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**Within-Board Pay Inequality and Performance
Evidence from the US Banking Industry**



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Preface and Acknowledgements

In front of you lies the master thesis: “Within-Board Pay Inequality and Performance: Evidence from the US Banking Industry”. The submission of this thesis marks the end of my academic studies and the beginning of my professional career. It was an amazing year full of challenges, growth and dedication to my goals. I am looking forward to seeing what the future holds.

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Abstract

This paper explores the effect of the within-board compensation gap on the performance of the organization. This issue is extremely significant in the US financial and banking industry, especially since the bankruptcy of Lehman Brothers has occurred in 2008, which certainly played a significant role in the global financial crisis. The empirical findings of previous research on the topic have been contradictory as they are depending on different sample choices. Therefore, I examine this relationship by using a current sample of US banks that covers the period from 2010 to 2017. For my analysis, I use the panel data fixed-effects regression model. Overall, my findings shed light on how pay gap and corporate specific characteristics affect the performance of the organization. Our results suggest that the firm performance is affected positively by the compensation gap when measured as the Return on Assets, the Return on Equity or the Tobin's Q. On the other hand, there is no effect on the performance if measured as the Total Shareholder Return. Meanwhile, firm size has a positive effect on the compensation gap, whereas firm leverage is negatively related to it.

Keywords: Executive Compensation, Pay Inequality, Performance, Size, Leverage, Fixed-effects Regression

JEL Classification : G30, G34, J31, J33, M12

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CHAPTER 1 Introduction

The compensation of executives is an issue that has been extensively examined by financial regulators. However, the issue of relative compensation of executives within the board is a new topic that has largely attracted the interest of the researchers recently, as there is strong concern about the pay of senior employees, especially after the credit crisis. A paper published in the *Journal of Financial Economics* (Faulkender and Yang, 2010) illustrates the significant role of the newly established compensation peer groups on the composition of CEOs' pay. Another paper, also posted in the *Journal of Financial Economics* (Bizjak, Lemmon and Nguyen, 2011) raises concerns regarding the design of compensation packages based on peer group benchmarking. Based on these views, my study will take a closer look in the relative compensation of the top executives within the board of directors and the effects of pay inequality on employees' incentives and performance of the organization.

In recent years, there has been a significant increase in executive compensation and especially in the United States. This rise is even greater than what the firm size, the industry and the performance of a firm can explain. In absolute numbers, the executive compensation nowadays is the highest the world has ever seen, and it has also been criticized for rewarding failure, which can be justified by the stocks plummeting and the dramatic increase in the wage disparity nationally. Growing interest has emerged in viewing the expanding gap in the absolute income of Chief Executive Officers (CEOs) relative to lower ranked executives within the board. Regarding the quality of the executive wage and the compensation policies there has been a fierce debate amongst academic researchers. Many of them claim that the scarcity in the required talent an executive needs and the competition that exists among the executives result to this rise of their compensation which can be thought of as a positive one assisting in the increase of the shareholders' value, while others support that it is the executives that are influencing the compensation process themselves to grow their income beyond the optimal level. It is also observed that the compensation committee makes use of peer group benchmarking – depending on a representative peer group of comparable banks – while structuring the compensation of a newly hired CEO. A subjective selection of this peer group may also lead to an upward drift in wages. Bizjak, Lemmon and Naveen (2008) provide empirical evidence on how the use of peer groups affects the income of CEOs, resulting in higher wages not tied to the performance of the organization. The last three decades many

regulations have been established in order to control the executive compensation by the Federal laws and Securities & Exchange Commission (SEC). These new rules were proposed to be used alongside the Say on Pay Provisions of the Dodd-Frank act (2010), which established for the first time the right of stockholders to vote on the remuneration of executives.

Executive compensation has garnered a huge attention of the public and has generated fierce debate, especially since the credit crunch occurred. Compensation packages play a major role on a modern company's incentive system. There is strong evidence that the compensation is one of the fundamental principles that drives the establishment of an effective corporate governance and most relevant research has shown that executive pay is pretty much aligned with firm performances. Based on how pay inequality affects the firm performance, academic researchers have developed two main views. On the one hand, the income inequality could be mainly explained by tournament theory (Lin, Huang and Sun (2003) and Chen and Zhang (2006)). That is, an appropriate pay gap motivates employees to achieve higher level of performance for a chance to be promoted to the upper levels in the hierarchy and reap the rewards. However, the opposite relationship between pay inequality and company performance is found in studies that examine fairness and collaboration between colleagues (Cowherd and Levine (1992)). Indeed, the Equity Fairness Theory supports that a smaller gap will be more beneficial as it will promote morale, cooperation and team spirit. A series of studies (Oi & Idson (1999), Zhou (2000), Merhebi et al. (2006) and Mueller, Ouimet & Simintzi, (2017)) have already investigated the factors that create this tremendous gap in executive pay and the impact of compensation disparity on the performance of the organization. Unfortunately, the empirical findings of these studies have been incomplete as they are focusing on different samples.

Thus, one of the main concerns in the structure of remuneration packages is the income equality between different employees within the company. In this paper, it will be mainly examined the pay gap between the top executive of each organization and the average pay of the remaining senior executives within the board. Bing-Xuan Lin and Rui Lu (2009) have already examined the effects of compensation gaps between executives on the performance of the organization in the Chinese market. In my opinion, this issue is extremely significant in the US financial and banking industry, especially since the credit crisis has occurred in 2007. Therefore, my paper contributes to the existing literature by using a current and unique sample of US publicly traded banks that covers the post crisis period, from 2010 to 2017.

It offers supportive evidence on company pay gaps by examining the following research question:

“What effects does the relative compensation of top executives compared to other senior executives have on employee motivation and performance of the organization?”

The main purpose of this paper is to provide an answer to the research question, while contributing to the existing research made on this topic, but with a different sample as the focal point. For my analysis, I use the panel data fixed-effects regression model to test the relation between compensation gap and performance. My results provide important insights into the corporate governance literature and more specifically in the pool of studies related to pay inequality within the organization. Overall, my findings indicate that the compensation gap positively affects firm’s performance measures, namely Return on Assets, Return on Equity and Tobin’s Q. On the contrary, there is a negative relation between compensation gap and Total Shareholder’s Return. In terms of corporate specific characteristics, larger firms exhibit more pay inequality within the board of directors, whereas it is found that the higher the leverage ratios of an organization, the lower the compensation disparity between the executives.

