2016

Relationship between Firm Performance and CEO's Stock Options in U.S. Pharmaceutical Companies

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This is to certify that the doctoral study by

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Abstract

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MA, University of Nairobi, 1997

MBA, Seton Hill University, 2007

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Business Administration

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Abstract

The CEO's compensation policy is one of the most important factors in an organization's success. CEO's stock options are awarded to align the interests of the CEO with the interests of the firms' stakeholders. However, lack of understanding of the relationship between firm performance and a CEO's stock options could threaten the alignment of a CEO's interests with those of the stakeholders. Grounded in agency theory, the purpose of this correlation study was to examine the relationship between return on equity, return on investment, total annual revenues, and CEOs' stock options awards, while controlling for firm size, age of CEO, and CEO tenure. Archival data from 99 U.S. pharmaceutical companies were analyzed using hierarchical linear regression. The results of the hierarchical regression analysis indicated a significant predictive model $F(6, 262) = 42.065$, $p < 0.05$, $R^2 = .343$. However, in the final model, only firm size and CEO tenure were significant. In addition, there was no significant relationship between return on equity, return on investments, and annual revenues to CEOs' stock options. The implications for positive social change include the potential for policy makers to utilize findings in furthering dialogue related to income inequality and feeling of unfair distribution of valuable resources in the society. Pharmaceutical business leaders might affect social change by structuring CEOs' compensation based on firm performance, encouraging innovation, and improving employment opportunities in the society.

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Acknowledgments

This research study would not have been possible without the support of my family. To my late dad, John Mwangi who always ensured that my school fees were paid on time when I was growing up in Africa and to my mother Teresia Mwangi who always encouraged me to study hard even when I had given up. In addition, to my two children Justin Njenga and Precious Njenga who spent a lot of their holidays indoors as I worked on this paper. Special thanks to Precious because of the many weekends we never did anything I as worked on this research.

This journey would also not have been possible without the encouragement of supportive people from Walden University. Special thanks to the study committee members; Dr. Frederick Nwosu, Dr. Rollis Errickson, and Dr. Gergana Velkova. Thanks to Dr. Frederick, the study chair for always reaching out to me when I needed help. Thanks to Dr. Erickson and Dr. Geri for prompt feedback, attention to detail and always-encouraging feedback. Without the two of you serving as committee members, I could not have gained the wealth of knowledge and masterly of APA format. I do look forward to a professional relationship even after this study.

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Section 1: Foundation of the Study

The explosive use of stock options to compensate CEOs' has increased CEO's compensation significantly (Essid, 2012). The justification often given for generous stock options awards is that stock options effectively link CEO's compensation to corporate performance (Murphy & Trefftzs, 2012). In general, stock options should help align CEO's incentives with those of the shareholders (Essid, 2012). The argument for paying a CEO with stock options is that it serves as an incentive to executives to increase shareholders value (Essid, 2012). In most publicly held companies, the compensation of top executives is virtually independent of performance (Akinloye & Hussein, 2012). However, with respect to pay for performance, compensation policy is one of the most important factors in organization success (Moore, 2014). Shareholders rely on the CEO to adopt policies that maximize the value of their shares (Moore, 2014). It is with this regard of maximizing shareholders value that makes stock options a primary form of compensation for the CEOs', to align the interests of the CEOs' with those of diversified stockholders (Essid, 2012). Therefore, an understanding of the relationship between CEO's stock options and firm performance could influence pharmaceutical industry compensation committees to make better decisions when structuring CEOs' compensation.

Background of the Problem

Firms grant executive stock options (ESOs') to chief executive officers (CEOs') to increase CEO's exposure to stock prices as a way to align CEO's compensation with the shareholders' (Khalid & Rehman, 2014). By linking executive pay to shareholders' wealth, stock options purportedly help reduce agency costs that arise from the separation of ownership and control in corporations (Khalid & Rehman, 2014). The increased use of stock options as an option to tie executive pay to firm performance has experienced considerable scrutiny from regulators and shareholders (Akinloye & Hussein, 2012). The increased scrutiny resulted, in part, because of stock option backdating and abuses of executive pay as companies jettisoned executive stock option payment (Murphy & Trefftzs, 2012).

While the rationale for awarding stock options to executives seemed apparent, tying executive compensation to firm performance was not clear. Guthrie, Sokolowsky and Wan (2012) stated that although stock options awarded to CEO should reflect firm performance, other factors influenced executive's pay. Study results on the relationship between ESO's compensation and firm performance were inconclusive (Akinloye, 2012; Kanagaretnam, Lobo, & Mathieu, 2012). Guthrie et al. argued on the CEO's ability to extract rent through bonus and options compensation, particularly for smaller firms. Akinloye investigated the relationship between executive pay and earning measure and found that awarding stock options to executives increased future earnings. Kanagaretnam et al. noted that most large firms compensated their top executives with stock options.

Problem Statement

The increased use of stock options as an option to tie executive pay to firm performance has received considerable scrutiny from regulators and shareholders (Akinloye & Hussein, 2012). Hall and Kelvin (2003) noted that during the 1990s, the average pay for CEOs' of S&P 500 grew from $3.5 million in 1992 to $14.7 million; while stock options grants grew nine-fold, averaging approximately $800,000 in 1992 to $7.2 million in 2000. The general business problem is that lack of understanding of the relationship between firm performance and CEO's stock options could threaten the alignment of CEO's interests with those of the stakeholders'. The specific business problem is that some compensation committees have limited knowledge of the relationship between return on equity, return on investment, annual revenues, and CEO's stock options awarded, while controlling for firm size, age of the CEO, and the CEO's tenure.

Purpose Statement

The purpose of this quantitative correlational study was to examine the relationship between return on equity, return on investment, annual revenues, and CEO's stock options awarded, while controlling for firm size, age of the CEO, and the CEO's tenure. The independent variables were the return on equity (ROE), return on investment (ROI), and annual revenues. The dependent variable was the value of CEO's stock options awarded. Controlling variables were firm size, age of the CEO, and the CEO's tenure. The targeted population was comprised of publicly traded pharmaceutical companies located within the United States. The implications for positive social change

include the potential to address societal concerns on increasing concentration of wealth to very high-earning salaried workers, in particular, CEOs', and thereby improving economic and social distribution in the society (Bakija & Heim, 2012). The results of this study may also help improve the culture of transparency, dialogue, fairness, and trust in the work place (Moore, 2014).

Nature of the Study

In this study, I used the quantitative method. According to Westerman (2012), researchers using quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data. Therefore, the quantitative method was appropriate for this study, for deductive testing and investigating whether a relationship existed between firm performance and CEO's stock options, while controlling for firm size, age of the CEO, and the CEO's tenure. A qualitative study is an in-depth exploration of phenomena that exist in the context of the real world by using interpretive techniques to understand, decode, and provide meaningful meaning to the phenomena (Cooper & Schindler, 2013; Zohrabi, 2013). Qualitative approach was not appropriate for this study because the method is appropriate for exploratory studies that involve open-ended interviews or observations of human participants (Zohrabi, 2013). However, the objective of this study was to test hypothesis, and hence a quantitative method was more appropriate.

I chose the correlational design for this study. Researchers conduct correlation research to determine the extent of the relationship between two or more variables using statistical data (Moore, 2014). A correlational design was an appropriate design for this

study as the goal was to examine the relationship between firm performance and CEO's stock options. Other designs, such as descriptive and experimental, were not appropriate for this research. With descriptive design, the researcher seeks to describe the status of an identified variable (Joanne, 2012). With experimental design, the researcher seeks to establish a cause-and-effect relationship among a group of variables to influence the outcome of a behavioral study (Joanne, 2012). However, to explore relationships between variables, a correlational study was more appropriate.

Research Question

What is the relationship between return on equity, return on investment, annual revenues, and CEO's stock options awards, while controlling for firm size, age of the CEO, and the CEO's tenure?

Hypotheses

$H_0$1: Return on equity, return on investments, and annual revenues would not significantly predict CEO's stock options, after controlling for firm size, age of the CEO, and the CEO's tenure.

H_a1: Return on equity, return on investments, and annual revenues would significantly predict CEO's stock options, after controlling for firm size, age of the CEO, and the CEO's tenure.

Theoretical Framework

I utilized agency theory in this study. Jensen and Meckling (1976) first developed agency theory. Scholars use agency theory to explain the relationship between managers and shareholders (Essid, 2012). Agency theorists suggested that, in imperfect labor and

capital markets, managers might seek to maximize their own utility (CEOs' stock options) at the expense of corporate stakeholder (ROE and ROI) (Essid, 2012). According to agency theorists, agents might operate in their own self-interest because they have more information than the principal and might make decisions that enhance their wealth at the expense of the shareholders (Ross, 1973). This information imbalance between the principal and the agent affects the principals' ability to monitor whether the agent is properly acting in the best interests of the principal (Essid, 2012).

Evidence of self-interest by the agent includes the consumption of some corporate resources in the form of perquisites and the avoidance of optimal risky positions (Brown, 2013). Avoidance of risky situations could include risk-averse managers bypassing profitable opportunities when shareholders of the firm would prefer the firm to invest (Arbogast & Mirabella, 2014). Outside investors recognize that the agent may make decisions contrary to their best interests (Akinloye, 2012). Accordingly, investors will discount the price they are willing to pay for securities of the firm (Arbogast & Mirabella, 2014). To monitor the agent, the principal may incur monitoring costs such as auditing the financial statements (Moore, 2014).

Definition of Terms

Definitions of the terms in this study are as follow:

Annual revenue. Gross sales, as reported in the annual report of a firm (Khalid & Rehman, 2014).

Employee stock option. A contract offered by a company to the employee, granting the employee the right to buy a fixed number of company shares in the future at a fixed price (Nancy & Fall, 2012).

Firm size. A measurement of total assets of a firm (Tzu-Ching, Chia-Hsuan, & Chun-Ho, 2014).

Proxy statement. A document required by the U.S. Securities and Exchange Commission (SEC) showing compensation paid to CEO and other executives of a public company (SEC, 2014).

Return on equity (ROE). Shareholders' return, measured as net income divided by the book value of common shareholders' equity (Sigler, 2003).

Return on investment (ROI). Firms return, measured as net income divided by total assets (Arbogast & Mirabella, 2014).

Tenure. The number of years the executive has served as CEO of the pharmaceutical firm (Sigler, 2003).

Vesting period. Specifies the time that an employee must wait to acquire full ownership of stock options (Baker, Wright, & Chernoff, 2013).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions are factors in the research considered true without any proof based on the study design (Leedy & Ormrod, 2013). First, I assumed that the rationale for awarding stock options to the CEO is to align the CEO's interests with the interests of the shareholders. Second, I assumed that firms provide accurate financial information in

their reporting to the SEC. In addition, my third assumption was that correlational design is appropriate to investigate the relationship between firm performance and CEO's stock options.

Limitations

Limitations are influences, conditions, or shortcomings that a researcher cannot control (Coffie, 2013). There are several limitations noted in this study. First, the sample consisted only U.S. pharmaceutical companies and the results might not translate to other industries. The lack of transferability of the data to other industries may be due to differing business practices (Atherton, 2012). Second, the use of secondary data, data collected for a different objective such as financial reporting and not for the purpose of this study, could potentially have introduced errors to the conclusions and designs of the current study. Any inaccuracy in archived data would negatively affect the accuracy of a study (Miranda, 2015). Third, the selected time span of the study (2007-2015) was a restrictive factor.

Delimitations

Delimitations are those characteristics that limit the scope and define the boundaries of a study (Moore, 2014). The focus of this study was limited to only U.S. publicly traded pharmaceutical companies for the years 2007-2015. I examined only companies with availability of financial data throughout the study period. The study variables on firm performance were limited to only ROE, ROI, and annual revenues. Firm performance data was restricted to data filed with only to the SEC. Controlled variables were firm size, age of CEO, and CEO's tenure. In addition, in this study, I

focused only on the CEO, and not on other high-level executives such as the chief financial officer, chief accounting officer, or chief technology officer.

Significance of the Study

The significance of this study arises from several gaps in understanding the use of executive stock option awards in the pharmaceutical industry to align CEOs' compensation with the performance of the firm. First, this study may help in addressing societal concerns on economic inequality due to increasing concentration of wealth to very high-earning salaried workers. Second, the results of this study may help improve the culture of transparency, dialogue, fairness, and trust in the work place. Third, compensation committees in U.S. pharmaceutical industry may use the results of this study in structuring CEO's stock option schemes and in the alignment of executives' compensation to stakeholders' interests.

Contribution to Business Practice

After the 2008 financial downturn, government regulators have put the spotlight on executive pay calling for more disclosures and prompting questions about the best way to structure compensation (Pham, 2015). According to Gerard (2014), influence, sympathy, friendship, loyalty, and neglect, rather than performance, affect CEOs' pay. The goal of a corporation is to maximize the long-term value of the firm and aligning CEO's incentives with all the stakeholders' interest is important (Essad, 2012). With respect to pay for performance, compensation policy is one of the most important factors in organization success (Moore, 2014). Therefore, the results of this study might contribute to new knowledge for compensation committees in designing CEO's pay

packages that aligns with the shareholders' interests. In addition, the results of this study may help improve the culture of transparency, dialogue, fairness, and trust in the work place.

Implications for Social Change

The implications for positive social change include the potential to address societal concerns on increases in inequality due to increasing concentration of wealth at the top, to high-earning salaried workers. From 1978 to 2013, CEO's compensation increased 937%, substantially greater than the painfully slow 10.2% growth of a typical worker's compensation over the same period (Economic Policy Institute, 2014). Wealth and inequality awaken justice concerns (Bakija & Heim, 2012). According to Bakija and Heim (2012), between 1997 and 2005, executives, managers, and finance professionals accounted for 60% of the top 0.1% income earners, and accounted for 70% of the increase in the share of national income going to the top 0.1% of income earners.

Kiatpongsan and Norton (2014) noted that to maintain high salaries, some firms reduced research and development (R&D) budgets or downsized employees. In addition, people in the society believe that there is unfair distribution of valuable resources such as income (Kiatpongsan & Norton, 2014). Implications for positive social change include a better understanding of the increasing income inequality, including feelings of unfairness, and improving employment opportunities. Firms paying their CEOs' based on performance are likely to invest more on R&D (Abraham, Harris, & Auerbach, 2014). Investing more on R&D could bring innovation and employment opportunities to the

society. Moreover, understanding pay inequality offers guidance for policy makers on how to address this societal concern.

A Review of the Professional and Academic Literature

The literature review contains an examination of the literature on the use of CEO's stock options within the pharmaceutical industry as a form of executive incentive. Strategies for review of academic literature included the use of Walden databases (Sage, ProQuest, Business Source Complete) as well as academic and professional databases (SEC, Standard & Poor's). I searched keywords and phrases including *pharmaceutical industries, stock options, the compensation committee, revenues, return on equity, return on investments,* and *CEOs' compensation*. Parameters for the search were peer-reviewed journals published within the past 5 years. The literature review contained 105 references, 85% of the 178 references (see Table 1). The section begins with a restatement of the purpose statement and the study hypothesis. I reviewed the academic literature and organized my study by the following themes: agency theory, executive compensation, stock options, and firm performance.

Table 1

Count of References Used in Doctoral Study Proposal

Type	Recent (within 5 years of 2016)	Older (more than 5 years of 2016)	Total	%
Books	8	1	9	5%
Conferences	0	0	0	0%
Dissertations	6	1	7	4%
Journal Articles	132	23	155	87%
Org. Report	7	0	7	4%
Websites	0	0	0	0%
Total	153	25	178	100%

The purpose of this quantitative, correlational study was to examine the relationship between ROE, ROI, annual revenues, and CEO's stock options awarded, while controlling for firm size, age of the CEO, and the CEO's tenure. The independent variables were the ROE, ROI, and total annual revenues. The dependent variable was the value of CEO's stock options granted. Controlling variables were firm size, age of the CEO, and the CEO's tenure. The targeted population comprised of publicly traded pharmaceutical companies located within the United States. The implications for positive social change include the potential to address societal concerns on increasing concentration of wealth to very high-earning salaried workers, in particular, CEOs', and thereby improving economic and social distribution in the society (Bakija & Heim, 2012). The results of this study may also help improve the culture of transparency, dialogue, fairness, and trust in the work place (Moore, 2014). The null hypothesis of this study was that ROE, ROI, and annual revenues would not significantly predict CEO's stock options, while controlling for firm size, age of the CEO, and the CEO's tenure. The alternative hypothesis of this study was that ROE, ROI, and annual revenues would significantly predict CEO's stock options, while controlling for firm size, age of the CEO, and the CEO's tenure.

Agency Theory

Jensen and Murphy (1976) set the tone of discussion on CEOs' pay. Agency theory is the foundation of the relationship between firm performance and CEO's pay (Akinloye, 2012). According to Jensen and Murphy, it is appropriate to pay CEOs' based

on shareholders' wealth because wealth is shareholders' objective (Ryan, Whitler, & Semadeni, 2014). The majority of researchers on agency theory have addressed the question of how CEO's compensation relates to firm performance and what influences this relationship (Armstrong & Vashishtha, 2012). The assumption underlying agency theory is that agents tend to be selfish and opportunistic and, unless monitored adequately, will exploit owner-principals (Miller, Sarsdais, & Case, 2012). According to agency theory, the agent is assumed to have greater knowledge than does the principal (Moore, 2014). Further, the agent might act in his or her self-interest by exploiting the information advantage that the principal does not possess (Moore, 2014). High-profile corporate failures such as Enron and WorldCom have underscored this conflict between agent and principal (Essid, 2012). Top corporate management could malfunction and manipulate critical information (such as earnings) and attempt to deceive the unwary pubic (Syriopoulos & Tsatsaronis, 2012). Therefore, structuring managers' compensation to reduce agency costs and encourage managers to act in the best interests of the shareholders forms the foundation of agency theory.

When the motives and objectives of shareholders and company senior managers are different, agency costs are incurred (Jensen & Meckling, 1976). Shareholders hire managers because they have specialized resources that increase firm value. Unless offered proper incentives, managers will not maximize shareholders' wealth (Paz, 2012). One way to align managers' interests with those of shareholders is to make managers' compensation a function of firm performance (Sigler, 2011). In a typical principal-agent relationship, the agent could act in his or her own self-interest by exploiting information

asymmetry, in that the agent has more information or knowledge than the principal does (Jensen & Meckling, 1976). The information asymmetry that exists between knowledgeable agents and owners could provide the basis for this opportunism, which the agent will act upon unless controlled or incentivized not to do so (Jensen & Meckling, 1976). It is because of efforts to resolve agency and principal conflict that agency theory has become the most widely used concept to explain executive compensation (Akinloye, 2012).

The foundation of agency theory is the contract that governs the relationship between principals and agents (Paz, 2012). Because of agent and principal conflict, agency theorists recommend that managerial compensation contracts include designs such that when managers increase the value of the firm, they also increase their expected utility (Mitnick, 2013). According to Sania and Mobeen (2014), monitoring the management and by aligning CEO's wealth with firm value reduces agency costs. The argument here is that incentives alignment must be less than the reduction in agency costs (Essid, 2012).

One way to increase shareholders' value through performance is for firms to invest more in research and development (R&D). Executive leadership is an important part of the revitalization of a firm (Tien & Chen, 2012). Tien and Chen (2012) examined the relationship between CEO's compensation and the behavioral momentum of innovation in R&D within the firm. The rationale behind Tien and Chen's study was that executive compensation affects organizational behavior and firm performance; therefore, proper incentives could motivate CEOs' to engage in strategic change.

