AN EMPIRICAL INVESTIGATION OF THE RELATIONSHIP BETWEEN CEO COMPENSATION AND INTELLECTUAL CAPITAL

by

William Gary Hooper

RAJ K. SINGH, PhD, Faculty Mentor and Chair

SHARDUL PANDYA, PhD, Committee Member

CHRISTOPHER LUCARELLI, PhD, Committee Member

Barbara Butts Williams, PhD, Dean, School of Business and Technology

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

Capella University

June 2016

Abstract

While intellectual capital has become essential for organizational performance, CEO compensation has risen to all-time highs. To understand the growth in CEO compensation, this study examined the relationship between CEO compensation and intellectual capital as a measure of organizational performance. The Value Added Intellectual Coefficient (VAIC™) model was adopted in this study to measure intellectual capital at the organizational and subcomponent levels. CEO compensation and financial data for the VAIC™ model were collected from 2009 to 2014 for a random sample of 90 firms listed on the NASDAQ Exchange. All data was obtained from audited financial statements for validity and reliability. This produced 450 observations for the VAIC™, its subcomponents, and CEO compensation that were analyzed with a cross-validated multiple linear regression. The results found capital employed efficiency (CEE), a subcomponent of the VAIC™, was the sole significant predictor accounting for 4.8% of the variance in CEO compensation or $4.80 of each $100 unit change in CEO pay. Although research on CEO compensation and intellectual capital fills a gap in the literature, the lack of material findings for the variables in this study aligns it with prior research suggesting CEO compensation and organization performance have become decoupled. This study recommends continuing research into this relationship using data from expanded executive compensation disclosures pending under the Dodd-Frank Act. Future research may also benefit from general linear modeling to identify potential data structures unique to CEO compensation in specific industry groups.

Dedication

The journey to my PhD has been filled with support from many loved ones – especially Lindsey and my parents. Thank you for your understanding and the sacrifices you've made to help me along the way.

My children have been a special source of inspiration. I hope that both Randy and Kelly come to embrace the joy of lifelong learning as I have.

Acknowledgments

I would like to acknowledge my good friend and fellow doctorate candidate Prosper Komla Ametu for all of his support and counsel. Also, I would like to thank Dr. Raj K. Singh and my committee members for their guidance and input.

Table of Contents

List of Tables

List of Figures

CHAPTER 1. INTRODUCTION

Introduction to the Problem

Increasingly, the sources of competitive advantage and firm value rely on intangible assets, rather than physical assets (Chu, Chan, & Wu, 2011; Williams, 2001). In 2010, for example, 80% of the gap between book and market values for S&P 500 companies consisted of intangible assets compared to 17% in 1975 (Ocean Tomo, 2011). This gap has been referred to as intellectual capital and represents firm value that cannot be captured by traditional accounting methods (Laing, Dunn, & Hughes-Lucas, 2010; Pulić, 1998, 2000, 2004). At the same time, CEO compensation has grown so rapidly that it has gained the attention of legislators, shareholders and other interested parties (Shorter, 2013). These concerns contributed to the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) requiring shareholder votes on executive compensation and disclosure of the ratio of CEO compensation to the median employee compensation (i.e., the pay ratio) for public companies (Mishel & Sabadish, 2013). With the growing attention on CEO compensation and the importance of intellectual capital (i.e., intangibles), these trends are fueling the debate on how to measure CEO performance and whether rising CEO compensation is related to organizational performance. To investigate these issues, this study explores the relationship between organizational performance, as measured by the Value Added Intellectual Coefficient (VAIC™) model, and CEO compensation.

Background of the Study

The relationship between CEO compensation and organization performance is grounded in agency theory and the concept of the modern corporation. Berle and Means (1932) characterized the modern corporation as a separation of control and ownership. Fama and Jensen (1983) extended this concept by describing the modern corporation as a nexus of written and unwritten contracts. Among these are agent-manager contracts –both formal and informal– that establish expectations, monitoring mechanisms, bonding, and incentives to align the interests of agents with owner-principals (Coase, 1937; O'Kelley, 2012). These aspects of the agent-principal contract define authority for decision making, decision control, and risk-sharing in the relationship between managers and owners.

Within the boundaries of the agent-manager and principal-shareholder relationship, agency theory seeks to explain behavior in the agent-principal relationship (Jensen & Meckling, 1976; Pepper, 2006; Ross, 1973). Agent-managers are assumed to be self-serving and utility-maximizing individuals (Eisenhardt, 1989). The agent-principal model suggests behavior is influenced by divergent interests and differing aversions to risk. To control agent behavior, two mechanisms have evolved (Eisenhardt, 1989). The first is the compensation and incentive arrangement. These arrangements are designed to align agent-principal interests by rewarding agents for organization performance. The second mechanism is monitoring of agents through governance procedures. Monitoring often includes approval of important decisions and performance assessment. Both mechanisms are embedded in the CEO's exchange of services for tangible and intangible benefits under their employment contract. Assuming the employment contract satisfies the CEO's minimum utility, it can align agent-principal interests by linking the CEO's personal wealth (i.e., as an agent) to shareholder wealth (i.e., principal) through equity-based incentives tied to measures of organization performance.

Organization performance relies on measures that fit the firm's needs and circumstances. In the performance measurement literature, contingency theory has been used to explain the process of adapting performance measures over time to fit the firm's environment (Valančienė & Gimžauskienė, 2008). This theory suggests external and internal environmental factors influence changes to the firm's measures. These measures are intended to capture data on the firm's performance for decision-making and rewarding employees. Traditionally, CEO's have been rewarded based on performance measures such as changes in the firm's stock returns and accounting measures like return on equity (Banker, Darrough, Rong, & Plehn-Dujowich, 2013; Sigler, 2011). The relevancy of these measures has been criticized by a number of researchers, practitioners, labor unions, shareholders and others (e.g., Bebchuk & Grinstein, 2005; Pepper, Gore, & Crossman, 2013). For instance, the use of changes in stock returns has been criticized because external events that are beyond the control of the CEO can influence prices. Accounting measures have been criticized for failing to capture value creation and recognize intangible resources that provide a competitive advantage (Rossi & Celenza, 2014).

According to the resource-based view of the firm (RBV), a competitive advantage can be achieved when firms use their resources to exploit internal strengths and neutralize weaknesses in their external environment (Barney, 1991). Firm resources under RBV are defined as physical, human, and organizational capital (Barney, 1991). Physical capital refers to equipment, raw materials, and other physical assets of the firm. Human capital consists of the firm's collective experience, training, intelligence, and the insights of its employees. The firm's reporting structure, systems, and relationships among groups in the firm and within its environment represent organization capital. When firm resources are deemed valuable and rare, it can provide a sustainable competitive advantage. Resources are only "valuable when they enable a firm to conceive of and implement strategies that improves its efficiency and effectiveness" (Barney, 1991, p. 106). A resource is considered valuable and rare as long as it is possessed by only a few competitors. At times, a single resource is ineffective and a bundle of physical, human, and organization capital is necessary to implement a strategy for a sustainable competitive advantage. In either case, a firm's resources or resource bundle allows them to conceive and implement strategies that others cannot. This occurs because current or potential competitors lack comparable resources with the ability to conceive similar strategies, implement them, or both (Barney, 1991). Often the success of strategy hinges on the CEO's talent to harness the firm's human capital for execution of strategy (Chng, Rodgers, Shih, & Song, 2012; Gates & Langevin, 2010).

Although firm resources can be diverse, it is RBV's emphasis on management talent and human capital that are important for this research. According to Barney (1991), firms are social entities that are made up of complex social phenomena. These phenomena can represent relationships between key members of the firm, its reputation with customers, suppliers, or an organization culture that provides a competitive advantage. For instance, innovative employees or an experienced management team may be rare; however, the difficulty competitors' face in replicating these makes them valuable. When human capital is combined with physical equipment, technology, or proprietary processes in a unique way it can be highly valuable and rare due to the difficulty of replication. These resources are intangible and have become known as the firm's intellectual capital (Mention, 2012; Riahi-Belkaoui, 2003).

In today's knowledge economy, intellectual capital is often recognized as a strategic asset for its contribution to organization performance (Nazari & Herremans, 2007; Ordóñez de Pablos, 2002). The VAIC method is designed to provide information about the value creation and efficiency of a firm's intellectual capital (Tan, Plowman, & Hancock, 2007). Among 42 competing models for assessing intellectual capital (IC), the VAIC model has gained the greatest acceptance (Chu et al., 2011). Its popularity is due to its use of readily available and objective data from company financial statements. Underlying the VAIC model is an assumption that IC is created by employees and that employee costs are not an expense but rather an investment in value creation (Pulić, 1998). The outcome of the VAIC model is a measure of IC and its efficiency from resources such as human, structural, physical and financial capital employed. In this study, the VAIC model provides a means for operationalizing IC as a measure of organization performance.

The separation of ownership and control in modern corporations has placed the CEO as the primary agent responsible for organization performance. Previous research on the relationship between CEO compensation and organization performance has defined performance using a variety of accounting measures. These measures range from changes in stock prices, earnings per share, return on assets, firm size, and more. Firm size, as the most common, has been operationalized in past research as either total revenue or total assets. Although CEO compensation has been linked to firm size (Gomez-Mejia, Tosi, & Hinkin, 1987; Sigler, 2011), the relationship between CEO compensation and other measures of organization performance has been mixed (Frydman & Saks, 2010; Murphy, 1999). Nevertheless, organization performance research has been anchored in accounting measures developed for physical asset intensive businesses from the industrial era (Edvinsson & Malone, 1997; Puntillo, 2009). In today's knowledge economy, intellectual capital has become an essential resource for organizational performance (Drucker, 1993; Janošević, Dženopoljac, & Bontis, 2013; Stewart, 1997). With this shift to intangible resources such as intellectual capital, no previous research has examined CEO compensation and organization performance from this perspective. This study addresses recommendations for further research into the rise in CEO compensation (Attaway, 2000; Frydman & Saks, 2010) and fills a gap in the literature by examining the relationship between CEO compensation and IC as a measure of organization performance.

Statement of the Problem

The sources of competitive advantage and firm value have begun to rely on intangible assets, rather than physical assets (Chu et al., 2011; Williams, 2001). In 2010, for example, 80% of the difference between book and market values for S&P 500 companies consisted of intangible assets compared to 17% in 1975 (Ocean Tomo, 2011). This difference is also referred to as intellectual capital and represents firm value that cannot be captured by traditional accounting methods (Laing et al., 2010; Pulić, 1998, 2000, 2004). At the same time, CEO compensation has risen to all-time highs amidst criticism that CEO compensation has become decoupled from organization performance (Bebchuk & Fried, 2004, 2005; Cennamo, 2008).

To understand the growth in CEO compensation, this study examines the relationship between CEO compensation and intellectual capital as a measure of organization performance. The Value Added Intellectual Coefficient (VAIC) model was adopted in this study to measure the organization's value creation and efficient use of intellectual capital for organization performance.

Purpose of the Study

The purpose of this quantitative non-experimental study is to examine the relationship between two constructs—CEO compensation and intellectual capital (IC) as measured by the VAIC model. Investigating the relationship between the variables underlying these constructs will provide new insights into business performance, intellectual capital, and the growth in CEO compensation. This research will benefit managers attempting to extract value from IC as well as boards of directors, executive compensation committees, shareholders, and others that assess organizational performance for CEO compensation purposes. The VAIC model will be used to determine the performance of the firm's IC and its subcomponents in relation to total CEO compensation.

By using IC as a measure of organization performance to examine these constructs, this study is aligned with recent trends emphasizing the importance of knowledge workers as a resource for competitive advantage (Drucker, 2001; Lerro & Schiuma, 2013). In addition, the use of IC as a measure of organization performance overcomes the mixed results and limitations associated with traditional measures (i.e., changes in stock prices and accounting measures) found in previous research.

Rationale

The previous research on the relationship between CEO compensation and organization performance has produced mixed findings (Attaway, 2000; Sigler, 2011). Further research has been recommended to understand the factors driving up CEO compensation (Attaway, 2000; Frydman & Saks, 2010). In addition, previous research has concentrated on traditional measures of organization performance stemming from the industrial era. This study will address this research problem and fill a gap in the literature by showing how the growth in CEO compensation is linked to IC using the VAIC model, an alternative measure of organization performance.

Research Questions and Hypotheses

This research examines the relationship between CEO compensation and intellectual capital (IC) through several subquestions designed to address the top-level research question. The top-level research question (*RQ*) and subquestions (*SQ*) are as follows:

RQ 1.0. How much of the variance in CEO compensation can be explained by IC and its subcomponents?