The remainder of this study is organized as follows. In Section 2, we describe the existing literature. In Section 3 we discuss our main hypotheses based on the literature review. In Section 4, we describe our sample, variables and the estimation model. In Section 5, we present our empirical results and analysis. Section 6 concludes the paper.

CHAPTER 2 Literature Review

This section provides a brief review of the existing literature that has also examined the relation between compensation gaps and performance. The literature review, on the impact of pay gaps on the performance of the organization, has been divided into five subsections. First, the theoretical background on compensation gaps will be presented. Second, the findings of previous studies will be described. The third subsection will be used to discuss the relation between pay inequality and performance. Finally, the fourth and fifth subsections describe the peer group benchmarking for the construction of compensation packages.

2.1 Theoretical Perspectives

2.1.1 Tournament Theory

According to Lazear and Rosen (1981), tournaments consist a fundamental part of the workplace which, however, is invisible at times. The criterion for promotion is no longer the individual performance but the relative performance of the employees compared to their rivals. The pay rise that follows the promotion makes the tournament an instinctive response to the difficulty of offering a pay based on individual performance. Taking the rapid compensation rise for the tournament winner into consideration, the traditional economic theory, which regards executives' pay as an operation of marginal revenue productivity, could face difficulties analyzing the observed compensation system as it would explain the pay boost by the expansion in the managerial skills. In the tournament context, performing better than the rivals can denote the potential of rising to the hierarchy, which leads to a corresponding higher compensation. This result stimulates higher effort by the employees. Moreover, based on tournament theory, a wide compensation gap between the tournament winner and the rest of the participants results in lowering the supervision cost and joins principals' and agents' interests. Under these circumstances the tournament theory prompts a positive relationship between the pay gap and the overall performance of the company. Rosen (1986), Henderson and Fredrickson (2001), Kale, Reis and Venkateswaran (2009) have found a positive relationship between pay gaps and performance. However, the fact that the pay gap is increasing roughly, has recently led people to doubt on the beneficial and incentivizing effects of tournaments. Bolton and Ockenfels (2000) argue that employee incentives are affected if they believe that they have received less than they deserved comparing to others within the organization. Similarly, Martin (1981) and

Crosby (1984) argue that individuals experience deprivation and are dissatisfied when they realize that its relative payoff is unfavorable.

2.1.2 Behavioral Theory

According to behavioral theory, there are three explanations regarding executive compensation. Firstly, relative deprivation theory points out the feeling of inequality provoked by the compensation gap between lower-level and upper-level managers, which leads to loss of motivation and diminishing efforts (Cowherd and Levine, 1992). Secondly, the theory of organizational politics indicates that even though the compensation gap stimulates greater exertion, it is done on a basis of self-interest that often includes political sabotage (Milgrom and Roberts, 1988). Finally, the allocation preference which suggests equal compensation determined by all parties can be applied in order to ensure social balance based on team-work and exclude competitiveness, as a small gap promotes a healthy collaboration and therefore better firm performance. The behavioral theory has been further reinforced by evidence provided by Deutsch (1985) and Bloom (1999).

2.1.3 Executive Power Theory

“Executive-power theory” suggests that the growing pay gaps are uncontrollable once executives take advantage of their power aiming to promote their personal interests and gain additional benefits (Bebchuk and Fried, 2003). In fact, it is indisputable that executives and mainly CEOs are pursuing more and more power that they are craving to maintain. Using the power they have secured, they can influence the board of directors and affect the compensation packages of the company in a way that their pay is constantly increasing. Therefore, without the shareholders’ and regulators’ interference, the pay gap expands even more (Adams et al., 2005). In conclusion, the executive-power theory makes evident that the pay gaps correspond to the misuse of power over the design of compensation contracts. The executive-power theory is also reinforced by research findings. In 2011, Bebchuk et al. after analyzing as many as 12,011 U.S firms in the period from 1993 to 2004, conclude that the greater the compensation disparities the lower the value of the firm. According to Chen et al. (2011), who studied U.S. publicly traded companies for the period 1993-2007, deduce that huge compensation gaps are an indicator for significant agency problems which contributes in the growth of the cost of capital. Such an issue becomes even more evident in firms with higher cash flows and those

who have undergone adjustments in managerial structure. Summing up, a large pay gap and agency problems seem to be interrelated and their relationship is quite distinct under these conditions.

2.2 Compensation Gaps

In recent times, the rapid growth of executive compensation contributed in an expansion of the pay gap. Bebchuk and Grinstein (2005) indicate that, with respect to size and performance, there is a greater expansion in the executive compensation disparity rather than in the overall firm development. In fact, the expansion of the compensation of CEO has surpassed the expansion of the pay of the rest senior executives altogether. According to Li's (2011) findings, the divergence between the executives with the highest and second highest compensation has risen from 40% to 60% during the period 1993-2006. Moreover, Sapp (2008) points out that in Canada, over the period 2000-2005, the dispersion between CEO and executives was twofold. In 2003, Lin et al. revealed that, after the investigation of publicly traded companies in China for the years 1999 and 2000, that CEO pay was more than 1.4 times bigger than the one received by the remaining executives.

Besides the expansion of the compensation disparity among executives, the one between employees and executives has been widening as well. Hall and Murph (2003), studying firms listed in the S&P500, state that executive compensation has grown 30 times than the one of the other employees from 1970 to 1990 and until 2002. In 2008, Zhang after conducting an investigation in the Chinese market showed that the number of firms with a five times compensation disparity is decreasing, while the ones with a disparity more than eight times was 10% and now has expanded more than 24%. Liu and Sun (2010) have discovered recently that the disparity between executives and employees in government owned companies has doubled from 2004 to 2007. Consequently, this pay gaps' expansion seems to be the case in the global market. "Tournament theory" examines the aftermath of the pay gap. In particular, the increasing gap motivates the executive to make greater effort, reduces supervising costs and results in overall improvement of the corporate performance. Therefore, companies that design their compensation packages based on "tournament theory" take into consideration relative and not absolute terms of the performance.

