third objective of this study is to significantly expand the number of commercial banks being analyzed. While previous compensation literature on banks ranges between 20 and 97 of the largest banks, this study utilizes 450 banks. This expansion of the data allows comparisons between mid-sized and the very large banks, as to differences in compensation structure and ability of the two theories to explain compensation.

Overview of Methodology

There are several procedures available for the estimation of pooled, time-series, cross-sectional or panel data. Two basic techniques commonly used are the one-way fixed effects model, or within-cases estimator, and the one-way random effects, or error components model, which is a within and between cases estimator. While fixed effects models will generally have less efficiency, they are far more likely to be unbiased and consistent. Given the typical expectation of bias in non-experimental or observational studies, this trade-off for reduced bias is very appealing.

Fixed effect models are also generally less restrictive than the random effects models. The random effects model can be looked at as

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a special case of the fixed effects model, one that requires far more assumptions.

Another consideration is which of the models can handle unbalanced data or missing data, as in this study. Both the fixed effects and random effects models can handle unbalanced designs which generally preserve degrees of freedom compared to excluding observations to create a balanced panel (Batalgi & Chang, 1994). The fixed effects model is expected to be the appropriate method for this study; however, there is a statistical specification test (Hausman & Taylor, 1982) available that tests the null hypothesis of the random effects model against the fixed effects model. This Hausman test allows the data to dictate which method is the appropriate one.

Summary

The remainder of this study is presented as follows. Chapter 2 is a review of relevant literature. Chapter 3 is a discussion of the data and methodology used in this study. Chapter 4 is a presentation of the results of this study. And finally, Chapter 5 presents a summary of the findings, contributions of the study, and suggestions for future research.

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CHAPTER 2

LITERATURE REVIEW

This chapter provides a discussion of the two compensation theories tested in this study and a review of literature relevant to this study. Section one reviews the two theories, profit/shareholder wealth maximization and sales/sales growth maximization. Section two, a chronological review of the literature, is divided into two parts. First, the earlier non-banking studies are reviewed. Second, bank-only research is reviewed. Finally, the chapter concludes with a brief summary.

Compensation Theories

Much of the empirical research in executive compensation is based on two competing hypotheses of firm behavior. The first of these hypotheses, from micro-economics, predicts that compensation contracts will be based solely on the maximization of firm profits. The second theory is Baumol's (1959, 1962 and 1967) sales or sales growth maximization hypothesis that suggests managers face incentives that lead to the maximization of firm sales, or

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alternatively to increases in the rate of growth of firm sales. These competing hypotheses, as well as the results of empirical tests of each, are discussed as they evolved in the literature.

Profit/Shareholder Wealth Maximization

The profit (or shareholder wealth) maximization hypothesis is the foundation for the application of agency theory to issues relating to executive compensation. Agency theory states that owners prefer managers to act in a manner consistent with shareholder-wealth maximization (Jensen & Meckling, 1976; Fama, 1980). Because, in general, managers' actions are not readily observable; one can argue that financial performance, profits or changes in shareholder wealth, provides an observable signal of managerial effort. The preceding description broadens classical microeconomic theory that predicts CEO compensation will be structured to induce only profit-maximizing decisions by managers. Classical theory does not consider strategic play by either managers or owners, nor does classical theory consider other agency costs, such as costly contracting or the costs of monitoring agents. Research in this field often seeks to identify the effects of these types of agency theory factors on incentive structures.

The most common signal of managerial effort that is proposed in the literature is firm profits. This research relies on various measures of firm profitability, often concentrating on shareholder return or the

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accounting profits of the firm. Some research, such as Murphy (1985) and Barro and Barro (1990), indicates that results obtained using either of these measures of performance do not differ qualitatively. However, the question of what is the best measure of firm performance is not yet resolved. Also, empirical research often produces contradictory answers to the question of how owners structure incentive contracts written between themselves and their managers. Attempts to estimate the relationship between firm performance and managerial compensation empirically generate wide ranging results.

Sales/Sales Growth Maximization

It is the work of Baumol (1959, 1962 and 1967) that starts much of the research in the area of compensation. His work results in the sales growth (total revenue) maximization hypothesis, a challenge to traditional micro-economic theory. Baumol's original hypothesis considers two competing objectives of managers and owners; the maximization of profits and sales. In the first version of his model, Baumol (1959) contends that both the firm's managers and its owners are concerned with both the profits and sales levels of the firm. Baumol further states that the perception of the firm held by owners, customers, and employees improves as the size of the firm increases. Access to the credit markets also improves and increases as firm size increases. The result of these factors creates incentives for both managers and owners to maximize the size of the firm (sales, total

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assets, change in sales, etc.) as opposed to profit maximization. Baumol (1962) refines the model and he states that "maximization of the rate of growth of sales revenue seems a somewhat better approximation to the goals of many management groups in large firms than is maximization of the current level of sales" (p. 1085). In this updated model, an equilibrium rate of growth of sales is determined that maximizes Total Revenue minus Total Costs. By using growth rate of sales, profit maximization is no longer a constraint. In the long run, it becomes an instrumental variable. Baumol asserts that, in the long run, profits are only necessary to help raise capital to fund further growth through direct retention or as dividends to induce future outside investors to invest in the firm. Also, beyond some point (equilibrium growth rate), profits compete with sales. Baumol also investigates the effect of government actions to promote economic activity and how these actions would interact with his model. Using comparative statics, he analyzes the effect of interest rate changes and subsidies. Both variables are important to the banking industry. Obviously, most of a bank's revenue is derived from interest income and subsidies are received in the form of Federal Deposit Insurance and investment tax credits. Decreases in interest rates or increased subsidies result in increased equilibrium sales growth rates, which lead to increased compensation for the CEO. Some empirical research

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designed to investigate the relationship between sales and compensation follows.

Empirical Literature

The measure of compensation frequently used in earlier research is the sum of salary and bonus payments made to executives. Basically, the sum of salary and bonus payments provides a measure of the cash compensation paid to executives by firm owners. Later studies add measures of compensation that include estimates of the change of share value resulting from executive stock ownership or the value of stock options awarded to the executives. Following is a survey of relevant literature tracing the evolution of research on the two theories of compensation under investigation in this study.

Non-Banking Literature

McGuire, Chiu, and Elbing (1962) test Baumol's original 1959 sales-revenue-maximization hypothesis against the profit maximization hypothesis. The authors' data set consists of 45 of the largest industrial firms in the United States covering a seven year period (1953-1959). The data set includes executive compensation, sales, and accounting profits for firms from a variety of industries. The authors acknowledge a potential for bias resulting from the inclusion of only the largest firms in the U.S.; then claim that a "careful analysis of the figures does not reveal such a bias" (p. 754). The authors do not

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address the potential problem of industry specific biases that may obscure results.

The compensation data (dependent variable) is base salary and the value of stock grants. The data set includes only the CEO position when stock is granted as part of the compensation package. The authors compute the market value of the stock using the closing stock price on December 31 of the year in which the stock is granted. Explanatory variables used in their seven regression models include sales and accounting profits and one- and two-year lagged versions of these variables. The authors find that executive compensation is strongly affected by sales but is generally not related to profits. The authors indicate that there may be additional variables affecting executive incomes and, in spite of their results, do not want to rule out the possibility of a relationship between profits and executive pay. While the authors find strong evidence to support Baumol's sales-maximization hypothesis, they have another interesting result. They find that CEO pay is not only a function of current sales, but also is strongly related to past sales, even when a new CEO assumes command. While this seems to contradict the sales-maximization model, the authors state that this result could be from not testing individual components of compensation, e.g. base versus bonus pay, etc.

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Lewellen and Huntsman (1970) test the original version of Baumol's sales maximization hypothesis against traditional profit maximization. The authors collected cross sectional data at three year intervals from 1942-63 for fifty very diverse manufacturing firms. The authors run several cross sectional regressions for each sample period using various specifications.

In one specification, the explanatory variables include reported after-tax accounting profits and the dollar value of sales; while, in another, the explanatory variables include the market value of outstanding common stock and the dollar value of sales. Each of these variables is analyzed against two different measures of executive compensation. The first measure of compensation includes only cash compensation payments, salary plus bonus. The second compensation measure includes the sum of salary and bonus and a measure of the value of deferred compensation. To correct for heteroskedasticity of the residuals, all variables in each of the four regressions are divided by the firm's asset value. Regression equations are estimated for each of the eight time periods and, in thirty of thirty-two total regressions, the estimated coefficients for the profit measures are statistically significant. However, the authors report that the sales coefficient is not statistically different from zero in any of the estimated regressions. Thus, the authors find strong support for profit/shareholder wealth

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maximization but no evidence to support the sales-maximization hypothesis.

As empirical research on compensation moves into the 1980's, researchers institute controls for the scale of the firm and begin to incorporate the growth rate of sales into empirical models. Coughlan and Schmidt (1985) is one of the first studies to use sales growth in an attempt to identify Baumol's (1962) hypothesized positive relationship between sales growth and compensation. Other research innovations, such as allowing the regression intercepts to vary across firms, are intended to capture the relationship between the size of the firm and the level of effort or human capital expended by managers. In this way, scale may be used as a substitute for the complexity of the manager's position. Baumol argues that the relationship between sales growth and compensation is independent of scale. If the relationship between sales growth and compensation is constant across firms, allowing intercepts to vary across firms after adjusting for scale will yield unbiased regression estimators.

During this period of time, other researchers suggest that once a firm has achieved some minimum level of profitability, regardless of scale, the manager is free to participate in activities that maximize his utility, rather than the utility of the owner (Jensen & Meckling, 1976; Murphy, 1985). The positive relationship between scale and compensation suggests that managers will strive to maximize the size

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of the firm, because this will lead to increased perquisites. These researchers suggest that managers face incentives to maximize sales that are independent of, or at best weakly correlated to, the incentives created by the manager's compensation contract. In fact, when researchers control for firm size, generally there is less evidence of a correlation between firm performance and executive compensation (Gomez-Mejia, Tosi, & Hinkin, 1987). Some empirical research designed to investigate the sales versus profits relationship to compensation while adjusting for firm scale is as follows.

Hirschey and Pappas (1981) make an early attempt to integrate scale effects by dividing their sample into four quartiles, using life cycle theory, and then testing the profit-versus-sales maximization controversy. Life cycle theory asserts that young industrial firms would maximize revenue growth, while those in their late stages of life would maximize profit. Life cycle theory further states that smaller firms maximize sales in order to gain the market share necessary for long-run profit maximization, while larger firms in mature markets maximize profits. The authors compile their data set of 680 large firms from *Forbes Magazine's* 1977 annual survey of CEO compensation. The data set includes 155 banks and 82 utilities so that information from the more heavily regulated firms could be compared to results for industrial firms. Banks face no explicit profit limitations, unlike utilities, but both do face many other regulatory restrictions that

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might result in very different outcomes. The study's compensation variable includes salary plus bonus plus deferred compensation and the independent variables for the study are net income after taxes and total revenues.

Results for the industrial firms showed strong support for profit maximization; however, only the smaller and younger firms supported Baumol's sales maximization theory. For banks, there is mild support for CEOs to pursue profits and clear support for utility CEOs to pursue sales maximization. There is also clear evidence that CEOs of regulated industries receive substantially less in annual compensation. A weakness of this study is the rather crude attempt to control for firm scale by using quartiles. This study did shed insight into the validity of the life cycle hypothesis.

Carroll and Ciscel (1982) ask if regulated industries appear to behave differently than their less regulated counterparts. They test the two compensation theories using data from 221 industrial firms, 45 utilities, and 21 transportation firms during the period 1970-1976. The regression dependent variable, executive compensation, is measured by only salary plus bonus of the firms' CEOs. Independent variables are sales and residual profit and dummy variables for the utility and transportation firms. Residual profit is defined as net profits that cannot be attributed to sales.

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The authors' first finding is that regulation substantially reduces annual compensation of the CEO. Second, the sales variable is highly significant every year in explaining the level of compensation, supporting the sales/sales growth maximization theory. This holds true for both regulated and less regulated firms. Finally, residual profits are significant only two of the six years for the entire sample, indicating no overall support for profit/shareholder wealth maximization. However, compensation in transportation firms is positively related to profits but is negatively related to profits for utilities.

Murphy (1985) expresses concern about previous research being largely unsuccessful in linking executive compensation to corporate performance using either profits or shareholder wealth. He points out that many managers hold large fractions of their wealth in the form of their companies' stock. Murphy also asserts the positive relationship between firm profits and stock price movements. In conclusion, he contends that, even if no direct link between firm performance and cash compensation is found, the manager's ownership of stock implies that the wealth of managers is indirectly linked to firm performance.

