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DETERMINANTS OF CEO BONUS COMPENSATION

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Abstract

The primary purpose of this study is to explore the determinants of CEO bonus compensation: to examine CEO bonuses and to explore whether or not the independent variables are associated with CEO bonus compensation. For the purposes of this study, a sample of 2,448 CEO bonus compensations across 1,622 firms from 1997 to 2002 was used to test several hypotheses. The dependent variable in this model is the CEO bonus compensation. Bonus is the dollar value of the bonus (cash and non-cash) earned by the named executive officer during the fiscal year. Corporate diversification was divided into two categories; international diversification and industry diversification. Firm performance is measured by both Market-based, Performance (RET) and Accounting-based, Performance (ACE). The results show that the higher the degree of international diversification, and the higher accounting earnings performance, the more CEOs receive in bonuses. In addition, this study found that international diversification is associated with a greater use of bonuses and with a greater reliance on accounting-based, rather than market-based measures of firm performance. The results also demonstrated that CEOs in firms with more investment opportunities will receive higher bonuses than CEOs in firms with fewer investment opportunities and CEOs in larger firms will receive higher bonuses than CEOs in smaller firms.

JEL classification: M4, M12

Keywords: CEO bonus compensation, corporate diversification, international diversification, industrial diversification, investment opportunity, stock ownership

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Introduction

Chief executive officer (CEO) compensation and its relationship to corporate performance has become an important issue in managerial, economic, accounting, and financial circles (Pavlik, Scott, & Tiessen, 1993). In the past decade, CEO compensation has drawn considerable public scrutiny (Cyert, Kang, & Kumar, 2002; Gaver & Gaver, 1993, 1995; Crystal, 1991; Byrne, 1996; Lublin, 1996; Lambert & Larcker, 1987). The researchers have examined the relationship between CEO compensation and corporate governance mechanisms (Cyert, Kang & Kumar, 2002; Sanders & Carpenter, 1998). Moreover, a growing number of researchers have found a link between incentive compensation and performance (Kaplan, 1994; Jensen & Murphy, 1990). Research has shown that CEOs of growth firms receive a larger portion of their compensation from long-term incentive compensation, while those of non-growth firms receive a larger portion of their pay from fixed salary.

Decision makers, such as boards of directors, investors, shareholders and CEOs, construct optimal compensation contracts that reduce agency cost and maximize shareholder wealth. Consequently, it is important to understand international diversification and industrial diversification effects on CEOs' bonuses.

The dependent variable in this model is the CEO bonus compensation designated as (BONUS). Bonus is the dollar value of the bonus (cash and non-cash) earned by the named executive officer during the fiscal year. Corporate diversification has been divided into international diversification and industrial diversification (Duru & Reeb, 2002; Kim, Kim, & Pantzalis, 2001). International diversification was defined as a firm's expansion beyond the borders of its domestic country across different countries and geographical regions (Capar & Kotabe, 2003). Industrial diversification entails expansion into different lines of business (industries) segments (Kim, Kim, & Pantzalis, 2001).

The rest of the paper is organized as follows. Section 2-literature review and hypotheses development, section 3-outlines the research design, data and methodology, section 4-results and discussion of findings, section 5-reports on and discussion of the empirical results, and section 6-conclusions from our findings.

Empirical literature and hypotheses development

Corporate diversification is separated into an international diversification and industrial diversification for this study (Kim, Kim, & Pantzalis, 2001). This study employs the concept of corporate diversification identified by Duru and Reeb (2002) and Kim, et al., (2001) that divides corporate diversification into international diversification and industrial diversification.

In order to explore whether corporate diversification impacts bonuses, this study utilized the agency theory to assert that when the contract between the principal and the agent is outcome based, the agent is more likely to behave in the interests of the principal; so increasing the CEO bonus will maximize shareholders wealth. This study also utilized the expectancy theory hypothesis that the higher bonus motivation will have higher firm performance; so increasing CEO bonus motivation will have the better firm performance. Therefore, this study applied both agency theory and expectancy theory to become a simple combination model. As a result, agency theory and expectancy theory imply that higher CEO bonuses will have higher motivation to CEOs; higher bonus motivation will have higher firm performance, accordingly, higher firm performance will maximize shareholder wealth.

International diversification and ceo bonuses

International operations are more profitable than comparable domestic operations (Fatemi, 1984). This differential provides firms with an incentive to expand beyond national boundaries to maintain their competitiveness, and diversify their international operations across multiple markets and operational units (Duru & Reeb, 2002; Kim, Kim & Pantzalis, 2001; Fatemi, 1984). Complexity is manifested in differing operational segments, customers, suppliers, types of labor, cultures, laws, rules, regulations, and capital markets (Duru & Reeb, 2002; Gomez-Mejla & Palich, 1997). When corporations diversify internationally, operations result in a more complex managerial decision-making environment (Duru & Reeb, 2002; Finkelstein & Hambrick, 1989). International diversification also requires enhanced information processing and requires specialized knowledge of competitors' operations as well as the firm's own operations across boundaries (Sanders & Carpenter, 1998; Nohria & Ghoshal, 1994). When the firm's diversification affects the complexity of the operating environment, it becomes more difficult for boards to directly monitor executive performance across different markets (Sanders & Carpenter, 1998; Eisenhardt, 1989; Gomez-Mejia & Balkin, 1992; Nilakant & Rao, 1994; Zajac & Westphal, 1994). Sanders and Carpenter (1998) em-

phasize that subsidiary managers may be even more difficult to monitor than domestic managers.

A portfolio of operations associated with the international dispersion of sales, assets, and personnel makes information processing more difficult for boards (Daft, 1992). This results in increased agency costs due to the increased cost and difficulty of monitoring executives from their home offices (Roth & O'Donnell, 1996). Moreover, based on expectancy theory, higher executive bonus motivation results in higher firm performance (Vroom, 1964). Under the expectancy theory, individuals will tend to maximize executive rewards and shareholder wealth, and minimize the costs and difficulty of monitoring performance (Hahn & Kleiner, 2002). Studies have also shown that international diversification is positively associated with executive compensation (Sanders & Carpenter, 1998; Henderson & Fredrickson, 1996). Boards of directors offering CEO bonus packages that are aligned with the maximization of shareholder wealth can resolve problems associated with monitoring executives (Sanders & Carpenter, 1998; Eisenhardt, 1989; Jensen & Murphy, 1990).