As a consequence, the pay gap increases along with the promotions (Lazear and Rosen, 1981; Rosen, 1986). This motivational pattern stimulates executives to exert themselves, striving for

better positions. Nonetheless, as economic activities become more intricate and supervision is a difficult and pricey matter, the need for an internal pay gap arises. A well-suited pay gap will reassure the reduction of opportunistic behavior among competitive executives and the subsequent reduction of supervising costs. An internal compensation disparity consists the basic way for a firm to drive employees as well as invite the talents, since this consists a valuable expense with a decisive impact on the firm's performance. Nonetheless, it is not only the pay gap that can affect the incentives of employees, as relative peer group pay also matters. However, the constantly widening pay gap has resulted in skepticism regarding the positive and incentivizing impact of tournament theory.

2.3 Pay Inequality and Firm Performance

The compensation contract in China was lately under investigation. The relationship between the pay gap among the members of the board and the performance of the firm is studied by Lin et al. (2003), who justify that this relationship is positive using data of Chinese firms in 1999 and 2000. After dividing the companies into firms with high and low growth Chen and Zhang (2006) find that compensation gap is interrelated with the market performance for high growth firms. On the other hand, the pay disparity is interrelated with earnings per share for the firms that have low growth. During 1999 and 2000 Lin, Shen and Su (2005) study 450 firms and executive information to find that the growth of the compensation depends on the individual promotions. Besides, it becomes evident that a big pay gap leads to better performance. Apparently, tournament theory can explain the compensation gap in these companies, while all the previous research never revealed that the gap can result in better performance. Therefore, provided that a large pay gap brings higher performance rates, a small one can contribute in poor firm performance.

In 1990 Jensen and Murphy examined the relationship between the general firm performance and the pay packages of the CEOs. They pre-estimated the pay for performance sensitivity (PPS) by examining multiple U.S. companies from 1974 to 1986 and stated that a positive effect exists among the CEO compensation and the PPS. In addition, the positive connection between firm performance and CEO compensation as a result of some changes regarding the value of CEO holdings of stock and stock options was introduced by Hall and Leibman (1998).

Boschen and Smith (1995) investigated the interconnection between executive compensation and the firm's past and current performance. The study used the stock market returns as

indicators for the performance of 16 US firms during the period 1958-1990. The findings showed that prior performance has an important effect on current compensation, which is though temporary. Moreover, according to the same study pay-performance sensitivity has changed in four decades. Core et al. (1999) and Rose and Shepard (1997) report that the last two years performance of the company influences positively the CEO pay.

2.4 Compensation Packages and Peer Group Benchmarking

For many listed companies, the compensation committee is the one that determines the compensation contracts. It is composed of the members of the board of directors. Generally, it chooses a peer group of companies to collect comparative data on compensation practices and pay levels. There is a link that exists among most of the companies and the peer group regarding the main salary, the stock options, the bonuses and the overall compensation. In many cases, companies target the different parts of compensation at the median pay grade of the comparison group, while it is not unusual to also target pay above the median. The selection of peer groups for the construction of compensation packages is a heated discussion and can provide valuable insight into their role in determining managerial compensation.

The managerial ability plays a vital role in determining the performance of the organization. Additionally, the labor market for managers is a decisive factor in determining the level of pay which is required to maintain and motivate executives. A board can easily gather information about the managerial labor market by focusing on the compensation packages in companies that can be called as talent competitors. To assess the value of the compensation that is important to invite and keep experienced executives the compensation committee uses the peer group benchmarking. Thus, it is expected that the supply and demand circumstances in the market of managers to play a significant role in the selection of the firms of the peer group. In what follows, there are some basic aspects that could determine the similarities that a company has with its comparable peers in the selection of the managers.

Companies in the same industry constitute a main source for compensation peers. Furthermore, companies that are competitors as they provide similar products or services are also likely to be assumed as peers when trying to seek for executives. Additionally, the size of the company also has an important part in peer selection. However, even though the size of the firm and its industry are key determinants in the drafting of the peer groups, it is also observed that companies seek for peers outside their own industry in case there is a convincing difference of

the size of the firms and its competitors. The performance of the company may also be used as an indicator when picking compensation peers. Companies that have comparable market-to-book ratios can consist part of a peer group or companies that have similar corporate structure (Smith & Watts, 1992). Moreover, other companies which can be regarded as peers are the ones that are competing for any type of financial capital. Lastly, companies that are more diversified usually require distinct sets of managerial skills since they are more complex. Diversification may be measured across regional units or product lines. Thus, it is more likely that diversified companies will examine other diversified firms for executive talent and include them in their peer group.

2.5 Peer Groups and Managerial Opportunism

Bebchuk and Fried (2004) claim that CEOs have a special ability to affect their own compensation packages because boards are either co-opted or powerless. Regarding the compensation peer groups, Jensen, Murphy, and Wruck (2004) state that the structure of compensation mainly comes from the human resource department of a company in cooperation with compensation consultants whose main responsibility is to gather information for competitive benchmarking of pay. The use of peer groups in compensation packages is beneficial to boards for determining appropriate compensation. However, the higher compensation could be justified by the prospect of biased peer group selection. Since it is proven that the composition of compensation packages is correlated with the size and performance of the organization, managers can justify or even seek for higher pay levels by selecting companies in their peer group that either are large enough or perform pretty well. Managers are therefore opportunistically selecting companies in their peer group.

CHAPTER 3 Hypotheses Development

The research question has already been stated in the Introduction, but hypotheses need to be developed to answer this question. These hypotheses are based on studies mentioned in the above literature review as well as in other studies. Section 3.1 describes the first two hypotheses that are related to the firm performance, while Section 3.2 shows the other two hypotheses regarding the corporate specific characteristics.

3.1 Hypotheses regarding Firm Performance

Originally, the pay inequality within an organization could be generally explained by the tournament theory (e.g. Lazear and Rosen, 1981). This theory argues that when there are higher pay differentials the executives have incentive for higher productivity. In addition, the supervising costs are reduced and as a result the overall performance of the organization is boosted. When a company is based on tournament theory in order to design a compensation package, the executive's compensation is not dependent on the overall performance as an absolute value of the executive but on the executive's relative performance to the others. Consequently, the compensation disparity increases continuously as promotions take place. This pay structure has therefore, a decisive and encouraging impact on executives, pushing them to put more effort to compete for better positions. Thus, our first hypothesis is as follows:

***Hypothesis 1:** The compensation gap between members of the board has a positive effect on the performance of the organization.*