Ownership structure is a cause of agency problems and, according to agency theory, giving managers equity ownership of the firm could reduce this issue (Jensen & Meckling, 1976). The theoretical rationale behind the use of equity-based executive compensation is to link executive wealth to the stock price, aligning the CEO's own interests with shareholders' interest (Gerard, 2014). The divergence of interests between the agent and principal is the perspective that makes some researchers argue that the motivational potentials of stock options should inspire top executives to act in a way that maximizes shareholders' value (Akinloye & Hussein, 2012). Managers are typically risk averse, and equity incentives should induce managers to undertake risky projects to maximize firm value and improve firm performance (Dicks, 2012).

It is not clear to what extent equity compensation could reduce agency problems and, in turn, increase firm performance (Denning, 2013). Denning (2013) reviewed Standard & Poor's CEOs' data from 1992 to 2003 and analyzed the impact of equity incentives to CEO's risk-taking. Leaders of firms must take risks to make use of opportunities and improve performance. Denning examined the connection between stock option compensation, risk-taking, and firm performance. Denning found that an incentive effect using equity compensation only occurs when the level of equity compensation is relatively small, and overused equity incentives reduced CEO's risk-taking motivation.

Use of equity incentives to reduce agency costs is justified because CEOs' have significant human capital tied to the firm and are less diversified, as compared with outside directors. Managers' expected utility depends on the distribution of payoffs by

the firm (Mitnick, 2013). However, with significant human capital tied to the firm, managers could pass off risk, ignoring projects that would benefit the shareholders' value (Hayes et al., 2012). Hayes et al. (2012) reviewed CEO's compensation data from fiscal years 2002 through 2008 to analyze CEO's compensation and CEO's risk-taking behavior. Hayes et al. found no relationship between equity compensation and risk-taking behavior of the firm, but accounting changes in reporting of stock options was an important factor affecting the use of equity incentives rather than firm performance. According to Hayes et al. accounting changes rather than the alignment of the CEO's compensation to the firm performance to reduce agency costs influenced awarding of stock options to the CEO.

Organizations that that are subject to fewer external constraints are predicted to exhibit higher agency costs in the form of greater excess compensation to the CEO (Gaver & Im, 2014). Gaver and Im (2014) analyzed financial data from nonprofit organizations from 1992 to 2007. Gaver and Im found that excess CEO's compensation had a negative association with external funding sources but positively related to funding from investment income. Gaver and Im found that organizations that received funding from outside sources were subject to monitoring from their sources of financing. However, organizations that relied on investment earnings had less monitoring. Gaver and Im concluded that demand for monitoring by fund providers was associated with agency problem, because managers had incentives to expropriate external funds than investments income.

The board of directors sets compensation packages of the top five firm executives (Moore, 2014). Since Jensen and Meckling's (1976) study, management scholars have posited that both the role of the board of directors and ownership structure are crucial in monitoring managerial activity to reduce agency cost. Moreover, regulatory bodies such as the SEC and New York Stock Exchange (NYSE) have outlined the role of the board of directors in monitoring firm executives (Essid, 2012). To improve corporate governance, the NYSE, National Association of Securities Dealers Automated Quotations (NASDAQ), and Sarbanes-Oxley Act of 2002 have included guidance on how to improve board monitoring in the firm (Álvarez-Pérez & Neira-Fontela, 2013). Both the NYSE and NASDAQ now require that the majority of the board of directors should be independent and that the firm has fully independent nominating, compensation, and auditing committees (Guthrie et al., 2012). In addition, companies listed on the NYSE must comply with Section 303A, which is consistent with Sarbanes-Oxley Act of 2002, on corporate governance standards (NYSE, 2014). These regulatory requirements are to help present a clear, concise, and understandable disclosure about the compensation paid to the executives of public companies (SEC, 2014).

The board of directors is the governing body to which shareholders delegate the responsibility of overseeing, compensating, and substituting managers as well as approving major strategic projects (Jesus & Emma, 2013). Some researchers have argued that the board might not be effective in mitigating agency problems. Lin and Lin (2014) analyzed whether directors' compensation has an effect on CEO's compensation by analyzing 713 firms from the period of 2007 to 2010. Lin and Lin incorporated the

characteristics of the board of directors' compensation in addition to CEO's characteristics to examine CEO's compensation. In the study, Lin and Lin found a positive relationship between CEO's power to CEO's compensation and a negative relationship to directors' compensation. Lin and Lin attributed CEO's power to CEO's tenure, revealing that CEOs' who had lengthy tenures were likely to dominate the board of directors, causing agency problems. Lin and Lin also found that highly paid directors were not paid based on their performance but by a *mutual back-scratching* relationship between the CEO's and the board of directors. It is therefore likely that the CEO might receive higher compensation not based on performance but by dominating the board of directors.

To understand how the board of directors influenced CEO's compensation and firm performance, Nyoamong and Temesgen (2013) investigated the relationship between the board of directors' governance variables and bank performance in Kenya. This study was important because it looked at banking in Kenya, where problems in the banking sector included 37 banks having collapsed between 1986 and 1998. Nyoamong and Temesgen analyzed board size, independence of directors, and CEO's duality. Nyoamong and Temesgen found that large board sizes tended to have a negative impact on bank performance. Nyoamong and Temesgen also found a positive association between a greater number of independent directors and higher performance. Nyoamong and Temesgen recommended that to improve performance, increasing the number of independent directors was more effective for corporate governance and a sound financial

system. Increasing the number of independent directors is likely to improve monitoring and reduce agency costs.

Guthrie et al. (2012) examined U.S. public firms and found that the requirement of a majority of independent directors on the board affected the level of CEO's pay. Guthrie et al. analyzed the governance compliance of 865 firms to examine the link between CEO's pay and independence of the board. Guthrie et al. found that (a) board independence did not affect the level of CEO's pay, (b) compensation committee independence caused CEO's pay to increase, and (c) increases in CEO's pay occurred only in the presence of block-holder directors or high institutional ownership concentration. High CEO's pay in firms with either block-holders or high institutional ownership contradicted agency theory because there are few shareholders and easier to monitor the CEO effectively (Guthrie et al., 2012). Guthrie et al. also noted that there was little evidence that board reforms had any meaningful effect on CEO's pay. Guthrie et al. study results casts doubt on the effectiveness of independent directors in constraining CEO's pay in firms with stronger shareholder monitoring.

Evidence has shown that boards and shareholders possess the ability to increase an incentive based on the long-term nature of the compensation contract rather than through fixed pay to motivate executives (Akinloye, 2012). However, while agent theorists propose the need to align the agent and the principal interests, modern businesses present unique challenges (Gaver & Im, 2014). According to Gaver and Im, modern businesses hav e complex operations including customers, types of labor, laws, regulations, and capital markets, making it more difficult for shareholders to monitor firm

performance. In addition, other modern business trends such as outsourcing services conducted in the hope of increasing shareholder value, understanding how these new trends affected the shareholders' value is difficult (Gaver & Im, 2014). Industrial diversification could benefit managers by providing them with more power through compensations (Cheng, Venezia, & Lou, 2013). Agency costs have increased due to the increased cost and difficulty of monitoring executives from the home office (Cheng et al., 2013).

Rival Theories

Over time, researchers have become all too aware of the limitations of agency theory, especially its narrow assumptions of human nature (Raelin & Bondy, 2013), stimulating a need of development and application for other theoretical lenses. The link between executive compensation and firm performance does not receive much empirical support, and agency theory partly fails to distinguish other factors such as opportunists' behavior, which could influence CEO's actions (Raelin & Bondy, 2013). Because of these shortcomings of agency theory in explaining the link between CEO's pay and firm performance, other theories have emerged to supplement agency theory in explaining CEO's compensation (Raelin & Bondy, 2013). Some of these new theories include (a) portfolio theory, (b) resource dependency theory, and (c) prospect theory (Moore, 2014).

Portfolio theory. Portfolio theory assumes that rational and risk-averse executives will invest their wealth in a diversified portfolio rather than in the stock of the firm that put the executive's wealth in one basket (Essid, 2012). However, with stock options, awarding CEOs' with only one company stock increases the CEOs' portfolio

risk (Gomez & Wiseman, 2012). This increase of CEO's portfolio risk is contrary to the foundation of portfolio theory (Gomez & Wiseman, 2012). On the other hand, resource dependency theory states that organizations are dependent on actors outside the organization because these actors provide uncertainties in meeting strategic performance goals (Cuevas et al., 2012). According to Cuevas et al. (2012), these external factors, that the CEO cannot control, affected firm performance. Therefore, consideration of external economic factors beyond executives control is important when structuring CEO's stock options.

Prospect theory. Tversky and Kahneman (1992) proposed prospect theory. Prospect theory is widely viewed as the best description on how people explore the role of attitudes toward risk (Tversky & Kahneman, 1992). Tversky and Kahneman advanced prospect theory as a critique to utility theory, which had dominated analysis of decision making under risk. Tversky and Kahneman argued that decision making under risk was a choice between prospects or risks. The term prospect refers to a set of probabilities where people overestimate outcomes that are certain, relative to outcomes that are probable (Tversky & Kahneman, 1992). In short, prospect theory predicts that individuals tend to be risk averse in a domain of gain, or when things are going well, and relatively risk seeking in a domain of losses, as when a leader is in the midst of a crisis (Tversky & Kahneman, 1992). Agency theorists assume that equity ownership to CEO's has a positive and direct effect on firm performance (Aaron, Harris, McDowell, & Cline, 2014). However, prospect theorists relax the assumptions of agency theory and apply a

behavioral approach (Yan & Liyan, 2013). Therefore, while agency theory assumes that the manager is rational, prospect theory incorporates human behavior.

While stock options are supposed to align, the CEO's interests to the shareholders' interests, under prospect theory, CEO's perception of gain or loss is important. According to Aaron et al. (2014), a CEO whose stock options are in the gain would adopt a defensive strategy designed to maintain current stock prices while a CEO in a loss position would adopt a risky strategy in an attempt to rescue options value. In either gain or loss position, the interests of the shareholders and the CEO conflicts (Wasiuzzaman, Sahafzadeh, & Najad, 2015). Per prospect theory, CEOs' will be loss averse, responding much more strongly to being in a loss position than being in a gain or neutral position (Ryan et al., 2014). According to Ryan et al. (2014), the short vesting period creates a mismatch between a firm's long-term fundamental value and the executive's speculation of the short-term stock performance. This mismatch between long-term company fundamentals and executive stock options might lead to specific behaviors such as unnecessary spending and risk-taking to boost stock prices.

Traditional microeconomic theories such as agency theory assume that agents facing alternatives evaluate all outcomes and could assess probabilities objectively before making decisions (Pirvu & Schulze, 2012). The strength of prospect theory is that it deviates from agency theory and takes into account human behavior because human beings are not rational in decision-making. In CEO's decision-making, psychological factors such as overconfidence, conservatism, and fear of regret would override all rational decision choices (Alghalith, Floros, & Dukharan, 2012). Prospect theory

incorporates real human decision-making patterns (Pirvu & Schulze, 2012). Agency theory lacks in this regard, assuming instead that monitoring and offering CEOs' incentives would align CEOs' interests with shareholders' interests. Although agency theory is an essential framework, failure to find a link between firm performance and CEO's compensation has stimulated the development of other theoretical lenses (Yan & Liyan, 2013).

On the other hand, although prospect theory has helped explain human behavior when making decisions, it is still a new theory, and any new applications to dynamic contextual situations await further research (Yan & Liyan, 2013). Extending prospect theory in several directions would encompass a wider range of decision problems (Daniel & Amos, 1979). Other researchers have argued that assumptions used in behavioral finance models such as prospect theory do not seem to capture the behavior of financial professionals and require considerations (Alghalith et al., 2012; Zank, 2012). Alghalith et al.'s (2012) study of financial professionals' decision-making behavior found that loss aversion, which plays a crucial role in prospect theory, was not as important as typically assumed. Alghalith et al. analyzed daily returns on the S&P500 from 2000 to 2010 to compute gain and explain investors' behavior, and found that investors were risk seeking in the face of both losses and gains, contradicting prospect theory, which proposes that in a winning situation, investors will avoid risk. Contrary to prospect theory, CEOs' with stock options that are increasing in value could still make risky decisions on behalf of their companies.

Executive Compensation

Executive compensation is one of the most debated topics in corporate governance literature (Rashid, 2013). Annual changes to CEO's compensation do not reflect the changes in corporate performance (Hannes & Tabbach, 2013). To monitor CEO's pay, SEC (2013) requires that all public companies disclose compensation paid to CEOs', CFOs', and certain other high-ranking executives. According to the SEC, the Summary of Compensation table is the cornerstone of required disclosure on executive pay. In addition, the SEC requires public companies to submit a proxy statement and a compensation table (See Appendix A), disclosing, base salary, bonus, stock awards, option awards, non-equity incentive compensation, change in pension value, and other compensation. According to Compensation Summary table for Pfizer as of 2014, the CEO received over 18 million in stock options between 2012 and 2014 (See Appendix B).

Executive compensation structure. CEO's compensation consists of some or combination of fixed short-term pay in the form of salary and benefits, fixed long-term payment in the form of pension, variable short-term pay in the form of annual bonuses, and variable long-term pay in the form of deferred bonuses and long-term ion incentive awards (Oberholzers & Theusissen, 2012). However, other than the base salary, the various components of CEO's pay are difficult to calculate with certainty. According to Economic Institute policy (2014), CEOs' pay tends to fluctuate in tandem with the stock market confirming that CEOs' tend to cash in their options when stock prices are high. The financial crisis in 2008 and the accompanying stock market tumble knocked CEOs'

compensation by 44% by 2009, but not surprisingly by 2013, CEOs' compensation had risen by 21.7% (Economic Policy Institute, 2014). In addition, Srivastava (2013), noted that in 1999, CEOs' pay including salary and other incentive payments averaged $2.3 million, but a change in CEOs' wealth resulting from holding the stocks awards and options paid to them averaged approximately $24.2 million. Therefore, although fixed components of the CEOs' compensation have reduced, variable components such as stock options have increased, in the alignment CEOs' compensation with the shareholders.

The structure of executive pay is meant to align the CEO's pay with the strategic plan of the corporation (Gopalan, Milbourn, Song, & Thakor, 2014). The board of directors is supposed to structure optimal compensation contract in which salaries, bonuses, stock, and stock options grants provide significant rewards for superior performance (Baum, Ford, & Zhao, 2012). Shareholders should set CEO's compensation through arm's length contracting between executives attempting to get the best deal for themselves and boards trying to get the best deal for shareholders (Gopalan et al., 2014). Therefore, CEO's compensation package should not only align the actions of the CEO's with the firm's performance, but also ensure that the total compensation package attracts and retains good talent (Moore, 2014). For firms to maintain competitiveness and improve shareholders value, attracting, and retaining good managers through a competitive compensation package is important.

Measurements of executive compensation. Researchers who have studied CEO's compensation and firm performance have investigated various dependent

variables related to CEO's compensation; including stock compensation (Sun, Wei, & Huang, 2013) and CEO's total compensation (Gong, 2011). Akinloye (2012) examined the relationship between executive stocks and the earnings performance of firms and found a correlation between executive stock options to the alternative earnings measure. Akinloye found that using $1 executive stock options to remunerate top executives increased corporate earnings by $1.92. However, Akinloye noted that although performance increased with executive stock options, such increases occurred at a diminishing rate, revealing an adverse relationship between firm earnings and high stock options levels. Sheikh (2012) found a positive relationship between stock options awarded to investments in R&D expenditures and number of patents. Oberholzers and Theusissen (2012) argued that there are concerns that CEOs' reaped the benefits of an increased share price, although the increased in stock price was probably due to market factors and not much to CEOs' performance. It is therefore possible that a firm CEO could receive stock options awards not because of effort but favorable external factors beyond the manager's control.

Sun et al. (2013) analyzed revenue and cost efficiency to understand the relationship between top executive compensation and firm performance. Sun et al. found that revenue efficiency had a significant relationship with cash compensation to CEO's, but no relationship to stock options incentives. On cost efficiency, Sun et al. found a positive relationship with stock options. Edmonds et al. (2012) sampled 1,456 firms from 1998 to 2009, focusing on CEO's bonus compensation and found that missing revenues forecast negatively affected CEO's cash bonus. Edmonds et al. also noted that CEOs'

from growth companies experienced severe reductions in their cash bonus payments because of missing earnings forecasts, as compared to CEOs' from value firms. Edmonds et al. concluded that compensation committees relied on information conveyed in revenues estimates when contracting with the CEOs' on the compensation package.

Riachi and Schwienbacher (2013) compared the sensitivity of managerial cash incentives to firm performance on firms listed on the Hong Kong stock listing. Riachi and Schwienbacher defined measured performance using ROA and stock performance. To control other factors that could affect performance, Riachi and Schwienbacher did not include utility companies because performance sensitivity is weaker for regulated firms. Riachi and Schwienbacher found that there was a significant relationship between CEO's cash pay and ROA, but there was an insignificant relationship between CEO's cash pay and stock performance. However, stocks performance is long-term oriented, while cash payments are short-term oriented, which could explain the insignificant relationship between cash pay and ROA.

Gong and Li (2012) sampled 1,039 CEOs' whose compensation tenure began in 1992 and ended in 2007 and found that increasing CEO's compensation increased shareholder value. Gong and Li found that a 1% increase in nominal CEO's pay lead to a 1.86% increase in shareholder value. Wang et al. (2013) studied 2,448 CEOs' from 1,622 firms spanning a range extending from 1997 through 2002 and noted that companies that highly paid their CEOs', had a greater degree of international diversification, higher accounting earnings performance, large firm size, and large investment opportunities. Wang et al. also noted that the greater the degree of industrial

diversification, the fewer levels of total compensation and stock options received. Wang et al. concluded that as firms expanded beyond national borders to remain competitive, managers are motivated to increase shareholders value. On the other hand, industrial diversification increases business segments, bringing in complexity and difficult to monitor managers (Wang et al., 2013). It is therefore possible that many business segments might be difficult for shareholders to monitor and could cause agency problems.

Power of the chief executive officer. The scope of the CEO's power in public corporations is vast. Agency theorists proposed that due to conflicts of interests between outside shareholders and managers, the board of directors has the fundamental role of monitoring managers to ensure that managers act in the best interest of shareholders. To ensure that the CEO does not influence the board, the NYSE requires that the three principal board committees (audit, compensation, and nominating) of listed companies be composed solely of independent directors (NYSE, 2014). The main purpose of these committees is monitoring for the shareholders and advising the management to reduce agency conflicts.

According to Lin and Lin (2014), CEO's may influence the board of directors, thereby compromising the independence of the board. Lin and Lin examined 713 firms between 2007 and 2010 to analyze how the CEO influenced the compensation process for the CEO's own gain. Because the compensation for directors and CEOs' should reflect the performance of firms, Lin and Lin used ROA and ROE. Lin and Lin stated that CEO could influence the board, hoping to change their stock options and compensation not

commensurate with firm performance. The researchers found that CEO's received higher pay when the directors' compensation was high, supporting the mutual back-scratching relationship between the CEO and the board of directors' (Lin & Lin, 2014). Lin and Lin also found that short-tenured directors had less ability to influence the board of directors' and CEO's with a lengthy tenure were likely to influence directors' selection process, causing agency problems. In addition, Lin and Lin found that ROE was a better predictor of directors' compensation than ROA because ROE reflected how well a firm performed from the shareholders' point of view.