Taken together, the increased complexity of international operations increases the shareholders and board of directors' difficulty of monitoring CEO, thereby better aligning CEOs' interests with stockholders' interests, increasing CEO bonus except for fixed-pay salary. The CEO is more likely to behave in the interests of the principal, which result in high agency costs. In order to reduce the shareholders and board of directors difficulty of monitoring the CEO, increase of the CEO bonus of motivation based on expectancy theory is used to motivate managers to work harder in the complexity of international operations to increase performance in making decisions that were consistent with shareholder wealth maximization. When the performance improved, the expected compensation reward was produced.

Thus, this study predicts that international diversification is positively associated with CEO bonus. Therefore, it can be expected that

Hypothesis H_1: International diversification is positively associated with CEO bonus.

Industrial diversification and CEO bonuses

Corporate diversification into different industries creates a portfolio of operational units (Kim, Kim & Pantzalis, 2001). Industrial diversification potentially benefits corporate managers through increased power through compensation (Denis, Densi & Yost, 2002; Stulz, 1990). Managerial compensation is tied to a firm's size (Jensen & Murphy, 1990). Industrial diversified firms are characterized by lower managerial equity ownership (Amihud, Jakov & Lev, 1981), so decreases in industrial diversification are often precipitated by market disciplinary forces, such as corporate control threats (Denis, Denis, & Sarin, 1997). Increasing the number of business segments can result in increasing the monitoring difficulties. Consequently, managers might reduce shareholders' wealth through increases in agency cost due to overinvestment (Kim, Kim & Pantzalis, 2001). Additionally, Denis, Densi and Yost (2002) find that global diversification has increased over time and is correlated with the decline in industrial diversification over the same period. Compared to international diversification, which is value-enhancing to compensation, industrial diversification is value-reducing to compensation (Duru & Reeb, 2002). Given that research studies have found that industrial diversification reduces shareholder wealth, this study predicts that industrial diversification results in relatively low compensation (Duru & Reeb, 2002; Denis, Densi & Yost, 2002).

Agency theory propositions assert that when the contract between the principal and the agent is outcome based, the agent is more likely to behave in the interests of the principal. Based on agency theory, the firms with more business segments; higher degree of industrial diversification may disperse optional risk, which causes the firms to pay less bonus compensation to CEOs, thereby, reducing agency cost. Therefore:

Hypothesis H_2: Industrial diversification is negatively associated with CEO bonus.

Firm performance and CEO bonuses

Researchers (Duru & Reeb, 2002; Balkin, Markman, & Gomez-Mejia, 2000; Grossman & Hoskisson, 1998) have indicated that companies in different industries are likely to have different measures of company performance. Two types of company performance measures are the accounting-based measure of performance and the market-based measure of performance. Sanders and Carpenter (1998) point out that firms with high levels of performance may be able to pay more compensation than those that are performing less well.

Consistent with previous literature researchers, the accounting- based measure of performance for this study is defined as annual earnings before interest and taxes (EBIT); the market-based measure of perfor-

mance is defined as the common stock return at the end of the fiscal year.

Market-based measures of performance

Market-based measures of performance are often centered around some measure of the price of a single share of a company's outstanding stock on a common stock exchange and stock return. Stock performance is usually measured by changes in stock prices or stock return.

Therefore, firms in industries that experience rapid growth, or involve rapid product cycles, may benefit from aligning their executives' bonus with market-based measures of performance (Grossman & Hoskisson, 1998).

Accounting-based measures of performance

Accounting-based performance measures are incrementally useful over market-based measures in CEO compensation contracts (Duru & Reeb, 2002; Holmstrom, 1979; Banker & Datar, 1989; Bushman & Indjejikian, 1993; Baber et al., 1996). In an accounting-based measure of company performance, researchers typically use profitability or stockholders' equity (Dyl, 1988; Tosi & Gomez-Mejia, 1994). Profitability is usually measured as EPS or ROA or EBIT and stockholder equity as ROE. The measures of EBIT, ROE and ROA are easily determined, perceived to be objective, and widely understood by owners and managers alike (Grossman & Hoskisson, 1998). According to Pavlik, Scott and Tiessen (1993), accounting performance is more important than stock performance with respect to cash compensation. Financial ratios are widely used in accounting-based measures in firm performance. Some researchers have relied on an internal performance measure, such as profit (Ciscel & Carroll, 1980; Deckop, 1988; Lewellen & Huntsman, 1970), or return on equity (ROE)(Redling, 1981), or change in shareholder return (Murphy, 1985; Platt, 1987), or a combination of nine measures of performance, including sales, profit, return on equity (ROE), and earnings per share (EPS) (Gomez-Mejia, et al., 1987).

Moreover, previous empirical evidence suggests that accounting-based, performance measures are incrementally useful over market-based, measures in executive compensation contracts (Duru & Reeb, 2002; Holmstrom, 1979; Banker & Datar, 1989; Bushman & Indjejikian; 1993; Baber, Janakiraman, & Kang, 1996). When accounting returns are less informative with respect to the executive's actions, there is a greater reliance on market-based measures than on accounting-based measures (Smith & Watts, 1992; Gaver & Gaver, 1993; Baber et al., 1996; Bryan, Hwang, & Lilien, 2000). Executives have discretion in choosing among various accounting or reporting alternatives, which can be used to manipulate accounting earnings. Because of the ability and incentive of executives to arbitrage differing accounting and tax regimes, international settings have a higher likelihood of earnings manipulation than domestic settings (Duru & Reeb, 2002; Scholes, Wilson, & Woflson, 1992). Moreover, the potential for imperfect hedging on foreign exchange exposure suggests that accounting-based performance measures are more useful than market-based performance measures when there is international diversification (Duru & Reeb, 2002).