In contrast to the preceding arguments, behavioral theory supports that the pay gap is detrimental to the structure of the organization and affects negatively the firm performance (e.g. Bolton and Ockenfels, 2000). The behavioral theory argues that lower-level executives compare their compensation packages with the ones of top executives to find out whether there is balance between their effort and rewards. When lower-level executives feel that their individual performance and prizes are inferior to those of upper-level executives, they tend to lose their motivation, as they are dissatisfied by the existence of inequality. The implication is that large compensation gaps might reduce employees' effort and productivity and weaken the performance of the organization at large. This leads to our second hypothesis:

***Hypothesis 2:** The compensation gap between members of the board has a negative effect on the performance of the organization.*

3.2 Hypotheses regarding Firm Specific Characteristics

Corporate specific characteristics such as size and leverage are expected to affect significantly executive compensation. A series of studies such as Murphy (1985), Zhou (2000) and Ryan and Wiggins (2001) empirically support the argument that the size of the firm affects the compensation of executives in a positive way. Rosen (1992) also explains how executive pay and firm size are positively interrelated. On the other hand, Murphy (1999) argues that pay – performance interconnection is weaker in the larger US companies. Additionally, the papers of Oi and Idson (1999) and Mueller et al. (2017) conclude that if there is an increase in the size of the firm, the within-firm pay inequality also increases. In the light of this mixed evidence on the pay-size sensitivity, we comprehensively examine the relationship among our sample.

***Hypothesis 3:** The larger the size of the organization, the higher the compensation disparity.*

Jensen (1986) suggests that debt financing that includes fixed contractual obligations manages to discipline the managers and diminish the agency problems. Debt functions as a disciplining device which means that compensation is not the only incentive for the executives. As a result, the higher the leverage ratios the lower the executive compensation practices. Palepu and Healy (2007) and Penman (2007) reinforce this thesis, as they report negative correlation between the leverage ratios and the executive compensation.

***Hypothesis 4:** The higher the leverage ratio, the lower the compensation disparity.*

In the table below, you can see all the four hypotheses that are tested in this paper summarized:

Table 3.1: Hypotheses

Hypothesis 1: The compensation gap between members of the board has a positive effect on the performance of the organization.

Hypothesis 2: The compensation gap between members of the board has a negative effect on the performance of the organization.

Hypothesis 3: The larger the size of the organization, the higher the compensation disparity.

Hypothesis 4: The higher the leverage ratio, the lower the compensation disparity.

CHAPTER 4 Research Design

This section describes the steps that I followed to conduct my research. The first section describes how the data for my panel analysis has been collected. The second subsection describes the dependent, independent and control variables for this thesis. The third section contains the regression models that are used in this study. Finally, the fourth subsection shows the descriptive statistics of the main variables.

4.1 Data Sources and Sample

In this paper, I investigate the effect of the compensation gap on the performance by collecting executive compensation data as well as key financial metrics such as Net Income, Total Assets, Leverage, Shareholder Equity, Total Market Value of Firm and Total Asset Value of Firm, Total Shareholder Return which I will use to assess bank performance. The type of industry will be defined by the four-digit Standard Industry Classification (SIC) code. In this thesis, we examine the pay inequality among executives in the banking industry. Therefore, the industry with SIC code 6029 is used that corresponds to all commercial banks. Executive compensation disclosure laws required all S&P500 companies to provide information regarding the remuneration of directors and executives on an individual basis. For my analysis, I use data from Standard and Poor's Execucomp and COMPUSTAT over a relatively long period. The core of my data material consists of North American banks (NAICS code 522110) that cover the period 2010-2017. Standard and Poor's Execucomp database contains executive pay data collected directly from each company's annual report and COMPUSTAT provides financial and market information for all the companies around the world. To end up with my final dataset I match the companies' constituents collected from Execucomp with the data available in the COMPUSTAT database. After controlling for some missing fields from the data that I obtained, I end up with a sample consisting of 73 publicly traded banks. The final dataset is a balanced panel dataset. And that is because it includes balanced data from different banks in multiple years. All 73 banks contain complete information for the 7-year period that we examine in this study. Thus, we have a total of 584 bank-year observations in the sample.

4.2 Variables

Return on Assets

Return on Assets is a metric that indicates the profitability of a business relative to its total assets. ROA is a ratio that shows how efficient a company is at generating profit by using its assets. It is mainly used for comparing firms in the same sector, because different industry groups use assets in a different way. For instance, the ROA for service-oriented businesses, such as banks, will be importantly higher than the ROA for capital intensive companies.

$$ROA = \frac{\text{Net Income}}{\text{Total Assets}}$$

Return on Equity

ROE is a measure of financial performance that shows the profitability of a business relative to the shareholder's equity. Return on Equity is a metric that measures how well a company is performing by comparing the earning's growth it is generating to the investments it is using. Net Income is calculated before common stock dividends and after preferred stock dividends and interest to lenders. Shareholders' Equity equals a company's assets minus its debt. ROE ratios can vary significantly even within the same industry, as the dividends that companies pay tend to fluctuate a lot.

$$ROE = \frac{\text{Net Income}}{\text{Shareholder Equity}}$$

Tobin's Q

The Tobin's Q ratio equals the market value of a company divided by the replacement value of the company's assets. Tobin's Q is a metric that indicates the relationship between market value and intrinsic value. At its most basic level, it is a measure that expresses if a company is relatively over- or under-valued. Tobin's Q is calculated by the following formula:

$$Q = \frac{\text{Market Value of Equity} + \text{Liquidating Value of Preferred Stock Debt}}{\text{Book Value of Total Assets}}$$

Total Shareholder Return

Total Shareholder Return is a metric that measures the performance of different firm's stocks and shares over a period. It is the internal rate of return (IRR) of all the cash flows returned to investors during the holding period of an investment.

$$TSR = \frac{Price_{end} - Price_{begin} + Dividends}{Price_{begin}}$$

Compensation GAP

In this study, we use the relative compensation among executives within the board to measure the pay gap. We use the following equation to calculate the relative pay gap between the highest paid top executive and the other top executives.

$$GAP = \text{Log} (\text{Salary of Highest Paid Executive} - \text{Avg Salary of remaining Senior Executives})$$

Leverage

Leverage is also one key determinant of an organization's performance. It is actually an investment strategy of using borrowed capital as a funding source and it indicates the ability of a company to expand its asset base and generate returns on risk capital.