Murphy gathers data covering the period 1964-1981 to analyze the relationship between firm performance and executive compensation. His sample includes 461 executives from 72 firms. The sample includes only firms where at least three executives appear on

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the firm's proxy statements for a minimum of five years. The final data set includes over 4,500 "executive years" of observations. Murphy defines firm performance as the total annual rate of return realized by the firm's common stock owners.

The author's model of managerial compensation depends on the size of the firm in question, past firm performance and the innate ability of managers (not specifically measured). Murphy points out that if the effects of unmeasured variables on compensation are not constant across firms/executives, results based on cross section data will exhibit omitted variable bias. If these variables are constant across time for a given executive, then, by analyzing the time series data for specific executives, the relationship between performance and pay will be correct. For these reasons, Murphy estimates the performance-pay relationship for specific executives using panel data in a generalized fixed effects model.

Murphy uses several different measures of compensation, including salary, salary plus bonus, deferred compensation payments, value of stock options, and total compensation. Total compensation includes all other measures, as well as the value of fringe benefits and savings plans. The results indicate a positive relationship between the firm's stock price performance and executive compensation. If simple cross sectional methods are used, results indicate an inverse

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relationship between compensation and stock price. Murphy suggests that this inverse relationship is from neglecting to control for firm size.

Murphy notes that owners of large firms are likely to pay their executives more than are owners of small firms, regardless of the performance of the firms. He suggests that these pay differences are simply the result of differences in the level of effort and human capital required in managing large firms as compared to small firms.

Murphy finds that the variable with the greatest power to explain changes in both cash compensation and total compensation is the common shareholders' realized annual return. Specifically, a 10% increase in the value of a firm's common stock yields an increase in total compensation of 2.1%. Murphy also reports that the growth of firm sales is positively and significantly related to executive compensation, supporting Baumol (1962), and estimates a 10% increase in sales results in a 1.6% increase in compensation. Overall, Murphy finds evidence to suggest that changes in the price of a firm's common stock is the best predictor of changes in executive total compensation.

A second paper investigating the profit maximization hypothesis is Coughlan and Schmidt (1985). This study more narrowly defines compensation as changes in base salary plus bonus. Unlike Murphy (1985), deferred compensation and stock options are not included. The primary goal of Coughlan and Schmidt is to firmly establish a link

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between stock price performance and managerial compensation. The authors also desire to use a variable that does not include factors beyond the managers' control. Because stock price changes also include general economic conditions, regulatory changes, etc., Coughlan and Schmidt use cumulative abnormal stock returns to more closely measure managers' direct effect on shareholder wealth. Also, due to Murphy (1985) and other studies, the authors include the real rate of growth of sales in their regression model; however, they test a hypothesis that the inclusion of sales growth will not negate or reduce to insignificance the stock performance variable.

Coughlan and Schmidt collect data on 249 corporations over three years resulting in 597 usable observations. The dependant variable is changes in compensation, thus CEOs had to remain in place at least two years. Results yield a very significant relationship between abnormal stock price performance and changes in CEO compensation. Sales growth is also significantly related to changes in CEO pay and only minimally reduces the stock return-compensation relationship.

The primary concern of Winn and Shoenhair (1988) is that earlier work does not separate firm scale from growth rate of sales. Their data set includes more than 200 manufacturing firms and covers the period from 1968-1981. To test the effects of growth rates, the authors break the data set into three equal time periods, each covering

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five years with 241, 222 and 213 firms in each of the respective samples. The authors then analyze the effects of scale (log of total assets) and growth rates of both profits and sales on executive compensation.

The authors focus only on the incentives created by the board of directors through the compensation contract, thus, the analysis includes only cash payments. Stock ownership, which can be obtained outside the compensation contract by CEO purchases, is ignored. The authors also point out that salaries of newly hired CEOs are not likely to be affected by the performance of the firm prior to their hiring (contradictory to McGuire, et. al., 1962). Therefore, the study treats firms with newly hired CEOs as a control group.

Results support that, for firms with veteran CEOs, compensation is positively related to the growth rate of profits. Estimates of the effects of the profit growth rate on compensation are even greater than reported by Jensen and Murphy (1990), (discussed later). Prior firm performance has no significant influence on the compensation of newly hired CEOs. Results also suggest that managers are rewarded for scale but are penalized for increases in the growth rate of sales. The authors argue that their results do not necessarily refute sales/sales growth maximization but, in fact, support Baumol's (1959) contention that managers may indeed have non-pecuniary incentives to increase revenue. Finally, it is accounting-

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based profit measures and not the market-based stock returns that are significantly related to compensation.

Agrawal, Makhija, and Mandelker (1991) investigate electric and gas utilities to determine if these regulated firms exhibit a link between profitability and executive compensation. They cite several previously reviewed studies of unregulated firms that find a strong positive link between compensation and profits. Therefore, the authors feel that Hirschey and Pappas (1981) and Carroll and Ciscel (1982) might be in error by not finding a positive relationship between compensation and profitability in regulated firms. Agrawal, Makhija, and Mandelker assert that regulated industries, like their less regulated counterparts, write performance incentive contracts that link compensation and profits.

The authors collect data on 69 electric and gas utilities from 1975-1984. They argue that properly specified variables might yield more accurate results. The authors' dependent variable is growth in total annual compensation which also includes stocks, options, deferred compensation and other remuneration. Following Gibbons and Murphy (1990), their independent variable is an industry-adjusted rate of return. They also test the sales/sales growth maximization theory of compensation by including a sales growth variable.

Their findings support the view that compensation packages align the interests of top management with shareholders. A strong

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positive relationship between executive compensation and firm profitability is found, in contrast to previous studies of regulated firms (Hirschey & Pappas, 1981; Carroll and Ciscel, 1982) that find no relation, or a negative relation, between compensation and profitability.

Jensen and Murphy (1990a) also analyze the relationship between firm performance and two measures of compensation. Measures of compensation used include the sum of salary and bonus (cash compensation), and the sum of salary, bonus, the value of restricted stock and fringe benefits (total compensation). The authors define the pay-performance sensitivity, "b," to be the dollar change in the CEOs wealth per dollar change in the wealth of the shareholders. The authors claim that a higher degree of sensitivity implies that the compensation contract results in managerial incentives that are more closely aligned with the incentives of owners.

The base sample for this study consists of salary and bonuses for 2,505 CEOs in 1,400 publicly held companies from 1974 through 1988 and stock option data on CEOs in the 430 largest companies in 1988. Jensen and Murphy state that, despite headlines at the time, top executives are not receiving record salaries and bonuses. They find CEO pay levels are just now catching up to where they are 50 years ago. During the period between 1934 through 1938, average salaries

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and bonuses for NYSE listed CEOs are $882,000, 1988 dollars. For the period 1982 through 1988, the average is $843,000.

Also, despite popular claims that pay is not linked to performance, Jensen and Murphy find that for the 250 largest companies, a $1,000 change in corporate value corresponds to a change of 6.7 cents in salary and bonuses over 2 years. If all compensation sources are include (stock options, stockholdings, etc.), a $1,000 increase in shareholder value results in a $2.59 increase in CEO wealth. The authors also find evidence to predict that this pay-performance relationship is increasing over time. In comparison, Hall and Liebman (1998) use Jensen and Murphy's methodology on a larger and more recent data set and find that average CEO wealth will increase by $25.11 for every $1,000 increase in shareholder wealth, an average almost 8 times greater. This supports a trend observed in the 1990's by many authors that the profit/share-holder maximization theory is becoming even more important over time.

Jensen and Murphy state that the most powerful link between shareholder wealth and executive wealth is direct stock ownership by the CEO. Yet, CEO stock ownership, as a percentage of shares outstanding, is 10 times greater in the 1930s than in the 1980s. These authors also argue that non-monetary rewards, perquisites, typically motivate managers to take actions that reduce productivity and harm shareholders. Thus, monetary compensation and stock ownership

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remain the most effective tools to align manager and shareholder interests. They did find that managers of relatively small firms have compensation more closely tied to firm performance, than do managers of relatively large firms. The authors contend that although they find a weak positive relationship between pay and performance, the strength of that relationship is not sufficient to solve the principal-agent problem. In summary, Jensen and Murphy conclude that management compensation is dependent on firm performance.

As research moves through the 1990's, testing of Baumol's sales/sales growth maximization theory almost disappears. Sales is sometimes used as a "size control" variable in studies of other theories of compensation, such as board composition or ownership concentration; however, the sales/sales growth maximization theory is not discussed or explicitly tested, even in banking studies. Emphasis on pay for performance, especially using market-based variables, tends to dominate the non-banking literature.

Banking Literature

Hubbard and Palia (1995) examine CEO pay in the banking industry and the effect of deregulation on the pay-performance relationship. Another stated goal is to study the banking industry to determine whether CEO pay is excessive or necessary to attract managerial talent. The authors discuss extensively the evidence in the non-banking studies of the link between pay-performance and their

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goal of investigating, especially after deregulation, if the pay-performance link also exists for banks.

Panel data is collected on 97 banks from 36 states for the years 1980-1989. To control for bank-specific omitted variables, each bank is allowed to have a separate intercept term, like Jensen and Murphy (1990b). Also, each observation is differenced from the mean for that variable to allow a type of fixed effects model in the analysis. The dependent variable, CEO compensation, is the sum of base salary plus bonus payments. Independent variables are total assets (to control for size effects), change in shareholder wealth (performance variable) and a dummy variable, representing significant interstate banking deregulation. Hubbard and Palia indicate that many studies do not include a size variable because of the potential correlation between firm size and performance. They include a size variable to examine whether more rapidly growing banks have CEOs with higher levels of pay.

Two models are tested, the full data set and a subset consisting of banks with no CEO turnover. For both models, a significant positive relationship is established between shareholder wealth and CEO compensation, supporting the profit/shareholder wealth maximization hypothesis. The authors find an increase in a bank CEO's salary of 12.9 cents per $1,000 increase in shareholder wealth. This is comparable to previous studies that range between 1.35 cents and 15

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cents per $1,000 change in shareholder wealth. They also find this relationship between shareholder wealth and compensation strengthens as interstate banking is permitted. Size is also positively and significantly related to compensation. The authors state that this suggests that CEOs of more rapidly growing banks have more generous salary and bonus packages. Results of the second model, no CEO turnover, are almost identical to the full model. The authors conclude that concerns about CEO turnover affecting the pay-performance link may be overstated. In summary, a significant positive relationship is established between shareholder wealth and CEO compensation, supporting the profit/shareholder wealth maximization theory. The next study investigates various performance measures related to profit/shareholder wealth maximization that could be related to banking CEO pay.

Tripp and Kenny (1995) examine CEO pay in the banking industry with only one goal, to determine whether CEO pay is linked to performance. Their motivation is "... are shareholders getting their money's worth from their CEOs?" (p. 72). Consequently, only the profit/shareholder wealth maximization theory is tested. The authors do investigate two market-based and one accounting-based performance measures to determine which, if any, is best in predicting growth in bank CEO compensation.

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A sample of the 25 largest commercial banks is selected and analyzed over a 5-year period, 1988-1992. Subsequent to the selection, one bank, Citicorp, is determined to be an outlier and is dropped from the sample. The dependent variable, CEO compensation, is the sum of base salary plus bonus payments. Explanatory performance variables are one-year total shareholder return, the previous year's one-year total shareholder return, and change in accounting return on equity or earnings yield, i.e., earnings per share/share price t-1. Tripp and Kenny use both market-based and accounting-based measures of performance, citing earlier studies, such as Barro and Barro (1990). These earlier studies argue that each type of performance measures could provide independent information regarding CEO performance. Current shareholder return, a measure of current CEO performance, is included because it should be related to current bonus pay. The previous year's shareholder return, a measure of past CEO performance, is include because it should be related to current base salary pay.

The previous-year shareholder return is significantly related to current total compensation, as defined in this study (p-value = 0.0068). The current-year shareholder return is mildly related to current total compensation (p-value = 0.0826). Earnings yield is insignificant, contrary to previous non-bank studies cited by the authors. Overall, for the banking industry, Tripp and Kenny find a

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strong link between pay and performance, as measured by returns to shareholders. This result does provide support for the profit/shareholder wealth maximization theory, but again reflects the problem: "Which performance measure is the best proxy?"

Sigler and Porterfield (2001) examine the relationship between the pay of bank CEOs and bank performance. They claim to extend the research of prior studies by focusing on a test period which begins after the deregulation of the banking industry. The study investigates a sample of 31 large banks from 1988-1997, a period in which banks did not face the strict regulation experienced prior to 1982. Another goal of the study is to expand the number of possible pay-performance variables.