Sun and Cahan (2012) studied 1,255 companies to examine the influence of a compensation committee on CEO's pay. The compensation committee is responsible for setting up the payment structure of the CEO. Sun and Cahan found a negative association between the quality of a compensation committee to higher CEO's influence and CEO's tenure. Cheikh (2014) defined three indicators of CEO's power: (a) CEO as chairman of the board, (b) CEO associated with being the founder of the firm, and (c) CEO as the only inside director on the board. Cheikh found that in firms where CEOs' had power, the CEOs' had no constraints on taking risks when making decisions. Additionally, Cheikh found that large enterprises had agency and centralization problems while, in small businesses, CEOs' were authoritarian, entrenched, and made risky decisions. Cheikh recommended the presence of external independent directors with expertise as best positioned to monitor CEOs' actions and reduce agency costs.

Bahloul, Hachicha, and Bouri (2013) focused on measuring CEOs' performance using value creation rather than using traditional metrics such as ROA and ROE. Bahloul

et al. studied 125 European insurance firms between 2002 and 2008 to measure how the power of CEO affected performance of the firms. Bahloul et al. found that in markets where the CEOs' had less power, these companies had improvements in cost efficiencies and improved productivity. Bahloul et al. also concluded that market discipline and directors' decisions could improve management in terms of effectiveness. Therefore, CEO's power could influence growth of productivity, enabling the firm to be more productive and efficient, thereby increasing shareholders value and reducing agency costs.

Jha, Kobelsky, and Lim (2013) sampled 3,654 CEOs' and found a negative association between high levels of stock options incentives and reporting material weaknesses. Jha et al. concluded this negative association occurred because CEOs' and CFOs' were more likely to override internal controls to manipulate firm performance. According to Jha et al., these findings had significant implications for boards of directors, managers, and regulators when structuring or analyzing executive pay. Individual firms' boards of directors may want to consider whether long-term and short-term incentives are enough to weaken controls in order to manipulate performance (Jha et al., 2013). In addition, compensation committees should consider how high levels of executive stock options might influence the alignment of CEOs' interests with the shareholders.

Huang, Haung, and Li's (2011) case study on GOME Inc. revealed how the CEO and board of directors fought for power, causing agency problems. GOME Inc. was one of the largest appliance retailers in China, listed on the Hong Kong Exchange (Huang et al., 2011). According to Huang et al., fighting for control at GOME started after the

arrest of the founder, Haung Guangyu, and Xiao Chen became the CEO and chairman of the board of directors. Chen, then the CEO and chairman of the board at GOME, engaged in activities that clearly showed how the CEOs' could cause agency problems. In 2009, Chen launched an incentive program with 383 million shares; approximately 3% of common stock outstanding, with Chen awarded 125.5 million shares (Huang et al., 2011). Chen also offered favorable debt covenants to Bain Capital to purchase convertible debt in 2009, enabling Bain Capital in 2010 to convert this debt into 16.31 million shares, thereby becoming the second largest shareholder of GOME with 9.8% of total shares outstanding. In this case, executives caused agency problems by awarding themselves generous stock options and offering favorable debt covenants to Bain capital, enabling Bain capital to become one GOMEs largest shareholders.

Another area in which CEOs' could use their power to influence firm performance is in the capital structure of the firm. Jiraporn, Chintrkarn, and Liu (2011) sampled 1,264 firms from 1992 to 2004 analyzed the impact of CEO's dominance in the capital structure of the firm. To measure CEO's dominance, Jiraporn et al. considered CEO's pay slice (CPS). CPS is the fraction of the aggregate top-five compensation captured by the CEO. Jiraporn et al. asserted that CPS was a better indicator of CEO's power because CPS is a continuous variable that captures subtle gradation of CEO's duality. The researchers noted that one way the CEOs' influenced capital structure was through suboptimal leverage (Jiraporn et al., 2011). In addition, Jiraporn et al. noted that dominant CEOs' tended to adopt lower leverage, probably to evade the disciplinary

mechanisms associated with debt financing. Therefore, choosing a suboptimal capital structure could negatively affect firms' performance, reducing shareholders value.

Bebchuk, Cremers, and Peyer (2012) also used CPS to understand the relationship between the CEOs' and the other members of the top executive team, as well as the relationship between this measure and performance of the firm. According to Bebchuk et al., CPS represented a rich set of relations with a broad range of aspects of the performance and behavior of firms. Using 3,256 CEOs data between 1993 and 2004, Bebchuk et al. found that the average CPS was 35%, and its standard deviation was 11.4%. Bebchuk et al. found that firms with high CPS had less CEO's turnover from poor performance, were less profitable, and had a more opportunistic timing of CEO's option grants. In addition, firms with high CEO's CPS had greater entrenchment, explaining the lower turnover of CEO's, even after poor performance—an apparent source of an agency problem.

Liu, Mauer, and Zhang (2014) examined how CEO's compensation incentives affected corporate cash holdings, causing agency conflicts, and found that there was a positive relationship between CEO's compensation and cash holdings. Using compensation data from ExecuComp, Liu et al. looked at 20,349 firm-years over the period from 1992 to 2006. According to Liu et al., CEOs' with volatile compensation from incentives adopted to holding large cash balances to moderately high cost of debt. Holding large cash balances is, therefore, likely to act as a hedge to the firm. Liu et al. suggested that CEO's risk-taking incentives encourage greater liquidity because CEOs' prefer holding large cash balances than taking risks, which might benefit shareholders.

Therefore, understanding CEOs' holding preference of either debt or cash is important to understanding how it affects firm performance and the shareholders' value.

CEOs' with higher incentives are likely to enter into liquidity covenants with creditors because creditors anticipate more risk-taking behavior by the CEO (Abels & Martelli, 2013). However, intense monitoring destroys the trust necessary for the CEO to share relevant strategic information with directors (Abels & Martelli, 2013). Abels and Martelli (2013) sampled 2,051 firms from 1998 to 2006 and studied CEO's turnover, CEO's compensation, and earning quality of firms. Abels and Martelli found that companies in which directors served on several committees devoted more to oversight than to providing top-level strategic counsel. In addition, according to Abels and Martelli, companies with more monitoring had lower earning quality and the CEOs' had excess compensation because of the anticipated CEO's turnover.

Agency theory suggests that CEO's duality, the practice of one person serving as both CEO and board chair of the firm, is unsuitable for firm performance because it compromises the monitoring, and control of the CEO. CEO's duality reflects lower board oversight and stronger CEO's power, while non-duality reflects higher board oversight and weaker CEO power (Krause, Semadeni, & Cannella, 2013; Moscu, 2013). Moscu (2013) examined the link between CEO's duality and performance (ROA and ROE) by analyzing 62 firms listed on the Bucharest Stock Exchange. Moscu's regression model included ROA and ROE as the dependent variables and duality, firm size, debt to equity, and CEO's shares ownership as the dependent variables. Moscu observed that duality and the ROA regression coefficient were positive but not significant. In addition,

in firms with duality with the CEO holding significant equity holding, a regression coefficient showed that this combination negatively affected performance. However, Dogan, Elitas, Agca, and Ogel (2013) analyzed 204 companies listed on the Istanbul Stock Exchange between 2009 and 2010. Dogan et al. noted that firms with duality had lower ROE, ROA, and Tobin's *q* (the proportion of market value to book value) compared to firms with a separate CEO and chair. These results were in accordance with agency theory on the benefits of reducing CEO's power to improve monitoring and reduce agency costs.

Other studies have addressed how CEO's tenure affected firm performance (McClelland, Barker, & Oh, 2012; Moore, 2014). Moore (2014) investigated whether there is a relationship between the CEO's tenure and compensation levels in the U.S. healthcare industry. Tenure was the number of consecutive days a CEO had held that position. Moore noted that CEO's tenure might lead to entrenchment of the CEO within a firm and afford the CEO the ability to influence compensation. Moore suggested that compensation committees should consider CEO's tenure and firm size as playing a significant role in determining CEO's compensation. According to Moore, firm size and CEO's tenure could override use of firm performance parameters in determining CEO pay.

McClelland et al. (2012) reviewed data on for 220 companies from Standard & Poor's to examine how CEO's age and CEO's tenure related firm performance. McClelland et al. stated that young CEOs' were more likely than older CEOs' to adopt risky strategies to enhance business value. CEOs' with shorter career horizons were

more likely to adopt strategic postures that are risk averse and more conducive to job security, while older CEOs' would avoid strategies that would pay off after their retirements. The dependent variables were ROA and Tobin's *q* (market to book value). Independent variables were CEO's age and CEO's tenure, and two moderating variables were CEO's ownership and industry dynamism. McClelland et al. concluded that CEO's with short tenures led to lower future financial performance, while CEOs' with lengthier tenure generated lower financial performance in dynamic industries, but not in stable industries. McClelland et al. also noted that there was a lower ROA, on average, when older CEOs' held high ownership positions in their firms. These results indicated that equity ownership, although advocated by agency theorists as aligning CEOs' interests with the shareholders' interests, had mixed effects on firm performance depending on CEO's horizon and CEO's tenure.

Pharmaceutical Industry Executive Compensation

Few studies have examined the use of stock options compensation to CEOs' in the pharmaceutical industry, although the use of incentives in the pharmaceutical industry is important to motivate research and, in the process, improve stock prices. The design of equity incentives such as stock options grants amplifies the value of the executive after FDA approval to unpredictable levels (Brown, 2013). Because a majority of prior compensation research has aggregated industries into a single omnibus sample, it has been difficult to detect compensation effects that are likely industry specific (Offstein & Gnyawali, 2005).

The pharmaceutical industry is also unusual because of the larger number of companies with small revenues, significant losses in net income, but high market value (Schmutz & Santerre, 2013). CEOs' of these companies receive compensating even when the performance of their firms is not observable (Schmutz & Santerre, 2013). Schmutz and Santerre (2013) explained many of these small pharmaceutical companies with negligible revenues but with large market values, and large budgets were likely developing a new pharmaceutical product that has not yet reached the market. It is therefore likely that investors estimate the company's valuation based on future earning potential of these pharmaceutical companies.

Pharmaceutical company proxy statement shows the intense pressure to develop drugs and get them approved by the FDA (Brown, 2013). Brown (2013) stated that residents of the United States spent $307 billion on pharmaceuticals in 2010; but to access this market, pharmaceutical companies need to generate research that leads to FDA approval and then sell these products to these markets. According to Brown, the major pharmaceutical companies have similar compensation formulas for their top executives, with a fixed component making only 20% of the total award and equity incentives components representing most of the compensation. New drugs working their way through the FDA approval process and vesting of stock options makes compensation of CEOs' in the pharmaceutical industry difficult to predict. However, vesting is important by ensuring that the CEOs' earns the stock options over time, ensuring management continuity during product development (Essid, 2012).

Roach (2003) reviewed data from 184 public pharmaceutical companies with revenues ranging from $100,000 to $47 billion. The companies selected also had market values ranging from $8 million to $285 billion. To calculate the market value of stock options, Roach used the Black-Scholes model. All of the stock options awarded had a 10-year life, 4-year vesting schedule, and were not transferable. In using the Black-Shores model, Roach applied a 5% risk-free interest as the 10-year Treasury bond, and volatilities of 144, which was the average volatility reported by the Chicago Mercantile Exchange for 2001. Roach stated that the results showed no relationship between CEO's compensation and company performance, but the use of stock options represented more than 51% of the CEO's pay. Roach also noted a positive relationship between CEO's wealth, CEO's tenure, and increased company market value. Roach concluded that CEO's wealth increased because the CEOs' had a long tenure and held substantial stock holdings in the enterprise.

Offstein and Gnyawali (2005) examined how the use of CEOs' incentives in the pharmaceutical industry affected firm competitive behavior by using data on CEOs' short- and long-term incentives from 1998 to 2000. Offstein and Gnyawali's considered SEC requirement that only firms with more than $10 million in revenues should report executive compensation. Offstein and Gnyawali's study sample included only 48 major publicly traded companies in the U.S. To gauge competitive actions, Offstein and Gnyawali used data from the FACTIVA database to code competitive activities and included launching of a new product and acquiring intellectual property rights. Firm size and firm performance were the control variables when measuring CEOs' incentives

because these components influenced both compensation and competition. Independent variables were the number of employees, CEO's bonus, and CEO's long-term incentives. Offstein and Gnyawali (2005) noted a positive relationship between CEOs' long-term incentives compensation while the use of short-term incentives such as bonuses were not significant. The lengthy nature of the R&D process in high-tech firms such as those in the pharmaceutical industry is fraught with ambiguity and uncertainty (Offstein & Gnyawali, 2005). In addition, Offstein and Gnyawali's study results indicated the importance of firm size and firm performance in depicting competitive activity, with the two variables explaining at least 76% of the variance in CEO's compensation.

Stock Options

Stock options are contracts that give the owner the right to buy a share at a pre-specified price, the *exercise* price, for a pre-specified period of a term called *vesting*. The holder of the option hopes to use the option when the company stock is higher than the exercise price (Baker et al., 2013). Many firms utilize both incentive stock options and nonqualified stock options as equity compensation for executives (Sigler, 2011). Nonqualified options have a disadvantage in that taxable income will be reported when options are exercised, whether the stock is sold or not. Moreover, income from nonqualified options is taxed as ordinary income (Internal Revenue Service [IRS], 2014). However, qualified stock options avoid this disadvantage because there is no income to report at the time they are exercised unless the stock is sold at the same time the purchase option is exercised and the stock qualifies for long-term capital gains if held for one year (Sigler, 2011). According to the IRS, the maximum capital gains tax, which is the price

appreciation above the exercise price, is 20% (IRS, 2014). Therefore, the lower tax rate and the ability to defer tax payments to the future makes qualified stock options attractive as part of CEOs' compensation package (Baker et al., 2013).

History on stock options. While research on executive compensation has appeared in academic literature since the beginning of the 20th century, it was not until the 1950s that literature on stock options started appearing (Jones & Smith, 2012; Murphy & Trefftzs, 2012). Murphy and Trefftzs (2012) noted that there were no tax codes on stock options during the 1920s. Frydman and Saks (2010) stated that before the Great Depression, small businesses run by family members dominated corporate structure in America. Changes in American corporate structure started happening between 1895 and 1904, when nearly 2,000 small manufacturing businesses combined to form 157 large corporations, and shifted management of these small businesses from the owners to professional executives (Murphy & Trefftzs, 2012). Shifting of business management from the owners to professional managers brought about agency problems, necessitating the need for alignment of interests between the owner and the managers (Murphy & Trefftzs, 2012)

Although disclosure of executive pay to the public became compulsory in 1934 after the highly publicized stockholder disputes about bonuses paid to executives at Bethlehem Steel, American Tobacco, and National City Bank (Spector & Spital, 2011), interest in stock options started after the Revenue Act of 1950 (Frydman & Saks, 2010; Murphy & Trefftzs, 2012). Murphy and Trefftzs (2012) stated that by the 1950s, stock options had become a serious issue because of the highest marginal tax rate on ordinary

and corporate incomes had swelled to 91% and 41%, respectively, while capital gains had remained at 25%. The most important advantage of the Revenue Act of 1950 was that it recommended that stock options should be taxed as capital gains at no more than 25% (Schneider, 1951). With a flat and favorable 25% tax rate, use of stock options by U.S. corporations listed on NYSE increased from 4% in 1950 to 12% by June 1951 (Murphy & Trefftzs, 2012). Frydman and Saks (2010) studied the 50 largest firms between 1940 and 1960 and estimated that the fraction of executive stock options increased from less than 10% of total compensation in the 1950s to over 20% in the 1960s. Therefore, according to Frydman and Saks, executive compensation changed considerably in the 1970s, as both stock options and other forms of incentive pay became larger components of total CEOs' compensation.

Legal and regulatory framework. Stock options are subject to tax, securities laws, and accounting standards. Securities laws that affect stock options are the Securities Act of 1933 and the Securities Exchange Act of 1934, which Congress passed in the hope of restoring investors' confidence after the stock market crash of 1929 (Baker et al., 2013). The Securities Act of 1934 gives the SEC the authority to set accounting standards, but the SEC has delegated this authority to the Financial Accounting and Standards Board (FASB). The most notable standard on stock options created by the FASB is FAS 123(R), revised in 2004 (Financial Accounting Standards Board [FASB], 2014). The aim of FAS 123(R) is to help users of financial statements understand the effect that equity compensations have on the financial condition of entities (FASB, 2014). FAS 123(R) requires that all entities recognize an expense for share-based systems using

a fair value method on the grant date and the cost recognized over the vesting period (FASB, 2014).

Adoption of stock options. Agency theorists recognize that there is a divergence of interest between the shareholders and managers. According to Jensen and Meckling (1976), if both the principal and agent are utility maximizers, there is a good reason to believe that the agent will not always act in the best interest of the principal. Jensen and Meckling recommended establishing appropriate incentives for the agent to reduce divergence of interests. One of the greatest challenges in organizations is that principals are often not privy to what agents are doing (Martin, Gomez-Mejia, & Wiseman, 2012). To reduce this agency conflict between shareholders and the CEOs', Jensen and Meckling (1976) recommended either monitoring or incentive alignment. However, monitoring CEO's behavior is challenging and instead of encouraging risk aversion, aligning the risk preferences by awarding equity-based incentives will discourage CEO's risk aversion (Gerard, 2014).

Monitoring is effective in block ownership, where stock ownership is concentrated among a few shareholders. Several studies have shown that when equity ownership of a firm is concentrated in institutional ownership, there is effective governance; the role to monitor and influence positive decisions of the firm is made by the leader/owners and there is no obvious need for executive incentive plans (Essid, 2012; Mitra, Hossain, & Marks, 2012; Murphy & Trefftzs, 2012). However, when a firm has many shareholders, equity ownership is widely dispersed among many shareholders, and alignment of agent and principal interests using incentives is necessary (Essid, 2012).

In widely dispersed companies where managers have a substantial level of discretion, there is a need for monitoring and the board of directors is the internal control mechanism that protects the interests of shareholders (Álvarez-Pérez & Neira-Fontela, 2013). One way in which boards of directors address the agency problem is to link executive pay to the wealth of the firm by offering equity ownership to managers (Sigler, 2003). Therefore, firms award stock options to attract, retain, and motivate executives by tying personal fortunes of senior executives to measures of performance of the firm (Wu, Liao, & Huang, 2013).

Some researchers have questioned the efficacy of CEOs' stock options as compensation in reducing agency costs (Akinloye & Hussein, 2012; Murphy & Trefftzs, 2012) and other researchers have questioned the effectiveness of board of directors in monitoring CEOs' to reduce agency costs (Lin & Lin, 2014). Murphy and Trefftzs analyzed data on CEOs' from 14 countries and found that U.S. CEOs' earned substantially more than foreign CEOs' and a significant portion of US CEOs' compensation was stock options. According to Murphy and Trefftzs (2012), the increased reliance on options helped fuel the accounting and backdating scandals in the early 2000s. Sheikh (2012) argued that stock options reduce agency problems because the managers' wealth is linked to performance of the firm. In addition, Sheikh stated that use of stock options influenced agents' risk preference, but current options awards were effective in encouraging innovation than incentives from previous awards. It is therefore possible that executives are motivated to innovate hoping to increase current options awards value.