$$LEV = \frac{\text{Total Debt Liabilities}}{\text{Total Assets}}$$

Size

One of the main factors that determine the performance is the size of the organization. The level of firm size which indicates the level of profitability of the organization is crucial for the success of the business. In general, it is stated that the larger a company, the higher its earnings. In the banking industry, the size of the organization is typically measured in terms of assets.

$$SIZE = \text{Log of the company's year} - \text{end total assets.}$$

Shareholders' Equity Ratio

To calculate the variable of shareholders' equity (EQ) we use the ratio of equity to assets. The capital can be described as the amount of funds that a bank has available in order to withstand any negative situation.

$$EQ = \frac{\textit{Shareholders' Equity}}{\textit{Total Assets}}$$

Operating Expenses Management

The ratio of the operating expenses management can be calculated by dividing the organization's operating expenses by the total assets. From the costs of the bank (operating and other), the management of the operating expenses can be a determinant of its profitability and performance. As a result, more efficient management can lead to an increased profitability.

$$EXP = \frac{\textit{Operating Expenses}}{\textit{Total Assets}}$$

Table 4.1: Variable Definitions and Descriptions

Variable Acronym	Variable Name	Variable Definition
ROE	Return on Equity	Net Income / Shareholder Equity
ROA	Return on Assets	Net Income / Total Assets
Q	Tobin's Q Ratio	Market Value of Equity + Liquidating Value of Preferred Stock + Debt / Book Value of Total Assets
TSR	Total Shareholder Return	(Price End-Price Begin + Dividends)/Price Begin
GAP	Payment Gap	Log (Salary for the highest paid executive – Average Salary for the remaining senior executives)
SIZE	Organization's Size	Log (Total Assets)
LEV	Leverage Ratio	Total Debt Liabilities/ Total Assets
EQ	Shareholders' Equity Ratio	Equity/ Total Assets
EXP	Operating Expenses Management	Operating Expenses/ Total Assets

4.3 Methodology

In the methodology section we will see what models are used to interpret the panel dataset and to test our main hypotheses. The general purpose of this study is to examine and analyze the effect of the compensation gap between executives within the board on the firm performance. Furthermore, we will also check for the relationship between compensation gap and specific corporate characteristics such as size or leverage. The methodology I use to answer the main research question of this study is mostly inspired by Bing-Xuan Lin and Rui Lu (2009). They also study the relationship between pay gap and performance among executives. More specifically, they use an OLS (ordinary least squares) model to see the way the performance of the organization is affected by the pay gap.

4.3.1 Methodology for Hypotheses about Firm Performance

For this thesis I run multivariate panel data regressions as my dataset includes information of different variables with a panel structure. The model we adopt to empirically examine the relationship between compensation gap and firm performance among the years is a panel data regression with firm fixed effects. The fixed-effects model is used to analyze the time-series panel data, as it is needed to check for omitted variables that may influence the outcome. The equation used in this analysis is presented as follows:

$$Performance_{i,t} = \alpha_0 + \beta_1 \cdot GAP_{i,t} + \beta_2 \cdot LEV_{i,t} + \beta_3 \cdot SIZE_{i,t} + \beta_4 \cdot EXP_{i,t} + \beta_5 \cdot EQ_{i,t} + FE + u_{i,t}$$

To determine their relation, we run regressions where the dependent variable is the performance of the organization, since it will be examined whether or how the compensation gap is related to the performance. According to Bowie and Hewitt (2011), there is no single quantitative measure, which can conclusively judge on a firm's pay-performance alignment. For the dependent variable performance, there are several key measures that can be used. The metric that is used to measure the performance of the organization depends on the specific industry and may also differ from company to company within the same industry. The most appropriate metric for investors in evaluating pay and performance alignment is Total Shareholder Return. The key financial indicators that will be used for this analysis are Return on Assets, Return on Equity, Tobin's Q and Total Shareholder's Return. The main independent variable is the Compensation Gap. It is reasonable that the Compensation Gap is not the only factor that can

affect the performance of the organization. There are other variables that can influence the firm performance. These variables will be used as control variables, namely Leverage (LEV), Size (SIZE), Shareholder Equity ratio (EQ) and Operating Expenses Management (EXP) and are included in the regression model.

4.3.2 Methodology for Hypotheses about Corporate Characteristics

After the tests whether the pay gap influences the firm performance, another relation can be tested. Namely, if the pay gap is affected by corporate specific characteristics such as size and leverage. Again, the model is calculated with firm fixed effects. The following equation shows the regression model.

$$GAP = \alpha_0 + \beta_1 SIZE_{i,t} + \beta_2 LEV_{i,t} + FE + u_{i,t}$$

In the model above, the dependent variable is the Pay Gap and the main independent variables are Size and Leverage. For all the regression models explained in this section, we will check whether our results are statistically significant by looking at the t-statistics of our variables. We can easily understand if there is a positive or negative relationship between the main variables by seeing whether the coefficient is positive or negative.

4.3.3 Problems, Detection and Solutions

There are three main issues confronting studies in empirical corporate finance, which are presented below as follows:

► Endogeneity Problem

The first issue that I must consider is related to the endogeneity problem – autocorrelation of the error terms. It broadly refers to situations in which there is correlation between an independent variable and the error term in a regression. The Compensation Gap and Performance are endogenously determined variables. It simply means that there is a bidirectional causation between these two terms. The endogeneity problem that stems from this relationship will be reduced by using lagged independent variables. Furthermore, I will use the Breusch Godfrey test to check the autocorrelation in the error term u_i . The two hypotheses that will be examined, are stated below:

H0: There is no autocorrelation.

H1: There is autocorrelation.

In the case where the autocorrelation issue exists in my panel data analysis and the second hypothesis is accepted then I have to obtain clustered standard errors to deal with the autocorrelation. The table 4.2 below, presents that there is autocorrelation when we use ROE, ROA and Tobin's Q as performance measures, while there is no serial correlation in our panel data when the Total Shareholder Return metric is used.

Table 4.2: Breusch-Godfrey Test for Autocorrelation

	Chi²	P-Value	H₀	H₁
ROE	17.6130	0.0000	Reject	Accept
ROA	5.5100	0.0189	Reject	Accept
Tobin's Q	15.9290	0.0001	Reject	Accept
TSR	0.1650	0.6842	Accept	Reject

► **Skewedness of The Compensation Gap**

It is noteworthy to mention here that the GAP is positively skewed, which means that a few large pay observations are above the median. More specifically, Table 4.2 provides that the mean (12.92) is greater than the median (12.90). Therefore, the variable is non-normal and violates the result of the fixed effects regression. To solve this problem, I will use the natural logarithm of the pay levels.