Taken together this study based on the expectancy theory utilized the high bonus of motivation strategy to motivate CEOs to increase firm performance in an effort that is consistent with shareholder wealth maximization. The performance improved, thereby, producing the expected CEO bonus reward as the expectancy theory proposition asserts that increasing motivation increased performance outcome.

Therefore, it can be expected that

Hypothesis H_3: Market-based performance is positively associated with CEO bonus.

Hypothesis H_4: Accounting-based performance is positively associated with CEO bonus.

Accounting-based performance measures, market-based performance measures and CEO bonus

In addition, Pavlik, Scott, and Tiessen (1993) found that accounting performance is more important than stock performance with respect to cash compensation. Stock return appears to be more important when the compensation includes shareholding and options. Singh and Agarwal (2002) found that short-term compensation will be better predicted by accounting-based performance measures than by market-based performance measures. In addition, Gaver and Gaver (1995) found that CEOs of growth firms receive a larger portion of their compensation from long-term incentive compensation; whereas, those of non-growth firms receive a larger portion of their pay from fixed sala-

ry. Moreover, prior studies have documented the fact that accounting earnings play a significant role in measuring performance for the purpose of compensation (Jensen & Murphy, 1990). Thus, this study argues that short-term compensation such as bonus will be better predicted by accounting-based performance measures than by market-based performance measures.

This leads to the following hypothesis:

Hypothesis H_5: CEO bonus compensation will be better predicted by accounting-based performance measures than by market-based performance measures.

Investment opportunity and ceo bonus

CEOs know corporate investment opportunities and are often the investment decision makers (Bryan, Hwang & Lilien, 2000). It is difficult for shareholders to alleviate this information asymmetry without having specialized knowledge. Therefore, such firms are likely to rely on CEO compensation (Bryan, Hwang & Lilien, 2000; Smith & Watts, 1992; Bizjak, Brickley & Coles, 1993; Gaver & Gaver, 1993). Shareholder wealth depends especially upon the successful exploitation of investment opportunities (Myers, 1977). Cyert, Kang and Kumar (2002) found that investment opportunities not only affect CEO effort, but also make the firm more attractive for takeovers, and therefore influence CEO compensation (Smith & Watts, 1992).

Firms with abundant investment opportunities increase the shareholders and board of directors' difficulty in monitoring their CEO, thereby better aligning the CEOs' interests with the stockholders' interests, and increasing bonus, the CEO is more likely to behave in the interests of principal, thereby raising agency costs to pay higher levels of bonus to their CEOs (Gaver & Gaver, 1993).

Thus, this study predicts that investment opportunities are positively associated with CEO bonus. Hence:

Hypothesis H_6: Investment opportunities are positively associated with CEO bonus.

Firm size and ceos bonus

Firm size effects managerial compensation (Jensen & Murphy, 1990; Sanders & Carpenter, 1998). Firm size is the key determinant of CEO pay (Singh & Agarwal, 2003). Moreover, firm size affects firm diversification (Kim, Kim & Pantzalis, 2001). If firm size is positively associated with a firm's international diversification, then it should have similar implications for CEO bonuses. CEOs who work in large firms with a high international diversification should also be compensated for the increased work burden they carry. Empirical research finds that firm size is positively associated with executive compensation (Sanders & Carpenter, 1998; Finkelstein & Hambrick, 1996; Gaver & Gaver, 1995; Geomez-Mejia, 1994). Higher levels of bonus except for the fixed-pay salary are expected to be paid to executives in larger firms (Gaver & Gaver, 1995) because the larger the scope of operations, the greater the demands on top executives. Moreover, since executives who manage larger and more complex firms require greater knowledge and ability than do executives of smaller and less complex firms, they require a higher level of bonus compensation on the external labor market (Becker, 1964; Rosen, 1982).

Ueng, Wells, and Lilly (2000) examined the determinants of CEO pay for small as well as large firms. He found that firm size is a primary factor in determining CEO pay within small firms.

Sales volume (Baker, Jensen & Murphy, 1988; Newman & Banister, 1998) and total assets (Baumol, 1959; Marris, 1963; Sridharan, 1996; Useng, et al., 2000) are two generally used measures of firm size. Firm size is generally measured by assets, but sales can also be used to determine firm size. Sales volume is also considered a measure of firm size because CEOs earn profit for the company through the volume of sales; the higher the sale volume sold, the higher the firm profit. In a small firm, because of the small number of units sold, even a big increment in managerial efficiency does not yield a large increase in total profits. Large firms are also often more operationally complex than small firms; CEOs of large firms, consequently, have the more difficult task of managing them. International diversification and industrial diversification firms generally have a larger scope of operations with complex work environments requiring higher bonus compensation for their CEOs.

This study extends previous research to examine whether firm size is related to CEOs bonus. Thus, this study predicts that firm size is positively associated with CEO bonus compensation, where CEOs from firms with high international diversification have more complex work than domestic CEOs in domestic environments. This study thereby argues that firm size impacts the effect of international and industrial diversification on CEO bonuses.

Hypothesis H_7: Firm size is positively associated with CEO bonus.

Stock ownership and ceo bonus

CEO stock ownership was negatively associated with salary, equity-based and discretionary compensation (Cyert, Kang & Kumar, 2002; Sanders & Carpenter, 1998). When CEOs hold a large fraction of their firms' outstanding stock, the CEOs are acting more as owners or shareholders than employees are. Therefore, it reduces the principal and agency relationship on agency theory, since CEOs are acting as owners rather than employees, thus, the demand for compensation is likely to be reduced, because the interests of CEOs and shareholders are already relatively aligned (Bryan, Hwang & Lilien, 2000; Jensen & Meckling, 1976).

Moreover, international diversification firms involve more complex work than domestic firms, and industrial diversification firms involve multi-segments business, which increases the complex work over single -segment firms. In order to encourage the CEOs work for shareholders' interests, higher international diversified firms and multi-segments business firms offer higher proportions of stock, making the CEOs act as shareholders, meanwhile, reducing agency costs and the requirement of CEO bonus compensation.