Dicks (2012) stated that reducing agency theory using incentives is not enough because CEOs' behavior could be influenced by other factors such as firm risk. Deviation of managers' behavior from the traditional paradigm of rational agents shows that incentives are not enough to align managers' behavior with shareholders (Gerard, 2014). Paz and Griffin (2014) noted that use of stock options eliminated the ex-post settling problem. The ex-post problem arises when managers are paid in cash for expected future cash flows that do not materialize (Tangjitprom, 2013). Tangjitprom (2013) concluded that by not rewarding CEOs' with cash but with using stock options, shareholders would not lose value if unrealized gains did not happen. Therefore, according to Tangjitprom, unlike cash that is immediate compensation, stock options are preferred because the CEOs' only benefits when the stock price increases above the strike price.

Khalid and Rehman (2014) found a positive relationship between executive incentives and shareholders' wealth. However, although use of stock options has been subject to extensive prior research in highlighting its incentive role, it was only after the corporate scandals in the 2000s that interest in the inefficiency of this type of compensation started appearing. The corporate scandals of Enron, WorldCom, and other companies demonstrated the inability of stock option incentives (Bozec & Dia, 2015; Hall & Kelvin, 2003). Hall and Kelvin (2003) noted that during the 1990s, the average pay for CEOs' of S&P 500 grew from $3.5 million in 1992 to $14.7 million in 2000, and most of this salary increase was because of a fixation on stock options grants, which grew nine-fold, averaging at approximately $800,000 in 1992 to $7.2 million in 2000.

However, it is not clear whether the increased use of stock options as part of CEOs' compensation correlates with increased shareholders value.

Jouber and Fakhfakh (2012) argued CEOs' salary as positively related to outside contingencies as well as shareholders' interests and noted that management takes advantage of external events, misleading investors of their skills and efforts. Jouber and Fakhfakh recommended that shareholders should be aware of the effects that macroeconomic factors could have on promoting CEOs' ability and include this caveat when designing CEOs' pay contracts. Benke (2014) noted that since the early 2000s, stock options had been a cause of unethical behavior as CEOs' engaged in earnings management. Benke stated that many executives participate in earnings management, hoping to beat analysts' forecasts and boost their stock options prices. Therefore, although stock awards mitigate agency problems between shareholders and self-interested managers, external factors beyond managers' control might affect this objective.

Firm Performance

With the separation of ownership from management, the discovery of an appropriate criterion has become increasingly important for evaluating the performance of managers and companies. Various independent variables have merits in measuring firm performance as it relates to CEO's compensation. Sigler (2003) stated CEOs' pay as related to three independent variables: CEO's tenure, ROE, and revenues, while Alrafadi and Md-Yusuf (2014) stated that ROI is a financial ratio commonly used to evaluate the overall performance of a company. Nakhaei (2012) stated firm performance as into two

categories: accounting measures and economic performance models. In the accounting performance evaluation model, the value of a business functions as parameters such as ROE, ROI, annual revenues, net profit, earnings per share, free cash flow, and dividends (Stewart, 1991). In the economic measure, firm value is a function power of potential investors, and the difference between rate of return and weighted average cost of capital-WACC. According to Nakhaeu, examining performance measures is important to help shareholders and managers in decision-making and understanding managers' performance.

Return on equity (ROE). Among all traditional measures, ROE is a common and relatively good performance measure and perhaps the most widely used overall measure of corporate financial performance (Nandi, 2012). ROE is an accounting-based measurement of the income of a firm divided by the total company equity. Using ROE as a measure of accounting performance for a given company is appropriate because it is the same information that shareholders receive from the firm (Banker, Darrough, Huang, & Plehn, 2013; Sigler, 2011). ROE represents the result of a structured financial ratio analysis called Du Pont and contributes to its popularity among analysts, financial managers, and shareholders (Nakhaei, 2012). In addition, ROE has a significant relationship to stock return and firm performance (Nakhaei, 2012).

To understand the relationship between CEOs' compensation and ROE, Sigler (2011) examined the performance of 280 firms listed on the NYSE for the period of 2006 to 2009. The period of 2006 to 2009 was significant because it was after the adoption of the Sarbanes-Oxley Act; an Act necessitated by corporate failures. To test the

relationship between CEO's pay and company performance, Sigler used a model that included company Beta, CEO's tenure, and ROE as the independent variable and CEO's pay as the dependent variable. Sigler's regression results revealed that ROE had a positive and significant coefficient with CEO's pay. Results also showed that size of the firm and tenure of the CEO had the most impact on the CEO's compensation. Sigler concluded that size of the firm affected pay because a larger company required special skills not available to many managers while tenure implied that the CEO has acquired more knowledge and expertise over time in the CEO's position.

Nakhaei (2012) examined which firm performance measurements were better in predicting business returns. In the study, Nakhaei reviewed the capabilities of economic measures such as value-added metrics to accounting measures of ROE and return on assets (ROA). In the study, stock performance was the dependent variable while accounting and economic measures were the independent variables. Nakhaei examined listed Malaysia firms over the period 2001 – 2010 and concluded that ROE was superior because it could be broken into three separate ratios of (a) profitability, (b) asset turnover, and (c) increased financial leverage, all which affected shareholders value. Nakhaei posited that although an increase in financial leverage could improve ROE, this could not be beneficial to shareholders as the firm incurred more debt.

Specifically, the past ROE and RET are both positively and significantly associated CEOs' compensation (Banker et al., 2013). Banker et al. (2013) examined the relationship between current compensation and past performance as a measure of CEOs' ability and sampled 2,498 firms between 1993 and 2006. ROE was the primary

performance measure, and stock returns (RET) were a forward measure. Banker et al. posited that past performance was relevant in CEOs' pay because it reflected ability. The model examined whether past business performance influenced salary, cash, bonus, or equity paid to the CEO of the firm.

Banker et al. (2013) found that CEOs' compensation was 70% more sensitive to past ROE or RET than to contemporaneous ROE or RET. When past performance was high, the principal could provide a continuing agent with a higher salary (Banker et al., 2013). Banker et al. also recommended that focusing on total CEOs' compensation instead of analyzing compensation components individually did not reveal any significant relationship with the past performance of a firm. In addition, Banker et al. noted that there was a positive association between CEOs' pay and past performance. Banker et al. concluded that association between compensation components, current and past performance is partly attributable to the CEOs' ability. Therefore, when analyzing CEOs' compensation, analyzing past CEO's ability might offer more oversight into the CEOs' compensation structure.

Return on investment (ROI). According to Alrafadi and Md-Yusuf (2014) to determine firm performance, ROI is commonly used. Alrafadi and Md-Yusuf stated that there are three dominant reasons for using ROI: First people easily understand ROI easily. Second, it combines three critical performance measures variables; scale, earnings, and investments. Third, it is popular with financial analysis, investors, creditors, and other external information users.

Scholars have measured ROI differently depending on whether it was a forward looking or back looking measure of performance. Eklund and Palmberg (2013) measured ROI as marginal return on investment over the firms cost of capital. Eklund and Palmberg used the net present value (NPV) rule for investments. The NPV rule for investments' holds that managers should invest until NPV of additional investments' is zero. NPV rule shows whether the firm is over or under-invested relative to its cost of capital (Alrafadi & Md-Yusuf, 2014). Sanz and Nicol (2014) measured ROI as the average return on invested capital over a performance measure period. Sanz and Nicol measured ROI using pre-tax income divided by invested capital (total debt and total equity). Paz (2012) stated that the difference between these two measures is that NPV is forward looking while average return on invested capital is backward looking. NPV is used to decide between projects to further evaluate future earnings (Paz, 2012). Tang (2013) stated that return on invested capital is a backward looking measure indicator that measures efficiency of company capital inputs. However, in this study, based on time constraints and the complexity of using NPV method, I used return on invested capital method.

Revenue. Revenue is one of the most important measures used by investors in assessing the performance and prospects of a company (FASB, 2014). To understand the importance of revenue to firms, on May 28, 2014, the FASB, and international accounting standards boards has jointly issued new requirements for revenue recognition by firms. FASB stated that the new standards would be significant achievements in improving financial reporting (FASB, 2014). Revenues apply to all firms, and revenue

recognition is a common type of restatement (Peterson, 2011). It is therefore not surprising that various studies have looked at how revenues affected CEOs' pay (Arbogast & Mirabella, 2014; Pandher & Currie, 2013).

Arbogast and Mirabella (2014) analyzed the relationship between CEO's age, education, and tenure to the performance of the company in relation to its percentage change in revenues per year by sampling 2011 *Fortune* 500 firms from 1995 to 2010. The dependent variables were percent change in revenues and the independent variables were CEO's education, tenure, age, and percent change of S&P. Tracking the CEO's performance against the S&P mitigated for market fluctuations. Arbogast and Mirabella noted that age had a negative impact on the change in revenues of firms. In addition, Arbogast and Mirabella noted that older CEOs' had lower returns than younger CEOs', at a projection of 1% less revenue for every one year that they aged. Education of CEOs' had no significant relationship to change of revenues. However, a change in S&P corresponded with an increase in revenues, indicating that other factors affected firm performance based on revenues, and shareholders should consider external factors that might affect revenues (Arbogast & Mirabella, 2014).

Pandher and Currie (2013) investigated how strategic factors related to firm capacity related to the CEOs' compensation and firm revenues. According to Pandher and Currie, evaluating revenue and the firm value was important to understand CEOs' compensation. Revenue is important because net income represents the resource advantages of the firm. Moreover, income is the difference between net revenues and expenses. Pandher and Currie's study results indicated that powerful CEOs' could not

receive high pay if the resource advantages (revenues, market value) of the firm were low while CEOs' with low power could receive high pay in firms with high resource advantages. In addition, Pandher and Currie also noted that corporate strategies that increased firm resource advantages increased CEOs' bargaining power relative to other stakeholders, leading to increased CEOs' cash, equity, and total compensation. Strategic actions taken by the firms reported as adding firm value included offshoring production to increase revenues and reduce costs.

Other researchers studied the relationship between using stock options to remunerate top corporate executives and improved firm performance (Akinloye, 2012; Sigler, 2011). Akinloye's (2012) study results indicated that contributions of executive stock options to firm performance became progressively smaller as time advanced. One of the performance metrics used by Akinloye was operating revenues of the firm, which revealed that sampled firms that were profitable used executive stock options extensively to remunerate executives. However, Sigler (2011) posited that some CEOs' compensation payments such as bonuses tied to current accounting numbers could make managers manipulate the timing of revenues and expenses to maximize their payouts, and using equity incentives helped because of the lengthy time horizon of this payment approach. Therefore, the vesting nature of stock options, which limits immediate payouts to CEO, might be more appropriate as the CEO's remuneration is when the stock price increases.

Performance in Pharmaceutical Industry

Prescription drug spending in the United States reached $307 billion in 2010, an increase of $135 billion since 2001, and comprised approximately 12% of all healthcare spending in the country (U.S. Government Accountability Office [GAO], 2012). The pharmaceutical industry has performance challenges not found in other sectors and a measure of performance is the drug development process (Brown, 2013). Brown (2013) noted that in the pharmaceutical industry, it could take years before realizing the full risks or benefits. Pharmaceutical products are subject to more volumes of data, regulatory oversight, and competition from manufacturers of generic products (Koku, 2011). Koku (2011) stated that because the industry has an impact on the health of consumers, the industry is regulated than other industries, making the approval process expensive and time-consuming.

Koku (2011) reviewed data from 550 pharmaceutical companies from 1980 to 2000 and analyzed the relationship between ROE, R&D expenditure, selling and marketing, and media coverage, with ROE as the dependent variable. Koku's results revealed that the market did not react to media announcements by managers, but there was a significant relationship between decisions made by the Food and Drug Administration (FDA) on ROE. Koku attributed this positive relationship between the ROE and FDA to the uncertain nature of the pharmaceutical industry and the FDA approval process. In general, FDA approval takes an average of 10 to 15 years of R&D (Prajapati & Dureja, 2012), making drug development process to be time consuming, uncertain, and expensive.

Study results have revealed that performance in the pharmaceutical industry depends on product lifecycles (Prajapati & Dureja, 2012). Prajapati and Dureja (2012) stated that product lifecycle management (PLM) allows a company to manage the way in which a product is sourced, manufactured, and sold actively. However, according to Prajapati and Dureja, there is a need to review pharmaceutical PLM to improve pharmaceutical industry competitiveness. Prajapati and Dureja highlighted some of the challenges faced by pharmaceutical companies as the escalation of development cost, the decline in R&D productivity, and the narrowing return on investments. The average development costs of a drug vary from $500 million to $2 billion and the number of new drugs approved by the FDA in 2010 was half the number approved in 1996 because of the stringent regulatory environment (Prajapati & Dureja, 2012). In addition, Prajapati and Dureja noted that the modern patent protection period, designed to allow companies to recoup costs incurred during R&D, had narrowed to an average of 5 to 8 years for most drugs. Narrowing patent protection period leaves pharmaceutical companies with shorter durations to recoup investments in the development of these drugs (Prajapati & Dureja, 2012).

Other studies have focused on how performance in the pharmaceutical industry is affected by changes in demographics. Walter (2012) and Burrill (2014) examined pricing pressures from regulatory bodies, necessitating leaders of pharmaceutical companies to look beyond their products for new revenue opportunities. Walter analyzed how demographic patterns affect demand for pharmaceutical products, affecting ROE. According to Walter, the timing of stock market reactions to demographic changes is

crucial for pharmaceutical industry ROE. To understand the relationship between ROE in the pharmaceutical industry and demographic changes, Walter (2012) analyzed 60 companies for the period of 1986 to 2008. Using a time series model, Walter reviewed changes in demographic data from the U.S. Census Bureau, drug age patterns, sales, and ROE. Walter reviewed only data from sales of the top 20 drugs of each company on an annual basis from 1986 to 2008. Walter found that because of demographic patterns, long-term investors (horizon of 6–12 years) realized a positive ROE (yearly returns of 3–5%), whereas for short-term investors (less than five years) realized a negative ROE. In addition, because of heavy investment in R&D by pharmaceutical companies, calculations of metrics such as ROA are complicated, because the financials usually represent billions of dollars in intangible assets (Walter, 2012).

Investors are interested in whether intangible assets and expenditures truly create shareholder value (Heiens, McGrath, & Leach, 2008). Mergers have primarily driven growth in intangible assets when the cost of the acquired company exceeds the net assets acquired, creating goodwill, and from spending in R&D and advertising (Heiens et al., 2008). Heiens et al. (2008) examined how intangible assets affect shareholders' value by reviewing data from 200 actively traded pharmaceutical firms for the period of 2000 to 2005. The researchers utilized holding period returns (HPR), an investment strategy associated with buy and hold strategy over a given time period. To compute daily return for each firm, Heiens et al. considered the excess return of the stock price of each firm over the market return to calculate abnormal returns of the selected companies. Abnormal returns revealed what an investor would obtain above the market return.

Heiens et al.'s study results indicated that most pharmaceutical companies that invested heavily on R&D and advertisement had higher HPR, but this heightened HPR was only in the long term, rather than in the short term, and was probably the result of investments in R&D taking more time to yields benefits for ROE.

Therefore, in the pharmaceutical industries, exploiting proprietary technologies such as technological licensing could increase firm value and shareholders wealth (Walter, 2012). According to Walter (2012), large pharmaceutical firms have advantages in manufacturing and distribution that small firms often lack. Small companies on the other hand have demonstrated advantages in generating a wide range of novel discoveries that large pharmaceuticals covert to fill their development pipelines (Walter, 2012). According to Walter, technology-licensing agreements between pharmaceutical firms could enable each group to leverage their distinctive competences while accessing those of the other.

Transition and Summary

In Section 1 of this study, I identified the current and historical issues relating to the adoption of CEOs' stock options and firm performance in the pharmaceutical industry. Section 1 began with a discussion of the specific and general problem statements, which were the focus of this study. After reviewing and analyzing previous research, the lack of available information for the pharmaceutical industry provided an opportunity for studying the relationship between CEOs' stock options compensation and pharmaceutical industry performance in the United States.

In Section 2, I have identified and discussed the methodologies and strategies for this research. I discussed my role as a researcher, the research method and design, the population and sampling methods, the participants in the study, data collection, analysis techniques, and validity of the study. In Section 3, I provided the results of the data analysis, recommendations, and conclusions.

Section 2: The Project

Over time, there has been an increase in stock-based and option-based executive compensation. Leaders of firms responsible for this change often describe the increase in CEOs' exposure to stock prices as a way to align upper management incentives with the interests of the shareholders (Banker et al., 2013). However, this strategy may have yielded mixed results. In particular, large stock option packages increase the incentives for managers to manipulate earnings (Arbogast & Mirabella, 2014).

Optimal CEOs' compensation strategies are dependent upon compensation committees developing appropriate strategies for compensation (Sun & Cahan, 2012). CEOs' pay component may entice some executives to engage in activities that produce problems for the firm (Sigler, 2011). According to Sigler (2011), executives could be tempted to manipulate accounting numbers when about to exercise their options, hoping to give an appearance of superior firm performance. This section of the study includes a restatement of the purpose statement, role of the researcher, participants, research method, research design, population and sampling, instrumentation, data analysis, and study validity.

Purpose Statement

The purpose of this quantitative, correlational study was to examine the relationship between ROE, ROI, annual revenues, and CEOs' stock options awarded, while controlling for firm size, age of the CEO, and the CEO's tenure. The independent variables were the ROE, ROI, and total annual revenues. The dependent variable was the value of CEO's stock options granted. Controlling variables were firm size, age of the

CEO, and the CEO's tenure. The targeted population comprised publicly traded pharmaceutical companies located within the United States. The implications for positive social change include the potential to address societal concerns on increasing concentration of wealth to very high-earning salaried workers, in particular, CEOs', and thereby improving economic and social distribution in the society (Bakija & Heim, 2012). The results of this study may also help improve the culture of transparency, dialogue, fairness, and trust in the work place (Moore, 2014).

Role of the Researcher

My role as a researcher was restricted to retrieving and analyzing pharmaceutical industry financial data as reported to SEC. I collected and analyzed data using correlational analyzes to make inferences about a larger population. I summarized and reported the findings and made recommendations for future research. Additional roles included selecting a sample for the study, rechecking recorded values, and organizing data in Excel spreadsheets.

It is imperative for the researcher to recognize the ethical issues of a study while planning and conducting the study, exploring the evidence, and using the information gained from research (Kar, 2011). This research topic was of particular interest to me as a financial analyst in the pharmaceutical industry managing stock options plans. However, I did not include my employer in the study sample. I used secondary data for this research. Publicly owned U.S companies, the target population of this study, had filed financial statements with SEC. Hence, informed consent was not necessary (Moore, 2014).

Collected data was stored on an encrypted, password-protected computer and only available to me. I will destroy all data 5 years after the completion of this study. Most researchers locate existing data and synthesize them to form a conclusion (Exner, 2014). I cannot control the reporting to SEC of financial reports and proxy statements. Firms dropped from databases from poor performance or privately acquired could present survivorship bias by overstating or understating performance (Linnainmaa, 2013). While the data was archival and assumed reliable, it is paramount that my analysis and interpretation be unbiased, accurate, and reported in an ethical manner.