► **Multicollinearity**

Multicollinearity is a state that occurs when the variables of our analysis are highly correlated to each other. It can mainly be detected by using the Variance Inflation Factor (VIF). If the

value of VIF is more than 10, then the multicollinearity is problematic. As it is shown below, there were no multicollinearity problems among our variables.

Table 4.3: Multicollinearity Test

Variable	VIF
SIZE	8.64
EQ	4.43
LEV	3.03
GAP	2.95
EXP	2.37

4.4 Descriptive Statistics

This section presents the descriptive statistics of the earlier mentioned variables. Table 4.4 presents the descriptive statistics of the key variables used in this paper. The matched compensation and company data are collected from Standard and Poor’s Execucomp and COMPUSTAT data sets for 73 banks and cover the period 2010 to 2017. We have a total of 584 bank - year observations.

Regarding the profitability, the average ROA for a bank is 1% (median=1%) which is very low and it probably shows us that US banks have not recovered yet from the credit crisis and for ROE the mean is 7% (median=8%). Not all firms have a positive ROE and ROA. The table indicates that the minimum ROE is -1.07. For the ROA the minimum is also a negative value, namely -7%. The maximum value of ROE for a specific bank is 0.34. This rate is just 4% for the ROA. This means that there are significant differences in the performance between banks. This explains why the mean and median for both ROE and ROA differ quite a lot. The mean of Tobin’s Q is also very low, namely 0.24 and this could maybe be explained by the fact that the banking industry is a declining sector in the United States. The compensation gap (log of difference in compensation between the highest paid executive and the remaining senior executives) ranges from 10.70 to 15.58. Table 2 also summarizes the sample corporate’s characteristics in terms of their size, leverage, shareholder’s equity and operating expenses management.

Table 4.4: Descriptive Statistics

ROA is the return on assets measured as Net Income divided by Total Assets. ROE is the return on Equity measured as Net Income divided by Shareholder's Equity. Q stands for the Tobin's Q Ratio and is equal to Market Value of Equity + Liquidating Value of Preferred Stock + Debt / Book Value of Total Assets. Gap is the payment gap which is the logarithm of salary for the highest paid executive – average salary for the remaining senior executives. Firm size (assets) is the logarithm of the company's year-end total assets. Leverage is total debt liabilities divided by total assets. Shareholder's Equity is calculated by using the ratio Equity to Assets. The ratio of the operating expenses management can be calculated by dividing the organization's operating expenses by the total assets.

Variable	Number of observations	Mean	Standard Deviation	Min.	Median	Max.
ROA	584	0.01	0.01	-0.07	0.01	0.04
ROE	584	0.07	0.07	-1.07	0.08	0.34
Q	584	0.24	0.07	0.06	0.24	0.62
TSR	584	3.88	21.54	-37.91	1.15	192.70
GAP	584	12.92	0.53	11.11	12.90	14.86
SIZE	584	9.68	1.34	6.72	9.42	14.48
LEV	584	0.89	0.58	0.04	0.79	5.36
EQ	584	0.11	0.02	0.04	0.11	0.22
EXP	584	0.03	0.01	0.01	0.02	0.08

CHAPTER 5 Empirical Results and Analysis

After the discussion of the data and methodology used, this chapter will analyze the results of the methods followed. In particular, the empirical results of our analysis will be explained in order to examine the main research question and the hypotheses presented earlier. Section 5.1 describes the main results of Hypotheses 1 and 2, while Section 5.2 shows the results of Hypotheses 3 and 4, respectively.

5.1 Results of Hypotheses I and II

The main hypotheses to answer the research question look at the effect of the compensation gap on the performance of the organization. They are stated in Section 3.1 and repeated here:

Hypothesis 1: The compensation gap between members of the board has a positive effect on the performance of the organization.

Hypothesis 2: The compensation gap between members of the board has a negative effect on the performance of the organization.

To investigate these hypotheses, four types of firm performance measures will be used. First, I look at the effects on Return on Equity and Return on Assets which are accounting performance measures and then I look at the effect on two market performance measures, namely Tobin's Q and Total Shareholder Return. The R-squared is the metric that will better explain the results of our regressions since we have used multivariate panel data regressions and it indicates the fluctuation of a dependent variable that is justified by the independent variable in a regression model.

The results are reported in Table 5.1. From this table, it follows that the effect of Compensation Gap on Return on Assets and Return on Equity is positive. There is a positive relationship between the Compensation Gap and Return on Equity which is statistically significant at the 1% significance level (0.0208). In addition, the effect is also positive and significant at the 5% significance level (0.00146), when using the Return on Assets as a performance ratio. The R-squared value is low but since we have statistically significant results, the conclusions that we

reach are still valuable. For instance, a one percentage increase in the compensation gap will result in a 0.0208% increase of the Return on Equity or a 0.0014% on the Return on Assets.

Following the analysis of the results on the accounting performance measures Return on Assets and Return on Equity, I will move to the description of the regressions on the market performance measures, Tobin's Q and Total Shareholder's Return, respectively. For this measure, the same type of regressions will be used. As we can see in Table 5.1, the Compensation Gap is positively correlated with the Tobin's Q and statistically significant at the 5% significance level (0.0106) whereas the Compensation Gap is negatively correlated with the Total Shareholder Return and statistically insignificant, which means that the pay gap does not affect the Total Shareholder Return of the firm.

This model also contains two control variables, namely Capital and Operating Expenses Management when examining the relation between compensation gap and performance. In the table 5.1 below, we can see that both control variables are significant in this model. On the one hand it is observed a positive relationship between capital and our performance measures. On the other hand, Operating Capital expenses affect negatively Return on Assets, Return on Equity and Tobin's Q, while there is only a positive effect on Total Shareholder's Return.

5.2 Results of Hypotheses III and IV

After studying the effects of Compensation Gap on the performance of the organization, Hypotheses III and IV test whether corporate specific characteristics, such as size and leverage, affect the compensation of executives within the board.

The third hypothesis of this thesis which is stated in Section 3.1 and added here as reminder

Hypothesis 3: The larger the size of the organization, the higher the compensation disparity.

is based on the studies of Oi and Idson (1999) and Mueller et al. (2017). Both studies show that there is a significant positive effect of firm size on pay gap. Therefore, I also expect the relation between these two to be positive.