Bryan, Hwang & Lilien, (2000) found that CEO ownership is significantly negatively related to restricted stock grants for the whole sample and for both subsamples. Ryan and Wiggins (2002) explored a negative relationship between the CEO's fractional ownership and equity-based incentives. The result suggested that stock ownership reduces the need for additional incentive aligning mechanisms. This study extended previous research to examine whether stock ownership is related to CEO bonus. Therefore, this study predicts that stock ownership is negatively associated with CEO bonus, when CEOs hold a large fraction of their firms' outstanding stock; it reduces the agency cost and CEO bonus. Therefore, it can be expected that

Hypothesis H_8: Stock ownership is negatively associated with CEO bonus.

Data and methodology

This study identified eight hypotheses associated as determinants of CEO stock bonus compensation.

They are listed as follows:

Hypotheses H_1, H_2, H_3, H_4, H_5 , H_6 , H_7, H_8.

Hypothesis H_1: International diversification is positively associated with bonus.

Hypothesis H_2: Industrial diversification is negatively associated with bonus.

Hypothesis H_3: Market-based performance is positively associated with bonus.

Hypothesis H_4: Accounting-based performance is positively associated with bonus.

Hypothesis H_5: Bonus compensation will be better predicted by accounting-based performance measures than by market-based performance measures.

Hypothesis H_6: Investment opportunities are positively associated with bonuses.

Hypothesis H_7: Firm size is positively associated with bonus.

Hypothesis H_8: Stock ownership is negatively associated with bonus

Research model

The compensation model

A regression model was developed to test the hypotheses. The compensation function discussed in the next sections is modeled as:

CEOs Bonus *i* = f(INTD, INDD, RET, ACE, IO, SIZE, OWN, Tenure, Age, Duality, Gender)

When *i*= c, CEO compensation structure = CEOs bonus compensation

INTD = International Diversification

INDD = Industrial Diversification

RET = Market-based measure of performance

ACE = Accounting-based measure of performance

IO = Investment Opportunities

SIZE = Firm Size

OWN = Stock Ownership

Tenure = CEO position tenure

Age=CEO age

Duality=CEO duality

Gender=CEO gender

The dependent variable in this model is the level and structure of CEOs stock bonus compensation, including CEO bonus Compensation designated as (BONUS). Bonus is the dollar value of a bonus (cash and non-cash) earned by the named executive officer during the fiscal year. ExecuComp database was the source for the data. The independent variables in the study are as follows: International Diversification (INTD), Industrial Diversification (INDD), Firm performance (FP), Investment Opportunity (IO), Firm Size (SIZE), and Stock Ownership (OWN). COMPUSTAT's Geographic Segment File, COMPUSTAT's Industry Segment File, COMPUSTAT's database, and the CRSP database obtained the data for the independent variables. Firm performance is measured by both Market-based, Performance (RET) and Accounting-based, Performance (ACE). Market-based, Performance (RET) is measured as the common stock return at the end of the fiscal year. Accounting-based Performance (ACE) is measured as annual earnings before interest and taxes (EBIT). The control variables are CEO position, tenure, age, duality, and gender.

Table 1 summarizes the dependent, independent and control variables included in the model as well as the measure and source for each variable. In total, the model includes a dependent variable (BONUS), seven independent variables (INTD, INDD, RET, ACE, IO, SIZE, OWN), and four control variables (tenure, age, duality, gender).

Table 1: Dependent, Independent and Control Variable in Regression Model

Variables	Measures (Source)
CEOs Stock Bonus Compensation	The dollar value of a bonus (cash and non-cash) earned by the named CEO officer during the fiscal year.
International Diversification (INTD)	Firms are classified as multinational if they report any foreign sales on COMPUSTAT's Geographic Segment File, otherwise, they are classified as domestic firms. COMPUSTAT limits the number of global segments to five, including the domestic segment.
Industrial Diversification (INDD)	Firms are classified as multi-segment on COMPUSTAT's Industry Segment File, if they report more than one business segment on COMPUSTAT's Industry Segment File, otherwise, they are classified as single-segment. COMPUSTAT limits the number of industrial segments to 10.
Market based Performance (RET)-firm performance	The common stock return at the end of the fiscal year.
Accounting based Performance (ACE)-firm performance	Annual earnings before interest and taxes (EBIT).
Investment opportunity (IO)	Research and development expenditures divided by the market value of the firm.
Firm Size (SIZE)	Total assets as a measure of firm size.
Stock ownership (OWN)	The percentage of the company's shares owned by the named CEO officer.
Tenure	The number of years that the CEO has held his\her current position at the end of the fiscal year.
Age	Age of CEO at the end of the fiscal year.
Duality	Considered 1 if the CEO is the chairman, 0 otherwise.

Source: Own elaboration.

A multiple regression model was established to identify the determinants of CEO bonus compensation. CEO bonus was selected as the dependent variable (Y) to be predicted by the independent variables, control variables.

The regression analysis tested the relationship between independent variables and CEO bonus. Therefore, the models for estimation become:

$$BONUS_{t,i} = c_0 + c_1 INTD + c_2 INDD + c_3 RET + c_4 ACE + c_5 IO + c_6 SIZE + c_7 OWN + C_8 Tenure + c_9 Age + c_{10} Duality + c_{11} Gender + \varepsilon_{t,1}$$

Where, c_0= the constant of regression equation model 1

$c_1, c_2, c_3, c_4, c_5, c_6, c_7, c_8, c_9, c_{10}, c_{11}$ = coefficient of *INTD, INDD, RET, ACE, IO, SIZE, OWN, Tenure, Age, Duality, Gender*

BONUS denotes bonus compensation for a firm at *i* time period *t*; it is a dependent variable in equation 1.

INTD denotes international diversification.

INDD denotes industrial diversification.

ACE denotes accounting-based performance and is measured by annual earnings before interest and taxes (EBIT).