Participants

In ensuring participants met pharmaceutical companies eligibility, the participants list was verified against SIC code 2834, pharmaceutical and medicine manufacturing (U.S Census Bureau, 2012). In addition, the participants in this quantitative correlational study were public listed pharmaceutical companies; hence, strategies for establishing a working relationship with participants were not necessary (Coffie, 2013). Public listed companies in U.S are required to file publicly their financial statements with the SEC (Moore, 2014).

I chose a specific industry, pharmaceutical industry, to determine the relationship between CEO's stock options and firm performance. According to Offstein and Gnyawali (2005), aggregating industries into a single omnibus sample makes it difficult to detect compensation effects that are likely to be industry-specific. Sigler (2011) stated that the mixing of the different components into a complex compensation package for executives allows the shortcomings of one component to be offset by the strengths of

another. In addition, although CEOs' compensation consists of many components, I investigated only stock options awarded to CEOs' as compensation. I selected data on CEOs' stock options from form DEF 14A filed with the SEC (SEC, 2014).

Some researchers have also argued that industries that invest heavily in R&D are likely to award their executives with stock options to encourage innovation (Koku, 2011; Sheikh, 2012). By investing in R&D, many pharmaceutical companies hope to discover new products or improve existing products; when successful, these products could improve the financial position of the firm (Koku, 2011). Sheikh (2012) analyzed 14,758 firm-years between 1992 to 2004 and found a positive association between increases in CEO's stock option awards to increases in both innovative inputs (R&D expenditures) and output (patents and citations). Pharmaceutical companies faced with regulatory challenges need to innovate new products to ensure that they use their earnings and capital appropriately.

Research Method

In this study, I adopted a quantitative correlational approach to collect and analyze data. Researchers engaged in quantitative research employ large and random samples, reduce complex phenomena to a few variables, test hypotheses, and thus deduce inferences (Bergman, 2011). The research method entailed a review of pharmaceutical companies financial statements filed with SEC (SEC, 2014). The objective of the this research was to determine whether and to what extent a relationship existed between firm performance, measured by ROE, ROI, and annual revenues to stock options awarded to CEOs' in pharmaceutical companies. In developing the research design for this study, I

reviewed Ayiro's (2012) work on educational research methods and statistics, including theoretical fit (reliability and validity), describing data, and testing hypotheses.

The pros and cons of research methods should be argued in relation to their specific context, including research question posed and resources available for research (Allwood, 2011). Academicians can choose among three methods when conducting research: (a) quantitative, (b) qualitative, or (c) mixed methods (Frels & Onwuegbuzie, 2013). Based upon the purpose of this study to examine the relationship between firm performance and CEO's stock options, I selected a quantitative research method (Allwood, 2011). A quantitative study involves researchers asking precoded questions with numeric value response options to examine the relationship between variables (Curtis & Drennan, 2013). Teo (2013) asserted that quantitative approaches best addresses problems in situations in which researchers want to understand which variables or factors influence outcomes.

Other research methods were available to conduct this study. I did not select either a qualitative or a mixed method for a number of reasons. A qualitative method was not appropriate choice for this study because qualitative study's inductive nature precludes defining variables and hypotheses before conducting the research (Ogussakin, 2015). Qualitative researchers explores questions such as *what*, *why*, *how*, rather than *how many* or *how much*; focusing on meaning rather than measuring (Cooper & Schindler, 2013). According to Cooper and Schindler (2013), understanding why individuals and groups think and behave as they do lies at the heart of qualitative

research. Findings in qualitative analysis are context-specific, unlike in quantitative analysis, where findings could be generalizable to a large population (Moore, 2014).

A mixed method was not appropriate for this study. Mixed method would involve collecting both quantitative and qualitative data for the study (Frels & Onwuegbuzie, 2013). However, for this study, there was no coherent method for combining qualitative results with quantitative data to achieve the study goals. The choice of a research method could influence greatly the data collections and analysis of the research study (Converse, 2012). The application of triangulation in research yields to complementary of the mixed methods as researchers use quantitative techniques to further develop findings derived from qualitative techniques and vice versa (Copper, 2012). Constraints such as time and resources could render using a mixed method approach impractical (Ridder, 2012). In addition, studies on the relationship between CEO's stock options and firm performance tend to favor the use of quantitative approach; remaining consistent would allow building upon the work of previous scholars (Essaid, 2013; Moore, 2014), allowing easy comparison of information.

A quantitative approach was more appropriate than the qualitative approach to determine the associations among ROI, ROE, annual revenues, and CEO's stock options compensation. I sought to infer the relationship between CEO's stock options and firm performance within the pharmaceutical industry, while controlling for firm size, age of the CEO, and the CEO's tenure. Big data are not only about the data, but also about analyzing those data and the resulting theoretical and empirical understanding of how

individuals, groups, and societies think and behave. Therefore, the quantitative research method was the most appropriate method for use in this study.

Research Design

Quantitative techniques are appropriate for identifying the relationship between variables (Joanne, 2012). I considered three quantitative research designs, including (a) experimental, (b) quasi-experimental, and (c) correlational design. The experimental design involves the random assignment of variables to test the effectiveness of interventions between two groups (Joanne, 2012). For the purpose of this study, no test of interventions between groups was necessary. Quasi-experimental is designed to investigate the effect of one variable on other variables but lacks the element of random assignment of variables (Aussems, Boomsma, & Snijders, 2009). In this study, no manipulation of variables to measure its effect on other variables was required. Therefore, the appropriate study design was hierarchal and nonexperimental (Martinez, 2014).

I used hierarchical regression analysis to examine the relationship between independent variables (ROE, ROI, and annual revenue) and the dependent variable (CEO's stock options) while moderating for firm size, the age of the CEO, and the CEO's tenure. Hierarchical regression was a conservative method of testing the hypothesis; entering control variables into the regression model before the variables of theoretical interest are analyzed (McClelland et al., 2012). Signs of the regression coefficients are used to indicate the relationship between variables and may range from -1 (a perfect negative relationship) to 0 (no relationship) to a +1 (a perfect positive relationship).

I adapted my study from previous research on health care industry by Sigler (2003). Sigler tested the relationship between cash compensation of healthcare CEOs' and organization financial performance. This study included an analysis of the relationship between stock options awarded to CEOs' in pharmaceutical companies and organizational financial performance. Stock options constituted only a trivial percentage of CEOs' pay in the 1970s but grew to a dominant form of pay by the late 1990s (Murphy & Trefftzs, 2012).

While firm performance is measured by many variables (e.g., return on assets, assets ratio, equity ratio, net profit margin), for the purpose of this study, I used ROE, ROI, and annual revenues. Fathi et al. (2012) stated that ROE measures the impact of management on shareholders' wealth, and Bihari (2014) stated that ROE is a key indicator of stock price. Pandher and Currie (2013) found a positive relationship between firm revenues and firm performance. Pandher and Currie stated that CEOs' use resource-based advantage (the difference between revenues and expenses) to bargain for higher compensation.

Sigler (2003) asserted that there is a positive and significant link between annual revenues and CEOs' compensation. Moderated variables for this study were the size of the firm, CEO's tenure, and CEO's age. Ozkan (2011) found CEO's tenure and age of CEO might be related to the entrenchment of the CEO, leading to compensation not tied to the performance of the firm. Lin and Lin (2014) found a significant positive relationship between CEO's compensation and firm size. Larger firms are typically more complex, and CEOs' are therefore highly compensated (Lin & Lin, 2014). I selected

ROE because this measure reflects how well a firm performs from the shareholders' point of view (Lin & Lin, 2014) and annual revenues, which is an indicator of core earnings of the firm (Ettredge, Schliz, Smith, & Sun, 2010).

Population and Sampling

Researchers should identify an optimal design that supports the research problem and guide in the selection of the sample (Xu & Yuen, 2014). In this study, publicly traded pharmaceutical companies in the U.S. were the population sample. Available data were publicly disclosed data from financial information and proxy statements. This sample contained data available within the pharmaceutical industry and was a simple random sampling, with every element of the sample having an equal likelihood of selection (Murray, Rugeley, Mitchell, & Mondok, 2013). However, I exempted companies with either annual revenues of less than $40 million or market capitalization of less than $75 million from the study. According to the SEC (2014), companies with less than $75 million in market capitalization or less than $40 million in revenues qualify as a smaller reporting company and are exempted from filing proxy statements to the SEC.

For probability sampling, randomization, rather than assumptions about the structure of the population, is the characteristic feature of the selection process (Verma, 2014). The LexisNexis Academic database included data on 115 public pharmaceutical companies for years 2007 to 2015. I conducted a power analysis, using G*Power Version 3.1.9.2 software, to determine the appropriate sample size for the study. G*Power is a statistical package used to conduct a priori sample size analysis (Faul,

Erdfelder, Bunchner, & Lang, 2009). An a priori power analysis, assuming a medium effect size (f = .15), a = .05, indicated that a minimum sample of 77 companies would be required to achieve a power of .80 (See Appendix C). Increasing the sample size to 99 increased the power to .90 (See Appendix D). Therefore, my sample of 115 companies was appropriate for the study (Clay, 2014).

For this study, I utilized a random sampling technique to select listed public pharmaceutical companies included in the LexisNexis Academic database using SIC code 2834, pharmaceutical and medicine manufacturing (U.S. Census Bureau, 2012). Studies in accounting, finance, business, and economics frequently employ SIC codes to identify industries for research (Kile & Phillips, 2009). I selected performance data of the selected pharmaceutical companies (ROE, annual revenues, and company assets) from Standard and Poor's Capital IQ (2014). The Standard & Poor's database provides executives and directors compensation analysis for U.S. companies listed among the S&P 1500 (Nancy & Fall, 2012).

I selected data on CEO's stock options from proxy statement Form DEF 14A filed with the SEC (SEC, 2014). The goal of the study was to examine the relationship between CEO's stock options compensation and accounting measures of firm performance (ROI, ROE and annual revenues) in the pharmaceutical industry while moderating for firm size, age of CEO, and CEO's tenure. Sigler (2003) examined the relationship between CEO's cash compensation and the performance of the healthcare companies by studying 23 healthcare organizations over the period from 1992 to 1999.

Ethical Research

Ethical guidelines are critical in research studies (Clay, 2015). All Walden University doctoral students are responsible for ensuring that they submit their proposal for institutional review board (IRB) for review by the faculty, and an IRB approval number assigned. This study satisfied Walden University ethical standards and assigned approval number 05-15-16-0400586. For this study, IRB approval was important before participants' recruitment or data collection efforts begin. IRBs are locally administered groups whose members undertake a review of research protocols involving humans to ensure the protocols adhere to federal regulations, adequately protect human participants' rights and welfare, and are ethically sound (Wao et al., 2014). Researchers are required to demonstrate the ethical acceptability of their projects to the IRB at the institution under whose auspices the research is conducted (Thomson, 2013).

This study involved analyzing publicly available data that public companies in the United States must file with the SEC (2014). As such, no ethical procedures or concerns were associated with the data, other than the general ethical directives of analyzing data honestly and disseminating results. As with any research, when using secondary data, the researcher should confirm that the original study had ethical approval (Curtis & Drennan, 2013). Since I used archival data and no human participants, there was no need for documentation on informed consent or confidentiality (Moore, 2014). I collected publicly available data on companies from Walden University websites, Standard & Poor's, and LexisNexis Academic databases. I assigned a numerical value for each company to keep the samples anonymous. In addition, all data collected for this research

study will be stored on an encrypted, password-protected computer and be available to me only. I will destroy collected data five years after the completion of this study.

Data Collection Instruments

Questionnaires or instruments are tools used to collect information relevant to the questions or aims and objectives of a study (Curtis & Drennan, 2013). For this study, I used secondary data; hence, data collection instruments such as surveys and questionnaires were not required. A review of the literature on the relationship between firm performance and CEOs' compensation revealed no use of surveys or questionnaires instruments (Moore, 2014; Sigler, 2003). Measurements used when measuring firm performance include financial indicators such as ROE, ROI, free cash flow, revenues, etc. (Pham, 2015). However, although no surveys and questionnaires instruments are used, maintaining study reliability and validity is important (Hagan, 2014). Below are the details of the variables used in this study

Table 2

Variables used in the Study

Dependent	Independent
CEO's Stock Option	Return on Equity
	Return on Investment
	Annual Revenues

Table 3

Data Type of Dependent Variables

Dependent	Scale
CEO's Stock Option	Expressed as thousands of dollars

Table 4

Data Type of Independent Variables

Independent	Scale
Return on Equity	Expressed as a ratio
Return on Investment	Expressed as a ratio
Annual Revenues	Expressed as thousands of dollars

I obtained study data from SEC EDGAR filings (EDGAR Online, 2014), LexisNexis Academic (2015), and Standard & Poor's Capital IQ (2014) (See Appendix E). All public companies in the United States are required by law to file financial measurements, industry data, and company information with the SEC (SEC, 2014). SEC data are reliable because registered companies must disclose important financial information, and an external auditor must audit this information. According to SEC requirements, an independent auditor must examine the financial statements that management of a company has prepared and issue an opinion. Auditor's opinion indicates the auditor's endorsement of the accuracy and adequacy of firm's financial position (SEC, 2014).

The LexisNexis Academic database contained data on industry based on SIC codes (LexisNexis Academic, 2015). However, the LexisNexis Academic (2015) database contained only current-year financial performance, necessitating use of the Standard & Poor's Capital IQ. Standard & Poor's Capital IQ contained (a) company profile, (b) industry data, and (c) six years of company financial performance (S&P Capital IQ, 2015). When conducting financial studies, researchers use databases such as Standard & Poor's Capital IQ and LexisNexis Academic for companies' data.

There was a possibility of survivorship bias in data collected. Survivorship occurs when the database does not include non-surviving firms (Bali et al., 2011). Exclusion of these companies could lead to skewed results and conclusions. In identifying possible survivorship bias, I compared data from SEC and Standard & Poor's Capital IQ (2014).

For this research, I used three databases: (a) LexisNexis Academic, (b) Standard & Poor's Capital IQ (2014), and (c) SEC filings. LexisNexis Academic database contained data on publicly listed companies. Form DEF-14A filed with the SEC contained information on CEO's compensation, age, and tenure while the Standard & Poor's Capital IQ database contained information on company performance (return on equity, return on equity, and annual revenues) for the previous six years. NexisLexis Academic aggregates financial reports in a database for each corporate filing and was accessible via the Walden University Library.

The independent variables for this study were ROE, ROI, and annual revenue. ROE is the measure of return on equity for pharmaceutical companies, measured as net

income divided by total equity to shareholders. ROE is used to measure stockholders' wealth due to the role of business profit on stockholders' profit (Fathi et al., 2012). ROI is a performance measure used to evaluate the efficiency of investments (Moore, 2014). Revenues were annual sales reported by the firm in the 10K report. The dependent variable was stock options granted to the CEO's, as reported on Form DEF-14A filed with the SEC. Managers' stock options are incentives given managers to align managers' interests with those of the shareholders by linking managers' wealth to the firm value (Armstrong & Vashishtha, 2012). The controlled variables were firm size, age of the CEO's, and the CEO's tenure. Firm size was the total assets reported by the firm, as found in the 10K report. CEO's age was the numerical age of the CEO, as reported on Form DEF-14A. CEO's tenure was the number of years that the CEO has held that position in the firm.

Data Collection Technique

I used archival data for this study. I collected secondary data from the SEC EDGAR database (EDGAR Online, 2014), Standard and Poor's Capital IQ (2014), and LexisNexis Academic (2015). I obtained the list of all pharmaceutical companies from LexisNexis Academic using SIC code 2834. Offstein and Gnyawali (2005) investigated CEO's compensation in the pharmaceutical industry and used SIC 2834 to select the study sample. Using SIC code 2834, I downloaded a list of publicly traded pharmaceutical companies based in the U.S.

The primary advantages of using secondary data were that the data had already been collected, and there were potential time and resource savings (Kiecolt & Nathan,

2015). Hyunju (2013) stated that using secondary data could aid a researcher interested in reviewing many years of data. The advent of computer technology means that researchers have the capacity to manipulate large data collections and to use complex methods of analysis (Fienberg, Martin, & Straf, 1985). However, using secondary data has several limitations. The primary limitation of secondary data is the use of data not originally collected for the purpose of the study. This was a potential problem because secondary data only approximate the kind of data intended for testing the study hypothesis (Pham, 2015). Gaillet (2015) noted several limitations of archived data: (a) researchers often do not know what to find in archives or what information will be important later, (b) the practical reality that researchers often do not have access or finances to revisit a physical collection, and (c) sometimes the difficulty of making sense from archived data.

To supplement data obtained from Standard & Poor's and LexisNexis Academic, I also used Form DEF 14A to obtain the name, age, and tenure of the CEO's of the selected pharmaceutical firms. The SEC (2014) recommended using Form DEF-14A for information on executive compensation because it is the final proxy statement. The form 14A component of the name of the form refers to proxy statements, filed in pursuit of Section 14(a) of the Securities Act of 1934 (SEC, 2014).

I used the NexisLexis Academic database to download a list of pharmaceutical companies with headquarters in the U.S. In addition, I used data from LexisNexis Academic to search for financial performance of companies for the previous six years. Data selected on CEO's compensation and company financial performance of companies

focused on pharmaceutical companies for the period from 2008 to 2014. I selected this period because of the impact of new regulations such as the Affordable Care Act (2010). The Affordable Care Act contains provisions for helping clients, but the size, scope, and complexity of the Act is overwhelming (Martin, Meehan, & Schackman, 2013.).

Data Analysis

What is the relationship between return on equity, return on investment, annual revenues, and CEO's stock options awards, while controlling for firm size, age of the CEO, and the CEO's tenure?

Hypotheses

$H_0$1: Return on equity, return on investments, and annual revenues would not significantly predict CEO's stock options, after controlling for firm size, age of the CEO', and the CEO's tenure.

H_a1: Return on equity, return on investments, and annual revenues would significantly predict CEO's stock options, after controlling for firm size, age of the CEO, and the CEO's tenure.

I examined the extent and nature of the overall relationship of firm performance, measured by ROE, ROI, and annual revenues, to stock options awarded to CEOs' using a quantitative, correlational design. I used a hierarchical regression model to test the independent variables of ROE, ROI, and annual revenues of firms to dependent variable of CEO's stock options, while controlling for the size of the firm, age of the CEO, and the CEO's tenure (Tabachnick & Fidell, 2012).

Management scholars have used multiple regression models to examine the relationship between CEO's compensation to firm performance. For example, Moore (2014) used a hierarchical regression to examine the relation between CEO's compensation to firm performance. Zondervan (2015) used a multiple regression model to specify the relationship between financial performance and CEO's compensation. Siger (2003) used a regression model to examine the relationship between CEO's salaries to firm annual revenues. In addition, Paz (2012) used a regression model to examine the impact of stock option expensing as part of CEO's compensation and earnings quality.

A hierarchical regression analysis is a type of linear regression model in which observations fall into hierarchical levels (Moore, 2014). In this study, it was important that I controlled how I input variables into the models. Using hierarchical regression allowed in specifying a fixed order of entry for predictor variables (Cooper, 2012). In Hierarchical regression, the researcher, not the computer determines the order of entry of the variables (Moore, 2014). The dependent variable (stock options), followed by the control variables (age of CEO's, tenure of CEO's, and size of the firm) were put into hierarchical model first. This order ensures that the control variables get credit for any variability they may have with stock options (Joanne, 2012). After controlling for the effect of controlled variables, then financial performance variables (ROE, ROI, and annual revenues) were input into the model to evaluate how much predictive power they had on stock options awards (Regression with SPSS, 2014).