SQ 1.1. How much of the variance in CEO compensation can be explained by its relationship to intellectual capital (IC)?

SQ 1.2. How much of the variance in CEO compensation can be explained by its relationship to the human capital (HCE) component of IC?

SQ 1.3. How much of the variance in CEO compensation can be explained by its relationship to the structural capital (SCE) component of IC?

SQ 1.4. How much of the variance in CEO compensation can be explained by its relationship to the intellectual capital efficiency (ICE) component of IC?

SQ 1.5. How much of the variance in CEO compensation can be explained by its relationship to the physical and financial capital employed efficiency (CEE) component of IC?

The hypotheses arising from these research questions are as follows:

$H_0$1.0. There is no statistically significant relationship between CEO compensation, IC, and its subcomponents.

$H_0$1.1. There is no statistically significant relationship between CEO compensation and IC.

$H_0$1.2. There is no statistically significant relationship between CEO compensation and HCE.

$H_0$1.3. There is no statistically significant relationship between CEO compensation and SCE.

$H_0$1.4. There is no statistically significant relationship between CEO compensation and ICE.

$H_0$1.5. There is no statistically significant relationship between CEO compensation and CEE.

Significance of the Study

This study on CEO compensation and IC provides scholars and practitioners four potential benefits that are significant to the field of organization and management. First, this research extends the theory and development of the VAIC model for performance measurement. Second, by examining the relationship between CEO compensation and IC, this research provides a new dimension for the use of IC measures. Furthermore, this research is designed to elicit interdependencies between CEO compensation and IC not previously examined for new insights into the growth in CEO compensation. The results of this study should assist board directors, compensation committees, shareholders, and others in understanding how the CEO's management of IC is linked to their remuneration. This study is the first of its kind to examine CEO compensation and its relationship to IC as an emerging measure of organization performance in the era of the knowledge economy.

Definition of Terms

Intellectual capital. Intellectual capital (IC) represents human, structural, and physical and financial capitals that combine to create value in the firm (Pulić, 1998).

Traditional accounting. Traditional accounting refers to financial reports based on Generally Accepted Accounting Principles (GAAP). GAAP is a framework of standardized procedures for accrual-based financial reporting (Weygandt & Warfield, 2011).

Accounting measures. Accounting measures represent financial ratios and similar data derived from traditional accounting reports prepared using GAAP.

Chief executive officer (CEO). This research focuses on the principal executive officer (PEO) or CEO as the organization's primary decision maker. Included in this operational definition are a variety of titles such as president, CEO-president, CEO-board chair, and similar titles for the organization's primary decision maker (Bhatia, 2010).

CEO compensation or CEO Pay. CEO pay is the value of the principal executive's compensation package. It typically consists of a base salary, annual bonus, incentives (i.e., equity, stock options, etc.), special benefits, (i.e., perks, life insurance, corporate jets, etc.) and a retirement scheme as disclosed in the company's annual filings with the U.S. Securities and Exchange Commission (SEC). The entire CEO pay package will be referred to as CEO compensation, CEO pay, or total CEO compensation in this study. In addition, "the terms executive compensation and CEO compensation are used interchangeably in the current body of literature, and this approach is maintained in this" study (James, 2014, p. 46).

Knowledge economy. The term *knowledge economy* refers the increasing role knowledge and technology play in economic growth (OECD, 1996). This concept was highlighted in Machlup's (1962) seminal work "*The production and distribution of knowledge in the United States*" where he noted that knowledge embodied in human capital is a resource that is instrumental in all economic gains.

Total employee compensation. Total employee compensation is the value of all compensation such a base salary, annual bonus, short-term and long-term incentives (i.e., equity, stock options, etc.), special benefits, (i.e., perks, life insurance, corporate jets, etc.) and a retirement scheme as reported in the company's annual financial statements and SEC filings.

Public company. An entity is a public company if it has filed with a regulatory agency to sell and trade its equity securities in a public market such as the NASDAQ Exchange in the United States (ASU, 2013). As an example, companies that have publically-traded debt instruments but no publically-traded equity securities are nonpublic companies.

Assumptions and Limitations

This study relies on several assumptions and limitations about the VAIC model and the reliability of the secondary data for analysis. The VAIC model is an alternative method for assessing performance in an economy where firm resources are largely intangible. The use of the VAIC model in this study assumes it is a relevant measure of organizational performance for assessing CEO compensation.

The data collected for use in the VAIC model will be drawn from publicly available filings made to the U.S. Securities and Exchange Commission (SEC). All companies listed on the NASDAQ Exchange are subject to SEC filing requirements as for-profit, publicly-traded enterprises. The financial data they file is self-reported to the SEC after being audited by independent Certified Public Accountants. The SEC data is available to the public through their website and financial databases such as Yahoo

Finance, Compustat and others. The focus on for-profit, publicly-traded firms in this study could limit the transferability of findings beyond this population. The use of secondary financial data in this study is a further limitation due to its dependence on the quality, consistency, completeness, and integrity of company reports filed with the SEC. Despite efforts to file accurate and reliable information with the SEC, these reports can include inaccuracies, errors, and periodically fraudulent information. These aspects of the secondary data for this study are beyond the control of this researcher and the study's design. Thus, this study assumes the financial reports and CEO compensation data included in this study do not contain material inaccuracies.

CEO compensation is established through a voluntary, yet mutually beneficial negotiation with the board of directors and their compensation committee. The nature of this process is multidimensional, confidential, and inherently complex. As a result, this study is limited by the fact that much of the data for setting CEO compensation is not available, is unobservable, or both. Furthermore, this study is limited by its focus on IC and its subcomponents to the exclusion of other influences on CEO compensation.

CEO compensation packages often consist of various tangible and intangible benefits. These can include certain tax benefits, perquisites, status, power, prestige, and many more. This study has limited its scope to total CEO compensation and total employee compensation as presented in the firm's SEC filings. In addition, this study is further limited by its concentration on total CEO compensation rather than the variety of individual components of the compensation package (e.g., stock options, equity, retirement pay, performance bonuses, etc.).

The individual components that make up CEO compensation involve numerous estimates and judgments for the quantification and presentation in the firm's financial reports and SEC filings. For instance, the reporting of compensation from stock options involves several assumptions and the selection of a valuation method such as the Black-Scholes model to place a value on this form of compensation. It is beyond the scope of this study to assess management's choice of specific compensation components, their assumptions for valuing them, and the valuation methods used. Also, this study is limited by the assumption that these methods have been applied consistently among individual companies in the sample and over the time frame examined in this study.

This study assumes that CEO compensation is lagged by one year. A lag reflects the practice of setting CEO compensation based on previous organization performance and results achieved (Milidonis & Stathopoulos, 2014; Pepper & Gore, 2012). At times, CEO compensation is affected by long-term incentive plans or performance arrangements. This study is limited by its assumption that a one-year lag between the firm's performance and CEO compensation is sufficient for examining the relationship between IC and CEO compensation. For example, the data in this study for IC and its subcomponents will cover the years 2009 to 2013 and be matched to the lagged data on CEO compensation from the years 2010 to 2014.

Nature of the Study

This quantitative study will examine the relationship between CEO compensation and organization performance. The relationship between these constructs was analyzed using secondary data from a random sample of public companies. A probabilistic random sampling strategy was used to eliminate bias in the selection process while increasing external validity (Vogt, 2007). The organization performance construct was operationalized through IC and its subcomponents as independent variables based on the VAIC model. The dependent variable, CEO compensation, was operationalized using total CEO compensation from all sources according to SEC disclosure requirements under the Code of Federal Regulations, Subpart 229, Section 229.402 (Executive Compensation, 2000). The numeric nature of these variables lends themselves to a non-experimental quantitative research design.

The quantitative research design for this study is aligned with the objectivist philosophy and positivist perspective. Together, these paradigms draw from the scientific method that assumes reality can be objectively measured (Crotty, 1998). The use of a random sample of existing data from audited financial statements for this study contributes to scientific objectivity; however, it is the lack of researcher intervention in this study that characterizes it as non-experimental (Cooper & Schindler, 2011; Vogt, 2007). A non-experimental approach, according to Holton, III and Burnett (2005), is common in quantitative research due to the difficulty of observing and measuring phenomenon of interest in organizational settings.

The private negotiations and internal factors used by corporate boards to set CEO compensation are an unobservable phenomenon. For insight into these decisions, research on CEO pay and organization performance (CEO pay-performance) has drawn from several theoretical domains. At the center of this research, as depicted in Figure 1, is *agency theory*.

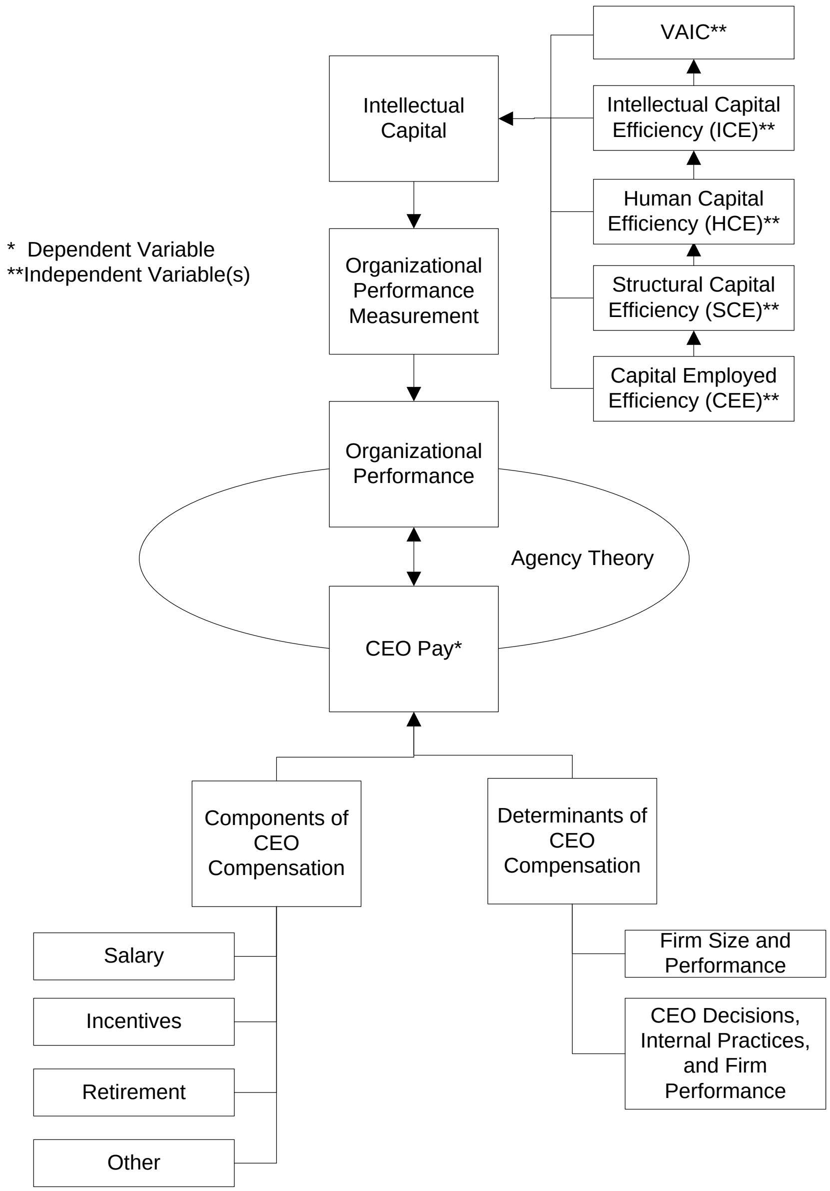

Figure 1. CEO pay-performance conceptual and theoretical framework.

.

Agency theory attempts to explain CEO behavior in the agent-principal relationship. The agent-principal model suggests CEO behavior is influenced by divergent interests and differing aversions to risk. According to Eisenhardt (1989), agent-principal interests can be aligned through two primary techniques. The first is the compensation and incentive arrangement. These arrangements are designed to align agent-principal interests by rewarding agents for organization performance. The second is monitoring of agents through governance procedures. Monitoring often includes approval of important decisions and performance assessment. Both of these techniques are embedded in the CEO's exchange of services for tangible and intangible benefits under their employment contract.

Agency theory has been the theoretical rational for extensive analysis of the CEO pay-performance relationship (Gomez-Mejia, Berrone, & Franco-Santos, 2010). This quantitative study extends this line of research by using IC as a measure of organizational performance to assess CEO compensation. In so doing, this study addresses recommendations for further research into the rise in CEO compensation (Attaway, 2000; Frydman & Saks, 2010) and fills a gap in the literature by examining the relationship between CEO compensation and IC.