RET denotes market-based performance and is measured by the common stock return at the end of the fiscal year.

IO denotes investment opportunities and is measured by R & D expenditures scaled by the market value of the firm.

SIZE denotes firm size and is measured by total assets.

OWN denotes stock ownership and is measured by the percentage of the company's shares owned by the named CEO officer.

Tenure denotes CEO's tenure and is the number of years that the CEO had held his/her current position at the end of the fiscal year.

Age denotes CEO's age and is the age of the CEO at the end of the fiscal year

Duality denotes CEO's duality and refers to the situation in which a CEO holds both the CEO and chairperson of the board positions.

Gender denotes CEO's gender and is the proxy gender of CEO, dummy variables, 1= male; 0= female

$\varepsilon_{t,i}$ is the error term (all measured for firm *i* at time period *t*).

Sample and data collection

The sample consisted of secondary data selected from three databases and supplemented with additional data from the Security and Exchange Commission (SEC). Company stock-return data from the Center for Research in Security Prices (CRSP) along with financial statement data made available from Standard & Poor's Research Insight was included. The ExecuComp database, based on the S&P 400, S&P 500, and S&P 600 indexes that comprise large, mid, and small-cap firms was selected for use because it reduces the time investment required to extract data from proxy statements and alleviates the difficulty of extracting specific information from individual company reports. However, there is often missing data, particularly relating to age and employment starting dates. Thus, it was necessary to supplement information in the ExecuComp database with information contained in Lexis/Nexis.

CEO stock bonus compensation data selected from Standard & Poor's COMPUSTAT ExecuComp (1997-2002) covers total compensation and current compensation, such as salary and bonuses. The data also contains long-term compensation, such as long-term incentive plans, restricted stocks, stock appreciation rights, and stock options granted. Most studies of CEO stock bonus compensation rely upon secondary data from filings with the Securities and Exchange Commission (Miller, 1995). International diversification data obtained from COMPUSTAT's Geographic Segment File classified firms as multinational, if firms report any foreign sales on COMPUSTAT's Geographic Segment File; otherwise, they are domestic firms. COMPUSTAT limits the number of global segments to five. Industrial diversification data obtained from COMPUSTAT's Industry Segment File classified firms as multi-segment if they report more than one business segment; otherwise, they are single-segment firms. COMPUSTAT limits the number of industrial segments to ten.

This study classified each firm's primary Standard Industrial Classification (SIC) Code according to the 10-K product breakdown (SIC), and classified each firm according to the industry classification scheme suggested by Lippert and Moore (1995) and further modified in this study. CEO was included only if that individual was listed on the firm's financial statement during 1997-

-2002 and remained with the same firm for at least five years. This sample selection method is also consistent with Miller (1995). For this study 2,448 CEOs across 1,622 firms during the period 1997-2002 were identified. Frequency statistics for sample firms are presented in Tables 2 and 3.

Table 2: Frequency Statistics for Sample Firms (n = 1,622)

Panel A: Filing Year		Observations	%
1997		113	7.0
1998		145	8.9
1999		1067	65.9
2000		193	11.9
2001		100	6.3
2002		4	0.0
Total firms		1622	100.0
Panel B: Type of Industry	**SIC Codes**	**Observations**	**%**
Aerospace and shipbuilding	3720-3829	65	4.0
Agriculture and metal	0000-1099, 1400-1499	18	1.1
Cars	3711-3716	26	1.6
Chemical, tire, and leather	2800-2821, 3011-3199	42	2.6
Commodity	4812-4899	36	2.2
Computer and software	3570-3579, 7370-7389	180	11.1
Construction, wood, furniture, and house	1500-1799, 2400-2599, 2840-2844, 3200-3299	58	3.6
Electric	3661-3699	115	7.1
Entertainment	7000-7369, 7400-7999	62	3.8
Finance	6000-6799	141	8.7
Food and tobacco	2000-2199	42	2.6
Health, education, and law	8000-9999	64	3.9
Machinery	3510-3569, 3580-3652	88	5.4
Medical, photo, and other	3841-3999	54	3.3
Paper and publishing	2600-2673, 2711-2780	54	3.3
Petroleum and refinery	1220-1389, 2911-2999	64	3.9
Retail and wholesale	5000-5999	201	12.4
Steel	3300-3496	62	3.8
Textile	2200-2399	25	1.5
Transportation	4011-4799	42	2.6
Utility	4911-4991	106	6.5
Other	2833-2836, 2851-2891	77	4.7
Total firms		1622	100.0

Source: Own elaboration.

Table 3: Frequency Statistics for Sample CEOs (n=2,448)

Panel A: Filing Year		Observations	%
1997		335	13.8
1998		414	16.9
1999		828	33.8
2000		438	17.9
2001		362	14.9
2002		71	2.9
Total CEOs		2,448	100.0
Panel B: Type of Industry	**SIC Codes**	**Observations**	**%**
Aerospace and shipbuilding	3720-3829	96	3.9
Agriculture and metal	0000-1099, 1400-1499	34	1.4
Cars	3711-3716	42	1.7
Chemical, tire, and leather	2800-2821, 3011-3199	73	3.0
Commodity	4812-4899	47	1.9
Computer and software	3570-3579, 7370-7389	299	12.2
Construction, wood, furnitureand, house	1500-1799, 2400-2599, 2840-2844, 3200-3299	86	3.5
Electric	3661-3699	161	6.6
Entertainment	7000-7369, 7400-7999	93	3.8
Finance	6000-6799	190	7.8
Food and tobacco	2000-2199	69	2.8
Health, education, and law	8000-9999	93	3.8
Machinery	3510-3569, 3580-3652	138	5.6
Medical, photo, and other	3841-3999	81	3.3
Paper and publish	2600-2673, 2711-2780	81	3.3
Petroleum and refinery	1220-1389, 2911-2999	87	3.6
Retail and wholesale	5000-5999	306	12.5
Steel	3300-3496	102	4.2
Textile	2200-2399	34	1.4
Transportation	4011-4799	61	2.5
Utility	4911-4991	160	6.5
Other	2833-2836, 2851-2891	115	4.7
Total CEOs		2,448	100.0

Source: Own elaboration.