I also chose hierarchical design mainly based on the purpose of the study and nature of the independent, dependent, and control variables. A hierarchical regression is

a model comparison approach in which richer models are compared to simple models to infer if additional regressors account for a statistically significant amount of variance (Damien, 2013). I considered other statistical analyses such as ANOVA and logistic regression. ANOVA is used to measure variability between and within groups (Klimberg & McCullough, 2013). The objective of this study was to explore the relationship between firm performance, measured by annual revenues and ROE, to stock options awarded to CEOs', and not the analysis of variance (Davis, 2013). Logistic regression is designed for use in studies in which the response variable is a categorical variable with two possible values (Glynn & Robinson, 2014). Logistic regression is distinguishable from multiple linear regression analysis in that the dependent variable is categorical in nature and assumes a nonlinear relationship between the explanatory variables (Teo, 2013). For this study, none of the variables was a categorical variable; thus, logistic regression was not appropriate. A hierarchical regression design is used to understand the cause-and-effect relationship between one dependent variable and one or more independent variables (Klimberg & McCullough, 2013). For this correlation design, I used SPSS Version 21 software to determine the direction of the relationship between the independent and dependent variables.

Data cleaning and screening involves the detection, removal of errors, and inconsistencies in data set (Pham, 2015). Leo (2013) recommended that researchers should look for the following in data screening and cleaning: (a) look for coding errors, (b) look for outliers, (c) check for logical consistency of answers, and (d) decide how to deal with incorrect or missing values. To clean and address missing data, I used a bar

graph to look for outliers (Moore, 2014). I also used cross-tabulating pairs of variables to root out for data inconsistencies (Regression with SPSS, 2014). In addition, I also went back to data source to fill in the missing data or remove incorrect values (Miranda, 2015).

In conducting inferential statistics, I checked the data for outliers. To check for the normality of variable, I used descriptive data such as mean, mode, median, standard deviations, minimum, maximum, and bar graphs. The effect size of the sample was calculated using a G*power statistical software to determine the appropriate sample size. After all assumptions were met, regression outputs, including correlation coefficient, F-ratio, beta, R-square, adjusted R-squared, R-square change values were evaluated. The F-ratio of ANOVA is reported to indicate the overall regression used for statistical analysis of data and whether the independent variables statistically predict the dependent variables (Pham, 2015). The R-value provided the indication of the quality ty of the prediction of the prediction variable. The R-squared provided the proportion of variance that could be explained by the independent variables while adjusted R-square also included the sample size. The R-square change indicated the change in R-square, indicating the predictive capacity of the dependent variable in the regression model.

Most researchers using statistical tests rely upon certain assumptions about variables used in the analysis (Regression with SPSS, 2014). In this study, I assumed that certain assumptions were not violated. Specifically, the assumptions were: (a) outliers, (b) linearity, (c) multicollinearity, (d) normality, (e) homoscedasticity, and (e) independence of residuals (Leo, 2013). Violations of these assumptions would have required data transformations as a minimum (Miranda, 2015).

In linear regression, an outlier is an observation in which the value of the dependent variable is unusual and contains high residuals (Miranda, 2015). According to Leo (2013), the best way to address outliers is to examine a scatter diagrams and residuals of each variable. In addition, Moore, 2014 recommended performing a Mahalanobis distance test to access for multivariate normality. Accordingly, I used a scatter plot of all my study variables and performed a Mahalanobis test on the variables.

I also performed the assumption test for multicollinearity. Multicollinearity is an adverse situation whether the correlations between the independent variables are very strong (Regression with SPSS, 2014). If a strong correlation existed between stock options and firm performance, these variables would have conveyed the same information and regression results would have been paradoxical (Miranda, 2015). I used the Variance Inflation Factors (VIF) test to flag for multicollinearity (Leo, 2013). A VIF result score of 1, means no strong correlation between the independent variables. If the VIF score is 10 or above, one of the study variables is removed (Pham, 2015).

In linear regression, an assessment of the normality of the data is essential because of the underlying assumptions that the data is normally distributed (Regression with SPSS, 2014). I used Skewness tests in SPSS to determine the normality of the data (McDonald, 2015). If skew is greater than -1 or less than +1, the distribution of the data would be considered normal (McDonald, 2015). However, data with a skew value of less than -1 or greater than +1 would be considered highly Skewed and not normally distributed (McDonald, 2015). For data that is highly skewed, transformation of data variables using data transformations techniques such as log transformations and square

roots reduces data skewness (McDonald, 2015). I also used boxplots and scatter plots before making a final determination (Leo, 2013).

Homoscedasticity, also known as homogeneity of variance, assumes that the dependent variable exhibits similar amount of variance across the range of the independent variables (Miranda, 2015). In homoscedasticity, the error variance would be constant between the variables (Regression with SPSS, 2014). To test for homoscedasticity, I conducted a scatterplot graph (Leo, 2013). Ideally, residuals randomly scattered around the horizontal line, means a relatively even distribution (Kiecolt & Nathan, 2015).

Issues of independence of residuals could be very serious (Regression with SPSS, 2014). Independence of residuals is when errors of one observation are not in correlation with errors of other observations (Miranda, 2015). Independence of residuals is a problem for time-series data (Leo, 2013). I used the Durbin-Watson test in SPSS to look for serial correlation (Regression with SPSS, 2014). The Durbin-Watson test ranges from 0 to 4. The residuals are uncorrelated when the Durbin-Watson test is approximately 2 (Miranda, 2015). A value close to 0 indicates strong positive correlation, while a value of 4 indicates strong negative correlation (Regression with SPSS, 2014).

The hierarchical regression included stock options awarded to CEO's as the dependent variable to predict the performance of firms after controlling for the size of the firm, the age of the CEO's, and the CEO's tenure. I entered control variables into SPSS before firm performance variables to ensure that the controls did not explain away the entire association between firm performance and CEO's stock options awarded. I

excluded cases pairwise to detect missing data, and list wise deleted any entries with missing data.

Researchers encounter missing information that may occur for reasons not anticipated (Pham, 2015). For this study, I only analyzed companies with complete financial data. The most common method and the easiest to apply is the use of only those cases with complete information (Leo, 2013). Leo stated that using only cases with available data has simplicity and comparable across analysis. However, according to Leo this reduces statistical power because it lowers *N* and does not use all information. Nevertheless, I had a large sample to select from to mitigate loss of statistical power from a lower *N*.

Study Validity

The study validity refers to the extent to which certain measurement satisfies the purpose for which it is selected (Pham, 2015). The quality element that could have undermined the study was the accuracy of financial records filed with SEC (SEC, 2014). Historical financial information filed with the SEC was the primary source of data for this study. The SEC staff collects data from public companies on a quarterly and annual basis, as per federal security laws (SEC, 2014). Internal validity relates the extent to which the design of a research study is a good test of the hypothesis (Hobart et al., 2013). For this study, I identified three threats to internal validity. The first threat to internal validity was the possibility that some companies could have filed restated financial information with the SEC, which could affected study data. Restatements of financial statements had resulted in an approximately $100 billion decline in market capitalization

(Government Accountability Office [GAO], 2014). The second threat to internal validity related to the changing nature on the disclosure of CEO's compensation as required by SEC. Statement 123 by FASB requires more frequent disclosures in financial statements about the effects of stock-based compensation (FASB, 2014). The third threat to internal validity was that, other variables, other than ROE, ROI, and annual revenues, explain CEO's compensation (Teo, 2013).

For increased internal validity, the researcher should ensure that the relationship between the independent and dependent variables cannot be explained by any other variable (Peer, Zyngier, & Hakemulder, 2012). There was a chance that other variables might have affected study results on the relationship between ROI, ROE, annual revenues, and stock options offered to the CEO. To increase statistical validity, I used a hierarchical or sequential regression model, which allowed me to examine the relationship between a set of independent variables and a dependent variable, after controlling the effect of some other independent variables on the dependent variable (Teo, 2013). In the regression model, I controlled the regressors (age of CEO, the CEO's tenure, and size of the firm) before assessing the primary regressors (ROE, ROI, and annual revenues) because the regressors might have explained a large portion of the variance. Adding variables in the regression equation, one at a time, maximizes the R^2 (Frydenberg & Reevy, 2015).

In fostering internal validity of this study, I looked at previous researchers' variables and analysis (Akinloye & Hussein, 2012; Sigler, 2011). Sigler (2011) examined the relationship between CEO's pay and company performance of 280 firms

listed on the NYSE while Akinloye and Hussein (2012) assessed the impact of CEO's options and compensation. In addition to these previously used variables, I used six years of data from company financial statements, as well as CEO's stock options to enhance the validity of data (Zohrabi, 2013). I also had an adequate sample size to mitigate the risk of making inappropriate claims about the population (Clay, 2014). The desired sample size for this study was 115 pharmaceuticals companies with revenues of more than $75 million.

External validity is the extent to which the results of a study can be generalized to other settings (Thomson, 2013). For this study, I used a representative sample to assist in establishing external validity. However, because the study sample consisted of only publicly listed pharmaceutical companies, the results may not be generalized to privately owned companies (Heughebaert & Manugart, 2012). For this study, I focused on pharmaceutical industry; therefore, users of this study may not generalize results to other industries (Offstein & Gnyawali, 2005). In addition, since I looked at companies based in United Stated, the study results may not be generalized to companies based in other countries. However, users of this study might apply the results to other public companies that offer CEO's stock options.

Transition and Summary

In Section 2, I identified key points, which included the purpose statement on what is the relationship between ROE, ROI, annual revenues, and CEO's stock options, while controlling for firm size, age of the CEO, and CEO's tenure. Section 2 contained the study methodology (quantitative) and design (correlational) I selected for this study. I

explained the rationale for selecting a quantitative methodology for this study instead of other methodologies (mixed or qualitative). In addition, I also explained why a correlational design was appropriate for this study. Section 2 included an explanation of how I collected data, how I interpreted these data relative to the study hypotheses, and potential implications of this study to other industries.

In Section 3, I analyzed the downloaded data and interpreted the results. Moreover, a main component of Section 3 is the application of the results of this study to current professional practices of the pharmaceutical industry. I also included a recommendation for action, a presentation of the study, further research, and my own reflections. Additionally, Walden encourages students to concentrate on studies that have implications for social change. As such, express implications in terms of tangible improvements to organizations and society are integral part of Section 3.

Section 3: Application to Professional Practice and Implications for Change

Executive stock options are an incentive mechanism that leads to the convergence of interest between the manager and the shareholders (Essid, 2014). In this study, I examined the use of executive stock options in CEOs' compensation packages to support the alignment of CEOs' compensation and the firm performance. Executive compensation continues to increase despite the SEC's reform of 1992, which approved executive compensation reform and full disclosure of top executive compensation (Moore, 2014). As stated in proxy statements, a primary responsibility of firms' compensation committee is to review, approve, and oversee executive compensation (SEC, 2014). Moreover, compensation committees are to use incentive programs such as stock options to promote alignment with stockholders interest (Essid, 2012). Section 3 contains an overview of the correlational quantitative study conducted to review the relationship between executive stock options to firm performance. In this section, I presented the findings of the data analysis. I also indicated how the findings apply to professional practice, implications for social change, and recommendations for actions.

Introduction

The purpose of this quantitative correlational study was to examine the relationship between ROE, ROI, total annual revenues, and CEO's stock options awarded, while controlling for firm size, age of the CEO, and the CEO's tenure. The independent variables were ROE, ROI, and total annual revenues. The dependent variable was CEO's stock options. Size of the firm, age of the CEO, and the CEO's tenure were the control variables. The null hypothesis was that ROE, ROI, and annual

revenues would not significantly predict CEO's stock options, after controlling for firm size, age of the CEO, and the CEO's tenure. The alternative hypothesis was that ROE, ROI, and annual revenues would significantly predict CEO's stock options, after controlling for firm size, age of the CEO, and CEO's tenure. The alternative hypothesis was rejected and the null hypothesis was accepted. The ROE, ROI, and annual revenues did not significantly predict CEO's stock options awards, after controlling for firm size, age of the CEO, and the CEO's tenure.

Presentation of the Findings

In this subheading, I discuss testing of the assumptions, presented descriptive statistics, presented inferential statistic results, provided a theoretical conversation pertaining to the findings, and concluded with a concise summary. I selected a hierarchical multiple regression model to examine the relationship between ROE, ROI, and annual revenues to CEO's stock options, while controlling for firm size, age of CEO, and CEO's tenure. The independent variables were ROE, ROI and annual revenues. The dependent variable was CEO's stock options. Using a hierarchical regression analysis allowed testing of the ability of ROE, ROI and annual revenues in predicting CEO's stock options, while controlling for the effect of firm size, age of CEO, and CEO's tenure on the CEO's stock options awards.

Tests of Assumptions

I evaluated the assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals. Violating statistical assumptions may indicate study results that not trustworthy (McDonald, 2014). According to McDonald,

knowledge and understanding of when violations of assumptions lead to serious biases, and when they are of little consequences, are essential to meaningful data analysis.

Test for multicollinearity. Multicollinearity occurs when the independent variables are not independent of each other (McDonald, 2014). McDonald recommends using Variance Inflation Factors (VIF) test for multicollinearity among independent variables. When no violation of the assumption of multicollinearity is present, the VIF values should be between 0.1 and 10 (Moore, 2014; Zondervan, 2015). When I conducted the VIF test, the VIF values were within acceptable parameters, between 0 and 10, and I assumed that the independent variables were not independent of each other (see Table 5).

Table 5

Descriptive Statistics – Skewness of Variables and Collinearity Results

Variables	*N*	*Skew*	*SE*	*VIF*
Options	*269*	*5.083*	*.149*	
Revenues	*269*	*3.849*	*.149*	*9.428*
ROE	*269*	*-.386*	*.149*	*7.873*
ROI	*269*	*-.197*	*.149*	*7.964*
Assets	*269*	*4.250*	*.149*	*8.501*
Age	*269*	*.272*	*.149*	*1.110*
Tenure	*269*	*1.246*	*.149*	*1.169*

Note. Options, Revenues, Assets and Tenure have large positive skews

Normality, linearity, homoscedasticity, outliers, and independence of residuals.

Statisticians assume that regression variables have a normal distribution (Moore, 2014). Non-normally distributed variables (highly skewed or with substantial outliers) can distort relationships (McDonald, 2014). To test for assumptions of normality,

McDonald (2014) recommended visual examination of data plots, P-P plots, and conducting skewness tests. According to McDonald, when the data skew is less than -1 or greater than +1, the distribution is highly skewed and data is not normally distributed. In addition, McDonald stated that for a normal distribution, the points on the P-P plot should fall close to the diagonal reference line. In this study, to test the data for normality, I conducted a skew test (see Table 5 above) and examined the probability plots (P-P) of the standardized residual (see Figure 3).

The skew test showed that four of the variables had skew scores greater than 1, a violation of normality and not suitable for statistical testing (see Table 5). CEO's stock options had a skew of 5.083, tenure had skew of 1.246, revenues had skew of 3.849, and assets had skew of 4.250. Skewness of data used in CEOs' studies research was a concern noted by other scholars (Moore, 2014; Zondervan, 2015). In addition, the points on probability plots (P-P) did not fall close to the diagonal reference line, indicating a violation of normality (Moore, 2014). However, ROE, ROI and age had small skews of between ± 1, and I assumed there was no violation of normality on the variables (see Table 5).

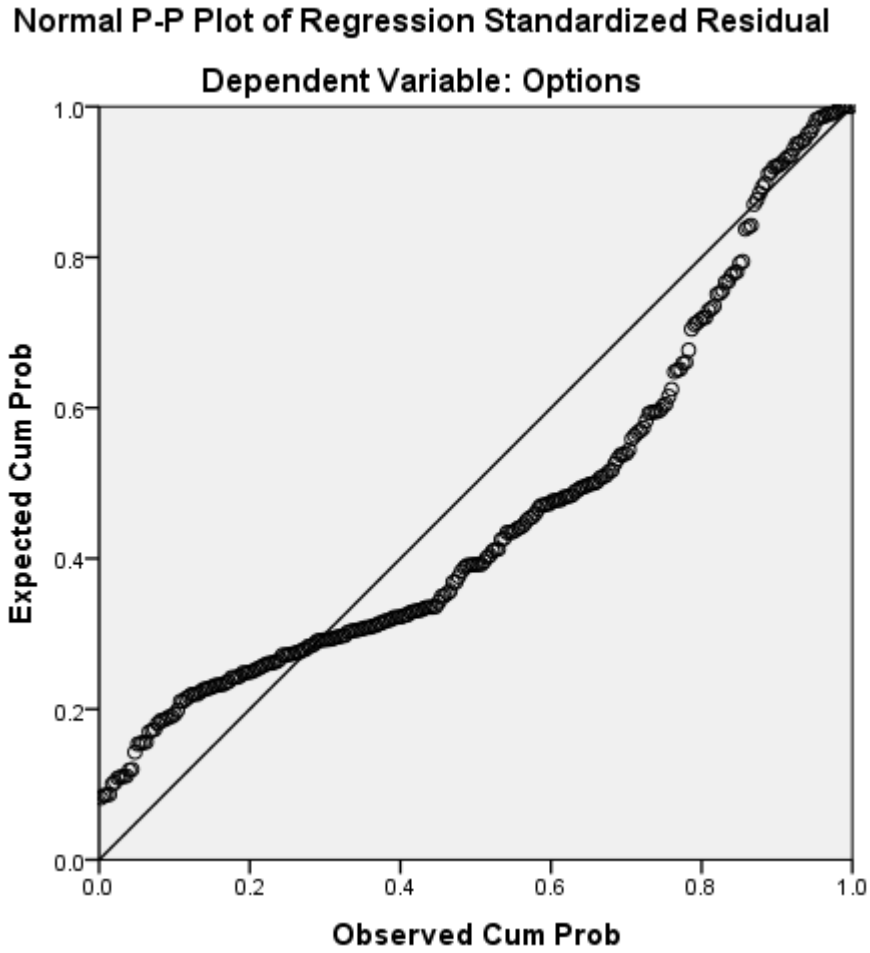

Figure 3. Normal probability plot (P-P) of the regression of standardized residuals

According to McDonald (2014) one way to fix non-normal distribution is through a nonlinear transformation. For variables with positive skews, McDonald recommended applying log transformation on the original variables to reduce the positive skew. Further review on literature revealed that other scholars on CEOs' compensation had performed data transformation on positively skewed data (Antenucci, 2013; Zondervan, 2015). After reviewing the literature, I transformed options, tenure, revenues, and assets variables because they had large positive skews (see Table 5). In addition, McDonald stated that the new variables created through transformation improve

the fit of a regression model. I conducted log10 transformation on the options, tenure, revenues, and assets, based on their large positive skews; a transformation other researchers had used (Antenucci, 2013; Zondervan, 2015). After conducting log10 transformations on options, tenure, revenues, and assets, I conducted the skewness test and the results indicated that all the variables had small skews of between ± 1, showing no violation of normality (see Table 6). In addition, the probability plots (P-P) showed that the points did fall close to the diagonal reference line, and I assumed no violation of normality assumptions (see Figure 4).