Organization of the Remainder of the Study

The remainder of this research includes four chapters. Chapter 2, Literature Review, provides a detailed review of contemporary literature on CEO compensation and organization performance. Chapter 3, Methodology, provides a detailed discussion of the quantitative study design, sampling procedures, measurements, data collection methods, data analysis, and ethical considerations. Chapter 4, Results, presents the data and analysis of the study's findings. Chapter 5, Discussion, Implications, and Recommendations, presents an interpretation of the results, implications of the findings, and suggestions for future research.

CHAPTER 2. LITERATURE REVIEW

Introduction

CEO compensation and organizational performance research is a source of enduring interest for scholars and practitioners. Contemporary interest reflects increased scrutiny of high CEO pay in the media and by regulators. In 2014, for instance, the average S&P 500 CEO earned $13.5 million or 373 times the $36,000 paid to an average nonsupervisory, production worker (Quinnell, 2015). With CEO pay at record levels, researchers continue to delve into the factors behind this phenomenon. The diverse factors influencing CEO pay and organization performance have contributed to literature that spans conceptual, theoretical, and empirical research. This chapter reviews this literature beginning with agency theory followed by sections on organization performance measurement, the determinants of CEO compensation, the components of CEO compensation, and a chapter summary.

Agency Theory

The modern corporation became a means for amassing capital and spreading risk across atomistic shareholders (Berle & Means, 1932). Its rise led to new theories of governance to address perceived shortcomings in previous economic theories. Agency theory extended the focus beyond quantifying pay from marginal productivity and profit maximization under economic theories to consider CEO behavior in the modern corporation. In this regard, the modern corporation is led by professional managers whose interests may diverge from those of owner-shareholders.

Agency theory assumes that self-serving executives can be controlled through monitoring and incentive compensation. According to Johl, Bruce, and Binks (2013), both are necessary to reduce *agency costs*. Agency costs stem from moral hazard and the potential for divergent interests. *Moral hazard* exists when the owner-principal cannot detect effort or observe behavior of agent-managers (Eisenhardt, 1989). Moral hazard arises from the agent-manager's broad discretion, their superior access to internal information, and the disperse ownership in modern corporations (Tosi & Gomez-Mejia, 1989). Divergent interests occur when agents use their position to increase personal utility at the expense of the owner-principal. Given these aspects of the agent-principal relationship, agency costs represent a trade-off for the advantages of the modern corporation.

Monitoring and incentive mechanisms, according to Fama (1980) and Fama and Jensen (1983), are important for controlling agency costs. These seminal works from the 1980's consider the agent-principal relationship to be a nexus of written and unwritten contracts. Embedded in these relationships is a hierarchy of *internal decision controls* that constrains agent freedoms. According to Fama and Jensen (1983), this represents a four-stage hierarchy of controls consisting of (a) initiation, (b) ratification, (c) implementation, and (d) performance measurement.

In the initiation stage, agent-managers assess the firm's resources and environment for threats and opportunities. Ideas from this stage result in plans to advance the firm using available resources. If the plan is aligned with the interests of principals, it is ratified in Stage 2 by an independent group such as the board of directors. Stage 3 is implementation of the ratified plan by agent-managers. In the fourth stage, principals or their representatives assess performance for rewarding agent-managers. Thus, agency theory relies on this internal decision control structure to reduce agency costs by constraining agent-manager freedoms.

In contrast to the internal focus of decision controls, the efficient market hypothesis (EMH) describes several external mechanisms for constraining agent-manager behavior. EMH begins with the assumption that agent-managers care about their personal network and reputation in the market place (Kim, Kogut, & Yang, 2015; Ozkan, 2011). Reputational capital accumulates when a CEO's compensation and organization performance are positively perceived in the market. Thus, a CEO's regard for her personal reputation acts as a disciplinary force to reduce agency costs and control agent-manager behavior (Gomez-Mejia et al., 2010).

Although monitoring and decision controls can reduce agency costs, they are not perfect. The literature on agency theory contains a variety of studies exposing vulnerabilities in these governance mechanisms. Among these are research on CEO influence over accounting decisions, M&A activities, and risk aversion. With accounting decisions, for example, CEOs are closely involved in setting and approving accounting policies that can affect both firm performance and their compensation (Olsen, Dworkis,

& Young, 2014). With the majority of CEO compensation packages tied to traditional accounting-based performance measures, these decisions can determine how and when data are presented in the firm's financial reports (Shalev, Zhang, & Zhang, 2013).

Managerial prerogative in accounting policy decisions is bounded by industry practices. Nevertheless, the choice of accounting policy is based on the judgment of CEOs and their decision(s) will impact firm performance–either positively or negatively. The literature in this area of agency theory has found CEOs have divergent interests and a tendency to choose accounting policies that benefit their remuneration (Healy, 1985). This CEO predilection has been found in empirical research on accounting for depreciation and amortization (Astami & Tower, 2006; Jackson, 2008), inventory costing (Astami & Tower, 2006; Dyl, 1989), accruals (Olsen et al, 2014), and goodwill (Shalev et al., 2013).

Research on goodwill has provided a unique venue for examining CEO accounting decisions and divergent interests. Under fair value accounting for acquisitions, the purchase price is allocated to identifiable tangible and intangible assets (Weygandt & Warfield, 2011). Any unassigned portion of the purchase price is deemed goodwill. The benefit of studying fair value accounting is that it provides observable data on CEO accounting decisions that are highly subjective. As Shalev et al. (2013) found in a study of 269 acquisition deals, the data on fair value accounting provides insight into CEO decisions and their affect on the firm performance and CEO bonuses.

According to Shalev et al. (2013), the portion of the purchase price treated as goodwill, unlike identifiable tangible and intangible assets, is subject to periodic impairment analysis rather than recurring amortization. Assuming no impairment of goodwill, a greater amount of goodwill increases accounting profits by avoiding recurring amortization. The study by Shalev et al. (2013) found CEOs tended to make accounting policy decisions that increased goodwill, accounting profits, and their bonus compensation.

Goodwill typically comes about through mergers and acquisitions. The rise of mergers and acquisitions (M&A) can be explained, in part, by a desire for higher pay and less employment risk under agency theory (Amihud & Lev, 1981). The desire for higher pay among CEOs dovetails with research on firm size that suggests CEOs expand the firm to justify more compensation (Jensen & Murphy, 1990; McGuire, Chiu, & Elbing, 1962; Murphy, 1999). Employment risk, which is an inherent part of the agent-principal relationship, also explains why CEOs expand beyond the firm's optimal size (Amihud & Lev, 1981; Jensen 1986). Although risk-adverse CEOs can be incentivized to take on risk to enhance firm performance, much of the literature on CEO compensation and M&A suggests their motives are increased pay (Datta, Iskandar−Datta, & Raman, 2004; Rosen, 2004) and mitigation of employment risk (Guest, 2009).

Guest (2009), for instance, found evidence among 4,528 M&A deals that good and bad acquisitions led to increased pay for CEOs. Guest's (2009) data covered 1984 to 2001 and showed that CEOs receiving the largest awards for acquisitions, mostly likely one-off bonuses for completing the acquisition, had an increased the likelihood of future acquisitions. In wealth-destroying acquisitions, Guest (2009) noted that increased CEO pay was more than offset by a decrease in the value of the CEO holdings. Guest's (2009) work is consistent with earlier studies by Bliss and Rosen (2001) and Grinstein and Hribar (2004). Nevertheless, because CEOs have the ability to earn rewards for decisions that decrease shareholder value, this research signals two concerns under agency theory. First, diffuse shareholders are unable to detect non-value adding decisions by agent-CEOs to increase compensation and mitigate employment risk through M&A activity (Guest, 2009; Morck, Shleifer, & Vishny, 1990). This is a moral hazard associated with M&A and, secondly, the research shows CEOs are motivated primarily by higher pay, even if it negatively impacts the value of the firm (Datta et al., 2004; Guest, 2009; Rosen, 2004).

Although increased CEO compensation seems to be the only constant in M&A deals, Rosen (2004) provides evidence that CEOs have a greater increase in compensation when their acquisitions improve stock returns. In addition, Herd and McManus (2012) cast doubt on the idea that acquisitions destroy value while bolstering CEO compensation. The results from their study of the 500 largest M&A deals between 2002 and 2009 showed managers are getting better at executing M&A deals and producing value for shareholders. Despite the criticism of M&A as a means to higher CEO compensation, Herd and McManus (2012) found that management teams can produce substantial value through acquisitions in a range of industries at virtually any point in the economic cycle.

While the findings in Rosen (2004) and Herd and McManus (2012) are promising, they represent only a small portion of the agency literature on M&A activity. Until this research is extended to counter widely-held beliefs that M&A decisions are motivated by increased CEO pay, this area of the literature is firmly anchored in support of agency costs such as moral hazard, increased CEO compensation, and efforts to limit employment risk.

M&A decisions are usually part of a strategic plan developed by the firm's senior executives to optimize firm resources and performance (Hambrick, Werder, & Zajac, 2008). CEOs, as the ultimate decision-makers, set the extent of risk and timeframe for achieving the firm's strategic ambitions. The literature in this area of agency theory has examined CEO compensation and firm performance along these dimensions—risk and time.

Business risk is uncertainty surrounding events or outcomes that may cause variability in the firm's future cash flows (Bloom & Milkovich, 1998). For CEOs, risk is the perceived loss of personal wealth (Larraza−Kintana, Wiseman, Gomez−Mejia, & Welbourne, 2007). When taken together, greater business risk may impose higher personal risk on agent-CEOs. This includes not only the CEO's potential loss of personal wealth but future employment, career options, and reputation.

Agency theory assumes CEOs are risk-adverse agents (Jensen & Meckling, 1976). To induce risk-taking, incentive pay is used to align principal-agent interests and encourage agent-CEOs to take risks that enhance firm performance (Jensen & Murphy, 1990). This view of agency treats all CEOs and their risk-taking uniformly. Research into behavioral aspects of agency theory, however, suggests risk-taking among CEOs can be influenced by incentive pay and risk preferences (Bloom & Milkovich, 1998). For example, Gormley, Matsa, and Milbourn (2013) found the relationship between incentives and risk-taking to be a nonlinear, convex relationship. Their research shows CEO risk-taking rises with the initial issuance of stock option incentives. As more options are issued, risk-taking rises at a slower pace before flattening and subsequently falling off. Thus, the convex relationship between incentives and risk-taking shows they are effective up to a point. After that, CEOs move to protect their compensation and personal wealth rather than taking risks to optimize firm performance. Similar results were found in studies by Lambert, Larcker, and Verrecchia (1991), Ross (2004), and Armstrong and Vashishtha (2012).

CEO turnover in 2014 was the highest since the 2008 recession (Challenger & Gray, Inc., 2014). High turnover among CEOs can influence the time horizon for risk-taking decisions. At the same time, longer-term horizons have a greater potential for events that are unforeseen and uncontrollable by the CEO (Murphy, 1986). The literature on agency theory and risk shows that CEOs become increasingly risk-adverse later in their career. In related research by Serfling (2014), he found that CEOs not only take fewer risks as they age but are increasingly unlikely to take risks that produce benefits beyond their tenure. In Serfling's (2014) study, he examined risk-taking and CEO age using a sample of 4,493 CEOs covering nineteen years and 2,356 unique firms. Risk in this study was quantified using R&D expenditures, operating leverage, financial leverage, and business diversification. The evidence showed incentive pay for younger CEOs (ages 29 to 52) encouraged risk-taking to enhance firm performance. Older CEOs, in contrast, tended to diversify their businesses to reduce risk and were less likely to invest in R&D. Decisions to limit R&D provide two messages about CEO risk-taking and time horizons.

First, limiting R&D avoids any short-term drag on earnings for CEOs that seek stable pay. Second, it indicates older CEOs are unwilling to make investments that will produce benefits beyond their tenure. Overall, these results show CEO age affects risk-taking and, ultimately, the firm's performance.

Research on CEO risk-taking, influence over accounting decisions, and M&A has shown how agency-based decision controls, monitoring and incentive programs can be undermined. This is due, in part, to internal information about the firm that is controlled by the CEO. With this control, CEOs can maintain an informational advantage over decision controls, monitoring, and bargaining for compensation. Under agency theory, the superior access and control of privileged information is referred to as asymmetric information. The presence of information asymmetries has contributed to the Sarbanes-Oxley Act (SOX) for stronger corporate governance and added disclosure for greater transparency (Hermalin & Weisbach, 2012). Added transparency, however, can introduce increased scrutiny of the CEO and organizational performance. According to Hermalin and Weisbach (2012), CEOs will expect higher pay in exchange for increased scrutiny and employment risks. Nevertheless, this research suggests that firms with reduced asymmetry have greater value through a lower cost of capital and increased marketability of their securities.