Results and discussion of findings

Statistical tests

The current study makes use of several statistical tests provided by SPSS as follows:

1) descriptive statistics: means and standard deviations,

2) pearson correlation coefficients were calculated to determine whether multicollinearity among the dependent variables is severe or not,

3) multiple regression analysis was employed to examine the relationship between independent variables and CEOs bonus compensation.

Descriptive statistics

Table 4 presents the following statistics for the variables in our regression model: mean, median, standard deviation, and minimum and maximum. The sample statistics are divided into the dependent variable and seven independent variables (Panel A), control variables (Panel B) and firm characteristics (Panel C) for the period 1997-2002. The average CEO in the sample was approximately 57 years, had been in the CEO position approximately 14 years, and had total compensation of approximately $2.35 million. A vast majority were male and about two-thirds of sample CEOs also held the Chairman position. Mean and median bonuses during the period (1997-2002) are $576,860,000 and $311,080,000 respectively.

Table 4: Descriptive statistics

Panel A: Variables	Number of Observations a	Mean	Median	Std. Deviation	Minimum	Maximum
Bonus	2,448.00	576.86	311.08	950.53	0.00	11,980.69
International Diversification	2,448.00	3.29	3.00	1.11	0.00	5.00
Industrial Diversification	2,448.00	2.55	2.33	1.57	1.00	10.00
Market-based Performance	2,448.00	0.01	0.00	0.04	-0.13	1.03
Accounting- based Performance	2,448.00	525.29	99.47	2,140.96	-10,537.00	39,093.50
Investment Opportunities	1,465.00	0.05	0.02	0.10	0.00	1.82
Firm size(Assets)	2,448.00	7,994.00	1,199.97	35,813.94	8.66	692,789.00
Stock Ownership	2,448.00	8,984.05	0.28	444,303.97	0.00	21,982,950.44
Panel B: Control Variable						
Tenure [b] (day)	1,069.00	2,947.66	2,192.00	2,774.43	13.00	19,935.00
Age	1,288.00	56.91	57.00	7.75	36.00	89.00
Duality [c]	2,448.00	0.56	0.67	0.45	0.00	1.00
Gender [d]	2,448.00	0.96	1.00	0.18	0.00	1.00
Panel C: Firm Characteristic (000s)						
Assets	2,448.00	7,994.00	1,199.97	35,813.94	8.66	692,789.00
Sales	2,448.00	4,346.94	1,102.44	11,799.42	0.00	180,041.33
Capital Exp	2,426.00	312.11	51.39	1,270.14	0.00	31,672.50
EBIT/Sales	2,445.00	89.70	0.51	796.75	-10,537.00	30,877.00
R&D/Sales	1,464.00	0.22	0.03	2.70	0.00	96.10
Capital Exp/ Sales	2,423.00	0.13	0.05	1.75	0.00	85.68
Market Value/ Capital Exp	2,364.00	64.27	24.10	264.19	0.05	10,996.64

[a] Compustat's Geographic Segment file limits the number of global segments to five; [b] Compustat's Industry Segment file limits the number of global segments to ten; [c] 0 = CEO is not chairperson; 1 = CEO is also chairperson; [d] 0 = female, 1 = male; [ee] in $ thousands

Source: Own elaboration.

Test for multicollinearity

Because multicollinearity between independent variables can cause large variances and covariances for the estimators of the regression coefficients, it becomes difficult to distinguish their relative influences. This problem is addressed by deriving the correlation coefficient matrix shown in Table 5 using the Pearson correlation coefficients test.

The correlation matrix in Table 5 shows that the strongest correlation coefficient among the independent variables was 0.751 between firm size and accounting-based performance. The second highest correlation coefficient was 0.418 between firm size and industrial diversification. Gujarati (1988) suggests that simple correlations between independent variables should not be considered "harmful" unless they exceed 0.80 or 0.90. The Pearson correlations coefficient suggests that multicollinearity is not severe for the independent variables in this study.

Table 5: Pearson Correlation Coefficient Matrix

Variables[a]	1	2	3	4	5	6	7	8	9	10	11	12
1. Bonus	1											
2. International Diversification	.101**	1										
3. Industry Diversification	.225**	.146**	1									
4. Market based Performance	-.087**	-.009	-.013	1								
5. Accounting based Performance	.548**	.080**	.327**	-.085**	1							
6. Investment opportunities	-.090**	.352**	.084**	-.048	-.298**	1						
7. Stock ownership	-.112**	-.108**	-.149**	.029	-.188**	-.089**	1					
8. Firm size	.506**	.121**	.418**	-.052**	.751**	-.138**	-.254**	1				
9. Gender[b]	-.027	.016	-.036	.012	-.008	-.017	.056**	-.025	1			
10. Age	.075**	.002	.065*	-.019	.125**	-.007	.169**	.119**	.108**	1		
11. Duality	.226**	.039	.097**	-.022	.251**	-.003	.105**	.267**	.023	.271**	1	
12. Tenure	.276**	-.046	-.034	-.047	.195**	-.120**	.341**	.089**	.127**	.369**	.297**	1

*Note. values [a] of n ranged from 1,069 to 2,448[b] *p < 0.01; **P < .05. This table shows the correlations between variables by using Pearson Correlation Coefficients.*

Source: Own elaboration.

Multiple regression analysis and hypotheses testing

To test hypotheses 1 through 8, hierarchical regression was employed. The first step was to enter the control variables (tenure, age, duality and gender) were entered into the equations. The second step was to enter, into the equations, the various independent variables representing international diversification, industrial diversification, investment opportunities, firm size, firm performance, and stock ownership. The significance of the change in R^2 from steps 1 to 2 provides a test of whether the set of predictor variables in step 2 explain a significant amount of the variance in CEO bonus beyond that already explained by the control variables.