Total compensation as defined by the *Forbes Magazine's* annual compensation survey includes base salary, bonus, fringe benefits and the value of exercisable stock options. The authors test both total compensation and changes in total compensation. Explanatory variables include CEO tenure, return on average assets, CAPM Beta and change in revenue. The authors expect a positive relationship between all explanatory variables and the two measures of total compensation. Change in revenue is a test of Baumol's (1959 and 1967) sales/sales growth maximization theory; yet, neither he nor his theory is referenced in this paper.

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When change in total compensation is evaluated, the only significant variable is return on average assets, which does lend support to the profit/shareholder wealth maximization theory. This model found that a 0.1% increase in asset return on average would yield a $93,870 increase in CEO total pay. When total compensation is investigated, both return on average assets and change in revenue are significant. For this model, a 0.1% increase in asset return on average would yield a $132,100 increase in CEO total pay and a $10 million increase in sales revenue would increase CEO pay by $1,700. Authors conclude that, in this post-deregulation period, they found very strong linkages between pay and performance in the banking industry. The significance of return on average assets provides support for the profit/shareholder wealth maximization theory. While the sales/sales growth maximization theory is not acknowledged as being tested, the significance of sales, in the total compensation model, provides support for this theory.

The preceding three studies focused on the pay-performance relationship and all found support for various performance related measures and no support for others. The final two papers also focus on the sensitivity of CEO compensation to performance; however, they study this in conjunction with major regulatory events.

Vafeas, Waegelein and Papamichael (2003) investigate the impact of the Revenue Reconciliation Act of 1993 (RRA) on bank CEO

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compensation. The RRA limits the deductibility of executive pay, by the firm, to $1 million unless said pay is in the form of a commission or is performance based. These performance goals must also be set by outside directors and approved by the shareholders. The authors expect to find a link between pay and performance that increases in significance in the post-RRA period.

In this investigation, a sample of 94 large commercial banks are studied during the period from 1989-1997. CEO compensation, collected from proxy statements, is defined by base plus bonus pay. A second "compensation" model uses the CEO's stake in the firm, the present value of all options currently held. Both compensation measures are transformed to their natural log. Explanatory variables, from Compustat, intended to capture the pay-performance relationship, are return on assets and one year shareholder return. The log of sales is included as a "size" control variable. The inclusion of sales should be a test for the support of the sales/sales growth maximization theory, but again, no mention of the theory or citation of Baumol's work is included. The authors state that a fixed effects regression is used to analyze their models; however, they include numerous dummy variables.

In the base-plus-bonus-compensation model, return on assets is highly significant overall but is only mildly significant in the post-RRA period. Shareholder wealth is not significant in any period for

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explaining cash CEO compensation. Sales are highly significant in all periods. In the 'value of options' compensation model, both sales and shareholder return are significant in only the post-RRA period. Authors state that all of these findings support the pay-performance linkage for banks. They further contend that the pay-performance linkage is strengthened due to results of their 'option value' model. Overall, these authors find support for both the profit/shareholder wealth maximization theory and the sales/sales growth maximization theory, even though they do not specifically test for the second theory. The authors find, in general, that non-cash pay is substituted for cash pay after the reform, resulting in option pay becoming an increasing proportion of total pay.

Harjoto and Mullineaux (2003) analyze the impact of commercial bank entry into investment banking on CEO compensation. Their first objective is to show a linkage between CEO pay and performance using a market based measure of performance. Previous studies have mixed results establishing this pay-performance link for some definitions of bank CEO pay. Second, they expect the entry into investment banking to result in even stronger pay-for-performance sensitivities than are shown in any previous studies of banks.

Data is collected on 74 of the largest bank holding companies over the period 1992-2000. Compensation data is from Standard & Poor's Execucomp database and explanatory variable data is from

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Standard & Poor's Compustat. A model of total compensation is analyzed, as well as, a model of incentive compensation that includes bonus pay, stock grants and option pay. Explanatory variables include a three-year shareholder return (to measure performance), total assets (to control size effects), market-to-book ratio (to measure firm 'growth options'), CEO tenure and various dummy variables. Due to the inclusion of numerous dummy variables and some missing data a one-way, random effects, unbalanced panel model is employed.

In regard to my current study, Harjoto and Mullineaux find a strong positive link between shareholder return and both measures of compensation. A 1% increase in shareholder return results in an increase of $8,380 of total compensation or an increase of $7,950 of incentive compensation. Entry into interstate banking results in further increases in compensation. Overall, the authors find strong support for the profit/shareholder wealth maximization theory.

Summary

This chapter begins with a discussion of the two theories of compensation being investigated in the current study, the profit/shareholder wealth maximization theory and the sales/sales growth maximization theory. Next, relevant compensation literature in the non-banking area is presented, followed by banking compensation

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research. Chapter 3 provides hypotheses development, model selection and methodology.

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CHAPTER 3

METHODOLOGY

This chapter presents five main sections. First, results of prior research and observed opportunities to extend this research are used to develop testable hypotheses. Second, the model specification and variables needed to test the aforementioned hypotheses are presented. Third, data sources and variable definitions are discussed. Fourth, a description of the statistical methodology to be used in testing the hypotheses is presented. This chapter concludes with a brief summary.

Hypotheses Development

Referring to the previous research in Chapter Two, most studies tests Total CEO Compensation. The definition of what is included as "Total" compensation varies, but from the 1960s through the 1980s, "salary" and "bonus" are the primary components. Occasionally, "deferred" or "other" pay is included to expand the definition of the "Total" compensation variable. It is only during this period that the profit/shareholder wealth maximization and sales/sales growth maximization theories are both explicitly tested in the

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research. Even so, results for both theories are mixed, with perhaps slightly more support for the profit/shareholder wealth maximization theory.

The greatest deficiency in studies during this period is that the definition of total compensation includes only cash components. Another limitation is that only one study includes any banks (Hirschey and Pappas, 1981). During this period, both theories of compensation are included. Overall, further research is needed.

Moving through the 1990s to the present; options, stock, and other fringe benefits are also incorporated into the definition of Total compensation. However, tests of the sales/sales growth maximization theory are dropped. Studies of compensation generally include one variable representing the profit/shareholder wealth maximization theory, a size-control variable, and then other variables to test other theories or issues concerning compensation. Unfortunately, studies on banks do not appear until the early to middle 1990s, by which time none explicitly include variables to test the sales/sales growth maximization theory.

Banking studies focus on testing the pay-performance link, e. g. testing the profit/shareholder wealth maximization theory, in conjunction with another issue of interest, such as de-regulation or entry into investment banking. Results of research using banks during this period are mixed for the profit/shareholder wealth maximization

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theory. These results often differ solely on what variable is include in the statistical model, accounting-based or market-based. Non-banking studies tend to use market-based measures of changes in shareholder wealth with greater frequency as the decade passed. Accounting-based variables are used less frequently but do not disappear altogether. Studies of non-banks generally support the profit/shareholder wealth maximization theory.

In summary, on the one hand, the more recent studies do use a more complete definition of total compensation and three studies for banks do include larger data sets, ranging from 74 to 97 banks. On the other hand, only the profit/shareholder wealth maximization theory is tested and results are still mixed, especially for the few studies using banks. Overall, further research is needed.

From the analysis in the preceding paragraphs, the first objective of the current study is established. The first objective of this study is to utilize the two theories, profit/shareholder wealth maximization and sales/sales growth maximization, to explain total CEO compensation in the banking industry. This objective is relevant because: 1. there is a paucity of banking studies on compensation, 2. the recent banking studies only include one of the compensation theories, 3. it is time to revisit the sales/sales growth maximization theory, which just disappears from the compensation literature in the early 1990s, 4. previous studies yield mixed results over all periods of

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time for both non-banks and banks, and 5. continued deregulation of the banking industry is often said to make banks look more like non-banks. Will results of this study for banks look similar to non-bank research?

To satisfy the first objective and address the relevant issues, the first hypothesis to be tested is:

$H1_o$: Neither the profit/shareholder wealth maximization theory nor the sales/sales growth maximization theory explains bank CEO total compensation.

More than one model specification is used to test hypothesis one. More details on these models are included in the next major section of this chapter.

Because each of the two compensation theories may only explain a portion of total compensation, the second objective of the current study is to analyze the two theories in relation to individual components or subsets of components of compensation. The major components of total compensation are base salary, bonus, other cash compensation, non-cash compensation and value of options granted. Previous research defines total compensation in many different ways; however, further analysis of the various components of compensation is generally omitted. Beyond just looking at total compensation in the banking studies, Vafeas, Waegelein and Papamichael (2003) separately

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investigate the value of all stock options held and Harjoto and Mullineaux (2003) look at the value of stock and option grants.

Objective two of this study is also important to firm owners, boards of directors, and especially compensation committees to help them structure better pay packages that will motivate and guide executive effort. Hopefully, this current research will offer insight into which variables to link to managerial effort and guidance for the design of the next compensation package for both total compensation and each component of compensation. To fulfill objective two, the following hypotheses are tested.

$H2_o$: Neither the profit/shareholder wealth maximization theory nor the sales/sales growth maximization theory explains bank CEO annual cash compensation.

$H3_o$: Neither the profit/shareholder wealth maximization theory nor the sales/sales growth maximization theory explains bank CEO stock option (non-cash) compensation.

Again, more than one model specification is used to test hypotheses two and three. More details on these models are included in the next major section of this chapter.

The third objective of this study is to significantly expand the number of commercial banks being analyzed. Previous compensation literature on banks typically include between 25 and 97 of the largest

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banks. This study significantly increases the number of banks and should greatly expand knowledge on compensation in the banking industry. Obviously, this expansion of the data may also allow comparisons between mid-sized and the very large banks, as to differences in compensation structure and ability of the two theories to explain compensation.

Model Specification and Variable Selection

The most parsimonious model to test the two compensation theories is:

CEO compensation = f (profitability, sales).

In the compensation literature, the overwhelming method used to test this functional relationship is some type of least squares regression. As more studies used panel data and econometric techniques evolved, the move is from simple ordinary least squares to various generalized least squares to today's fixed effects and random effects models. Some researchers, Jensen and Murphy (1990b), and Hall and Liebman (1998), model firm specific time and CEO effects similar to a random effects model discussed in section four of this chapter. Most researchers assume that time trends and pay-performance relations are constant across executives. If so, annual performance related changes in total compensation are modeled as:

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$$(\text{CEO Pay}) = \alpha + \beta_1(\text{profitability}) + \beta_2(\text{sales}) + \varepsilon_{it}$$

where α is the mean of CEO pay not attributable to other variables, and β_1 and β_2 are either performance sensitivities or elasticities. Independent variables, profitability and sales, are vectors of contemporaneous and lagged-profit or sales measures. This study will estimate this specification using fixed effects methods.

This model specification may not be adequate to yield unbiased estimators. As discussed in the literature review, control variables beyond the basic two theories of compensation may be needed. For example, as research progressed, many studies include a "size effect" control variable such as total assets or the log of sales. Thus, a more complete model specification might be:

CEO Compensation = f (profitability, sales, control variables).

This study seeks to determine a preferred specification that explains bank CEO compensation.

The dependant variable, CEO compensation, will be total compensation or one of its components. Again, the components of total CEO compensation are base salary, bonus, other cash compensation, non-cash compensation, and value of options granted or some combination of these. In choosing the independent variables, a common problem in this and previous research is what is an appropriate proxy for performance. From previous research, for the profit-maximization theory, performance measures are either

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accounting-based or market-based, measured as absolutes, first differences, or other transformations.

Typical accounting measures are return on assets, return on equity, net income, etc. In an attempt to reduce possible confounding and collinearity, Hirschey and Pappas (1981) and Carroll and Ciscel (1982) use 'residual profit' or net profits not attributable to sales. Later studies point out that, due to the extremely low correlation between sales and return on assets, net income (profit) should be avoided and return on assets should be used as the profit measure. Market-based profitability, or shareholder return measures, commonly used are total annual stock return, total/changes in shareholder wealth, or value of all stock or options currently held by the CEO.