In the modern corporation, asymmetric information is to be expected with the separation of control and ownership. An unanticipated consequence, however, is the tremendous advantage asymmetric information gives agent-CEOs over today's atomistic shareholders (Berle & Means, 1932). The Dodd-Frank Act represents recent legislation to strengthen shareholder rights through votes on CEO compensation and expanded disclosure of factors designed to link CEO pay and organization performance. This legislation reinforces the enduring nature of agency theory while strengthening its primary mechanisms for monitoring and incentivizing CEOs. As a result, agency theory has become an overarching framework for examining the CEO pay-performance relationship.

Organization Performance Measurement

The CEO pay-performance relationship relies on organizational performance measures that fit the firm's needs and circumstances. At heart of the literature on organizational performance measurement is relevancy. Relevant measures focus on what is important to stakeholders as well as resources that drive organizational performance. This section discusses these concepts through a review of the literature on the RBV of the firm, contingency and stakeholder theories. These theories provide a conceptual background for reviewing literature on IC and the Value Added Intellectual Coefficient (VAIC). IC has become a strategic resource in many organizations and the VAIC is a model to assess IC for organization performance.

Resource-Based View of the Firm

Penrose's inspiration in 1959 that the firm is a collection of productive resources laid the foundation for the RBV of the firm (Penrose & Pitelis, 2009). According to this theoretical view, firms can achieve a competitive advantage when they deploy resources to exploit internal strengths and neutralize weaknesses in their external environment (Barney, 1991). Firm resources under RBV are defined as physical, human, and organizational capital. Physical capital refers to equipment, raw materials, and other tangible assets of the firm. Human capital consists of the firm's collective experience, training, intelligence, and the insights of its employees. The firm's reporting structure, controls, systems, and relationships among groups tied to the firm represents organizational capital. When firm resources are considered valuable and rare, it can provide a sustainable competitive advantage (Barney, 1991).

Resources are only "valuable when they enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness" (Barney, 1991, p. 106). A resource is considered valuable and rare as long as it is possessed by only a few competitors. At times, a single resource is ineffective and a bundle of physical, human, and organization capital is necessary to implement a strategy for a sustainable competitive advantage. In either case, a firm's resources or resource bundle allows them to conceive and implement strategies that others cannot. This occurs because current or potential competitors lack comparable resources with the ability to conceive similar strategies, implement them, or both (Barney, 1991). Often the success of the firm's strategy hinges on the talent of the CEO to harness the firm's human capital for implementation.

Although firm resources can be diverse, it is RBV's emphasis on management talent and human capital that is important for CEO pay-performance research. According to Barney (1991), firms are social entities that are made up of complex social phenomena. These phenomena can represent relationships between key members of the firm, its reputation with customers, suppliers, or an organizational culture that provides a competitive advantage. For instance, innovative employees or an experienced management team may be rare; however, the difficulty competitors' face in replicating these can make them valuable. When human capital is combined with physical equipment or technology, it can be highly valuable and rare due to the increasing difficulty of replication. This combination of resources often makes a firm more valuable than their book value and has been labeled *intellectual capital (IC).*

Contingency Theory

The strategic significance of IC is pushing managers to find new ways to measure and develop firm resources using contingency theory. This theory assumes environmental factors influence changes to the firm's internal structure and performance measures. These factors drive firms to find performance measures that can be adapted to fit the firm's external and internal environments. Thus, the firm's performance measures reflect its reaction to the environment (Valančienė & Gimžauskienė, 2008). Contracting with agents, such as the firm's CEO, in any environment involves the delegation of responsibility as well as mechanisms for monitoring behavior and organization performance (Eisenhardt, 1989; Jensen & Meckling, 1976; Tosi, Werner, Katz, & Gomez-Mejia, 2000). The nature of CEO employment contracts under agency theory plays a role in the firm's choice of strategy and related organizational performance measures. The performance goals in employment contracts often become variables used to measure, monitor, and reward CEOs for organization performance. In this regard, the focus on performance measurement is control (Taticchi, Tonelli, & Cagnazzo, 2010) whether the measures are financial or nonfinancial such as quality or client satisfaction

(Zuriekat, Salameh, & Alrawashdeh, 2011). Control is exercised by assessing performance against expectations drawn from the CEO's contract, firm strategy, or other sources. Together, these measures and controls produce knowledge of the organization's strengths, weaknesses, opportunities, and threats within its environment. This knowledge shapes organizational behavior and the selection of performance measures so that resources are effectively deployed for competitive advantage.

Stakeholder Theory

Through the lens of stakeholder theory, organizations consider performance as creating value for stakeholders (Harrison & Wicks, 2012). This expanded view of firm performance includes shareholders, clients, employees, suppliers, government entities, and others. By focusing on value, this theory extends beyond traditional financial metrics to measures of stakeholder value (Harrison & Wicks, 2012). The notion of value and the stakeholders entitled to it is heavily debated (Harrison & Wicks, 2012; Parmar, Freeman, Harrison, Wicks, Purnell, & de Colle, 2010).

At the center of this debate are two questions about the role of management in creating value. The first question is whether management should focus solely on creating value for shareholders. The second question asks if it is possible for managers to satisfy the diverse needs of all stakeholders. Supporters of stakeholder theory believe managers can and should strive to satisfy all stakeholders, not just shareholders (Jensen, 2002). They believe stretching managers in this way can lead to insights that create value for stakeholders and society (Harrison & Wicks, 2012). In contrast, opponents believe it is impractical to suggest that managers can effectively serve all stakeholders (Jensen, 2002).

Furthermore, they believe the greatest benefit managers can provide to shareholders is maximization of the firm's long-term value. Increasing the firm's long-term value, according to opponents of stakeholder theory, should also maximize the benefits to society (Jensen, 2002). In spite of this debate, most researchers agree that economic performance measures cannot completely capture the firm's success factors, nor can they fully explain how value creation binds stakeholders to the firm (Parmar et al., 2010). Underlying the concept of value is the assumption that a firm creates it by making stakeholders feel better off over time; thereby, ensuring continuing participation in a cooperative network of stakeholders (Harrison & Wicks, 2012). This approach to organizational performance measurement "challenges managers to examine more broadly the value their firms are creating from the perspective of the stakeholders who are involved in creating it" (Harrison & Wicks, 2012, p. 98).

By emphasizing new perspectives on organizational performance measurement, stakeholder theory has caused managers to look at their resources differently. As a result, stakeholder theory, the RBV of the firm, and contingency theory have contributed to the perception that IC is an essential resource to measure and manage.

Intellectual Capital

With the rise of the knowledge economy, IC has become a strategic asset for competitive advantage (Nazari & Herremans, 2007). This resource-based view has been substantiated by several large-scale econometric studies of public companies (Marr, Gray, & Neely, 2003). At the same time, "managers need tools that help organisations in defining key performance indicators for those knowledge assets that are underpinning the strategic key capabilities of the organisation" (Marr, Schiuma, & Neely, 2004, p. 552). Therefore, interest in IC as a strategic resource continues to grow (Ordóñez de Pablos, 2002) along with the need for a systematic measurement tool (Marr, et al., 2003). To meet this need, many managers and scholars have adopted the VAIC model. The discussion that follows reviews the literature surrounding IC and the VAIC model beginning with a conceptual definition of IC and its subcomponents.

IC and subcomponents. "Intellectual capital is the sum of the 'hidden' assets of the company not fully captured on the balance sheet, and thus includes both what is in the heads of organizational members, and what is left in the company when they leave" (Roos & Roos, 1997, p. 415). Specifically, this definition emphasizes creating value from knowledge rooted in a firm's personnel, processes, and network of organizational relationships (Bontis, 1996; Kong, 2008; Kong & Thomson, 2009; Stewart, 1997). In an effort to disentangle IC drivers, it has been broken down and categorized into subcomponents.

The most common subcomponents of IC are human capital, structural capital, and customer relationship capital (Javornik, Tekavcic, & Marc, 2012; Mehralian, Rasekh, Reza, Akhavan, Peyman, & Farzandy, 2012; Ordóñez de Pablos, 2002). *Human capital* belongs to employees such as innovations and learning (Pulić, 2004). This perspective on human capital is consistent with theory on the RBV of the firm (e.g., see Barney, 1991; Becker, 1962; Penrose & Pitelis, 2009; Schultz, 1961). Knowledge sharing platforms and similar intangibles owned by the firm are the architecture for knowledge transfer labeled *structural capital* (Cabrita & Bontis, 2008; Edvinsson & Sullivan, 1996). *Customer* *relationship capital* is the connection of the firm with its suppliers, customers, and other stakeholders (Bontis, 1996). These subcomponents have become core elements of several competing models for IC measurement and management.

Competing IC models. Traditional accounting systems measure value created from tangible assets (Marr et al., 2003; Mention, 2012). Yet, some of the largest companies today derive substantial value from intangible assets. Google and Microsoft, for example, sell knowledge-based products that are entirely digital. In an effort to measure and manage resources not completely captured by traditional accounting systems, numerous IC models have been developed. The emergence of these models reflects the desire to systematically manage IC given the limitations of traditional systems to measure it (Firer & Stainbank, 2003; Marr et al., 2004). To date, 42 IC models have been developed (Sveiby, 2010). Sveiby (2010) distinguished IC models by their design and categorized them into one of four groups.

The first group noted by Sveiby (2010), *direct intellectual capital models (DIC)*, quantifies IC as the value of identifiable subcomponents. By summing the components, DIC models permit analysis of IC at the organizational or subcomponent level. The second group involves *market capitalization models (MCM).* For MCMs, the difference between the company's market capitalization and the book value of stockholders' equity represents IC. *Return on assets models (ROA)*, the third group, treats the excess returns above the industry average ROA on tangible assets as IC. ROA models estimate the value of IC by dividing the company's excess returns by its average cost of capital or an interest rate. The last group consists of *scorecard models*. Models using this approach identify sources of intellectual capital and techniques for tracking them. All results are quantified for scorecard analysis. Scorecard models, unlike the other models, do not try to place a dollar value on IC or its components. MCMs and ROA models emphasize the value of organizational IC while DIC models value both subcomponent and organizational level IC.

Among Sveiby's (2010) groupings are four IC models that are consistently noted in the literature. According to Marr et al. (2004), they are the *IC Audit*, the *Intangible Asset Monitor*, the *IC-Index*, and the *Skandia Navigator*. The IC Audit (Brooking, 1996) is a DIC design that calculates an organizational value of IC. This value is derived from IC components identified as market assets, human-centered assets, intellectual property assets and infrastructure assets, human capital, customer capital, process capital and innovation capital. The significance of these assets are determined from a questionnaire that guides management to one of three methods for valuing IC—a replacement cost approach, a market-value approach, or an income-based approach.

The Intangible Asset Monitor (Sveiby, 1997) is a scorecard design focused on indicators for internal intangibles, external intangibles, and employee competence to measure IC. The Intangible Asset Monitor prefers labeling items as intangible assets rather than IC as used in other models.

The IC-Index (Roos, Roos, Dragonetti, & Edvinsson, 1997) adopts a scorecard design for an organizational level measure of IC. The index is compiled from several components that represent aggregate measures of human and structural capital. The IC-Index includes measures of relational capital (i.e., relationship with key customers, suppliers, etc.) within its concept of structural capital. In addition, this model encourages management to identify, rank, and assign weights to the most important component measures of IC.

The last of the four models is the Skandia Navigator (Edvinsson & Malone, 1997). This model offers a scorecard design similar to the Balanced Scorecard (Kaplan & Norton, 1992, 1996) technique that is popular among consultant-practitioners. The Skandia Navigator separates financial capital from IC. In turn, IC is measured at the component level based on human and structural capital. Structural capital is further broken down into customer capital, process capital, and innovation capital, As Sveiby's (2010) groupings show, there is no generally accepted method for measuring IC. The majority of these models offer flexible frameworks, an array of components to consider, and broad guidelines for customizing them to the individual firm. On one hand, this underscores how unique IC resources and their measurement are to each firm (Barney, 1991; Roos & Roos, 1997). On the other hand, a customized model results in a proprietary dataset that, with some models, is derived from subjective assessments of IC components (Firer & Stainbank, 2003). As a result, many IC models and their data are not subject to empirical analysis for consensus building.