The results of this hypothesis are presented in Table 5.1 and show that the coefficient of the firm size is positively correlated with the gap and statistically significant at the 1% significance level. The moderate R-squared of the two firm characteristics shows that a significant proportion of the variance for Gap is explained by the size or leverage in the regression model.

Overall, we conclude that the compensation disparity within the board is bigger in larger firms, similar to the result of Mueller, Ouimet and Simintzi (2017), where they find that larger firms in size indeed reveal more pay inequality among the different levels of employees within the organization.

After studying the effects of firm size on the compensation gap between executives, Hypothesis 4 examines another factor that can affect the pay gap, which is the leverage. The Hypothesis is stated in Section 3.1 as follows:

Hypothesis 4: The higher the leverage ratio, the lower the compensation disparity.

Consistent with prior studies, we see a negative relationship between leverage and compensation gap. It follows from the coefficients in the table that the fixed effects model shows a significant negative relationship between leverage and pay gap, namely -0.0812 at the 5% significance level.

Table 5.1: Results of Regressions for H1 and H2

VARIABLES	ROE	ROA	Q	TSR
GAP	0.0208*** (0.0100)	0.0015** (0.0007)	0.0106** (0.0065)	-1.8600 (1.2920)
LEV	0.0146** (0.0127)	0.0009 (0.0009)	0.0854*** (0.0083)	-0.2110 (1.2070)
SIZE	-0.0858*** (0.0280)	-0.0068*** (0.0019)	0.0193*** (0.0102)	0.9590 (1.7900)
Capital	0.8350*** (0.4865)	0.1020*** (0.0353)	1.0590*** (0.2624)	78.7200** (38.1800)
EXP	-6.0650*** (1.6501)	-0.5320*** (0.1105)	-1.5120*** (0.2666)	169.0000** (67.9400)
Constant	0.6180*** (0.1534)	0.0505*** (0.0120)	-0.2060*** (0.1016)	-1.5320 (21.3900)
Observations	584	584	584	584
R-squared	0.495	0.538	0.776	0.825
Adj. R-squared	0.418	0.512	0.764	0.799
Firm Fixed Effects	YES	YES	YES	YES

Clustered and Robust Standard Errors in parentheses

***** p<0.01, ** p<0.05, * p<0.1**

Table 5.2: Results of Regressions for H3 and H4

VARIABLES	GAP
LEV	-0.0812** (0.0374)
SIZE	0.1590*** (0.0511)
Constant	11.4100*** (0.4460)
Observations	584
R-squared	0.659
Adj. R-squared	0.610
Firm Fixed Effects	YES

Clustered and Robust Standard Errors in parentheses

***** p<0.01, ** p<0.05, * p<0.1**

5.3 Robustness Checks

Robustness checks have to be done to test whether the results that arise from our main methodology are robust to other conditions. For instance, we can either use different models for our calculations or different variables. In this thesis, I will run the same regression models as in the main part in order to conduct my robustness checks, while changing the way the compensation gap is calculated.

The first two hypotheses test the effect of within board compensation gap on the performance of the organization. In our main results, the compensation difference and the effect of tournament is studied by comparing the pay of the chief executive with the remaining executives within the board. We assumed that the highest paid executive was the most influential manager in the organization. Furthermore, to ensure the robustness of our results, we incorporate a different method using an alternative measure to calculate the compensation gap. We run additional regressions to check whether the new measure of compensation gap and our new results are similar to the ones described in Table 5.1. In particular, we conduct our robustness check by re-running the previous equation but for the top management we use the top three members of the of the board with the highest pay. Thus, the pay gap is calculated by the difference between the average salary of the top three executives with the highest pay and the average salary of the remaining senior executives. Similarly, for our third and fourth hypotheses we use the same measure for our compensation gap to test the relationship between gap, leverage and size.

The results of the robustness check are similar to the results of our main regression. First, I take a look at the results arising from our regression between the compensation gap and firm's performance measures. There is, again, a positive relationship between pay gap and Return on Assets, Return on Equity at the 5% significance level and Tobin's Q at the 1% significance level. However, the effect of compensation gap on Total Shareholder's Return is still negative and insignificant. Based on the coefficients of our robustness check we can also observe same results in the relationship between size and compensation gap, and leverage and compensation gap, respectively.

Table 5.3: Robustness Checks for H1 and H2

VARIABLES	ROE	ROA	Q	TSR
GAP	0.0087** (0.0060)	0.0053** (0.0005)	0.0105*** (0.0034)	-0.468 (1.021)
LEV	0.0132** (0.0075)	0.0007 (0.0006)	0.0883*** (0.0042)	-0.284 (1.258)
SIZE	-0.0841*** (0.0110)	-0.0065*** (0.0009)	0.0217*** (0.0062)	0.456 (1.844)
Capital	0.884*** (0.234)	0.105*** (0.0193)	1.053*** (0.133)	79.53** (39.33)
EXP	-6.104*** (0.414)	-0.535*** (0.0340)	-1.522*** (0.235)	165.7** (69.39)
Constant	0.819*** (0.100)	0.0644*** (0.0082)	-0.147** (0.0570)	-18.44 (16.86)
Observations	555	555	555	555
R-squared	0.493	0.536	0.796	0.811
Firm Fixed Effects	YES	YES	YES	YES

Clustered and Robust Standard Errors in parentheses

***** p<0.01, ** p<0.05, * p<0.1**

Table 5.4: Robustness Checks for H3 and H4

VARIABLES	GAP
LEV	-0.0638** (0.0508)
SIZE	0.140** (0.0689)
Constant	4.104*** (0.600)
Observations	555
R-squared	0.561
Firm Fixed Effects	YES

Clustered and Robust Standard Errors in parentheses

***** p<0.01, ** p<0.05, * p<0.1**

CHAPTER 6 Conclusion

6.1 Concluding Remarks

In recent years, executive compensation has attracted the attention and has been the subject of intense debate, mainly because of the excessive compensation packages that didn't align with the consequences of the economic crisis. Additionally, corporate compensation practices have been the issue of many academics' criticisms, focusing deeply on the level and the composition of executives' wages in the US financial and banking industry. The primary purpose of this paper is to investigate how the compensation gap influences the performance of the organization. There is a series of previous studies on this topic that show different findings. Some of these studies indicate the pay gap affects company's performance in a positive way, while others find results that indicate that this relationship is negative. Furthermore, there are also other studies that conclude that there is no significant relationship between compensation gap and performance. – as there are other factors that influence more-variables.