Whether the accounting-based variable or the stock-based variable is a more appropriate proxy for performance is still a controversial issue. Some papers, like Crawford, Ezzell, and Miles (1993), Houston and James (1993), Murphy (1985), and Jensen and Murphy (1990), use stock return as the proxy for performance saying that it is superior to accounting based proxies for performance. These studies have mixed results linking CEO wealth changes to stock returns. However, there is also a significant amount of research documenting the extensive and successful use of accounting earnings as a basis for CEO compensation. Sloan (1993), Paul (1992), and Lambert and Larcker (1987) argue that because stock returns are

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heavily influenced by the overall economy, they reflect lots of systematic risk instead of a firm's individual performance. The major part of the stock's movement is beyond the CEOs' control. Thus, it is uncertain how many managerial contracts are based on market performance rather than accounting performance. Barro and Barro (1990) propose that accounting returns might provide independent information regarding CEO performance not contained in the return to shareholders and assert that both measures of performance might affect changes in compensation. If collinearity is not an issue, I will follow Barro and Barro and include both market-based measures and accounting-based measures as performance proxies. I do not expect collinearity to be a problem because the correlation between return on assets and shareholder return is low (r = .12).

When testing the Sales/Sales growth maximization theory, previous research primarily uses dollars of sales, an absolute measure as described in the original Baumol (1959, 1967) theory. This study also includes annual sales growth from Baumol's revised (1962) theory. If a size effects proxy is used, prior research typically uses total assets or a log transformation of total assets. Some researchers, Vafeas, Waegelein and Papamichael (2003) successfully use sales to substitute for total assets. In this study sales can easily substitute due to its 0.97 correlation to total assets. For this study, the inclusion of

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sales accomplishes both size effects control and a test of the sales maximization theory.

There is often the issue that a particular variable is not equally representative across the entire data sample. For example, in any banking study, what should/could represent "sales"? Should it be interest income or non-interest income, etc.? In this study the most comprehensive measure of revenue would best reflect the efforts of the CEO, who is responsible for all operations of the bank. The most complete measure of sales available for banks, in the Standard and Poor's Research Insight database and is defined as "total current operating revenue and net pre-tax profit or loss on securities sold or redeemed" and this is the sales measure used in this study.

The next question is, will this definition of sales suffice for testing Baumol's sales/sales growth maximization theory? Yes. Baumol (1959) asserts that CEO compensation is closely tied to the scale of operations. For scale, he suggested the use of total revenue or sales, total assets, or annual changes in those measures. In 1962, he further suggests that annual growth of sales might be superior to an absolute measure of sales revenue. Sales, as defined by Standard and Poor's, fits Baumol's descriptions very well.

This research also utilizes lagged explanatory or independent variables. The idea that CEO compensation might be related to past firm performance is often discussed in published literature, though

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rarely tested. This is surprising considering that base pay, at least to some extent, should be related to past performance Barro and Barro (1990). Some other studies also use lagged variables. McGuire, Chiu, and Elbing (1962) state that the one-period lag of Sales is significant, even if the CEO is replaced. Tripp and Kenny (1995) find that the only significant variable to explain total compensation is the one-period lag of shareholder return. Sigler and Porterfield (2001) include change in sales as a size control variable; although, they are actually testing the sales maximization theory.

This study primarily uses return on average assets (ROAA), one year total return to shareholders (Return) and net sales (Sales). Lagged versions are also included. These particular variables demonstrate in past studies to be the most successful in explaining CEO compensation in both non-bank and banking studies.

The model specifications and variables to test the aforementioned hypotheses in section one are as follows. To test hypothesis one, the first or base model is a very simple, three variable model that includes explanatory variables (ROAA, Return and Sales) to test both the profit/shareholder wealth maximization theory and the sales/sales growth maximization theory. This basic model is like the majority of the literature with total compensation as the dependent variable and contemporaneous explanatory variables. The second model specification, and all further models in this research, include

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six explanatory variables by adding lagged variables, first differences, or annual growth rate variables. Both of these specifications test hypothesis one using the entire data set.

Model three in this study tests hypothesis one using only the 372 smaller banks. This allows for a comparison of results to previous studies and a direct comparison to the large banks in my sample. To best compare this study's finding to previous research, a subset of only the 78 largest banks (typical of prior research) are analyzed in the fourth model. Hypotheses two and three, that test components of total compensation, both utilize models including the entire data set and the large banks subset.

Data

This study will rely on two data sources, SNL Financial L.P. and Standard and Poor's Research Insight (Compustat North America). Bank CEO Compensation data, from SNL Financial, is broken down into its component parts of base salary, bonus, other cash compensation, non-cash compensation and value of options granted. Other option data available includes value of options exercised and value of options held, both exercisable and un-exercisable. Definitions of compensation variables used in this study are available in Table 3.1. Other firm-specific and accounting data available from SNL

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Financial includes number of employees, number of branches, net interest margin, and various peer-performance measures.

Table 3.1. Compensation Variable Definitions

Variable	Definition
Base salary	Cash salary, includes any compensation earned but deferred at the officer's election.
Bonus	Cash bonuses, includes any compensation earned but deferred at the officer's election.
Other cash	Other cash compensation including 401(k)'s, cash incentive plans, employment agreements, change in control agreements, profit sharing, etc.
Annual cash**	The annual cash-equivalent compensation paid to the executive. It consists of base salary plus bonus plus other cash compensation.
Non-cash	Includes restricted stock, Employee stock option plans, etc.
Options**	Value of options awarded: Exercise price times options granted divided by three. This commonly used approximation of the Black-Scholes model estimates the present value of the options and allows comparability across companies. Awards are generally granted with strike price equal to stock price on day of the grant.
Total**	The sum of Annual cash plus Options.

Note: ** denotes dependent variables used in statistical models.

Data from Research Insight include various market-based and accounting-based performance measures identified in the preceding section. Return on average assets, one year shareholder return, sales, and one year change in sales are the primary explanatory or

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independent variables used in the statistical models. Definitions of the explanatory variables used in this study are contained in Table 3.2.

Table 3.2. Explanatory Variable Definitions

Variable	Definition
TA	Total assets in millions of dollars at fiscal year end.
ROAA	Return on average assets. Net income before extra-ordinary items divided by average assets times 100.
ROAAL	One period lag of ROAA. ($ROAA_{t-1}$)
Return	Annualized percentage total return to common shareholders. Includes price appreciation and dividend reinvestment.
ReturnL	One period lag of Return. ($Return_{t-1}$)
Sales	Includes total operating revenue and net pretax profits or loss on securities sold or redeemed.
chgSales	Current sales minus previous period's sales. ($Sales_t - Sales_{t-1}$)
groSales	Annual percentage growth in sales. $((Sales_t - Sales_{t-1})/Sales_{t-1}) \times 100$
NIM	Net Interest Margin: net interest income, fully taxable, as a percentage of average earning assets.

The period under study is 1998 through 2004. Due to various lagged and growth variables, financial data on commercial banks and bank holding companies across nine years (1996-2004) is required for this study. Analyzing both data sources, information is available on 484 banks in 2004. Due to missing data on some market-based

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variables and components of compensation in earlier years, the final sample includes 450 commercial banks and bank holding companies. This number is almost five times that of any previous study of banks. The majority of banks, 372, range in asset size (2004) between 400 million and 8 billion dollars. The next 57 banks range between 8-50 billion dollars, with the largest 21 banks ranging between 50 billion to 1.45 trillion dollars. Due to the skewed nature of the bank sizes, appropriate measures are taken to reduce bias in the final analysis.

Statistical Methodology

There are several procedures available for the estimation of pooled, time-series, cross-sectional or panel data. Choice is dependent upon assumptions made about the interrelationship of the exogenous variables, both cross-sectionally and across time, assumptions regarding the error term(s), and or the researcher's desire for either less bias or greater efficiency in the estimators. Two basic techniques commonly used are the one-way fixed effects model, or within-cases estimator, and the one-way random effects, or error components model, which is a within and between cases estimator. The one-way effects model assumes the specification is dependent only on the cross-sections to which the observations belong. There are also more sophisticated two-way effects models, which assume that both the cross section and the time series to which an observation belongs are

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important. There are also special autoregressive and mixed-variance component models available, using special econometric time-series techniques, if needed. To date, previous research employs a one-way random effects model using generalized least squares techniques.

The fixed effects regression specification or the within-cases estimator includes time-variant independent variables and unobserved effects (beyond random error) that may be correlated with the independent variables. The fixed effects model equation is:

$$y_{it} = \mu_t + \beta x_{it} + a_i + \varepsilon_{it} \qquad (3.1)$$

where $i = 1,..,n; \quad t = 1,..,T$

In equation (3.1), μ_t is an intercept that is allowed to vary with time, β is a row vector of fixed parameter coefficients, x_{it} are the predictor variables (strictly exogenous), and ε_{it} is the random disturbance term. The a_i represents all differences between persons/cases that are stable, (fixed parameters, one per person) over time and may or may not be correlated with x_{it}. In this study, it is possible that unobserved individual effects, a_i , such as the innate ability of CEO's, may be correlated with specific independent variables, such as firm performance measures. These unmeasured, stable characteristics may be estimated directly or conditioned out of the estimation process, hence the name, "fixed effects." Fixed effects methods completely ignore the between-person variation and focus only on the within-person variation. Discarding the between-person

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variation can yield standard errors that are considerably higher than those produced by methods that utilize both within- and between-person variation. A researcher would use fixed effects methods and ignore between-person variation because the between-person variation is likely to be contaminated by unmeasured personal characteristics that are correlated with compensation. By restricting ourselves to within-person variation, we eliminate that contamination. Thus, while fixed effects models will generally have more sampling variability (less efficiency) they are far more likely to be unbiased and consistent. Given the typical expectation of bias in non-experimental or observational studies, this trade-off for reduced bias is very appealing.

There is an important downside to the fixed effects methods. Only variables that have within-person variation will yield coefficients. Thus, time-invariant variables, such as gender or race, could not be included. This could be a critical limitation if a dummy variable is needed for the skewed nature of asset size of the sample banks. Fixed effect models are also generally less restrictive than their alternative, the random effects models. The random effects model can be looked at as a special case of the fixed effects model, one that requires far more assumptions. The basic random effects model is as follows:

$$y_{it} = \mu_t + \beta x_{it} + \gamma z_i + a_i + \varepsilon_{it} \qquad (3.2)$$

where $i = 1,..,n; \quad t = 1,..,T$

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As in the previous model, μ_t is an intercept that is allowed to vary with time, β is a row vector of fixed parameter coefficients, x_{it} are the predictor variables (strictly exogenous), and ε_{it} is the random disturbance term. Now, however, instead of assuming that a_i represents a set of fixed parameters, we assume each a_i is a random variable with a specified probability distribution. The typical assumption is that a_i has a normal distribution with a mean of zero and constant variance, and that it is independent (uncorrelated) with x_{it}, z_i, and ε_{it} . In this equation, γ is a row vector of coefficients and z_i are the time-invariant variables.

The primary difference between fixed effects and random effects estimates is that the random effects model does not control for between-person variation. This is because a key assumption of the random effects method is that the a_i are uncorrelated with x_{it}. The fixed effects model, on the other hand, imposes no restrictions on the relationship between a_i and x_{it}.

So, why use a random effects model? First, the random effects method can produce coefficient estimates for time-invariant variables. Remember, fixed effects methods control for these time-invariant predictors: it just does not produce coefficient estimates for them. Also, unlike random effects models, the fixed effects models control for *all* time-invariant variables, not just those include in the regression model. A second attractive feature of the random effects model is the

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ability to introduce random coefficients for the time-varying predictors. The model from equation (3.2) can be rewritten as:

$$y_{it} = \mu_t + \beta_i x_{it} + \gamma z_i + a_i + \varepsilon_{it} \qquad (3.3)$$

where $i = 1,....,n; \quad t = 1,....,T$

Equation (3.3) simply puts an i subscript on the β coefficient, which represents these random coefficients for the time-varying predictors. A third advantage of random effects methods is the ability to allow for autoregressive and other covariance structures on the ε_{it} component, if needed. In summary, the random effect model calculates both within and between variability which results in more efficient estimators, but, if assumptions are not met, can easily lead to biased estimators. Fixed effect models are often favored due to their less restrictive nature and unbiased estimators, of key importance in non-experimental or observational studies. Random effects models are necessary if coefficient estimates are needed for time-invariant variables and they allow for autoregressive and other covariance structures on the error term (ε_{it}). Another consideration is which models can handle unbalanced data or missing data, if at all? Both the fixed-effects and random-effects models in SAS (PROC GLM and PROC MIXED, respectively) can handle unbalanced designs which generally produce better results than excluding observations to create a balanced panel (Batalgi and Chang, 1994). The fixed effects model is expected to be the appropriate method for this study given it is less

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prone to bias and no time-invariant variables are being used. There is a statistical test available in SAS using the TSCSREG procedure that tests the null hypothesis of the random effects model against the fixed effects model. This is the Hausman test (1981), available in SAS ETS using PROC TSCSREG, another panel data method, used primarily for balanced design. This Hausman test allows the data to dictate which method is the appropriate one. The SAS TSCSREG also has the greater flexibility to test and adjust for autoregressive and other problems, if they exist.