Value added intellectual coefficient (VAIC) model. According to Chan (2009), the VAIC model is a fifth approach to IC whose design doesn't squarely fit into Sveiby's (2010) groupings. Given the multidimensional nature of IC, a number of models in Sveiby's (2010) groupings have been criticized for complicated data collection processes, subjective assessments, or both (Laing et al., 2010; Williams, 2001). The VAIC model, in contrast, avoids these issues by using data from publicly available, audited financial statements to compute measures of IC. This approach provides data that are objective and verifiable (Pulić, 1998). The VAIC methodology also produces measures of IC that are consistent, comparable, and replicable (Kujansivu & Lönnqvist, 2007; Firer & Stainbank, 2003). The VAIC model achieves these results from an aggregate measure of IC based on three subcomponents—human capital efficiency, structural capital efficiency, and capital employed efficiency. Each of these components is computed from the VAIC model's definition of *value added*. The discussion that follows explains the key assumptions and formulas for value added, the VAIC and each of its subcomponents.

Value added (VA). The VAIC methodology assumes value is added when the value of outputs exceeds input costs. An alternative interpretation "is the wealth created or distributed by the company through the utilisation of its essential productive resources" (Firer & Stainbank, 2003, p. 28) .The VAIC model expresses the creation of wealth through the concept of value added as follows:

$$\textit{Value Added (VA)} = \textit{Operating profit (OPS)} + \textit{Total employee compensation costs (HC)} + \textit{Depreciation \& Amortization (D)} \quad (1)$$

An important concept underlying the VAIC model is its definition of value added. Under the VAIC methodology, all employee costs are added back to compute VA. Total employee costs (HC) represents wages, salaries, incentives, benefits, and other amounts earned by employees. The VAIC model views these amounts as an investment in human capital rather than a cost to the business (Pulić, 1998). While the VAIC approach provides an objective measure of value added (Pulić, 1998), this treatment differs from traditional accounting where these amounts are categorized as an expense on the firm's income statement.

Human capital efficiency (HCE). According to the VAIC model, the outlays for employee costs are referred to as human capital (HC) or the firm's investment in HC. The ability of investments in HC to produce VA is expressed as:

$$HCE = VA / HC \quad (2)$$

This portion of the VAIC methodology indicates the amount of VA created for each dollar of HC invested. HCE reflects the VAIC assumption that employees have knowledge, experience, skills, and other intangibles that produce value. Measuring HCE allows organizations to focus on employees and the importance of cultivating their tacit knowledge for value creation (Mavridis & Kyrmizoglou, 2005). In this regard, HC is an intangible resource available to the firm but owned exclusively by employees (Fathi, Farahmand, & Khorasani, 2013). According to Baker (2008), this is an economic perspective on human capital as a productive resource that departs from traditional accounting.

Structural capital efficiency (SCE). "Structural capital allows the human capital to be all that it can be" (Edvinsson & Sullivan, 1996, p. 360). Structural capital, for example, represents knowledge sharing platforms and similar intangibles that are part of the architecture to transfer and leverage human capital (Cabrita & Bontis, 2008; Edvinsson & Sullivan, 1996; Pulić & Kolakovic, 2003). The structural capital efficiency component of the VAIC methodology is expressed as the relationship of structural capital to VA. In this context, structural capital is VA less HC.

Structural capital efficiency (SCE) = (VA – HC) / VA (3)

SCE measures how structural capital adds value. It can be interpreted as the residual value added after removing HC. This relationship suggests less structural capital is necessary as HC increases and vise versa. This phenomenon, according to Pulić (2000), is especially true in the pharmaceutical and software industries where value added from HC is high and the value added from structural capital is low. Overall, structural capital represents intangible resources owned by the firm or rather "everything that is left when people have gone at night" (Edvinsson & Malone, 1997, p. 11).

Intellectual capital efficiency (ICE). The firm's intellectual capital efficiency is the combination of the HC and SC efficiencies. It is expressed as the sum of HCE and SCE.

Intellectual capital efficiency (ICE) = HCE + SCE (4)

The VAIC methodology is designed to encompass the interplay between human and structural capital in the creation of intellectual capital through ICE.

Capital employed efficiency (CEE). The capital employed efficiency is an indicator of the value added from firm's physical and financial capital. It represents the value added for each dollar of capital employed. It is expressed as the relationship of VA to capital employed.

Capital employed efficiency (CEE) = VA / CE (5)

For purposes of this computation, capital employed (CE) is the net book value of the firm's assets. In financial statements, this is often referred to as total equity. By including a measure of physical and financial capital in the VAIC methodology, the portion of value added from these assets can be separately measured.

The VAIC. Due to the interdependent nature of IC and its subcomponents, the final step in the VAIC methodology is to bring the key components together. Combining these components recognizes their synergic nature. For example, CEE requires HCE to optimize its performance and add value. HC cannot be leveraged without SCE. Therefore, the key components are aggregated in the following expression:

$$VAIC = (HCE + SCE) + CEE \quad (6)$$

$$VAIC = ICE + CEE \quad (7)$$

The result of the VAIC expression is an organizational level indicator of IC. However, the format of this expression allows for organizational (i.e., the VAIC) and subcomponent monitoring of IC. Thus, VAIC measures of IC efficiency allow companies to be compared consistently at both organizational and subcomponent levels (Bornemann, 1999; Firer & Stainbank, 2003; Kujansivu & Lönnqvist, 2007). The impact of the VAIC and its subcomponents on IC as a measure of organization performance has been the subject of numerous empirical studies.

VAIC Research

The VAIC model has been described as "an analytical procedure that is designed to enable management, shareholders and other relevant stakeholders to effectively monitor and evaluate the efficiency of value added (VA) by a company's total resources and each major resource component" (Firer & Stainbank, 2003, p. 31). The VAIC model was first presented in a 1998 conference by Pulić as a resource-based view of the firm. In his presentation, he stressed the rise of IC, the shift away from physical assets as the primary driver of value creation, and the shortcomings of traditional accounting to capture IC. Pulić (1998) also presented various case studies to support his claims and the need for an objective measure of IC for organizational performance—the VAIC model. Since 1998, the VAIC model has been tested using a variety of statistical methods across a wide range of sample sizes and contexts. The discussion that follows reviews the literature surrounding the VAIC model.

Early studies testing the VAIC model found empirical support. Bornemann (1999) and Pulić (2000), for instance, linked the VAIC to financial performance and market value, respectively. Both studies used samples of European companies. Pulić's (2000) results were based on case studies. Bornemann's (1999) study used a convenience sample of 550 Austrian and Croatian firms covering the years 1992 to 1998. Firer and Stainbank (2003) found further evidence linking the VAIC to profitability for a 2001 cross-sectional sample of 65 knowledge-intensive firms listed on South Africa's Johannesburg Stock Exchange. Knowledge-intensive firms were identified for sample homogeneity and covered six industries ranging from financial services to health and social services. Collaborative research by Mavridis (2003) also linked the VAIC and firm profitability in a study of 17 Greek banks (i.e., financial services) from 1996 to 1999. These early studies expanded the awareness of IC and the VAIC method.

A great deal of the early VAIC research can be characterized by a number of limitations such as diverse contexts, narrow time frames, case studies, sampling techniques (e.g., convenience and judgmental, etc.), and small samples. Nevertheless, the early VAIC research triggered a wave of studies at differing levels of analysis. To date, the VAIC methodology has been applied to individual businesses, industries, and nations. Additionally, it has contributed to the debate on IC disclosure and a large number of studies using the VAIC method to rank firms by their IC performance.

The literature on IC disclosure reflects a running debate on how to define and standardize its measurement and presentation. At the individual business level, the debate has struggled with whether or not to disclose the firm's IC. Some businesses have embraced voluntary IC disclosure while others are reluctant for fear it will undermine their competitive position. Taking a stakeholder view of the firm, Williams (2001) examined IC disclosure using the VAIC model. This study analyzed VAIC results for IC and voluntary disclosure patterns for 31 companies listed on the FSTE 100 from 1996 to 2000. The findings failed to identify a relationship between the VAIC and voluntary IC disclosures; however, the influence of competitive threats was noted. Specifically, this study revealed an overall increase in voluntary IC disclosure during the study period, but found that firms tended to cease disclosure at higher levels of IC as measured by VAIC.

For research at national and industry levels, the VAIC model has been used as a ranking tool to investigate IC. This branch of the literature has studied a variety of regions and industries to assess their IC resources for global competitiveness. For instance, studies have been conducted ranking IC based on the VAIC for industries in Greece (Mavridis, 2003; Mavridis & Kyrmizoglou, 2005), Japan (Mavridis, 2004), Slovenia (Sitar & Vasic, 2004), Croatia (Pulić & Kolakovic, 2003), Australia (Laing et al., 2010), Poland (Sledzik, 2013), and more. This portion of the literature reflects the universal appeal of the VAIC method and its ease of application in diverse settings. Yet, there are two concerns about this research. First, it is dominated by regional data from emerging markets. This limits the transferability of these studies because they do not control for differences in economic systems, tax systems, culture, and other unique regional or industry factors (Javornik et al., 2012). Secondly, these studies concentrate on IC rankings rather the scientific merits of the VAIC model.

VAIC research, while still concentrated in emerging markets, has become increasingly empirical. Firer and Williams (2003), for example, performed a cross-sectional study of 75 South African public companies based on 2001 data. They examined the relationship between the VAIC and three traditional measures of organization performance such as profitability, productivity, and market value. Their correlation and multiple regression results produced mixed findings. The authors attributed these results to the South African context where businesses have yet to understand the potential of IC and instead focus on physical capital to create value.

Following Firer and Williams's (2003) approach were two replication studies of Taiwanese businesses. The study by Shiu (2006) examined 80 Taiwanese technology companies over the period 2000 to 2003. The findings showed increases in IC efficiency based on the VAIC model influenced profitability and market value. In another study by Chen, Cheng, and Yuchang (2005), they found IC based on the VAIC model positively impacts financial performance, market value, and the firm's future performance. This large scale study of nearly all firms listed on the Taiwanese Exchange from 1992 to 2002 represented 4,254 firm years. Beyond its scale, this study found strong associations between the VAIC, its subcomponents, and all variables. The relationship between the VAIC and profitability was also found to be much stronger than noted in previous research. Overall, the results from the work by Chen et al. (2005) demonstrated increased explanatory power of the VAIC model.

Previous research on Taiwanese firms was collaborated by further empirical tests of the VAIC model. Tan et al. (2007), for instance, analyzed 150 companies listed on the Singapore Exchange from 2000 to 2002 using the VAIC model for IC and partial least squares. Their results showed IC was positively correlated with traditional measures of firm performance and is a likely predictor of future performance. In addition, Javornik, et al. (2012) examined the relationship of VAIC and its subcomponents to the financial performance of 12,000 Slovenian companies. The aim of this study was to test both the link between the VAIC and its subcomponents to financial performance as well as its use as a leading indicator of future performance. This study covered a fourteen-year period (1995 to 2008) and found IC efficiency is both a driver of financial performance and a leading indicator. Similar evidence in support of the VAIC method can be found in studies by Makki and Lodhi (2008), Makki, Suleman, and Rohra (2009), Zéghal and Maaloul (2010), Chu et al. (2011), Chu, Chan, Yu, Ng, and Wong (2011), Vishnu and Gupta (2014) and Rossi and Celenza (2014).

Despite the body of support for the VAIC model, its assumptions and approach have been challenged by several researchers. According to Ståhle, Ståhle, and Aho (2011), the VAIC model is conceptually confusing and isn't a valid measure of IC. Ståhle et al. (2011) reached this conclusion after testing the relationship between the VAIC and the value of IC for 125 Finnish companies listed on the Helsinki Stock Exchange. This study treated the value of IC as the gap between the firm's book and market values using data from 2006 to 2008. Overall, this study failed to find a correlation between the variables. Based on a combination of their empirical work and analysis of prior studies, these authors' criticized the extensive use of the VAIC model. They believe the VAIC is a measure of labor and capital productivity, not IC. Furthermore, they suggest that inconclusive findings in several studies stem from the misguided use of the VAIC model as a measure of IC. As an example, these authors' cite a large scale study by Kujansivu and Lönnqvist (2007).

Kujansivu and Lönnqvist (2007) examined the relationship between ICE, a subcomponent of the VAIC, and the value of IC. The value of IC was based on excess return(s) on assets compared to industry averages. Data from this study consisted of 15,252 Finnish firms in 11 industries. This study found the relationship between ICE and the value of IC to be weak for many industries. The authors' attributed this to several factors such as the difficulty of capturing IC concepts and the use of a rarely tested method for valuing IC. Janošević et al. (2013) elaborate on these issues in a conceptual paper critiquing the VAIC model.