For the regression model 1 bonus compensation

Table 6 reports the results of the hierarchical regression bonus compensation model, which examined hypotheses H_1, H_2, H_3, H_4, H_5 , H_6 , H_7, H_8.

Table 6: Hierarchical Regression of CEOs Bonus on Hypothesis H_1, H_2, H_3, H_4, H_5 , H_6 , H_7, H_8. Model 1

$$BONUS_{t,i} = b_0 + b_1 INTD + b_2 INDD + b_3 RET + b_4 ACE + b_5 IO + b_6 SIZE + b_7 OWN + b_8 Tenure + b_9 Age + b_{10} Duality + b_{11} Gender + \varepsilon_{t,i}$$

		Bonus Compensation[a]			
Variables		*β*	t	ΔR^2	ΔF
Step 1:				.075	49.779***
	Control Variables				
	Tenure	.123***	7.114		
	Age	-.014	-.859		
	Duality	.061**	3.462		
	Gender	-.029†	-1.753		
Step 2:				.276	147.793***
	Predictor Variables				
	International Diversification	.037*	2.151		
	Industrial Diversification	.010	.563		
	Market-based Performance	-.042**	-2.554		
	Accounting-based Performance	.370***	14.256		
	Investment Opportunities	.035*	1.931		
	Firm Size	.198***	7.468		
	Stock Ownership	-.013	-.726		
Overall R^2 and F				.351	119.771***
Adjusted R^2				.348	

[a]n = 2446[b] Beta weights and *t*-values reflect results for the full model and subsequent models
†p < .10;* p < .05;** p < .01*** p < .001

Source: Own elaboration.

Table 7 reports the results of the estimated two models (controls variables only and a full model), which included control variables plus the main effects of the independent variables to examine hypotheses H_1, H_2, H_3, H_4, H_5 , H_6 , H_7, H_8.

Hypothesis H_1: International diversification is positively associated with bonus.

Hypothesis H_2: Industrial diversification is negatively associated with bonus.

Hypothesis H_3: Market-based performance is positively associated with bonus.

Hypothesis H_4: Accounting-based performance is positively associated with bonus.

Hypothesis H_5: Bonus compensation will be better predicted by accounting-based performance measures than by market-based performance measures.

Hypothesis H_6: Investment opportunities are positively associated with bonus.

Hypothesis H_7: Firm size is positively associated with bonus.

Hypothesis H_8: Stock ownership is negatively associated with bonus.

Table 7: Results of Regression Equations Model 1 Analysis for CEOs Bonus Compensation

$$BONUS_{t,i} = c_0 + c_1 INTD + c_2 INDD + c_3 RET + c_4 ACE + c_5 IO + c_6 SIZE + c_7 OWN + c_8 Tenure + c_9 Age + c_{10} Duality + c_{11} Gender + \varepsilon_{t,i}$$

Variable	Model 1	Model 2
c_1 International Diversification (*INTD*)		.037* (2.151)
c_2 Industry Diversification (*INDD*)		.010 (.563)
c_3 Market based Performance (*RET*)		-.042** (-2.554)
c_4 Accounting based performance (*ACE*)		.370*** (14.256)
c_5 Investment Opportunities (*IO*)		.035* (1.931)
c_6 Firm Size (*SIZE*)		.198*** (7.468)
c_7 Stock Ownership (*OWN*)		-.013 (-.726)
c_8 Tenure	.152*** (7.628)	.123*** (7.114)
c_9 Age	.004 (.222)	-.014 (-.859)
c_{10} Duality	.199*** (9.858)	.061** (3.462)
c_{11} Gender	-.045* (2.294)	-.029† (-1.753)
Adjusted R^2	.074	.348
Change in adjusted R^2	.075***	.276***

Note. [a]n = 2446[b] Beta weights and *t*-values reflect results for the full model †p < .10;* p < .05;** p < .01*** p < .001. When the predicted sign is either (+) or (-), then the p value is a one-tailed test; when the predicted sign is (?), then the p value is a two-tailed test.

Source: Own elaboration.

An examination of the zero-order correlations (Table 5 Pearson Correlation Coefficient Matrix) reveals that bonus compensation is correlated with the seven measures of predictor variables (international diversification r = .101; industrial diversification = .225; market-based performance = -.087; accounting based performance = .548; investment opportunities = -.090; stock ownership = -.112; firm size = .506). To test the relationship between the seven independent variables as a whole and total compensation, a hierarchical regression model was created by entering the control variables in step 1 and the seven independent variables in step 2 as discussed above. Results of the regression are shown in Table 7. Standardized regression weights (beta) are reported for ease in comparing the strength of the relationship between bonus compensation and the various predictor variables in each regression model.

As indicated by the significant overall F score (119.771, $p < .001$), the total set of predictor variables was significantly related to bonus compensation. In addition, the set of predictor variables explained 34.8% (adjusted R^2) of the variance in the dependent of bonus compensation.

For the hypothesis H_1: International diversification is positively associated with bonus. The results of international diversification ($\beta = .037$, $t = 2.151$, $p < .05$) show that there is a positive significant relationship between international diversification and bonus compensation. Thus, the results support the hypothesis H_1 that international diversification is positively associated with bonus compensation. The results demonstrated that the higher the degree of international diversification, the higher the bonus compensation paid to CEOs.

For the hypothesis H_2: Industrial diversification is negatively associated with bonus. The industrial diversification analysis ($\beta = .010$, $t = .563$, $p > .1$) indicates that industrial diversification is not negatively associated with bonus compensation. Therefore, the null hypothesis cannot be rejected; the findings show that industrial diversification is not significantly associated with bonus compensation. Thus, the hypothesis H_2 was not supported.

For the hypothesis H_3: Market-based performance is positively associated with bonus. The market-based performance analysis ($\beta = -.042$, $t = -2.554$, $p < .01$) indicates that market-based performance is negatively and significantly associated with bonus compensation. As with hypothesis H_3, the predicted sign was opposite. Thus, ultimately no support was provided for the hypothesis H_3.