Summary

This chapter provided the theoretical justification for this study and its related hypotheses. Additionally, this chapter provided the model specification, data sources, variables and definitions, and the statistical methodology to be used in testing the hypotheses. The results of this study are discussed in the next chapter.

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CHAPTER 4

EMPIRICAL RESULTS

This chapter presents three main sections. First, a detailed description of the sample is provided. Second, the results of statistical tests of hypotheses are provided. Finally, the chapter concludes with a brief summary.

Sample

The final data set consists of 450 banks with total assets ranging between $500 million and $1.45 billion, in 2004. Seven years of annual data are used, spanning the years 1998 through 2004. Due to missing data in earlier years or new startup banks, individual banks have between three and seven years of usable data. Overall, if a one-year lagged variable is analyzed, the average bank has 5.97 observation years. This section continues by providing descriptive summary statistics on variables used in this study and a detailed breakdown of total compensation into its component parts.

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Descriptive Statistics

The time span of this study encompasses periods of strong, weak and stagnant economic environments. Also during this period, several 'shocks' to the economy and banking environment occurs with the Long Term Capital Management, Enron, and WorldCom scandals, the terrorist attack of September 2001, and the war in Iraq in the spring of 2003. These events could result in more dramatic movement in explanatory variable values in both magnitude and direction, thus yielding a "richer" data set. These big events effect the "mood of the country," changing consumer confidence and expectations, resulting in faster response and larger swings in the economy. Compensation packages should also change more frequently in response to the changing environment, increasing the probability of finding linkages between them and the explanatory variables, if they exist. The ability to find these linkages will determine if the profit/shareholder wealth maximization theory and/or the sales/sales growth maximization theory explains bank CEO compensation. Descriptive statistics for the entire data set of 450 banks over seven years are found in Table 4.1.

As shown by the results reported in Table 4.1, the minimum and maximum values indicate the vast diversity of the banks on pay, size and performance. While the maximum values in the upper panel are either Citibank or Bank of America, all other data values are from

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Table 4.1. Descriptive Aggregate Summary Statistics
All Banks: 1998-2004

Variable	N	Mean	Minimum	Maximum
Annual Pay	3012	687680.000	32500.000	19933818.000
Option Pay	2905	473312.000	0.000	36267345.000
Total Pay	3012	1144178.000	68173.000	45021119.000
Sales	2998	1029.000	1.591.000	112022.000
chgSales	2835	95.000	-19993.000	38882.000
Total Assets	3006	13139.000	46.000	1484101.000
ROAA	2990	1.108	-6.412	5.678
Return	2999	16.559	-73.707	281.941
groSales	2834	13.780	-69.089	6013.190
Annual/TA	2932	364.142	4.110	7023.620
Option/TA	2851	77.693	0.000	3088.560
Total/TA	2932	439.689	5.666	7023.620

Note: Sales and Total Assets in millions of dollars. ROAA, Return and groSALES are in %. Pay variables are in $ or $ per million of total assets

many various banks. Mean values in the upper panel are heavily influenced by the larger banks due to the skewed nature of bank size as depicted in Figure 4.1. Lower panel means are dominated by the smaller banks in the study.

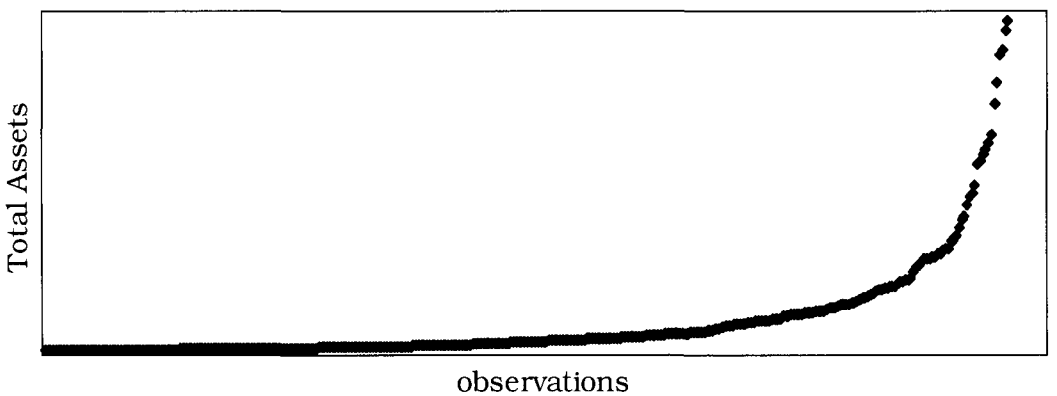

Figure 4.1. Plot of Bank Total Assets Sorted by Size

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While Table 4.1 includes the sample means used in hypothesis tests, investigation of means for individual years yields interesting results. Annual Cash Compensation is the only variable to increase every year of the study. Total Assets, increase six of seven years. All other variables have mixed results, increasing in three or four years and declining or remaining flat in other years as they respond to the changing economic environment. Interestingly, the variable values do not move up or down in unison. For example, in only two years do the performance variables, ROAA and shareholder Returns, change in the same direction. Mean Option compensation declines enough during three years, offsetting gains in Annual Cash Compensation, such that total compensation falls in two years and remains flat in the third. The worst year for bank performance and growth is 1999; also the best year for growth of CEO compensation.

As previously discussed in Chapters 2 and 3, prior bank compensation studies use much smaller data sets as compared to this research. Studies by Harjoto and Mullineaux (2003) and Vafeas, Waegelein and Papamichael (2003) utilize 74 and 94 banks respectively. To allow for direct comparisons between this research and earlier work, a subset of my 78 largest banks is analyzed. Also, referring to the total asset plot in Figure 4.1, there could be a systematic difference between the largest 78 banks and the remaining 372 smaller banks that could affect compensation theory hypothesis

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tests. Descriptive statistics for these 78 largest banks are summarized in Table 4.2.

The most interesting results are when Table 4.2 mean values are compared to those of Table 4.1. The large banks are far more efficient in asset utilization by generating a mean Return on Average Assets (ROAA) of 1.276% as compared to 1.108% for all banks (and 1.073% for small banks). Yet, in mean return to shareholders, the smaller banks achieve higher returns. Comparing results for Annual Pay divided by Total Assets

Table 4.2. Descriptive Aggregate Summary Statistics
Large Banks: 1998-2004

Variable	N	Mean	Minimum	Maximum
Annual Pay	542	1898427.000	326900.000	19933818.000
Option Pay	526	2025662.000	0.000	36267345.000
Total Pay	542	3864291.000	336663.000	45021119.000
Sales	546	5214.000	136.831	112022.000
chgSales	544	467.000	-19993.000	38882.000
Total Assets	546	66122.000	1465.000	1484101.000
ROAA	546	1.275	-6.412	3.605
Return	544	15.334	-69.899	281.941
groSales	544	12.815	-69.089	418.388
Annual/TA	542	99.103	4.110	991.769
Option/TA	526	73.310	0.000	1085.500
Total/TA	542	170.249	5.666	1338.870

Note: Sales and Total Assets in millions of dollars. ROAA, Return and groSALES are in %. Pay variables are in $ or $ per million of total assets

(Annual/TA), large bank CEO's receive an average of $99.10 per million dollars of assets as opposed to an average of $364.14 for the entire data set. Comparing results for Option pay divided by Total

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Assets (Option/TA), large bank CEO's receive an average of $73.31 per million dollars of assets as opposed to an average of $77.69 for the entire data set. These results would indicate that Annual Pay is a decreasing function of bank size, while Option pay is virtually identical. These pay results could indicate that my two theories' ability to explain CEO compensation might be different for big banks compared to smaller banks.

Component Compensation by Year

Component compensation by year is analyzed to assess the magnitude or dominance of any category of compensation, and to identify any trends in the various components of compensation. The breakdown of components of CEO pay by year is summarized in Table 4.3. The cash components of compensation (Annual Pay) are Base, Bonus and most of Other (as defined in this table). Non-cash compensation is primarily represented by restricted stock.

Table 4.3. Aggregate Components of CEO Pay as a Percentage of Total Compensation

Year	Base	Bonus	Non-Cash	Option	Other
2004	21.2	15.7	7.0	43.4	12.7
2003	28.3	23.2	10.6	30.3	7.6
2002	22.1	13.9	5.8	47.8	10.4
2001	22.1	14.8	6.2	49.6	7.3
2000	15.1	9.7	4.0	65.3	5.9
1999	17.5	11.2	8.9	55.7	6.7
1998	21.4	15.6	5.3	50.6	7.1

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From the 1998 levels, all cash components steadily decline in 1999 and 2000 as a per-cent of total compensation, while option compensation grows dramatically. The overall cash to non-cash rewards move from 44%/54% to a dramatic 30%/70% split. A structural shift in pay packages seems to occur when moving from 2000 to 2001. Base and bonus components increase their share of total compensation in 2001 and remain a relatively stable proportion over the final four years. The level of other pay also increases in 2001 and continues to grow to a larger component proportion of total compensation. The level of option pay drops in 2001 and continues to decline as a proportion of total pay. By the end of the period under study, 2004, cash to non-cash pay is an even 50%/50% split. This decline in option pay seems unusual for two reasons. First, Jensen and Murphy (1990a and 1990b), Harjoto and Mullineaux (2003) and other studies claim that, over time, pay-performance sensitivities, as measured by shareholder return, are steadily increasing, resulting in substantially larger CEO option compensation. Second, given how option compensation awards are valued, all else being equal, the substantial growth in stock prices of banks over the last four years should result in option pay being an even larger component of total compensation, or at least show an increase in dollar value awarded. Because the dollar value of options awarded remains flat from 2001-2004, the most plausible explanation is that fewer shares are awarded,

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on average, each year. This could indicate a structural shift in compensation packages that requires further investigation when more data is available.

Component Compensation
by Asset Size

The breakdown of component compensation by asset size is analyzed to assess possible differences between larger and smaller banks. This breakdown of components of CEO pay by asset size for selected years is summarized in Table 4.4. Base pay is the dominant component for smaller banks, averaging 55% of total compensation. As bank size increases, base pay falls rapidly as a per-cent of total pay. This is partly due to the Revenue Reconciliation Act of 1993 that places a one million dollar cap on the tax deductibility of base salaries, unless these salaries are tied to performance. Base salary in my sample data exceeded one million dollars only five times in 3150 observations.

Option compensation is the dominant component for larger banks, but decreases in magnitude over time similar to results in Table 4.3. As bank size increases, option pay rises rapidly as a per-cent of total pay. Of interest is that option compensation increases as a proportion of total pay for all but the largest category of banks. It appears that the smaller three categories of banks are shifting dollars from options to the bonus and other components. The many

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Table 4.4. Aggregate Components of CEO Pay as a Percentage of Total Compensation, by Asset Size (selected years)

Year Asset Size	Base	Bonus	Non-Cash	Option	Other
2004					
<$500M	56.1	13.6	2.1	19.0	9.2
$500M to 1B	44.2	14.0	5.3	23.0	13.5
$1B to $5B	32.4	16.7	5.6	34.1	11.2
>$5B	13.9	21.4	7.9	38.9	17.9
2001					
<$500M	53.9	14.7	1.6	15.7	14.1
$500M to 1B	48.4	15.7	3.2	17.7	15.0
$1B to $5B	36.0	19.9	5.7	27.9	10.5
>$5B	13.0	18.7	9.7	52.7	5.9
1998					
<$500M	55.3	15.6	2.1	16.1	10.9
$500M to 1B	56.6	17.7	1.8	14.2	9.7
$1B to $5B	39.6	22.9	2.2	29.4	5.9
>$5B	9.9	14.3	6.8	62.3	6.7

differences on where compensation is allocated depending on bank size lend further support that bank size may change the outcome of hypotheses tests.

Results of Statistical Tests of Hypotheses

This section provides the results of statistical tests of hypotheses. Before model or variable significance can be used to test hypotheses, we must first check that each model does not violate assumptions, contain collinear explanatory variables, influential outliers or any other irregularities. One common problem in this type of study is the violation of the constant variance assumption, or heteroskedasticity, due to the skewed nature of the data as depicted in

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Figure 4.1. Typically, there is an increase in variation for larger values of the response variable. One common remedy is to use a transformation of the response variable (Steel and Torie, 1980). However, to maintain a linear regression relationship among variables, a simultaneous transformation of the independent variables is also often needed. Another remedy, the method used most in the literature, is the inclusion of a "size-effects" control variable among the explanatory variables. Total assets is the most commonly used size control variable; however, some recent studies have used sales (Sigler & Porterfield, 2001). In this study, sales are included in all models to act as both the size-effects control variable and as a test variable for Baumol's (1959) sales maximization theory. Baumol's (1959) theory is that scale effects (size-effects) is more highly correlated to compensation than is profits.