Janošević et al. (2013) argue that VAIC model uses confusing terminology and that it is really a compliment to other IC approaches. This paper claims that VAIC terminology and the definition of its subcomponents represents a "semantic shift" as compared to other IC approaches (Janošević et al, 2013, p. 560). At the same time, Janošević et al. (2013) support the value added concepts developed in the VAIC model, but they feel it offers a one dimensional view of IC. Therefore, they do not recommend using the VAIC model by itself but rather in concert with rival approaches.

Criticism of the VAIC model has centered primarily on its terminology and assumptions. Nevertheless, a large number of researchers (e.g., Chen et al., 2005; Shiu, 2006; Tan et al., 2007; Chan, 2009, etc.) have selected the VAIC model as the most beneficial approach to study IC and its impact on organization performance. Javornik et al. (2012), in fact, examined "the 28 most important VAIC model-based studies performed in the previous two decades" and found "more than half of studies support the hypotheses, about a quarter of them reject them and only a small proportion of the studies show partial hypothesis confirmation. The large number of studies confirming the hypotheses is probably one of the most important reasons the VAIC model is so popular in the IC research community" (p. 537). Other strong arguments for the VAIC model can be found in Kamath (2007, 2008) and Chan (2009).

Among the theories of organizational performance measurement, IC has become a strategic asset under the RBV theory of the firm and in the eyes of stakeholders. For stakeholders and scholars to assess IC, measures of organization performance have adapted under contingency theory to include the VAIC model. This model has gained acceptance in the literature as a measure of IC for its objectivity, consistency, ease of use, and replication (Chan, 2009).

Determinants of CEO Compensation

The determinants of CEO compensation have been examined from a variety of perspectives. The diversity of approaches and methodologies stems from the lack of observable phenomenon in the pay-setting process. Nevertheless, the research literature on CEO compensation falls into two board groups. The first group examines whether it is firm size or firm performance that drives CEO compensation. Economists refer to this portion of the literature as the CEO pay-performance debate. The second group examines how CEO decisions can affect compensation and firm performance.

Firm Size and Performance

Economists are divided on the drivers of CEO compensation. This debate pits classical economic views against neoclassical beliefs. For classical economists, firm performance drives CEO pay because managers are assumed to be profit maximizers (Lewellen & Huntsman, 1970). In contrast, neoclassical economists believe CEO pay is driven by expanding the firm's size (Combs & Skill, 2003; Tosi et al., 2000). Most often, though, total revenue is defined as firm size; however, this variable has been operationalized as the scale of operations, total assets, and others. Thus, neoclassical economists believe that CEO's use their decision-making freedom to increase their pay by maximizing sales at the expense of performance. The clash between neoclassical *sales maximization* and classical *profit maximization* has produced extensive research on both sides. As research has evolved, this debate has also been characterized as a battle between firm size (i.e., sales maximization) and firm performance (i.e., profit maximization). To date, research has failed to stem the debate due to mixed or inconclusive results.

In 1950, the American Management Association (AMA) published its original survey on executive compensation showing a direct link between pay and sales maximization (Patton, 1961). Early empirical research by Roberts (1956, 1959) found similar results in his correlation analysis when controlling for sales. McGuire, Chiu, and Elbing (1962) studied correlations in total net sales and profits over a seven-year period compared to changes in executive compensation lagged over one and two years. Although this study intended to challenge previous findings, McGuire et al. (1962) also found executive compensation was highly correlated with sales maximization.

The sales maximization hypothesis has been contradicted and criticized by several subsequent studies. For example, early research by Lewellen (1969), Lewellen and Huntsman (1970), and Masson (1971) criticized previous studies for their measures of compensation, performance, and statistical methodology. Lewellen and Huntsman's (1970) research noted previous studies ignored collinearity among key variables and that compensation was limited to salary and bonuses. In addressing these issues, Lewellen and Huntsman (1970) used multivariate modeling and found executive compensation was solely dependent on profit maximization.

Since the 1970s, research on executive compensation, firm size, and performance has introduced improved multivariate models with new variables, a greater diversity of firms, and larger samples. Masson (1971), for example, found executive compensation was tied to stock market performance rather than sales maximization. Hirschey and Pappas (1981) studied 680 firms ranging from small to large across a group of industrials (443), banks (155), and utilities (82). The results showed executive compensation was linked to profit maximization in large firms and sales maximization in smaller firms. Murphy (1986) used stock returns as a proxy for profit maximization in a study of 1,488 CEOs over a twelve-year period. He found executive compensation was significantly correlated to stock returns. Unfortunately, these studies reflected mixed results and failed to resolve the ongoing sales-profit maximization debate.

In 1990, Jensen and Murphy (1990) joined the debate with one of the most comprehensive studies of CEO pay-performance. This study included 2,213 CEOs at 1,225 companies over a thirteen-year period. This study was "an all-inclusive estimate of the pay-performance sensitivity—including compensation, dismissal, and stockholdings" (Jensen & Murphy, 1990, p. 227). The findings showed a small positive and statistically significant link between CEO pay and firm performance. However, these authors were disappointed to find such a "small [pay-performance link for] an occupation in which incentive pay is expected to play an important role" (Jensen & Murphy, 1990, p. 227). In a related study, Madura, Martin, and Jessell (1996) failed to find a positive and statistically significant CEO pay-performance relationship in small public companies. Adding to the confusion were studies by Lambert, Larcker, and Weigelt (1991), Nourayi and Daroca (2008), and Nulla (2012a, b, c) that found significant associations between CEO pay and firm size.

The literature on CEO compensation has expanded to include large samples, enhanced methodologies, and a variety of measures for pay, firm size, and performance. Despite the comprehensive nature of these studies, the findings for CEO pay-performance studies show small or inconsequential correlations (Gomez-Mejia et al., 2010). The findings on CEO pay and firm size, however, tend to show strong correlations that appear to be consistent with the complex duties of CEOs in large corporations. At the same time, other research suggests the weak explanatory power in CEO pay-performance research indicates other factors are involved (Gomez-Mejia et al., 2010). While the debate between classical and neoclassical economists continues, it has given rise to new branches of research such as the impact of CEO decisions on pay and performance.

CEO Decisions, Internal Practices, and Firm Performance

The CEO is responsible for numerous decisions that, depending on the circumstances, can impact CEO pay and firm performance. Although the CEO pay-performance relationship is statistically weak, the research shows that CEOs respond to rewards (Berrone & Gomez-Mejia, 2009; DeYoung, Pensg, & Yan, 2013; Nyberg, Fulmer, Gerhart, & Carpenter, 2010). In pursuing rewards, CEO decisions may conflict with the interests of shareholders (Eisenhardt, 1989; Jensen & Meckling, 1976). When rewards are tied to traditional accounting metrics, they can also lead to short-term oriented decisions that benefit agent-managers to the detriment of firm value (Larcker, Richardson, & Tuna, 2007). Thus, this branch of literature focuses on internal practices that can affect the CEO pay-performance relationship.

Several internal practices have been noted as determinants of CEO compensation. Generally, these involve CEO influence over actors responsible for establishing, monitoring, and governing CEO compensation (Tosi & Gomez-Mejia, 1989). These practices represent influence or power used to override the firm's internal controls designed to maintain the relationship between CEO pay and firm performance. The literature on CEO pay-performance describes three internal practices that can undermine this relationship.

First are professional HR and compensation consultants. These consultants provide executive recruiting, compensation surveys, and advice on compensation design. The unique of role of these advisors allows them to collect compensation data that is not readily available to in-house HR executives. Since a firm's board and compensation committee meet infrequently, these consultants have become a convenient source of information and advice (Conyon , Peck, & Sadler, 2009). According to some researchers, their advice is a way for boards and compensation committees to legitimize decisions to shareholders (Bebchuk & Fried, 2004). To others, it raises questions of independence and conflicts of interest (Murphy & Sandino, 2010). Concerns over conflicts of interest stem from CEOs hiring compensation consultants to advise the firm's HR function, which is subordinate to the CEO, or the compensation committee. Independence issues have arisen from the consultant's natural desire to gain repeat business and sell additional services.

Murphy and Sandino (2010) examined compensation consultant independence and conflicts of interest in a study of 1,046 large public firms from the U.S. and Canada. They found U.S. and Canadian CEOs were paid 18% and 33% more, respectively, in firms where compensation consultants provided additional services. Interestingly, they also found CEOs were paid more when compensation consultants were hired by the board rather than management. Although Bebchuk and Fried (2004, 2005) and Conyon et al. (2009) do not distinguish between hiring by the board or management, these studies provide additional evidence of higher CEO pay packages in firms with compensation consultants. In contrast, Cadman, Carter, and Hillegeist (2010) also found CEO pay is higher in firms using consultants, but they claim it is not widespread. Collectively, all of these studies found little or no evidence of conflicts or independence issues from the use of compensation consultants.

A second practice involves the CEO's influence over the board's compensation decisions. Tosi and Gomez-Mejia (1989) studied this issue in 175 large manufacturing firms characterized as either owner or management-controlled. That is, when one equity holder controls more than 5% of the voting stock, the firm is considered owner-controlled. When it is less than 5%, the firm is management-controlled (Gomez-Mejia et al., 1987; O'Reilly III, Main, & Crystal, 1988). Tosi and Gomez-Mejia (1989) found the board and major stockholders held greater influence over CEO pay in owner-controlled firms. In management-controlled firms, the CEO held more influence over their pay. The portion of pay gained through the CEO's influence, power, or other means is often referred to as *excess rents* or *skimming* (Bertrand & Mullainathan, 2000). Related research collaborates these findings on CEO influence and compensation in studies of board of director independence (Boone, Field, Karpoff, & Raheja, 2007), corporate governance (Field & Karpoff, 2002; Forst, Park, & Wier, 2013), and asymmetric control of information (Grabke-Rundell & Gomez-Mejia, 2002).

The last internal practice is CEO entrenchment. Entrenchment gives rise to higher pay for CEOs and subordinates as well as reduced CEO employment risk. Evidence of these practices has been found in studies on voting control and antitakeover actions. For example, Cronqvist, Heyman, Nilsson, Svaleryd, and Vlachos (2009) measured entrenchment as CEO voting control and found "that CEOs with more control pay their workers [or subordinates] more" rather than improving firm performance (p. 336). Voting control was based on a 5% cutoff similar to previous research on owner-manager controlled firms (e.g., Tosi & Gomez-Mejia, 1989). The findings in this study show workers are paid more so CEOs can enjoy stronger social relations with subordinates and less effort negotiating wage levels, especially when workers are represented by an aggressive union. Thus, CEO influence over internal pay-setting practices can solidify the CEOs position and, potentially, decouple the pay-performance relationship under agency theory (Tosi & Gomez-Mejia, 1989). These results imply agency costs from entrenchment practices may be far greater than previous thought (Cronqvist et al., 2009).

Antitakeover provisions are another form of managerial entrenchment. Antitakeover provisions are corporate bylaws to defend the company against an unwanted takeover (Rhee & Fiss, 2014). The most common are poison pills and greenmail. *Poison pills* "are severance agreements that provide cash and non-cash compensation to senior executives upon an event such as termination, demotion, or resignation following a change in control" (Li, Jahera, Jr., & Yost, 2013, p. 209). Poison pills are also known as golden or silver parachutes. CEOs and senior executives typically receive rich severance packages called *golden parachutes*. *Silver parachutes*, in contrast, are lesser packages for a larger base of firm employees. Other poison pill strategies involve the purchase or sale of voting stock. *Greenmail*, for example, is the repurchase of shares at a premium from a large shareholder in exchange for delaying or halting a takeover (Field & Karpoff, 2002). Supporters of antitakeover provisions argue they allow management to focus on long-term decisions without the risk of employment (Li et al., 2013). Nevertheless, antitakeover strategies prevent takeovers by inflicting significant costs on the firm. At the same time, they may encourage suboptimal risk-taking that weakens firm performance and contributes to entrenchment (Li et al., 2013). For CEOs, entrenchment lessens employment risk, protects compensation and, with antitakeover provisions, can lead to substantial pay unrelated to firm performance.

Components of CEO Compensation

CEO compensation is the sum of several components ranging from salary to perquisites. For most companies, the components of compensation are relatively uniform; although, the proportions of each component can vary. The components of CEO compensation have been operationalized for empirical research using remuneration data disclosed in SEC filings (e.g., Bebchuk & Grinstein, 2005; Robinson, Xue, & Yu, 2011). The disclosure of this data comes from regulatory requirements of the SEC and the Dodd-Frank Act for greater transparency of executive compensation (Shorter, 2013; Robinson et al., 2011).