Table 6

Descriptive Statistics – Skewness of logged Variables

Variables	*N*	Skew	*S.E*
Options.log	269	-.087	.149
ROE	269	-.386	.149
ROI	269	-.197	.149
Revenues.log	269	.800	.149
Age	269	.272	.149
Assets.log	269	.698	.149
Tenure.log	269	.136	.149
Valid N	269		

Note. Options.log, Revenues.log, Assets.log , and Tenure.log have small skews

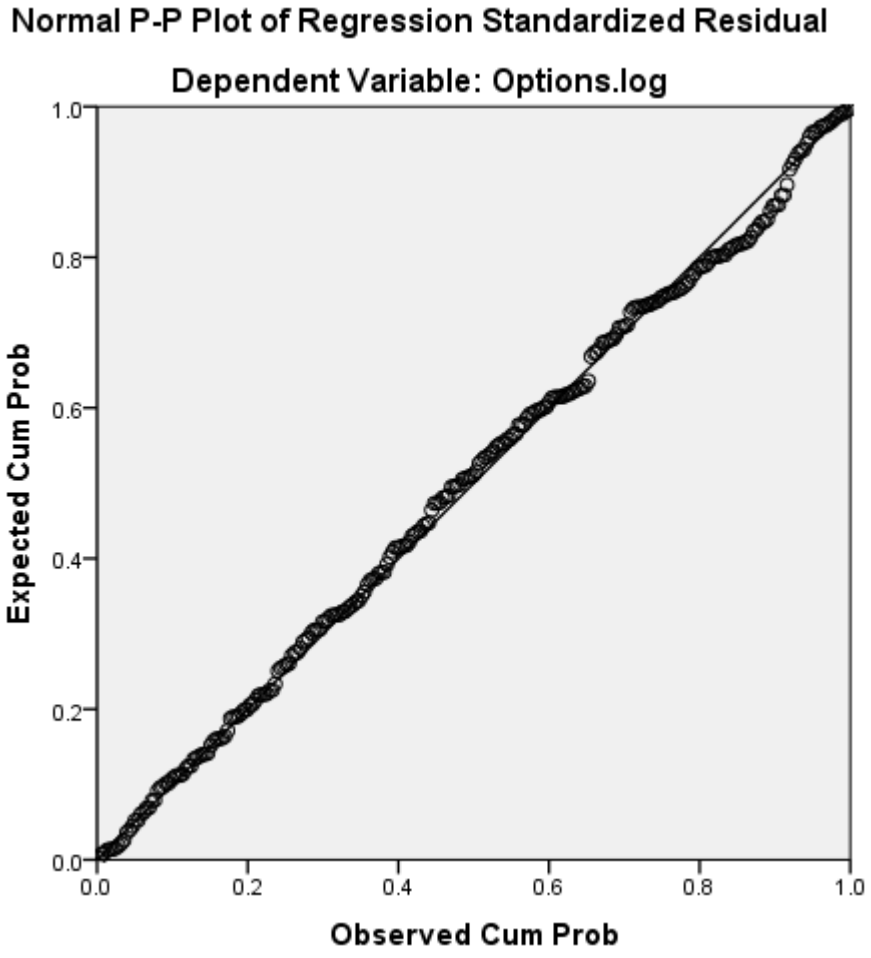

Figure 4. Normal probability plot (P-P) of the regression of options.log.

To evaluate independence of residuals, I used the Durbin-Watson test. The Durbin-Watson test ranges from 0 to 4 (Miranda, 2015). The residuals are uncorrelated when the Durbin-Watson test is approximately 2 (Miranda, 2015). The Durbin-Watson statistics score was 1.766, above 1, and below 3, but approximately 2, indicating that the data met the assumptions for independence of residuals.

To test for outliers, I assessed multivariate outliers by examining the Mahalanobis distances. Statisticians apply the Mahalanobis distance on a set of data to find outliers in

multiple linear regression models (Moore, 2014). The Mahalabonis distance showed that 34 samples had significant *p*-values of less than 0.05. Data with a significant Mahalanobis distances indicate the presence of outliers (McDonald, 2014). Elimination of these 34 variables was important because they exceeded the allowable values of 12.159, X^2 (6, N = 303) = 12.159, $p < .05$.

Homoscedasticity is the assumption in which the error term is the same across all values of the independent variables (Moore, 2014). I used a scatterplot to test for homoscedasticity of the independent variables (see Figure 5). Ideally, residuals scattered randomly around the horizontal line supports the assumptions of homoscedasticity (Kiecolt & Nathan, 2015). From Figure 5 it seemed reasonable to conclude that residuals were homoscedastic. Linearity is the assumption that the relationship between the dependent and independent variables are linear (Loe, 2013). Figure 5 also shows a linear relationship between the independent and dependent, and I assumed that the assumption of linearity was not violated.

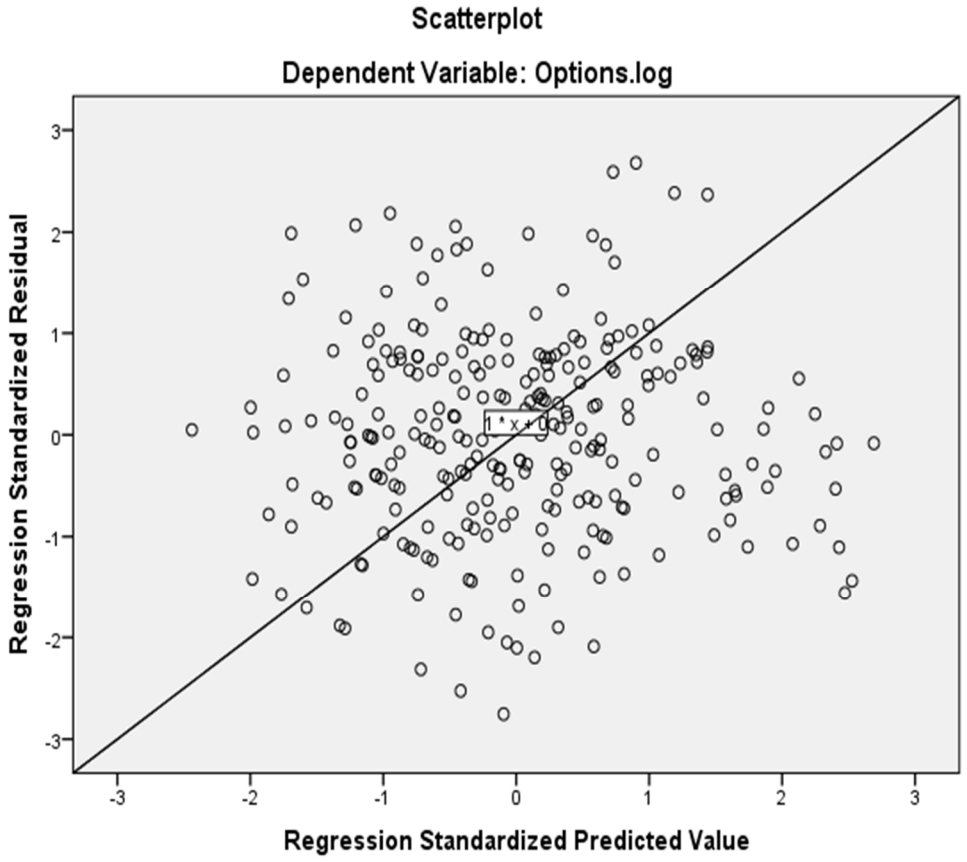

Figure 5. Scatterplot of the standardized residuals.

Descriptive Statistics

In total, I analyzed 302 CEO's stock option years. I eliminated 33 outliers' records, resulting in 269 records for the study analysis. The average value of options given to CEOs' was 2.90 M, ranging from of 0.10 to 38.60, and standard deviation of 4.63. The average value of revenues was 3,209.70, ranging from of 40 to 48,296, and standard deviation of 8,704.61. The descriptive statistics for ROE and ROI are in percentages. The ROE ranged from -67.7% to 81.9%, with an average of 2.92 and a standard deviation of 25.32, while ROI ranged from -32.8% to 40% with an average of 1.91 and a standard deviation of 13.42. The average value of assets was 6,500.42,

ranging from 29.80 to 111,148, with a standard deviation of 18,183.48. Average age of CEOs' was 56.81 years, ranging from 38 to 79 years, and a standard deviation of 6.56. CEOs' tenure ranged from 1 to 31 years, with an average of 8.01 and standard deviation of 6.47. Table 7 contains descriptive statistics of the study variables.

Table 7

Descriptive Statistics for Selected Variables

	N	*Min*	*Max*	*M*	*SD*
Options	269	.10	38.60	2.90	4.63
Revenues	269	40.00	48,296.00	3,209.70	8,704.61
ROE	269	-67.70	81.90	2.92	25.32
ROI	269	-32.80	40.00	1.91	13.42
Assets	269	29.80	111,148.00	6,500.42	18,183.48
Age	269	38	79	56.81	6.56
Tenure	269	1	31	8.01	6.47

Inferential Results

Hierarchical linear regression, $\alpha = .05$ (two-tailed), was used to examine the ability of ROE, ROI, and annual revenues to predict CEO's stock options, after controlling for firm size, age of the CEO, and the CEO's tenure. The independent variables were ROE, ROI, and annual revenues. The dependent variable was CEO's stock options. The null hypothesis was that ROE, ROI, and annual revenues would not significantly predict CEO's stock options, after controlling for firm size, age of the CEO, and the CEO's tenure. The alternative hypothesis was that ROE, ROI, and annual revenues would significantly predict CEO's stock options, after controlling for firm size, age of the CEO and the CEO's tenure. Preliminary analyses were conducted to assess

whether the assumptions of multicollinearity, outliers, normality, linearity, homoscedasticity, and independence of residuals were met; no serious violations were noted.

Age of CEO, CEO's tenure, and firm size (control variables) were entered at Step 1, explaining 32.3% percent of the variance in CEO's stock options. In the first model, assets and CEO's tenure were statistically significant with assets ($t = 10.302$, $p < 0.05$) accounting for a higher contribution to the model than tenure ($t = 5.253$, $p < 0.05$). Age did not explain any significant variation in CEO's stock options. After entry of the predictors (ROE, ROI, and annual revenues) at Step 2, the total variance explained by the model as a whole was 34.3%, $F(6, 262) = 22.792$, $p < 0.05$. The three predictors explained an additional 2.0% of the variance in CEO's stock options after controlling for firm size, age of the CEO, and CEO's tenure. In the final model, only firm size and the CEO's tenure were statistically significant. Table 8 depicts a model summary of the regression variables. The final predictive equation was:

$$\text{Log}_{10}(\text{options}) = b_0 + b_1(\text{Age}) + b_2\text{Log}_{10}(\text{Assets}) + b_3\text{Log}_{10}(\text{Tenure}) + b_4(\text{ROE}) + b_5(\text{ROI}) + b_6\text{Log}_{10}(\text{Revenues}).$$

$$\text{Log}_{10}(\text{options}) = -.934 + -.007(\text{Age}) + 0.502\log_{10}(\text{Assets.log}) + 0.494\log_{10}(\text{Tenure.log}) + -.001(\text{ROE}) + -.001(\text{ROI}) + -.153\log_{10}(\text{Revenues.log}).$$

Table 8

Hierarchical Regression Summary for Variables Predicting CEO's Stock Options

Variable	*B*	*SE B*	β	R^2	ΔR^2
Step 1				.323	.323
Age of CEO	-.008	.004	-.103		
CEO Tenure	.528	.100	.280		
Firm Size	.341	.033	.523		
Step 2				.343	.020
Age of CEO	-.007	.004	-.096		
CEO Tenure	.494	.111	.267		
Firm Size	.502	.102	.758		
ROE	-.001	.003	-.064		
ROI	-.001	.005	-.024		
Annual revenues	-.153	.117	-.233		

Note. $N = 269$

Assets. The positive slope for assets (10.302) as a predictor of CEO's stock options indicated there was about a 10.302 increase in CEO's stock options for each one-point increase in assets. In other words, CEO's stock options tend to increase as assets increases. The squared semi-partial coefficient (sr2) that estimated how much variance in CEO's stock options was uniquely predictable from assets was .535, indicating that 53.5% of the variance in CEO's stock options is uniquely accounted for by assets, when tenure and age are controlled.

Tenure. The positive slope for tenure (5.253) as a predictor of CEO's stock options indicated there was a 5.253 increase in CEO's stock options for each additional one-unit increase in tenure, controlling for assets and age. In other words, CEO's stock options tend to increase as CEO's tenure increases. The squared semi-partial coefficient (sr2) that estimated how much variance in CEO's stock options was uniquely predictable from tenure was .307, indicating that 30.7% of the variance in CEO's stock options is uniquely accounted for by tenure, when assets and age are controlled.

Analysis summary

The purpose of this study was to examine the relationship between ROE, ROI, and annual revenues to CEO's stock options while controlling for firm size, age of the CEO, and the CEO's tenure. I used hierarchical regression model to examine the ability of ROE, ROI, and annual revenues to predict the value of CEO's stock options. Assumptions surrounding multiple regression were assessed with no serious violations noted. The model as a whole was able to significantly predict CEO's stock options, $F(6, 262) = 22.792$, $p < 0.05$, $R^2 = .343$. The final model indicated that the three predictors explained an additional 2.0% of the variance in CEO's stock options after controlling for 32.3% accounted for by the control variables (firm size, age of the CEO, and the CEO's tenure). However, none of the predictors (ROE, ROI, and annual revenues) provided useful predictive information about CEO's stock options. The conclusion from this analysis is that ROE, ROI, and annual revenues are not significant predictors of CEO's stock options.

The study result indicated that firm size and CEO's tenure were significant predictors of CEO's stock options. Firm size followed by CEO's tenure explained the most of CEO's stock options. Research results show that executive compensation and firm size are positively correlated (Murphy, 2012). These results were consistent with other studies (Abraham, Harris, & Auerbach, 2014; Conyon, 2015; Moore, 2014). Conyon (2015) noted that the estimated elasticity might be in the range 25% to 45%, indicating that firm size is an important predictor of executive pay. Abraham et al. found that firm size and CEO's tenure explained significantly the CEOs' compensation. According to Abraham et al., larger firms use competitive wages as a means to attract talent. In addition, Abraham et al. noted that, increases in CEOs' tenure, led to celebrity status of the CEO's and potentially increased compensation. Other studies results showed that CEO's tenure and firm size played a significant role in CEO's compensation (Mitnick, 2013; Moore, 2014). CEO's tenure may lead to entrenchment within a firm and support a CEO's ability to influence the pay package (Moore, 2014). Therefore, when structuring CEO's compensation, compensation committee should consider factors such as firm size and CEO's tenure that may greatly influence structuring of CEO's compensation. In structuring CEO's compensation, compensation committees should adopt a balanced approach that incentives stock appreciation, corporate results, and retention (Reda & Tonello, 2015).

Analysis of the data did not reveal the age of the CEOs' as a significant predictor to CEO's stock options. In the literature there seems to be conflicting evidence on the relationship between age of the CEO and CEO's compensation. Moore (2014), found no

significant relationship between CEO's age and CEO's compensation. Zondervan (2015) examined causality insurance industry and found that age was a significant predictor to CEO's compensation. Zheng and Zhou (2012 analyzed data on retiring CEOs' and noted that retiring CEOs' average age was 67.7 years old and had worked with their firm for 13.4 years. Although Zheng and Zhou study results showed significant relationship between age and tenure, the average age in my study was 57 years, 10 years younger. I therefore believe that a separate study is necessary to examine why literature on relationship between CEO's compensation and age of the CEOs' is conflicting.

Data analysis did not reveal annual revenues as significant predictor to CEO's stock options. The finding on the existing literature is not clear depending on the industry under review. Researchers who have analyzed technology and health industries (Reda & Tonello, 2015; Schmutz & Santerre, 2013) found no significant relationship between revenues and CEO's stock options. On the other hand, researchers who had looked at other industries such as insurance, utilities, and financial firms found a statistically significant relationship between annual revenues and CEO's compensation (Moore, 2014; Zondervan, 2015). Increased revenue shows sales of the firms' products and implies superior financial performance (Abraham, Harris, & Auerbach, 2014). However, in the study there were many firms with lower revenues and high valuations, an observation noted on technological firms by other scholars (Abraham, Harris, & Auerbach, 2014; Reda & Tonello, 2015). The pharmaceutical industry is unusual because of the larger number of companies with small revenues, significant losses in net income, but high market value (Schmutz & Santerre, 2013). Schmutz and Santerre

(2013) explained many of these small pharmaceutical companies with negligible revenues but with large market values, and large budgets were likely developing a new pharmaceutical product that had not yet reached the market; eventually creating shareholders value.

Abraham et al. (2014) stated that unlike in other sectors where there is high correlation between sales and CEOs' compensation, in technological industries, expectation of innovation, research, and development in expectation of future returns (future sales and stock price appreciation) contributes to CEOs' compensation. According to Abraham et al., it may be more appropriate to employ revenue growth per year as an indicator of both new and existing product performance when analyzing technology driven firms. To tie CEOs' compensation to shareholders' value, compensation committees should consider other performance measures such as benchmarking with other peer-comparison companies (Reda & Tonello, 2015). Benchmarking with companies in the same industry and size is likely to offer more insights into the relationship between firm performance, CEO's compensation, and reduction of agency costs.

My findings on the relationship between CEO's stock options to ROE and ROA are similar to those produced by (Angelis & Grinstein, 2015; Moore, 2014; Zondervan, 2015) who all found no statistically significant relationship between CEOs compensation and firm performance. Given the intense competitiveness and large initial outlay for research and development to fund innovation in pharmaceutical companies, and the many pharmaceutical firms with lower revenues, it was not surprising that ROE and ROI were

not significant predictors of CEO's stock options. Angelis and Grinstein (2015) stated that technological firms are more likely to grant stock options to their CEO's even when in net losses positions. Stock options remain central to the toolset used by smaller IT and health care companies to attract and retain key talent (Reda & Tonello, 2015).

In this study, some of the firms that had awarded their CEOs' millions in stock options had net losses in net income. This might explain why ROE and ROI had no significant statistical relationship to CEO's stock options. CEO's of these companies received compensation even when the performance of their firms was not observable (Schmutz & Santerre, 2013). Moore (2014) analyzed insurance companies, while controlling for firm size, age of CEO, and CEO's tenure, and found that ROE had no significant relationship to CEO's compensation. CEOs' who position their firms to create disruptive technology that sustains competitive advantage benefit from higher stock options grants (Abraham, Harris, & Auerbach, 2014). When structuring CEOs' stock options compensation, compensation committee need to consider other factors such as sales growth, investments in research and development, and how the CEO has driven competitive advantage from innovation than only examining short term measures such as annual revenues. In addition, for effective business practice, stock options remain central for smaller and innovative companies to attract and retain key talent.

Applications to Professional Practice

The purpose of this study was to examine one component of CEOs' compensation (stock options) to firm performance within a single industry. The findings of the study did not support the agency theory with respect to awarding CEO's stock options based on

firm performance. Equity compensation, is proposed as an efficient mechanism to align managers and shareholders' interests and has received a lot of scrutiny from regulators and shareholders (Khalid and Rehman, 2014; Murphy 2012). However, the pharmaceutical industry is unique, in that there are many firms with lower revenues and high valuations (Schmutz & Santerre, 2013).