Each model specification should also be checked to see if a fixed-effects or random-effects model is appropriate. As previously discussed in Chapter 3, this study should use fixed effects procedures because no time invariant variables are used. Also, the fixed effects model is preferred due to its less restrictive nature and unbiased estimators, of key importance in non-experimental or observational studies.

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Hypothesis One Results

$H1_o$: Neither the profit/shareholder wealth maximization theory nor the sales/sales growth maximization theory explains bank CEO total compensation.

The first model to test hypothesis one is a very basic three explanatory variable model, typical of many earlier compensation studies. The response or dependent variable is total CEO compensation. To test the profit/shareholder wealth maximization theory, the explanatory or independent variables are ROAA and Return. To test the sales/sales growth maximization theory, the explanatory or independent variable is Sales.

The first step is to determine if a random effects or a fixed effects model is appropriate. The one-way random effects model is estimated first because it automatically performs the Hausman test for random effects, a model specification test. If this test is rejected, the fixed effects model is the appropriate model. Results showed the Hausman test for random effects to be strongly rejected (p-value < .0001). The fixed effects model also includes a model specification test that checks for significant fixed effects among this model's 450 (number of banks) cross-sectional regressions. This F test for no fixed effects is strongly rejected (p-value < .0001), further supporting the choice of the fixed effects model. Residual plots indicate no violations of model assumptions, but a few outliers are present. Further investigation

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revealed none of these outliers are influential; therefore, no observations are dropped. A few prior studies found ROAA and Return are often related, but no evidence of collinearity is detected in this model. The results of the basic model using the fixed effects procedure are presented in Table 4.5.

Table 4.5. Estimates of Total Compensation for Bank Chief Executive Officers: Model 1

Independent	Base Model n = 450	
Variable	Coefficient	*p*-value
ROAA	293179.00	.0001
Return	127.00	.8780
Sales	486.00	.0001
Adj. R^2	0.77	
F-value	18.09	.0001

Hypothesis one is rejected due to the overall significance of the model (F-value = 18.09, p-value < .0001). Individual variable test results are as follows. From Table 4.5, ROAA exhibits a significantly positive relationship to the response variable, total compensation (coefficient = 293179, p-value = .0001). The coefficient is interpreted as follows: a 0.1% increase in return on average assets results in an increase of total CEO compensation of $29,318, on average, all other variables held constant. Looking again at table 4.5, Sales also exhibits a significantly positive relationship to total compensation (coefficient = 486, p-value < .0001). This coefficient is interpreted as, a $1 million increase in sales results in an increase of total CEO compensation of

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$486, on average, all other variables held constant. Return to shareholders is positively related, but not significantly related to total compensation (p-value = .8780). In summary, hypothesis one is rejected. The profit/shareholder wealth maximization theory is supported by the significance of ROAA. The sales/sales growth maximization theory is supported by the significance of Sales. Other variables analyzed in this model are net interest margin, substituted for ROAA and change in sales, substituted for sales. Neither variable proved very useful here or in later models. Net interest margin is sometimes mildly significant in "cash" compensation models but, overall, ROAA proved superior by consistently indicating stronger linkages to pay.

A second model to test hypothesis one expands on the base model in an attempt to gain insight into what additional variables could be added to better explain CEO compensation. Variables used are grounded in both prior research and theory. McGuire, Chiu, and Elbing (1962) reported that some one-period, lagged variables are often better than contemporaneous variables and Tripp and Kenny (1995) successfully used the lagged variable, $Return_{t-1}$. To test Baumol's (1962) sales growth maximization theory, Coughlan and Schmidt (1985) and others include the contemporaneous one-year growth of sales. This present study will now add lagged variables for return on

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average assets, ROAAL, and one-year shareholder return, ReturnL, and also add annual growth in sales, groSales.

In this study's second model, a full six variable specification is estimated. To test the profit/shareholder wealth maximization theory, the explanatory or independent variables are ROAA, ROAAL, Return and ReturnL. To test the sales/sales growth maximization theory, the explanatory or independent variables are Sales and groSales. The full model results showed the Hausman test for random effects to be strongly rejected (p-value <.0001). This model specification F test for no fixed effects is strongly rejected (p-value < .0001). Residual plots indicate no significant violations of model assumptions, but again a few outliers are present. Further investigation revealed that none are influential; therefore, no observations are dropped. Evidence of some collinearity is detected in this model. The variance inflation factors (VIF) for ROAA and ROAAL are each about 1.96, which are well below the accepted cutoff of 10. Inspection of the eigenvalue structure, condition index and sequential betas indicate the level of collinearity is at an acceptable level. The results of the full model using the fixed effects procedure are presented in Table 4.6.

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Table 4.6. Estimates of Total Compensation for Bank Chief Executive Officers: Model 2

Independent Variable	Full Model n = 450	
	Coefficient	*p*-value
ROAA	290052.00	.0011
Return	-24.00	.9795
Sales	477.00	.0001
ROAAL	147443.00	.0850
ReturnL	631.00	.4191
groSales	-5142.00	.0002
Adj. R^2	0.78	
F-value	16.85	.0001

Hypothesis one is rejected due to the overall significance of the model (F-value = 16.85, p-value < .0001). Individual variable test results are as follows. From Table 4.6, ROAA again exhibits a significantly positive relationship to the response variable, total compensation (coefficient = 290052, p-value = .0011). Sales exhibits a significantly positive relationship to total compensation (coefficient = 477, p-value < .0001). Two of the three new variables contribute to the model. The variable groSales has a significantly negative relationship to total compensation (coefficient = -5142, p-value = .0002). The variable ROAAL has a mildly significant positive relationship to total compensation (coefficient = 147443, p-value = .0850). Current return to shareholders, Return, and last year's return to shareholders, ReturnL, are not related to total compensation (p-values = .9795 and .4191 respectively).

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In summary, hypothesis one is rejected. The profit/shareholder wealth maximization theory is supported by the significance of ROAA and ROAAL. The sales/sales growth maximization theory is supported by the significance of Sales. The negative coefficient, although significant, for groSales is contrary to theory and will be discussed further in the next chapter. From this point forward, only the full, six variable models is used.

At this point, the issue of differences in bank size - Will bank size affect how well the two theories explain CEO compensation? - must be addressed. Hypothesis one is again tested, but with two subsets of the sample data. The first model uses the 78 largest banks (comparable to prior research), while the second model uses the 372 smaller banks. Once again, to test the profit/shareholder wealth maximization theory, the explanatory or independent variables are ROAA, ROAAL, Return and ReturnL. To test the sales/sales growth maximization theory, the explanatory or independent variables are Sales and groSales. The results for both models show the Hausman test for random effects to be rejected (p-value = .0266 and .0435 respectively). This model specification F test for no fixed effects is strongly rejected (p-value < .0001) for both models. Residual plots indicate no violations of model assumptions, but again a few outliers are present. Further investigation revealed no outliers are influential; therefore, no observations are dropped. Evidence of some collinearity

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is detected in these models. The variance inflation factors (VIF) for ROAA and ROAAL each are about 2.0, which are still well below the accepted cutoff of 10. Inspection of the eigenvalue structure, condition index and sequential betas indicate the level of collinearity is within acceptable levels. The results for the 78 largest banks using the fixed effects procedure are presented in Table 4.7.

Hypothesis one is rejected due to the overall significance of the model (F-value = 13.51, p-value < .0001). Individual variable test results are as follows. Inspection of columns two and three in Table 4.7 reveals results very different than for the 450-bank, full model in Table 4.6. Results from Table 4.7 for the big bank model are: Sales exhibits a significantly positive relationship to total compensation

Table 4.7. Estimates of Total Compensation for Bank Chief Executive Officers: Model 3

Independent	Large Banks n = 78	
Variable	Coefficient	*p*-value
ROAA	477321.00	.1382
Return	-1550.00	.7149
Sales	466.00	.0001
ROAAL	357808.00	.2772
ReturnL	1566.00	.6719
groSales	-11401.00	.0169
Adj. R^2	0.71	
F-value	13.51	.0001

(coefficient = 466, p-value < .0001) while groSales has a significantly negative relationship to the response variable, total compensation (coefficient = -11401, p-value = .0169). All other variables are

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statistically unrelated to total compensation. In summary, hypothesis one is rejected in the large banks only model. The sales/sales growth maximization theory is supported by the significance of Sales but challenged by the significantly negative relationship of groSales. The profit/shareholder wealth maximization theory is not supported.

Results when using only the smaller 372 banks in the sample are reported in Table 4.8. Hypothesis one is rejected due to the overall significance of the model (F-value = 6.61, p-value < .0001). The biggest difference is the reduction of adjusted R^2 from 0.775 in the full sample model to 0.584 in this small bank model. Individual variable test results are as follows. Overall, a slightly different picture emerges

Table 4.8. Estimates of Total Compensation for Bank Chief Executive Officers: Model 4

Independent	Small Banks n = 372	
Variable	Coefficient	*p*-value
ROAA	127652.00	.0024
Return	699.00	.0792
Sales	2379.00	.0001
ROAAL	67088.00	.0818
ReturnL	749.00	.0243
groSales	-845.00	.2159
Adj. R^2	0.58	
F-value	6.61	.0001

as to what explanatory variables are related to the response variable, total CEO compensation. From Table 4.8, ROAA exhibits a significantly positive relationship to total compensation (coefficient = 127652, p-value = .0024). Sales exhibits a significantly positive

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relationship to total compensation (coefficient = 2379, p-value < .0001). ReturnL has a significantly positive relationship to total compensation (coefficient = 749, p-value = .0243). Two variables are moderately significant and positively related to total compensation. These variables are Return (coefficient = 699, p-value = .0792) and ROAAL (coefficient = 67088, p-value = .0818). Growth in sales, groSales, is insignificant (p-value = .2159). In summary, hypothesis one is rejected in the small banks only model. However, compared to the big bank sample, a very different set of variables are significant. The profit/shareholder wealth maximization theory is strongly supported by the significance of ROAA and ReturnL and mildly supported by Return and ROAAL. The sales/sales growth maximization theory is supported by the significance of Sales. Also, compared to the full n=450 bank sample, shareholder return variables are now significant in explaining total compensation.

Considering how the sample is split into small and large banks, the difference in results suggests that size is still an omitted variable, even though sales are include in the models. To validate the robustness of my models, I add a dummy variable for size and for all interactions between the dummy variable and explanatory variables and re-run the regression on the full sample. Because the hypothesis is still rejected, i.e., the model F-value is significant, and the coefficients remain stable, the model is robust as to specification. This

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robustness check is repeated for each hypothesis, with identical results.

Hypothesis Two Results

$H2_o$: Neither the profit/shareholder wealth maximization theory nor the sales/sales growth maximization theory explains bank CEO annual cash compensation.

The first model to test hypothesis two is the full model that utilizes six explanatory variables, including lagged variables, and all 450 banks in the data set. The response or dependent variable is Annual Cash Compensation. To test the profit/shareholder wealth maximization theory, the explanatory or independent variables are ROAA, ROAAL, Return and ReturnL. To test the sales/sales growth maximization theory, the explanatory or independent variables are Sales and groSales. The model results showed the Hausman test for random effects to be strongly rejected (p-value < .0001). The model specification F test for no fixed effects is strongly rejected (p-value < .0001). Residual plots indicate no violations of model assumptions, but several possible outliers are indicated on residual plots. Further investigation reveals that none are influential; therefore, no observations are dropped. Evidence of some collinearity is detected in this model between the variables ROAA and ROAAL, but is determined to be at an acceptable level. The results of the model using the fixed effects procedure are presented in Table 4.9.

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Table 4.9. Estimates of Annual Compensation for Bank Chief Executive Officers: Model 1

Independent Variable	Full Model n = 450	
	Coefficient	*p*-value
ROAA	138744.00	.0001
Return	1348.00	.0001
Sales	204.00	.0001
ROAAL	13420.00	.6512
ReturnL	624.00	.0214
groSales	-2179.00	.0001
Adj. R^2	0.86	
F-value	30.32	.0001

Hypothesis two is rejected due to the overall significance of the model (F-value = 30.32, p-value < .0001). Individual variable test results are as follows. From Table 4.9, the explanatory variable ROAA is significant and positively related to the response variable, Annual Cash Compensation (coefficient = 138744, p-value < .0001). Return is significant and positively related to Annual Cash Compensation (coefficient = 1348, p-value < .0001). Sales is significant and positively related to Annual Cash Compensation (coefficient = 204, p-value < .0001). ReturnL is significant and positively related to Annual Cash Compensation (coefficient = 624, p-value = .0214). Variable groSales is significant but negatively related to Annual Cash Compensation (coefficient = -2179, p-value < .0008). Only ROAAL is not significant (p-value = .6512). In summary, hypothesis two is rejected. The profit/shareholder wealth maximization theory is supported by the significance of ROAA, Return and ReturnL. The sales/sales growth

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maximization theory is supported by the significance of Sales but challenged by results for groSales.