Regulatory Reporting

Executive compensation for public companies is disclosed in shareholder proxy communications and the annual report on Form 10-K, as required by SEC rules (Executive Compensation, 2000). These rules identify seven components of compensation as noted in the Summary Compensation Table (Figure 2) for named executive officers and certain non-executive officers (Pagnattaro & Greene, 2011). Named executive officers include the principal executive officer (PEO) or CEO, the principal financial officer (PFO) or CFO, and the next three highest paid executive officers. In addition, companies must disclose total compensation for up to two non-executive officers that are among the highest paid. No disclosure is required, with the exception of CEO and CFOs, for executive officers with $100,000 or less in total compensation (Executive Compensation, 2000).

The data in the Summary Compensation Table (Figure 2) reflects the dollar value of all earnings for services performed during the fiscal year (Sepe, 2011). This information is extracted from records underlying the company's annual financial statements. These financial statements have been audited by independent Certified Public Accountants. Furthermore, the accuracy of public company financial statements and related compensation data is covered by CEO and CFO certifications under the Sarbanes-Oxley Act of 2002. The CEO-CFO certifications are subject to incentive clawbacks for restatements and other punitive actions. The components in Figure 2 can be grouped into four categories—salary, incentives, retirement, and other. Based on the SEC rules for compensation disclosure, each category will be described in the following discussion beginning with salary.

Salary, column (c). As depicted column (c) in Figure 2, salary is the dollar value of cash and non-cash compensation earned over a fiscal year. Unlike other forms of compensation, salary is not considered at-risk due to its fixed and predictable nature. Salary levels are adjusted periodically for merit increases, cost of living increases, and other factors. Salary is also important because of its affect on other types of compensation (Pepper, 2006). For example, incentive compensation such as a bonus may be determined as a percentage of salary.

SUMMARY COMPENSATION TABLE

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.									
PFO.									

Figure 2. Summary Compensation Table adapted from the Code of Federal Regulations, Subpart 229, Section 229.402.

Incentive compensation. Incentive compensation, as depicted in columns (d) through (g) of Figure 2, can take a variety of forms. Generally, incentive compensation is variable-based, at-risk remuneration used for achieving short and long-term goals. The amount, timing, vesting, and other criteria for earning incentives are often associated with an individual or group incentive plan. In this context, "the term plan includes, but is not limited to, the following: Any plan, contract, authorization or arrangement, whether or not set forth in any formal document, pursuant to which cash, securities, similar instruments, or any other property may be received" (Executive Compensation, 2000, p. 392). According to Healy (1985) and Armstrong, Jagolinzer, and Larcker (2010), incentive compensation typically depends on the firm's accounting-based earnings. The board of directors' decision to payout incentives can be quantitative, qualitative, discretionary or any combination of factors. The components of incentive compensation are discussed next beginning with bonus compensation in column (d).

Bonus, column (d). A bonus is a single, lump sum payout of compensation. Bonuses are usually issued annually and represent the dollar value of cash or non-cash compensation.

Stock awards, column (e). Stock awards represent common stock, restricted stock, restricted stock units, phantom stock, phantom stock units, common stock equivalent units or any similar stock instruments. Stock awards are distinguished from other types of incentive awards as a shareholder or ownership interest in the company. The dollar value of stock awards is determined from the stock price at the time of issuance according to Financial Accounting Standards Board Statement of Financial Accounting Standards No. 123 (revised 2004), Share-Based Payment, as modified or supplemented (FAS 123R).

Option awards, column (f). An option award refers to the dollar value of stock options, stock appreciation rights (SARs) and similar instruments with option-like features. Options provide the right to acquire company stock at a specific price.

Non-equity incentive compensation, column (g). Non-equity incentive compensation represents bonus pay whose performance criteria were unknown to recipients or uncertain at the start of the reporting period.

Retirement compensation, column (h). All changes in the value of pensions earned as well as benefits to be paid after retirement from the company are deemed retirement compensation for column (h) in the Summary Compensation Table (Figure 2).

Retirement compensation, for example, includes the dollar value of tax-qualified defined benefit plans and supplemental executive retirement plan benefits earned during the fiscal year.

All other compensation, column (i). The dollar value of perquisites, security personnel costs, severance pay, life insurance premiums, and all other forms of executive compensation for the fiscal year not presented elsewhere in the Summary Compensation Table (Figure 2) is included in column (i).

The regulatory reporting structure underlying the executive compensation disclosure as depicted in Figure 2 contributes to audited data that is consistently presented for SEC purposes. These aspects provide a foundation for their use in executive compensation research. In turn, the data from Figure 2 and its related disclosure regulations represents a common source of reliable data used throughout the research literature on CEO compensation.

Summary

The growth in CEO compensation has contributed to continuing interests in the relationship between CEO pay and organization performance. This chapter reviewed the literature on CEO pay-performance, including theories related to agency, executive compensation, and organizational performance. In attempting to explain the CEO pay-performance relationship, this literature offers diverse perspectives. A common thread throughout much of the literature in this area is the assumption based on agency theory that organizational performance has a significant influence on CEO pay.

As CEO pay continues its unprecedented rise, a large portion of the literature claims CEO pay is decoupled from organization performance. In fact, with the exception of CEO pay and firm size, the research to date has yet to agree on the essential factors underlying the growth in CEO pay. The SEC is addressing this matter with a proposed rule issued in May 2015 calling for public companies to disclose the relationship between executive compensation and the firm's financial performance (SEC, 2015). This proposal has been dubbed *pay versus performance* and would require disclosures of executive pay and total shareholder returns for the firm and its peer group. The proposal hopes to improve transparency into CEO pay by providing an objective means for assessing the relationship between CEO pay and firm performance.

The pay versus performance proposal compliments a previous SEC proposal in 2013 on the *pay ratio disclosure* (SEC, 2013). The pay ratio is the relationship of CEO pay to the compensation of the median employee (Shorter, 2013). While both proposals should benefit CEO pay-performance transparency, one branch of the CEO pay-performance literature recommends new measures of organizational performance for the knowledge economy. This literature takes a RBV of the firm and suggests that traditional accounting metrics fail to capture the firm's IC. This has spawned a great deal of literature on IC as a strategic resource and the VAIC model as measure of IC. As research on IC continues to expand, no previous research has examined the relationship between IC and CEO pay. This gap in the literature is an opportunity to examine a new dimension in the CEO pay-performance relationship.

CHAPTER 3. METHODOLOGY

This study investigates a new dimension in the relationship between CEO compensation and organizational performance based on the VAIC model as a measure of IC. By focusing on IC to examine organization performance and CEO compensation, this study is aligned with research on the importance of knowledge workers such as CEOs for competitive advantage (Drucker, 2001; Lerro & Schiuma, 2013). The use of IC overcomes the mixed results and limitations associated with traditional measures of organization performance (e.g., changes in stock prices, EPS, and other accounting measures) found in previous research on CEO compensation.

This chapter begins with a restatement of the study's research questions and hypotheses. The sections that follow discuss the methodological structure used to address the research questions, the research design, sample, setting, data collection, data analysis, validity and reliability, and ethical considerations.

Research Questions and Hypotheses

The relationship between CEO compensation and IC in this study is examined through several subquestions designed to address the top-level research question. The top-level research question (*RQ*) and subquestions (*SQ*) are as follows:

RQ 1.0. How much of the variance in CEO compensation can be explained by IC and its subcomponents?

SQ 1.1. How much of the variance in CEO compensation can be explained by its relationship to intellectual capital (IC)?

SQ 1.2. How much of the variance in CEO compensation can be explained by its relationship to the human capital (HCE) component of IC?

SQ 1.3. How much of the variance in CEO compensation can be explained by its relationship to the structural capital (SCE) component of IC?

SQ 1.4. How much of the variance in CEO compensation can be explained by its relationship to the intellectual capital efficiency (ICE) component of IC?

SQ 1.5 .How much of the variance in CEO compensation can be explained by its relationship to the physical and financial capital employed efficiency (CEE) component of IC?

The research questions in this study have been reduced to hypotheses to examine specific relationships among the variables. Thus, the hypotheses arising from the research questions in this study are as follows:

$H_0$1.0. There is no statistically significant relationship between CEO compensation, IC, and its subcomponents.

$H_0$1.1. There is no statistically significant relationship between CEO compensation and IC.

$H_0$1.2 .There is no statistically significant relationship between CEO compensation and HCE.

$H_0$1.3. There is no statistically significant relationship between CEO compensation and SCE.

$H_0$1.4. There is no statistically significant relationship between CEO compensation and ICE.

$H_0$1.5. There is no statistically significant relationship between CEO compensation and CEE.

Research Design

The CEO pay-performance constructs were analyzed in this study using secondary data from a random sample of public companies. A probabilistic random sampling strategy was selected to eliminate bias in the selection process while increasing external validity (Vogt, 2007). The organization performance construct was operationalized through IC and its subcomponents as independent variables based on the VAIC model. The dependent variable, CEO compensation, was operationalized using total CEO compensation presented in the firm’s Summary Compensation Table (Figure 2) contained in SEC filings. The numeric nature of these variables lends themselves to a non-experimental quantitative research design.

The quantitative design for this study is aligned with the objectivist philosophy and positivist perspective. Together, these paradigms draw from the scientific method that assumes reality can be objectively measured (Crotty, 1998). The use of a random sample of existing data from audited financial statements for this study contributes to scientific objectivity; however, it is the lack of researcher intervention in this study that characterizes it as non-experimental (Cooper & Schindler, 2011; Vogt, 2007). A non-experimental approach, according to Holton, III and Burnett (2005), is common in quantitative research due to the difficulty of observing and measuring phenomena of interest in organizational settings.

The quantitative design in this study uses multiple linear regression (MLR). MLR is one of several statistical regression techniques recommended when dependency is assumed to exist among metric independent and dependent variables (Cooper & Schindler, 2011). Metric variables are interval and ratio measurements such as archival financial statements and CEO compensation data used in this study. Due to the agency contract that binds CEOs to perform on behalf of shareholders in exchange for compensation, CEO pay is dependent on organization performance (Sigler, 2011).

According to Vogt (2007), MLR is an effective technique for predicting a dependent variable by assessing the relationship and interdependency of independent variables (IVs) to a dependent variable (DV). In examining the relationship between IC and its subcomponents to CEO compensation, MLR is well suited for understanding how changes in independent variables such as IC affects CEO compensation (DV) when holding other variables constant. In addition, the use of MLR in this study is consistent with previous research. CEO pay-performance studies by Frydman and Saks (2010) and Wang, Venezia, and Lou (2013) are examples of MLR research designs.

Setting

The private negotiations and internal factors used by corporate boards to set CEO compensation are an unobservable phenomena. This process stems from agency theory which attempts to link pay and organization performance. As CEO pay has grown, scholars and other stakeholders have found that executive pay has become decoupled from traditional measures of organization performance (Bebchuk & Fried, 2004, 2005). Critics of CEO pay have pushed for increased transparency in setting pay and accountability in monitoring executive pay-for-performance.

Greater accountability came with the 2002 enactment of the Sarbanes-Oxley Act (SOX). SOX came into existence after several corporate scandals involving highly paid executives. In 2010, the Dodd-Frank Act expanded accountability with further disclosures on executive pay. This led to a series of SEC mandates for increased transparency in the executive pay-setting process. The first of these was the *say-on-pay* vote (Pagnattaro & Greene, 2011). This requirement went into effect in 2011 and allows shareholders to place non-binding votes on executive compensation packages. The say-on-pay was followed by the *pay ratio* in 2013. The pay ratio is a proposal to disclose the ratio of executive pay to median worker pay. The SEC continues to work through comments on the pay ratio and other Dodd-Frank provisions for expanded disclosure of executive compensation. Against this backdrop, CEO pay has risen to record levels. Thus, data from 2009 to 2014 as used in this study provides a unique setting for examining the CEO pay-performance debate.

Sample

This study commenced with a random sample of 1,350 companies listed on the NASDAQ Exchange. This sample was drawn from the December 31, 2014 constituent population list of 2,963 companies downloaded to Excel from the NASDAQ.com. A random sample of 1,350 companies was made from the population using Research

Randomizer, an online tool for making random sample selections. A large initial sample of 1,350 firms was necessary to satisfy G*Power3.1 requirements and the selection criteria for data collection.