For the hypothesis H_4: Accounting-based performance is positively associated with bonus. The accounting-based performance analysis ($\beta = .370$, $t = 14.256$, $p = .000$) shows that accounting-based performance is positively and significantly associated with bonus compensation. Thus, the results support the hypothesis H_4 that accounting-based performance is positively associated with bonus compensation. Thus, the results support the hypothesis H_4 that accounting-based performance is positively associated with bonus compensation. The results demonstrated that CEOs in higher earnings firms will receive higher bonus compensation than CEOs in lower earnings firms.

For the hypothesis H_5: Bonus compensation will be better predicted by accounting-based performance measures than by market-based performance measures. As tables 5 (zero-order correlation analysis) and Tables 7 (regression analyses) show, there is support for the hypothesis H_5. This means that accounting-based performance is positively correlated with bonus compensation (.548) at significant levels ($p < .05$), and market-based performance (-0.087) is less significant, which supports the hypothesis H_5. In the hierarchical regression analysis (Table 7), accounting-based performance is a significant predictor of bonus compensation (.370, $p < .001$) and adds incrementally to the adjusted R-square. Market-based performance is also a significant predictor of bonus compensation (-.042, $p < .001$), as predicted. In contrast to accounting-based performance, the results, as predicted, show that bonus compensation is better predicted by accounting-based performance measures ($\beta = .370$) than by market-based performance measures ($\beta = -.042$).

For the hypothesis H_6: Investment opportunities are positively associated with bonuses. The investment opportunities analysis ($\beta = .035$, $t = 1.931$, $p < .05$) shows that there is a positively significant relationship between investment opportunities and bonus compensation. Thus, the results support the hypothesis H_6 that investment opportunities are positively associated with bonus compensation. The results demonstrated that CEOs in firms with more investment opportunities will receive higher total compensation than CEOs in firms with fewer investment opportunities.

For the hypothesis H_7: Firm size is positively associated with bonus.

The firm size analysis ($\beta = .198$, $t = 7.468$, $p = .000$) shows that there is a positively significant relationship between firm size and bonus compensation. Thus, the results support the hypothesis H_7 that firm size is positively associated with bonus compensation. The results

demonstrated that CEOs in larger firms will receive higher bonus compensation than CEOs in smaller firms.

For the hypothesis H_8: Stock ownership is negatively associated with bonus.

The stock ownership analysis (β = -.013, t = -.726, p > .1) indicates that industrial diversification is negatively associated with bonus compensation. The findings show that stock ownership is not significantly associated with bonus compensation. Thus, hypothesis H_8 was not supported.

Taken together, these results provide support for hypotheses H_1, H_4, H_5, H_6, H_7. The data did not support hypotheses H_2, H_3, H_8.

Conclusions

The purpose of this research was to examine CEO bonuses and to explore whether or not the independent variables (international diversification, industrial diversification, market-based performance, accounting-based performance, investment opportunities, firm size, and stock ownership) were associated with CEO bonuses.

Significant research findings

Duru and Reeb found that there is a positive relationship between international diversification and total compensation and incentive compensation. This study builds in their findings by exploring in more depth the relationship between independent variables and CEO bonuses. The results demonstrated that the higher the degree of international diversification, the higher the bonus compensation paid to CEOs.

Duru and Reeb (2002) found that there is a negative relationship between industrial diversification and total compensation, and there is a positive relationship between industrial diversification and incentive compensation. This study extended their study to examine in more detail whether industrial diversification is negatively associated with CEO bonus compensation. The result shows that there is no relationship between industrial diversification and CEO bonus compensation.

Contrary to findings in prior studies, there is little evidence that uses of CEO bonus compensation paid increases with stock return performance, as traditionally measured.

In addition, the results demonstrated that firms with higher earnings will pay higher bonus compensation to their CEOs, which is consistent with Singh and Agarwal (2002) finding that there is a positive relationship between accounting-based performance and bonus compensation. These results are also consistent with Pavlik, Scott, and Tiessen's (1993) finding that accounting earning performance is more important than stock return performance with respect to cash compensation such as bonus.

Duru and Reeb (2002) found that investment opportunities are positively related to total compensation and incentive compensation. This study extended their research in more detail to examine whether investment opportunities are related to CEO bonus compensation. The results demonstrated that firms with more investment opportunities will pay their CEOs higher bonuses.

Firm size is the key determinant of CEO pay (Singh & Agarwal, 2003). Moreover, firm size affects firm diversification (Kim, Kim & Pantzalis, 2001). Empirical research finds that firm size is positively associated with executive compensation (Sanders & Carpenter, 1998; Finkelstein & Hambrick, 1996; Gaver & Gaver, 1995; Geomez-Mejia, 1994). This study extended their research to examine whether firm size is related to CEO bonuses. The results demonstrated that firm size is a positive relationship with CEO bonuses, which explains the firms with the larger scope of operations have greater demands on top executives and will expect to pay the higher levels of bonus except for the fixed-pay salary as the motivating strategies.

Grace (2004) found that incentive compensation as a percentage of total compensation decreased in solvency regulatory attention and CEO stock ownership. Bryan, Hwang & Lilien, (2000) found that CEO ownership is significantly negatively related to restricted stock grants for the whole sample and for both subsamples. Ryan and Wiggins (2002) explored a negative relationship between the CEO's fractional ownership and equity-based incentives. The result suggested that stock ownership reduces the need for additional incentive aligning mechanisms. This study extends previous research in more depth to examine whether stock ownership is negatively associated with CEO bonuses. The findings show that stock ownership is not related.

Limitations of this study

The limitations of this study provide future research opportunities. This study uses sample data based on years; future researchers should consider using quarterly or monthly sample data to examine the

relationship between independent variables and CEO bonus compensation. More detailed data may enhance the accuracy of the research.

This study uses only NYSE and NASDAQ data; future research may attempt to examine organizations in other countries or other market exchanges.

This study focused on CEO bonuses; future studies might include research on executive and employee compensation, which may provide more objective information on compensation. Many companies such as hi-tech companies offer bonus compensation to their employees, which may be an important consideration in overall compensation packages.

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