The second model to test hypothesis two is again the full model that utilizes six explanatory variables, including lagged variables. However, only the 78 largest banks in the data set are included. The response or dependent variable is Annual Cash Compensation. To test the profit/shareholder wealth maximization theory, the explanatory or independent variables are ROAA, ROAAL, Return and ReturnL. To test the sales/sales growth maximization theory, the explanatory or independent variables are Sales and groSales. The model results show the Hausman test for random effects to be strongly rejected (p-value = .0126). The model specification F test for no fixed effects is strongly rejected (p-value < .0001). Residual plots indicate no violations of model assumptions, but three possible outliers are indicated on residual plots. Further investigation reveals none are influential; therefore, no observations are dropped. Evidence of some collinearity is detected in this model between the variables ROAA and ROAAL, but is determined to be within acceptable levels. The results of the large bank model using the fixed effects procedure are presented in Table 4.10.

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Table 4.10. Estimates of Annual Compensation for Bank Chief Executive Officers: Model 2

Independent Variable	Large Banks n = 78 Coefficient	*p*-value
ROAA	198027.00	.0363
Return	3261.00	.0091
Sales	201.00	.0001
ROAAL	53654.00	.5785
ReturnL	2346.00	.0311
groSales	-4359.00	.0019
Adj. R^2	0.86	
F-value	34.49	.0001

Hypothesis two is rejected due to the overall significance of the model (F-value = 34.49, p-value < .0001). Individual variable test present a very similar picture to the full sample model as to which explanatory variables are related to the response variable, Annual Cash Compensation. From Table 4.10, for large banks, the explanatory variable ROAA is significant and positively related to the response variable, Annual Cash Compensation (coefficient = 198027, p-value = .0363). Return is significant and positively related to Annual Cash Compensation (coefficient = 3261, p-value = .0091). Sales is significant and positively related to Annual Cash Compensation (coefficient = 201, p-value < .0001). ReturnL is significant and positively related to Annual Cash Compensation (coefficient = 2346, p-value = .0311). Variable groSales is significant but negatively related to Annual Cash Compensation (coefficient = -4359, p-value = .0019). Only ROAAL is not significant (p-value = .5785). In summary,

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hypothesis two is rejected. The profit/shareholder wealth maximization theory is supported by the significance of ROAA, Return and ReturnL. The sales/sales growth maximization theory is supported by the significance of Sales but again challenged by results for groSales.

The third model to test hypothesis two is again the full model that utilizes six explanatory variables, including lagged variables. Now, only the 372 smaller banks in the data set are included. The response or dependent variable is annual cash compensation. To test the profit/shareholder wealth maximization theory, the explanatory or independent variables are ROAA, ROAAL, Return and ReturnL. To test the sales/sales growth maximization theory, the explanatory or independent variables are Sales and groSales. The model results shows the Hausman test for random effects to be rejected (p-value = .0482). The model specification F test for no fixed effects is strongly rejected (p-value < .0001). Residual plots indicate no violations of model assumptions, but some possible outliers are indicated on residual plots. Further investigation reveals that none are influential; therefore, no observations are dropped. Evidence of some collinearity is detected in this model between the variables ROAA and ROAAL, but is determined to be at an acceptable level. The results of the small bank model using the fixed effects procedure are presented in Table 4.11.

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Table 4.11. Estimates of Annual Compensation for Bank Chief Executive Officers: Model 3

Independent Variable	Small Banks n = 372	
	Coefficient	*p*-value
ROAA	49151.00	.0551
Return	864.00	.0004
Sales	1642.00	.0001
ROAAL	989.00	.9664
ReturnL	396.00	.0507
groSales	-1037.00	.0127
Adj. R^2	0.55	
F-value	5.76	.0001

Hypothesis two is rejected due to the overall significance of the model (F-value = 5.76, p-value < .0001). Individual variable test present a very similar picture to both the full sample and large bank sample models as to which explanatory variables are related to the response variable, Annual Cash Compensation. Only slight reductions in p-values are observed. From Table 4.11, for small banks, the explanatory variable ROAA is mildly significant and positively related to the response variable, Annual Cash Compensation (coefficient = 49151, p-value = .0551). Return is significant and positively related to Annual Cash Compensation (coefficient = 864, p-value = .0004). Sales is significant and positively related to Annual Cash Compensation (coefficient = 1642, p-value < .0001). ReturnL is mildly significant and positively related to Annual Cash Compensation (coefficient = 396, p-value = .0507). The variable groSales is significant but negatively related to Annual Cash Compensation (coefficient = -1037, p-

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value = .0127). Only ROAAL is not significant (p-value = .9664). In summary, hypothesis two is rejected. The profit/shareholder wealth maximization theory is supported by the significance of ROAA, Return and ReturnL. The sales/sales growth maximization theory is supported by the significance of Sales but challenged by results for groSales.

Hypothesis Three Results

$H3_o$: Neither the profit/shareholder wealth maximization theory nor the sales/sales growth maximization theory explains bank CEO stock option (non-cash) compensation.

The first model to test hypothesis three is the full model that utilizes six explanatory variables, including lagged variables, and all 450 banks in the data set. The response or dependent variable is Stock Option Compensation. If no options are received, this value is zero. To test the profit/shareholder wealth maximization theory, the explanatory or independent variables are ROAA, ROAAL, Return and ReturnL. To test the sales/sales growth maximization theory, the explanatory or independent variables are Sales and groSales. The model results show the Hausman test for random effects to be strongly rejected (p-value < .0001). The model specification F test for no fixed effects is strongly rejected (p-value < .0001). Evidence of some collinearity is detected in this model between the variables ROAA and ROAAL, but is determined to be within acceptable limits.

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Residual plots indicate no violations of model assumptions, but three obvious outliers are indicated on the residual plots. Further investigation reveals that all three are influential; therefore, all three observations are dropped. The three observations are from Citigroup, 1998-2000. These three option pay awards totaled $600 million. The total option awards for all other 2,905 observations in the study totaled $1,375 million. Thus, the inclusion of the three outliers would represent almost 30% of all option pay awards. Analysis of the three outliers using DIFFITS and DFBETA statistics indicate that all are influential in both level and slope of the coefficients; therefore, all three observations are dropped. The results of the model for option pay using the fixed effects procedure are presented in Table 4.12.

Table 4.12. Estimates of Option Compensation for Bank Chief Executive Officers: Model 1

Independent Variable	Full Model n = 450 Coefficient	*p*-value
ROAA	181079.00	.0333
Return	-1281.00	.1482
Sales	359.00	.0001
ROAAL	103811.00	.2036
ReturnL	171.00	.8198
groSales	-2355.00	.0799
Adj. R^2	0.60	
F-value	7.09	.0001

Hypothesis three is rejected due to the overall significance of the model (F-value = 7.09, p-value < .0001). Individual variable test results are as follows. From Table 4.12, ROAA is significant and positively

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related to the response variable, Stock Option Compensation (coefficient = 181079, p-value = .0333). Sales is significant and positively related to Stock Option Compensation (coefficient = 359, p-value < .0001). Variable groSales is mildly significant but negatively related to the response variable, Stock Option Compensation (coefficient = -2355, p-value = .0799). All other variables are not significant. They are Return (p-value = .1482), ROAAL (p-value = .2036) and ReturnL (p-value = .8198). In summary, hypothesis three is rejected. The profit/shareholder wealth maximization theory is supported only by the significance of ROAA. The sales/sales growth maximization theory is supported by the significance of Sales but challenged by results for groSales.

The second model to test hypothesis three includes only the 78 largest banks in the data set. The response or dependent variable is Stock Option Compensation. To test the profit/shareholder wealth maximization theory, the explanatory or independent variables are ROAA, ROAAL, Return and ReturnL. To test the sales/sales growth maximization theory, the explanatory or independent variables are Sales and groSales. The model results show the Hausman test for random effects to be rejected (p-value = .0444). The model specification F test for no fixed effects is strongly rejected (p-value < .0001). Residual plots, after the three previously discussed influential outliers are excluded, indicate no violations of model assumptions. A few

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possible outliers are indicated on residual plots. Further investigation reveals no more are influential; therefore, no further observations are dropped. Evidence of some mild collinearity is detected in this model between the variables ROAA and ROAAL, but is determined to be at an acceptable level. The results of the large-bank model using the fixed effects procedure are presented in Table 4.13.

Hypothesis three is rejected due to the overall significance of the model (F-value = 5.77, p-value < .0001). Individual variable test results are as follows. When only using the largest banks, a very different picture emerges as to what explanatory variables are related to the

Table 4.13. Estimates of Option Compensation for Bank Chief Executive Officers: Model 2

Independent	Large Banks n = 78	
Variable	Coefficient	*p*-value
ROAA	360685.00	.2599
Return	-4629.00	.2755
Sales	355.00	.0001
ROAAL	195926.00	.5503
ReturnL	-297.00	.9357
groSales	-5759.00	.2321
Adj. R^2	0.52	
F-value	5.77	.0001

response variable, Stock Option Compensation. From Table 4.13, only the explanatory variable Sales is significant and positively related to the response variable, Stock Option Compensation (coefficient = 355, p-value < .0001). All other variables are not significant. They are ROAA (p-value = .2599), Return (p-value = .2755), ROAAL (p-value = .5503),

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ReturnL (p-value = .9357), and groSales (p-value = .2321). In summary, hypothesis three is rejected. The sales/sales growth maximization theory is supported by the significance of Sales. The profit/shareholder wealth maximization theory is not supported.

The final model to test hypothesis three is comprised of the 372 smallest banks in the data set. The response or dependent variable is Stock Option Compensation. To test the profit/shareholder wealth maximization theory, the explanatory or independent variables are ROAA, ROAAL, Return and ReturnL. To test the sales/sales growth maximization theory, the explanatory or independent variables are Sales and groSales. The model results show the Hausman test for random effects to be rejected (p-value = .0146). The model specification F test for no fixed effects is strongly rejected (p-value < .0001). Residual plots, after the three previously discussed influential outliers are dropped; indicate no violations of model assumptions. A few possible outliers are indicated on residual plots. Further investigation reveals no more are influential; therefore, no further observations are dropped. Evidence of some collinearity is detected in this model between the variables ROAA and ROAAL, but is determined to be well within acceptable limits. The results of the small-bank model using the fixed effects procedure are presented in Table 4.14.

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Table 4.14. Estimates of Option Compensation for Bank Chief Executive Officers: Model 3

Independent Variable	Small Banks n = 372	
	Coefficient	*p*-value
ROAA	80364.00	.0128
Return	-186.00	.5429
Sales	724.00	.0149
ROAAL	65862.00	.0251
ReturnL	381.00	.1374
groSales	208.00	.6904
Adj. R^2	0.46	
F-value	3.89	.0001

Hypothesis three is rejected due to the overall significance of the model (F-value = 3.89, p-value < .0001). When only using the smaller banks, results are closer to the full data set results, but are still different. Individual variable test results are as follows. From Table 4.14, the explanatory variable ROAA is significant and positively related to the response variable, Stock Option Compensation (coefficient = 80364, p-value = .0129). Sales are significant and positively related to the response variable, Stock Option Compensation (coefficient = 724, p-value = .0149). ROAAL is significant and positively related to Stock Option compensation (coefficient = 65862, p-value = .0251). All other variables are not significant. They are Return (p-value = .5429), ReturnL (p-value = .1374), and groSales (p-value = .6904). In summary, hypothesis three is rejected. The profit/shareholder wealth maximization theory is supported by the significance of ROAA and

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ROAAL. The sales/sales growth maximization theory is supported by the significance of Sales.

In the previous two models, especially the large-bank sample, relatively few variables are significant in explaining Stock Option Compensation. This could occur because only 65%, or 296, of 450 banks actively utilize stock options as part of their compensation packages. To better predict option-based pay, perhaps only those banks that utilize options should be include in the statistical models. Analysis of the 230 of the 372 small banks and the 66 of the 78 largest banks, that actually awarded options, yielded results virtually identical to the two previous models; therefore, results are not include here.