Industries may have specific characteristics that affect the variation in CEO's compensation and compensation committees need to be aware of these unique industry characteristics (Abraham, Harris, & Auerbach, 2014). For firms that are unique, Reda and Tonello (2015) recommended compensation benchmarking as more appropriate. According to Reda and Tonello (2015) most firms are already benchmarking with industry and company size as the most used criteria for the peer-comparison group. Therefore, business leaders serving in companies that are innovation driven could consider benchmarking with other companies in the same industry and size. Most biotech companies in the research phase have high valuations and no revenues, and comparison with other companies in the same business cycle is more helpful when designing CEOs' compensation and reducing agency costs.

Reda and Tonello (2015) analyzed CEOs' compensation across all industries and noted that growth companies in the information technology and health care sectors were the only subset that continued to rely extensively on stock options. The pharmaceutical industry is technology driven, and compensation committees along with investment managers should consider evaluating whether performance parameters such as net income and revenues are appropriate for firms investing heavily in R&D for future

benefits. Performance measures such as revenues, ROI and ROE are short-term measures, but drug development process is time consuming and expensive. Brown (2013) noted that in the pharmaceutical industry it could take years before realizing the full risks or benefits. However, Reda and Tonello (2015) noted that most firms were adopting capital efficiency measures to evaluate the CEO's performance. When evaluating CEO's performance, business leaders could use measures other long-term performance measures such as percent change in earnings per share, long-term use of debt, and improved funding sources (Abraham, Harris, & Auerbach, 2014). For improved business practice, looking at firm performance with a long-term view aligns with the long-term nature of research undertaken by pharmaceutical firms.

Implications for Social Change

The rise in executive compensation contributes to the skewing of income distribution in the United States (Kiatpongsan & Norton, 2014). Implications for positive social change include the potential for policy makers to address societal concerns on widening income inequality due to increasing concentration of wealth at the top, to high-earning salaried workers. People in the society believe that there is unfair distribution of valuable resources such as income (Kiatpongsan & Norton, 2014). Therefore, understanding the widening income gap, and the consequences of income inequality such as feelings of unfairness in the society, are some of the implications of this study. Furthermore, firms compensating their CEOs' based on performance are more likely to invest more on R&D, leading to innovation, increased employment opportunities leading to increased economic growth (Abraham, Harris, & Auerbach, 2014).

Recommendations for Action

The intent of this study was to analyze the relationship between firm performance and CEOs' stock options. I will share the results, publication, and presentation of this study at professional workshops or conferences. I will publish this study in the ProQuest/UMI database. The results of this study are potentially beneficial to select audiences if disseminated appropriately. Three primary benefactors of this study would be compensation committees, scholars, and investors. While none of the predictors was significantly significant in predicting CEOs' compensation, compensation committees could evaluate how firm performance parameters relate to the industry they serve. In making investment decisions, investors should consider performance parameters based on the industry specific characteristics and industry cycle (Abraham, Harris, & Auerbach, 2014). Investing in industries that are technologically driven is likely to require long-term analysis of performance that aligns with the long-term nature of R&D investments, which would improve competitive edge (Abraham, Harris, & Auerbach, 2014).

Knowing that each industry is unique opens a door for future research, to evaluate how each component of executive compensation benefits the shareholders. In addition, other variables such as firm size and CEO's tenure explained most of CEO's stock options. Conyon 2015 noted that when firm size was controlled, some performance variables such as CEO's talent lost their positive correlation to CEO's compensation. For improved business practice, compensation committees, business leaders, and investors need to evaluate whether other strategies provide better results in explaining CEO's stock options compensation.

For scholars, there is need to expand research to further analyze CEO's pay differently based on the industry they (CEOs') serve. Contemplating different performance parameters that aligns with industry competitiveness and technological strategies is important. When compensation researchers create an omnibus sample of industries, firm level effects between high technology firms and less technology-driven firms maybe negated (Abraham, Harris, & Auerbach, 2014). To sustain innovation and gain competitive advantage, technology driven companies must invest significantly in R&D. Therefore using traditionally commonly used performance parameters such as revenues, net income, etc. without considering other factors such as product development cycle and R&D expenditures may drive the wrong study conclusions. Confining a study to a single industry is useful in isolating practices, smoothened out in multi-industry study (Abraham et al., 2014). Analyzing CEO's compensation as a whole package, without considering the different components (salary, bonus, stock options etc.) might not help in addressing how these components benefit the shareholders.

Recommendations for Further Research

Future studies could examine other components of CEO's compensation structure to firm performance. In this study, I analyzed only one component of CEO's compensation; stock options, but other components such as bonus, stock awards, cash etc. might offer more insights into the CEO's compensation. In addition, instead of examining the whole pharmaceutical industry, researchers could focus on firms categorized into different indexes such as S&P 500 (large companies), S&P Midcap 400 (mid-sized companies), and S&P 600 (small-sized companies), as each segments is

driven by different business dynamics. Further research, could involve investigating different performance variables that are more suitable for technology driven industries, than using commonly used variables, which might not be relevant to the industry under review. Performance variables that align with the long-term nature of R&D in the pharmaceutical industry would be more appropriate to gauge firm performance.

Reflections

The research process was a humbling, yet exciting experience. The doctorate experience was at times overwhelming, because of the size and complexity of writing at a doctoral level. As I continued to immerse myself into the doctorate journey, I leaned to take criticism positively, and to get the most out of my classmates, committee members and the other resources at my disposal. Above all, I honed my organization and time management skill in order to accommodate the rigor of a doctorate study. I intend to reach out to other doctoral students to share my experiences, especially using online resources for maximum benefits.

By reviewing pharmaceutical industry, an industry that I have spent a considerable time of my career in, I have learned a lot about the industry's CEOs' compensation, information that I could share with my managers to help in understanding how stock options relate to the industry. I hope that my research will support decision makers in the pharmaceutical industry to better understand how executive compensation relates to firm performance.

Summary and Study Conclusions

Previous researchers have examined the relationship between CEO's compensation and firm performance (Moore, 2014; Sigler, 2003; Zondervan, 2015), but few have focused on the pharmaceutical industry. Linking CEO's compensation to firm performance is an important consideration of agency theory (Moore, 2014). The agent (CEO's) may have interests that differ with those of the principal (shareholders') of the firm (Akinloye, 2012). To link the agent and the principal interests, equity compensations, should include both the interests of the CEO's and the shareholders' (Essid, 2012). However, how effective the use of equity compensation is in reducing agency costs is not clear (Essid, 2012).

The research question addressed the association among ROE, ROI, and annual revenues to CEO's stock options in the pharmaceutical industry. Using a hierarchical regression, I examined how firm performance (ROI, ROE, and revenues) related to CEO's stock options. None of the three predictors was statistically significant in predicting CEO's stock options. Whether CEO's stock options reduces agency theory is not clear. Canyon (2015) stated that firms frequently grant options that do not link to firm performance but instead allow managers to reap windfall gains from stock price increases that are due solely to the market and sector within which the firms operate.

Reda and Tonello (2015 noted that between 2010 and 2014, CEOs' compensation in the health care sector surged with the stock options weighing significantly more on total pay. It was however clear that firms justify using stock options to attract and retain talent, more so in the technology driven industries. Pharmaceutical firms need to produce

a steam of innovations in order to survive in a competitive environment (Abraham, Harris, & Auerbach, 2014). Using short-term performance parameters such as net income and revenues to evaluate an R&D intensive industry might not help in understanding how CEOs' compensation relates to shareholders' value. Other measures such as cash flow, net present value, funding sources, changes in revenues, and internal rate of return are among the performance metric that could be evaluate when analyzing firm performance.

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Appendix A: Summary Compensation Table

Summary compensation table for 20X2, 20X1 and 20X0

Name and principal position (a)	Year (b)	Salary ($) (c)	Bonus ($) (d)	Stock awards ($) (e)	Option awards ($) (f)	Non-equity incentive plan compensation ($) (g)	Change in pension value and nonqualified deferred compensation earnings ($) (h)	All other compensation ($) (i)	Total ($) (j)
PEO	20X2 20X1 20X0								
PFO	20X2 20X1 20X0								
A	20X2 20X1 20X0								
B	20X2 20X1 20X0								
C	20X2 20X1 20X0								

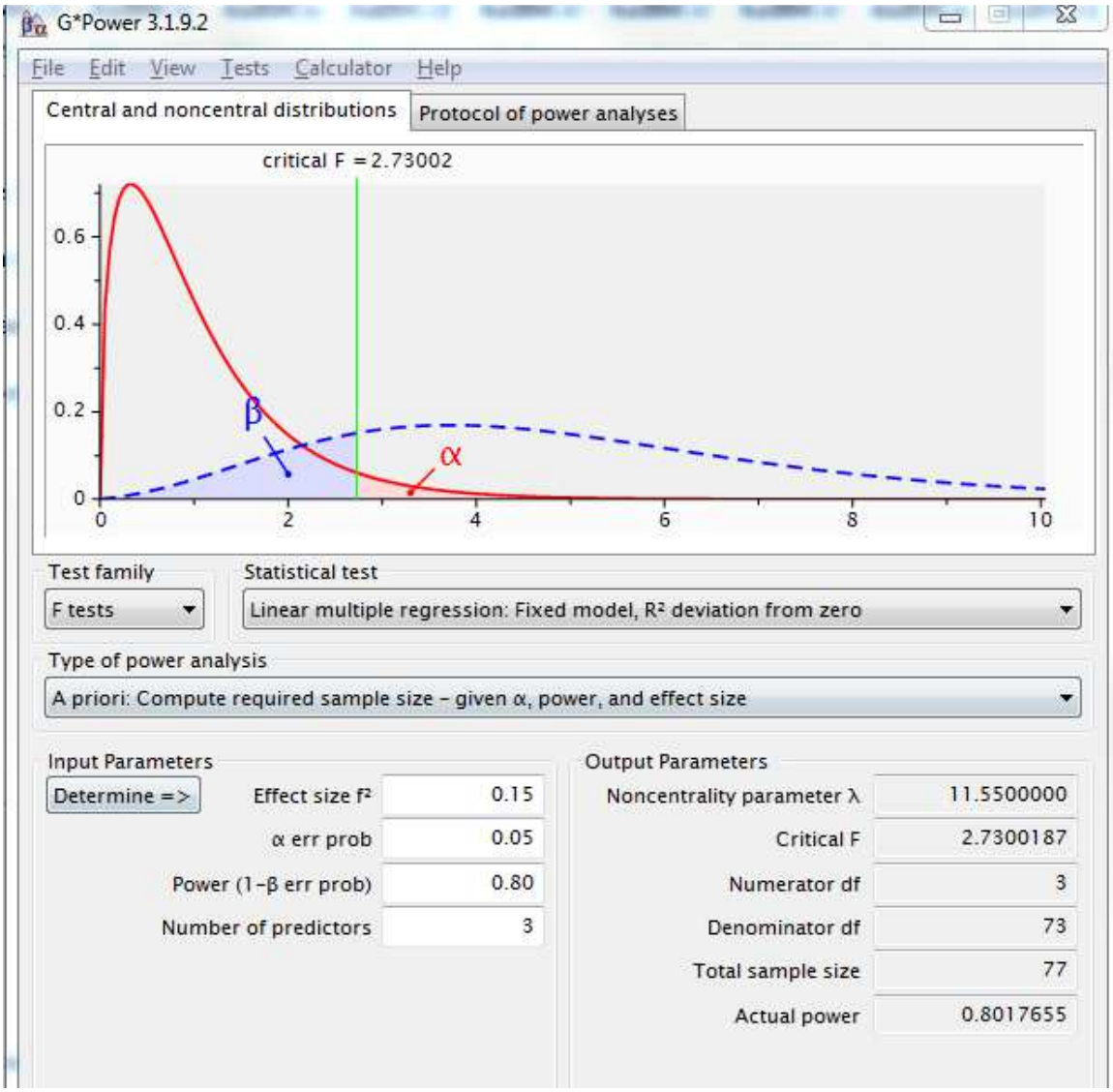
The SCT requires disclosure of the following types of compensation for each NEO for a three-year period:

Appendix B: Summary Compensation Table for Pfizer

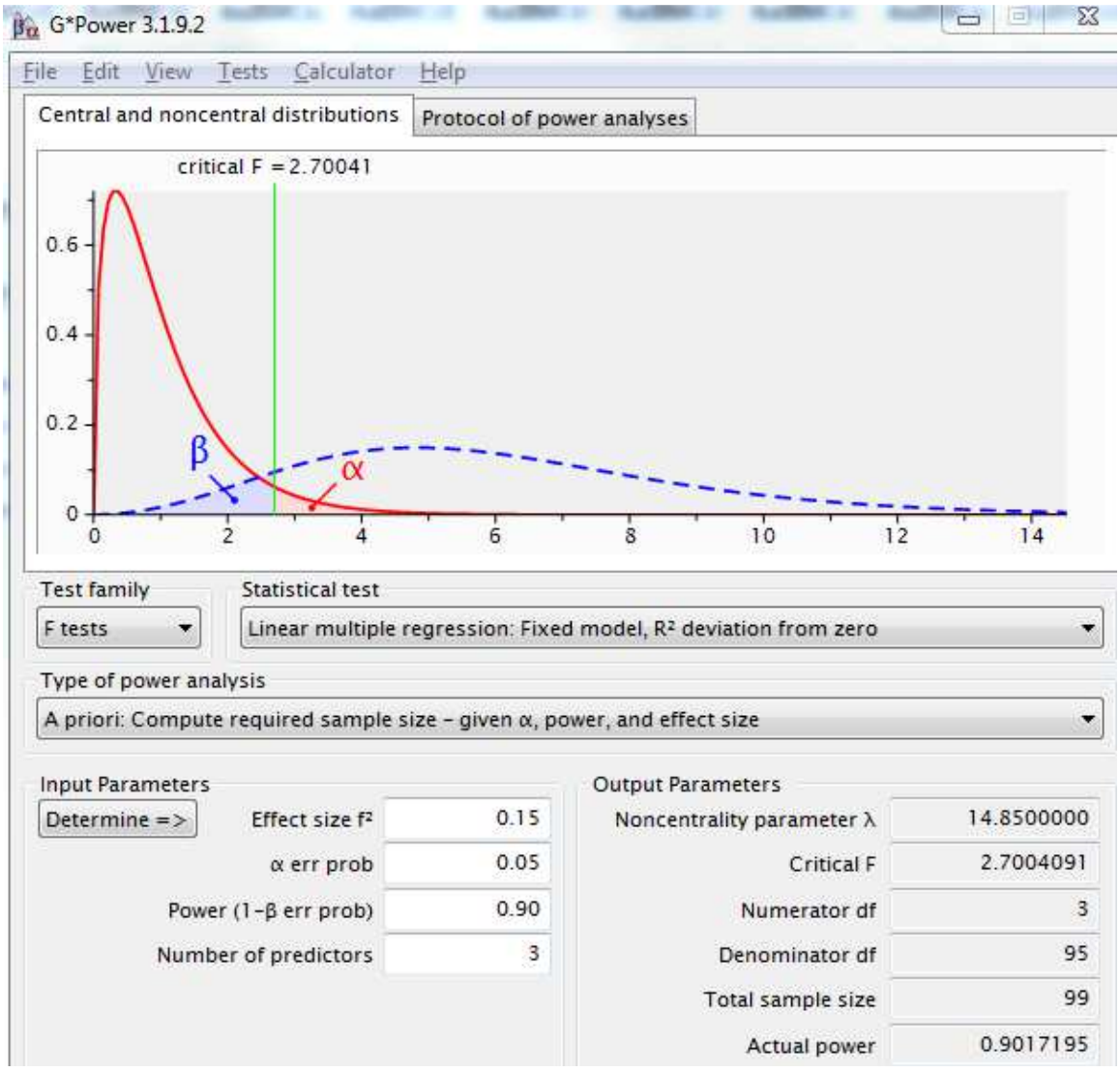
osition	ear	alary	onus	tock wards	Opti on Awards	N on-Equity	I eferred	ll Other	A otal
EO	014	,815		,447	6,36 1	3 ,000	5 ,266	91	3 3,023
EO	013	,776		,016	6,06 6	3 ,400	1 ,212	76	4 8,948
EO	012	,737		,441	6,49 7	3 ,400	7 ,147	09	4 5,634

Note. Pfizer CEO Compensation received from 2012 to 2014 in thousands.

Appendix C: G*Power for a Priori Analysis for a Pearson Correlation Model



Appendix D: G*Power for a Priori Analysis for a Pearson Correlation Model



Appendix E: Sample of Standard and Poor's Capital IQ

Income Statement (Million $).

	2014	2013	2012	2011
Net Inc.	9,086	11,341	9,490	8,697
Depr.	5,276	6,119	7,028	7,787
Int. Exp.	1,360	1,414	1,524	1,681
Eff. Tax Rate	26%	27%	21%	32%
Pretax Inc.	12,238	15,716	12,080	12,762
Oper. Inc.	20,939	23,123	26,222	27,502
Revs.	49,605	51,584	58,986	67,425

Other Financial Data (Million $).

	2014	2013	2012	2011
Cash	36,156	32,498	32,708	26,758
Curr. Liab.	21,631	23,366	28,619	28,069
LT Debt	31,557	30,763	31,069	34,945
% Ret. on Equity	12.3	14.4	11.6	10.2
Total Cap.	106,190	109,443	115,196	117,572
Total Assets	169,274	172,101	185,798	188,002
% Net Inc.of Revs.	18.3	22.0	16.1	12.9
% LT Debt of Cap.	29.7	28.1	27.0	NI
Curr. Assets	57,702	56,244	61,415	57,728
Curr. Ratio	2.7	2.4	2.2	2.1
Cash Flow	14,361	17,458	16,516	16,440
Cap. Exp.	1,199	1,206	1,327	1,660
% Ret. on Assets	5.3	6.3	5.1	4.5
Common Equity	71,272	76,274	81,221	82,145

Appendix F: Ticker of Companies used in the study

Tickers for Pharmaceutical Companies used in the Study							
1	ABBV	26	CBM	51	INFI	76	PBH
2	ABT	27	CBST	52	INSY	77	PCRX
3	ACT	28	CELG	53	IPXL	78	PCYC
4	AEGR	29	CL	54	IRWD	79	PFE
5	AGIO	30	COO	55	ISIS	80	PGNX
6	AGN	31	CORI	56	ITMN	81	PRGO
7	AKRX	32	CPIX	57	JNJ	82	PTX
8	ALIM	33	CSII	58	LCI	83	REGN
9	ALKS	34	CTIC	59	LFVN	84	RPTP
10	ALNY	35	CTLT	60	LGND	85	SCLN
11	ALXN	36	DNDN	61	LLY	86	SCMP
12	AMAG	37	EBS	62	MDCO	87	SGNT
13	AMLN	38	ECYT	63	MDVN	88	SLXP
14	AMPH	39	ENDP	64	MGNX	89	SPPI
15	ANIP	40	ENTA	65	MJN	90	SUPN
16	APHB	41	EPZM	66	MRK	91	UTHR
17	ARNA	42	FMI	67	MYL	92	VIVO
18	ARRY	43	FURX	68	NATR	93	VRTX
19	AUXL	44	GSK	69	NEOG	94	VRX
20	AVNR	45	Halo	70	NKTR	95	VVUS
21	BDSI	46	HSP	71	OMED	96	XNPT
22	BDY	47	HZNP	72	ONXX	97	ZGNX
23	BMRN	48	IMGN	73	OPHT	98	ZTS
24	BMY	49	INBP	74	OPK	99	ZYS
25	CAPS	50	INCR	75	OREX		