In this thesis, we examined the phenomenon of pay inequality and its effect on the performance of the organization by analyzing 73 firms from the US Banking Industry. A panel data fixed-effects regression model has provided empirical evidence on the impact of pay gap on the organization performance. The research question in this paper was formed as follows:

“What effects does the relative compensation of top executives compared to other senior executives have on employee motivation and performance of the organization?”

The results of this study find a significant positive relationship between compensation gap and three out of four performance measures that we used, namely Return on Assets, Return on Equity and Tobin's Q and a non-significant negative relationship between Gap and Total Shareholder's Return. Consequently, these results lead to the rejection of Hypothesis 2 and acceptance of Hypothesis 1. Furthermore, our findings also show that the pay disparity between executives of the board is largely determined by the size of the organization. According to our findings, there is a greater compensation gap between executives in larger firms. Moreover, we find that there is lower compensation disparity in corporations where the leverage ratios are high.

In conclusion, we observe that some of our findings are in line with previous studies and research made on the topic, while some other results are not consistent with prior studies. For instance, the size of an organization is positively correlated with the compensation gap as Mueller, Ouimet and Simintzi (2017) paper concludes, however there are other control variables that also affect the pay gap, namely Leverage, Capital and Operating Expenses Management, either in a positive or in a negative way. The robustness checks of this thesis could also confirm our main findings. Based on the outcome, both market and accounting performance measures are significantly and positively affected by the pay disparity within the board. Only the relation between compensation gap and total shareholder return is insignificant and negative.

6.2 Limitation and Further Research

This thesis has several limitations. Here, I would like to point out a few ideas that can be considered for further research. First, it is interesting to say that even if my dataset is not small, as it contains 584 bank-year observations, there are studies that contain a much bigger sample i.e Faleye et al. (2012) and Yarram (2014) – 8,683 observations. As I was mainly focused in the banking industry, I could not expand the dataset any further. A recommendation for further research can be an expansion of this study on more countries, as my thesis is only focused in the US banking industry.

Another recommendation for further research is that a broader analysis should be done on the factors that affect the pay inequality within the organization. While we are investigating whether size or leverage influence the pay disparity between executives of the board, an idea for further research would be to focus also on the behavioral factors that possibly affect the pay gap.

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APPENDIX A

No.	Ticker Symbol	Company Name
1	BPOP	POPULAR INC
2	BOH	BANK OF HAWAII CORP
3	BK	BANK OF NEW YORK MELLON CORP
4	CMA	COMERICA INC
5	CBSH	COMMERCE BANCSHARES INC
6	CFR	CULLEN/FROST BANKERS INC
7	RF	REGIONS FINANCIAL CORP
8	TRMK	TRUSTMARK CORP
9	MTB	M & T BANK CORP
10	USB	U S BANCORP
11	HBAN	HUNTINGTON BANCSHARES
12	NTRS	NORTHERN TRUST CORP
13	WFC	WELLS FARGO & CO
14	PNC	PNC FINANCIAL SVCS GROUP INC
15	KEY	KEYCORP
16	STI	SUNTRUST BANKS INC
17	UMBF	UMB FINANCIAL CORP
18	ZION	ZIONS BANCORPORATION NA
19	ASB	ASSOCIATED BANC-CORP
20	BBT	BB&T CORP
21	VLY	VALLEY NATIONAL BANCORP
22	FMBI	FIRST MIDWEST BANCORP INC
23	SNV	SYNOVUS FINANCIAL CORP
24	FULT	FULTON FINANCIAL CORP
25	BXS	BANCORPSOUTH BANK
26	WABC	WESTAMERICA BANCORPORATION
27	CHFC	CHEMICAL FINANCIAL CORP
28	TCF	TCF FINANCIAL CORP
29	PBCT	PEOPLE'S UNITED FINL INC
30	CHCO	CITY HOLDING CO
31	CBU	COMMUNITY BANK SYSTEM INC
32	FBP	FIRST BANCORP P R
33	GBCI	GLACIER BANCORP INC
34	INDB	INDEPENDENT BANK CORP/MA
35	IBCP	INDEPENDENT BANK CORP/MI
36	OFG	OFG BANCORP
37	ONB	OLD NATIONAL BANCORP
38	WAFD	WASHINGTON FEDERAL INC

39	WBS	WEBSTER FINANCIAL CORP
40	SBCF	SEACOAST BANKING CORP/FL
41	FFBC	FIRST FINL BANCORP INC/OH
42	TMP	TOMPKINS FINANCIAL CORP
43	UBSI	UNITED BANKSHARES INC/WV
44	FNB	F N B CORP/FL
45	FCF	FIRST COMMONWLTH FINL CP/PA
46	NBTB	N B T BANCORP INC
47	SFNC	SIMMONS FIRST NATL CP-CL A
48	STBA	S & T BANCORP INC
49	CVBF	CVB FINANCIAL CORP
50	IBOC	INTL BANCSHARES CORP
51	CATY	CATHAY GENERAL BANCORP
52	HWC	HANCOCK WHITNEY CORP
53	COLB	COLUMBIA BANKING SYSTEM INC
54	FFIN	FIRST FINL BANKSHARES INC
55	BPFH	BOSTON PRIVATE FINL HOLDINGS
56	ABCB	AMERIS BANCORP
57	LION	FIDELITY SOUTHERN CORP
58	MBFI	MB FINANCIAL INC/MD
59	BANR	BANNER CORP
60	SBSI	SOUTHSIDE BANCSHARES INC
61	WTFC	WINTRUST FINANCIAL CORP
62	UCBI	UNITED COMMUNITY BANKS INC
63	PPBI	PACIFIC PREMIER BANCORP INC
64	UMPQ	UMPQUA HOLDINGS CORP
65	HOPE	HOPE BANCORP INC
66	PB	PROSPERITY BANCSHARES INC
67	EWBC	EAST WEST BANCORP INC
68	PACW	PACWEST BANCORP
69	BHLB	BERKSHIRE HILLS BANCORP INC
70	PNFP	PINNACLE FINL PARTNERS INC
71	TCBI	TEXAS CAPITAL BANCSHARES INC
72	HOMB	HOME BANCSHARES INC
73	LTXB	LEGACY TEX FINANCIAL GRP INC