Summary of Results

Hypothesis $H1_o$ is rejected. Support is found for both theories of compensation in three of the four model specifications. Support is found both for and against the sales/sales growth maximization theory in the large-bank, n = 78, model. There are several differences as to which explanatory variables are significant for each bank sample.

Hypothesis $H2_o$ is rejected. Support is found for both theories of compensation in each of the three model specifications. Evidence against the sales growth maximization theory is also found. There are no differences as to which explanatory variables are significant, but there are changes in the level of significance of the variables.

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Hypothesis $H3_o$ is rejected. Support is found for both theories of compensation in the full sample, n = 450, and the n = 372, small-bank model. Support is found for only the sales/sales growth maximization theory in the n = 78, large-bank model. There are several differences as to which explanatory variables are significant for each bank sample.

Summary

This chapter begins with a description of the sample. Descriptive statistics on the entire aggregated sample, for the large bank sample, and for components of compensation are provided. Results of statistical tests of each of the three hypotheses are provided. Chapter 5 provides a summary and implications of the results, the contributions of this study and suggestions for future research.

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CHAPTER 5

CONCLUSIONS

This chapter presents in three main sections. First, a summary and implications of the results, by hypothesis, is provided. Second, the contributions of this study are discussed. Finally, suggestions for future research are provided.

Summary and Implications of the Results

Results of tests of hypotheses show strong support for both theories of CEO compensation investigated in this study, unlike many previous studies. However, sub-samples of banks often yield different pay-performance linkages. Because each hypothesis tests a different definition or component of CEO compensation, discussion of results follow one hypothesis at a time.

Hypothesis One Conclusions

$H1_o$: Neither the profit/shareholder wealth maximization theory nor the sales/sales growth maximization theory explains bank CEO total compensation.

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The first model tested (Table 4.5) contains only contemporaneous explanatory variables, like the majority of previous research, while the second model (Table 4.6) includes lagged variables, rarely used previously. Both models strongly rejected hypothesis one and show strong support for both compensation theories. In both, a 0.1% increase in return on average assets results in an increase of over $29,000 in CEO compensation. Also, a 0.1% increase in the previous year's return on average assets results in an increase of $14,744 in CEO compensation. These results support the profit/shareholder wealth maximization theory and demonstrate the value of lagged variables to explain CEO pay. Of interest is that shareholder return is not significant at a time when most research is trying to establish links between pay and market-based variables.

Sales are also very strongly related to CEO compensation, yielding an increase of $477 to $486 of pay for each $1 million increase in sales. While this result for sales supports Baumol's (1959 and 1967) sales maximization theory, the significantly negative relationship between growth of sales and pay refutes Baumol's (1962) sales growth maximization theory. This result is not entirely without precedent. Winn and Shoenhair (1988) and Agrawal, Makhija, and Mandelker (1991) are two non-banking studies that find sales growth to be negatively related to pay. My findings may support Baumol's contention that managers may indeed have non-pecuniary incentives

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to increase revenue. My findings may also suggest that growth of sales may only be useful in explaining specific components of pay as opposed to total compensation.

Hypothesis one is next tested by using subsets of the full 450 bank model. Model three (Table 4.7) uses only the largest 78 banks in the study, allowing comparisons to previous research and comparisons to banks not previously investigated. The only variables related to total compensation in these large banks are sales and growth of sales. The result for sales is similar to the full model, an increase in CEO total pay of $466 for every $1 million increase in sales, supporting the sales maximization theory. Also, the negative relationship between pay and growth of sales is found, refuting the sales growth theory. This large-bank result is unexpected, because most bank and non-bank studies in the last ten years find at least a weak link between pay and the profit/shareholder wealth maximization theory. In contrast, a very different picture is found for the smaller banks, previously not used in compensation research.

The results from model 4, Table 4.8, reject hypothesis one and show broad support for both compensation theories. Return on average assets is strongly linked to total compensation and, more importantly, the previous year's shareholder return is also strongly linked to total compensation. Current shareholder return and the previous year's return on assets are both moderately linked to total

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CEO compensation. Thus, very strong support is found for the profit/shareholder wealth maximization theory, when looking at the smaller banks. The sales maximization theory is also supported by the strong link between sales and total compensation. For a $1 million increase in sales, total pay increases $2,379. It is interesting that sales increases are approximately five times more valuable to the CEO of the smaller banks, $2,379, than to the CEO of the large banks, $466. Also, other performance measures are important to the smaller bank CEOs; while, only the scale of operations is important to the larger bank CEOs. We will see this again when option pay is discussed. Next, we turn to only the "cash" components of total CEO compensation.

Hypothesis Two Conclusions

$H2_o$: Neither the profit/shareholder wealth maximization theory nor the sales/sales growth maximization theory explains bank CEO annual cash compensation.

Results for all three CEO annual cash compensation models are identical, regarding which variables are significantly related to pay. The only differences are level of significance and a few key differences in pay-performance sensitivities. All three models, Tables 4.9-4.11, strongly reject hypothesis two and provide support for both compensation theories. All variables, except the previous year's return on assets, are strongly related to cash components of compensation.

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Growth of sales is again negatively related to pay, refuting the sales growth theory.

Supporting the profit/shareholder wealth maximization theory are return on assets, shareholder return and the prior year's shareholder return. As should be expected, the pay-performance sensitivities (coefficients) for the larger banks, Table 4.10, are higher than for the smaller banks, Table 4.11. This is not unexpected; because, a percentage change in ROAA or Return would generate far larger increases in total dollars of profits or shareholder wealth in the big banks. For example, a 0.1% increase in return on assets results in an increase in annual cash compensation of $19,803 for large-bank CEOs, as opposed to $4,915 for smaller-bank CEOs. Also, a 1% increase in return to shareholders results in an increase in annual cash compensation of $3,261 for large-bank CEOs, as opposed to $864 for smaller-bank CEOs. When looking at total assets, the large banks are 48 times larger, on average; yet, the pay sensitivity is only 4 times larger. Are pay-performance linkages stronger in smaller banks?

The significance of sales, in all three models, again supports the sales maximization theory. A $1 million increase in sales results in cash compensation increases of $201 for large-bank CEOs and $1,642 for small-bank CEOs. Sales increases are over eight times more valuable to the CEO of the smaller banks than to the CEO of the large banks. Again, I find a stronger linkage between pay and performance

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for the smaller bank CEOs, even though both are statistically strong relationships.

Hypothesis Three Conclusions

$H3_o$: Neither the profit/shareholder wealth maximization theory nor the sales/sales growth maximization theory explains bank CEO stock option (non-cash) compensation.

Hypothesis three is strongly rejected for all models testing only CEO option compensation. In the full 450 bank model, Table 4.12, both return on assets and sales show strong links to option pay, supporting both compensation theories. However, bank size again results in different linkages. For the 78 larger banks, Table 4.13, only sales are significantly linked to CEO option pay. A $1 million increase in sales yields $355 more option awards to the average CEO. This result, along with large bank results for total pay, is somewhat surprising considering recent research generally finds positive linkages between shareholder wealth and CEO total or option pay.

For the 372 smaller banks, Table 4.14, strong linkages are found between option compensation and return on assets, prior return on assets, and sales. Option compensation increases $8,036 for a 0.1% increase in return on assets and increases $6,582 for a 0.1% increase in return on previous year's assets. Option compensation increases $724 for each additional $1 million increase in sales. While accounting-based variables are much less prevalent in recent

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research, the positive result is typical. Overall, support for both the profit/shareholder wealth maximization theory and the sales maximization theory is found when investigating CEO option pay.

In summary, this research strongly supports both compensation theories in each of the three tested definitions of CEO pay. Negative relationships between pay and growth of sales are contrary to expectations; however, future research on more narrow definitions of pay might yield expected results. For the larger banks, representative of bank samples of earlier research, less support is found for the profit or shareholder wealth maximization theory. In this study, scale of operations dominates other linkages between pay and performance. Smaller banks show stronger linkages to pay than larger banks.

Contributions of this Study

A primary contribution of this research is the strong support that both theories of compensation, the profit/shareholder wealth maximization theory and the sales/sales growth maximization theory, are still viable theories, are necessary to explain CEO compensation in the banking industry. Perhaps the omission of Baumol's sales and sales growth theories is premature. Second, the increase in sample size, including over 350 banks not previously used, greatly extends the breadth of prior research. The ability to compare larger and smaller banks added insights not previously discovered. Third, the consistent significance of accounting-based performance variables, and the few

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instances of the market-based variables being significant, might help reverse the recent trend of including only market-based variables. Fourth, the significance of lagged variables in each of the three definitions of CEO compensation demonstrates the need for their use in far more research than previously used. Finally, the pay-performance linkage appears much stronger for smaller banks resulting in larger or relatively larger performance rewards for CEOs of these smaller banks.

Suggestions for Future Research

Future research should address the following issues. First, more components or subsets of components of CEO compensation need to be analyzed. Also, the components of compensation could be modeled as a system of equations, allowing for various hypothesis tests. For example, at the margin, how many dollars of option compensation are needed to replace a dollar of cash compensation, and vice-versa?

Second, a study to determine when or under what conditions banks begin to utilize option pay in their compensation packages is needed. Options represent over 50% of total compensation in my overall sample; yet, 31% of banks in this study have never awarded options.

Research could also address the following issues. One, in conjunction with point one, the sample of banks should be broken into more sub-groups along size or possibly along regional lines. Two,

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include more theories of compensation into the models, simultaneously testing for all. Research is typically restricted to two, or at most three, theories of compensation in any one study. Finally, extend the data set in both directions in time and investigate issues such as structural shifts in compensation composition.

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APPENDIX

LIST OF SAMPLE BANKS

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LIST OF SAMPLE BANKS

1ST SOURCE CORP
ABC BANCORP
ACNB CORP
ALABAMA NATL BANCORPORATION
ALLIANCE FINANCIAL CORP/NY
AMCORE FINANCIAL INC
AMEGY BANCORPORATION INC
AMERICAN BANK INC/PA
AMERICAN NATL BANKSHARES
AMERICANWEST BANCORP
AMERISERV FINANCIAL INC/PA
AMES NATIONAL CORP
AMSOUTH BANCORPORATION
ARROW FINANCIAL CORP
ASSOCIATED BANC-CORP
ASTORIA FINANCIAL CORP
AUBURN NATIONAL BANCORP
BANC CORP
BANCFIRST CORP/OK
BANCORP RHODE ISLAND INC
BANCORPSOUTH INC
BANCTRUST FINANCIAL GRP INC
BANK KY FINANCIAL CORP
BANK MARIN CORTE MADERA CA
BANK MUTUAL CORP
BANK OF AMERICA CORP
BANK OF COMMERCE HOLDINGS
BANK OF GRANITE CORPORATION
BANK OF HAWAII CORP
BANK OF NEW YORK CO INC
BANK OF THE OZARKS INC
BANKATLANTIC BANCORP
BANKUNITED FINANCIAL CORP
BANNER CORP
BAR HARBOR BANKSHARES
BAYLAKE CORP

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BB&T CORP
BCSB BANKCORP INC
BERKSHIRE BANCORP INC
BNCCORP INC
BOK FINANCIAL CORP
BOSTON PRIVATE FINL HLDGS
BRIDGE BANCORP INC
BROOKLINE BANCORP INC
BRYN MAWR BANK CORP
BWC FINANCIAL CORP
C&F FINANCIAL CORP
CAMCO FINANCIAL CORP
CAMDEN NATIONAL CORP
CAPITAL BANK CORP/NC
CAPITAL CITY BK GROUP INC
CAPITAL CORP OF THE WEST
CAPITAL CROSSING BANK
CAPITOL BANCORP LTD
CAPITOL FEDERAL FINANCIAL
CARDINAL FINANCIAL CORP
CASCADE BANCORP
CASCADE FINANCIAL CORP
CATHAY GENERAL BANCORP
CAVALRY BANCORP INC
CENTER BANCORP INC
CENTERSTATE BANKS OF FLORIDA
CENTRAL COAST BANCORP
CENTRAL PACIFIC FINANCIAL CP
CENTRUE FINANCIAL CORP
CENTURY BANCORP INC/MA
CFS BANCORP INC
CHARTER FINANCIAL CORP/GA
CHEMICAL FINANCIAL CORP
CHESTER VY BANCORP INC
CHITTENDEN CORP
CITIGROUP INC
CITIZENS & NORTHERN CORP
CITIZENS BANKING CORP
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LSB CORP
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MAIN STREET BANKS INC
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MAINSOURCE FINL GROUP INC
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MASSBANK CORP READING MA
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NBC CAPITAL CORP
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WAINWRIGHT BANK & TRUST CO
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WEBSTER FINANCIAL CORP
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