A two-tailed, multiple linear regression computation using G*Power3.1 produced a recommended sample size of 89 companies. This G*Power3.1 computation was based on the work of Faul, Erdfelder, Buchner, and Lang (2009) for a fixed model, single regression coefficient, five predictors, an effect size of .15, and an error probability (α) of .05 for statistical power of .95 ($1 - \alpha$) or greater. The selection criteria for this sample consisted of three requirements for data validation and satisfying the requirements of the VAIC model. First, each company's SEC filings were reviewed to verify its continuous listing on the NASDAQ Exchange from 2009 to 2014 and that all filings were up to date. This was achieved by reviewing SEC filings from 2009 to 2014 for forms 10-K, DEF 14A proxy, prospectuses, and other filings listed on EDGAR (Electronic Data Gathering, Analysis, and Retrieval) for each sample firm. EDGAR is a site maintained by the SEC for archiving filings and making them publicly available (Gerdes, 2003). Second, the Summary Compensation Table (Figure 2) contained in form DEF 14A proxy and other filings for each sample firm were reviewed to ensure that the CEO was continuously employed in this capacity from 2009 through 2014. This criterion matches organization performance to the compensation of a single executive for comparability and analysis. Lastly, financial statements for each sample company were reviewed to remove firms with a deficit in equity or operating loss after adding back non-cash depreciation and amortization for any year from 2009 to 2013. The VAIC model requires these criteria for computing IC and its subcomponents as measures of organization performance (Pulić, 1998, 2000, 2004).

A five-year sampling frame was used in this study to allow a CEO's efforts to influence organization performance. While the literature does not suggest a definitive period for producing measureable results, a five-year sampling frame has been used in this study because "manager employment contracts…last an average of five years" (Sepe, 2011, p. 193). Although diverse time frames exist among studies on CEO pay and performance, a five-year sampling frame is long enough to produce results while limiting noise from short-term irregularities.

Data Collection

Data for this study was manually collected from SEC filings on EDGAR. These filings are publically available online and contain audited financials statements and executive compensation data. For consistency and potential replication, this study adopted a three-step approach to data collection. First, annual financial statements were gathered from form 10-K for each firm in the sample for the years 2009 through 2013. Then, the firm's total employee compensation, operating profit, depreciation and amortization, and equity for each year were extracted and input into an Excel spreadsheet. Secondly, data from the first step was used to compute the variables from the VAIC model. Based on previous VAIC research, the financial data collected from 2009 through 2013 was used to complete the following computations:

$$Value\ Added\ (VA) = Operating\ profit\ (OPS) + Total\ employee\ compensation\ costs\ (HC) + Depreciation\ \&\ Amortization\ (D) \quad (8)$$

$$HCE = VA / HC \quad (9)$$

$$Structural\ capital\ efficiency\ (SCE) = (VA - HC) / VA \quad (10)$$

$$Intellectual\ capital\ efficiency\ (ICE) = HCE + SCE \quad (11)$$

$$Capital\ employed\ efficiency\ (CEE) = VA / CE \quad (12)$$

$$VAIC = ICE + CEE \quad (13)$$

The results of these computations produced data for five variables (i.e., ICE, HCE, SCE, CEE, and VAIC) that were added to the Excel spreadsheet for each firm by year. Lastly, total CEO compensation was collected from the Summary Compensation Table (Figure 2) contained in form DEF 14A proxy or other filings for each firm over the years 2010 to 2014. The CEO compensation data was added to the Excel spreadsheet for each firm by year allowing for a one-year lag. A lag recognizes the practice of rewarding executives after assessing the previous year's financial results. Thus, the CEO compensation data was shifted back one year to match it with the related organization performance. For example, 2014 CEO compensation data was matched to the 2013 organization performance data, and then the 2013 CEO compensation data was matched to the 2012 organization performance and so on.

Once data for all variables was collected and added to the Excel spreadsheet, it was reviewed for completeness and cross-verified to the original source document(s) a second time for accuracy. In total, the full dataset represents five years of CEO

Table 1. *CEO Compensation and Intellectual Capital Data Collection by Variable*

Variable	Definition of the Variable for the Firm	Nature[a]	Source[b]	Use[c]
Ticker	The firm's ticker symbol.	Descriptive	1	I,*
Name	The firm's legal name.	Descriptive	1	I,*
Sect	The firm’s market sector.	Descriptive	1	C, I,*
Ind	Industry assigned to the firm.	Descriptive	1	C,*
Rev	The firm’s annual revenues.	Thousands	2	C,*
Yr	This is the calendar or fiscal year of the firm's data.	Actual	2, 3	C, I,*
OPS	The firm's annual pre-tax income from operations for the reporting year.	Thousands	2	M
HC	The firm's annual cost of employee wages, salaries, and other costs for the reporting year.	Thousands	2	M
D	The firm's annual depreciation and amortization of property, plant, and equipment for the reporting year.	Thousands	2	M
CE	Capital employed is the firm’s net equity for the reporting year.	Thousands	2	M
CEO_Pay	The firm's total CEO compensation for the reporting year.	Thousands	3	DV,*
SCE	Value added (VA) less Human Capital (HC) / VA.	Actual	5	IV,*
HCE	Value added (VA) / Human Capital (HC).	Actual	5	IV,*
CEE	Value added (VA) / Capital Employed (CE).	Actual	5	IV,*
ICE	HCE plus SCE	Actual	5	IV,*
VAIC	Value added intellectual coefficient.	Actual	5	IV,*

Note: a. Nature – This column describes the character of the variable. b. Source - This column identifies where the data was extracted as follows: 1 = NASDAQ Constituent List download on December 31, 2014, 2 = EDGAR - Form 10-K audited financial statements, 3 = EDGAR - Form DEF 14A Proxy Summary Compensation Table, 4 = listed on EDGAR as part of the firm's profile, and 5 = derived from VAIC formula using financial statement data. c. Use - The column explains what the variable was used for in this study as follows: C = a grouping variable to facilitate analysis, I = data for identification of the firm and/or time period, M = data used in the calculation of the VAIC methodology but not loaded into SPSS, DV = dependent variable, IV = independent variable(s), and *data loaded into SPSS for analysis.

compensation and organizational performance information for a random sample of 90 firms listed on the NASDAQ Exchange. Table 1 provides a summary of the data collected for each variable in this study. Appendix A provides a list of the data collected for analysis on all firms in the sample.

Data Analysis

This study will use multiple linear regression (MLR) to examine the relationship between CEO compensation and IC. According to Cooper and Schindler (2011), the choice of MLR can provide an understanding of the relationship between independent variables to a dependent variable. MLR is also beneficial for predicting outcomes based on a model fitted to the underlying data (Field, 2009). The choice of MLR aligns this study with previous research on executive compensation and organization performance (e.g., Frydman & Saks, 2010; Wang et al., 2013).

The Statistical Package for Social Sciences 23 for Microsoft Windows (SPSS) will be used in this study for data analysis and MLR modeling. This includes descriptive statistics and tests of multicollinearity, homoscedasticity, linearity, and others to assess the assumptions for regression. An initial MLR model will be constructed with forced entry for predictors to identify variables with the greatest influence on CEO pay and a significance level of 0.05 or less ($p > .05$). If the regression assumptions hold for the initial model, then the analysis will advance to interpretation of the results for acceptance or rejection of the hypotheses.

If the regression assumptions for the initial model are not satisfied within acceptable tolerances, select variables will be transformed in an effort to resolve issues in the data. Then the transformed data will be used to develop a revised MLR model. The culmination of the development process will be a final model that addresses the research questions and hypotheses. Lastly, the final MLR model will be cross-validated using a random case selection to split the data for predictive validity.

Validity and Reliability

Validity and reliability arise from the steps in the research process (Creswell, 2009). The research process relies on unbiased procedures, objective measures, and replicable results. This study limits bias through random sampling to select firms for analysis regardless of size, market sector, or other characteristics from archival data. Archival or secondary financial data drawn from SEC filings of publicly-traded firms is accepted as a reliable source. The reliability stems from consistent measurement and presentation of data based on SEC regulations and GAAP accounting standards. Added reliability comes from the use of independent Certified Public Accountants to audit this data as a prerequisite for SEC filings. Publicly available data, such as SEC filings, adds to the integrity of the study because it can be easily retrieved and verified. When publicly available data is married with accepted statistical techniques like MLR, the study's procedures can be verified and the results replicated.

This study was designed to minimize threats to validity and reliability. Threats to external validity were minimized by operationalizing variables from recognized constructs for CEO pay and organization performance. Threats to internal validity were limited through a combination of replicable procedures, random sampling, publicly available secondary data, and accepted statistical analysis. Collectively, these steps add to this study's validity and the ability to generalize the results across publicly-traded firms.

Ethical Considerations

Ethical considerations should be present in the research design and throughout the research process (Creswell, 2009). Researchers are encouraged to anticipate potential ethical issues and to assess their relative risk-to-benefit (Belmont Report, 1979). The use of publicly available secondary data from SEC filings in this study precludes many of the ethical issues involving human subjects identified by *The Belmont Report*. Nevertheless, confidentiality in this study has been maintained by referring to each firm's primary decision-maker as the CEO rather than by name. The CEO compensation and organization performance data for this study along with all supporting records will be retained for seven years. All data and records will be securely stored and destroyed at the end of this period.

CHAPTER 4. RESULTS

Introduction

The purpose of this study was a quantitative analysis of the relationship between CEO compensation and IC as a measure of organization performance. This study was designed to address several research questions and hypotheses on this relationship. The data for this study was collected from a random sample of NASDAQ firms and analyzed using multiple linear regression (MLR). This chapter reports the results of this quantitative analysis in several sections. It begins by reporting the characteristics of the sample followed by the results from descriptive and inferential statistics. Subsequent sections report the results of transformations, research questions and hypotheses testing before concluding with a chapter summary.

Sample Characteristics

The CEO pay-performance constructs were analyzed in this study using secondary data from a random sample of public companies listed on the NASDAQ Exchange. The organization performance construct was operationalized through IC and its subcomponents as independent variables based on the VAIC model. The dependent variable, CEO compensation, was operationalized using total CEO compensation presented in the firm's Summary Compensation Table (Figure 2) contained in SEC filings. This study examined a random sample of 1,350 companies listed on the NASDAQ Exchange from 2009 to 2014. This sample was drawn from the December 31, 2014 constituent list of 2,963 companies downloaded to Excel from the NASDAQ.com.

To maximize statistical power, a two-tailed multiple linear regression computation based on G*Power3.1 recommended a minimum sample size of 89 firms. This sample size computation was derived using a fixed model, single regression coefficient for five predictors, an effect size of .15, and an error probability (α) of .05 for statistical power of .95 (1 - α) or greater.

The selection criteria for this sample consisted of three requirements for data validation. First, each company's SEC filings were reviewed to verify continuous listing on the NASDAQ Exchange from 2009 to 2014 and that all filings were up to date. This was achieved by reviewing SEC filings listed on EDGAR. Second, the Summary Compensation Table (Figure 2) in form DEF 14A proxy and other filings for each sample firm were reviewed to ensure continuous employment of the CEO from 2009 through 2014. This criterion matches organization performance to the compensation of a single executive for comparability and analysis. Lastly, financial statements for each sample firm were reviewed to remove those with a deficit in equity or operating losses after adding back non-cash depreciation and amortization for any year from 2009 to 2013. The VAIC model requires these criteria for computing IC and its subcomponents as measures of organization performance (Pulić, 1998, 2000, 2004). A recap of the NASDAQ population of firms, the random selection, and the final sample after applying the selection criteria is presented in Table 2 by market sector.

The NASDAQ has been characterized by innovative firms. Although much of this reputation is tied to intellectual capital intensive industries such as technology, Table 2 shows the NASDAQ population of firms has an array of market sectors. Seven market

Table 2. *Frequencies of Sample Firms by Market Sector*

	Population		Random Sample		Final Sample	
Market Sector	*N*	%	*N*	%	*N*	%
Basic Industries	76	2.6%	36	2.7%	-	0.0%
Capital Goods	181	6.1%	96	7.1%	-	0.0%
Consumer Durables	85	2.9%	35	2.6%	-	0.0%
Consumer Non-Durables	105	3.5%	47	3.5%	-	0.0%
Consumer Services*	353	11.9%	152	11.3%	6	6.7%
Energy*	81	2.7%	31	2.3%	1	1.1%
Finance*	585	19.7%	264	19.6%	75	83.3%
Health Care*	533	18.0%	251	18.6%	2	2.2%
Miscellaneous*	97	3.3%	44	3.3%	1	1.1%
Public Utilities	62	2.1%	32	2.4%	-	0.0%
Technology*	472	15.9%	215	15.9%	1	1.1%
Transportation*	54	1.8%	20	1.5%	3	3.3%
Not Classified	279	9.4%	127	9.4%	1	1.1%
Total	2,963	100.0%	1,350	100.0%	90	100.0%

Note: The firms in this table were obtained from a download of NASDAQ constituents as of December 31, 2014. This download contained market sectors assigned to each firm by the NASDAQ.com. *These sectors represent 73.3% of the NASDAQ population and 98.8% of the final sample.

sectors of the NASDAQ population and final sample represent 73.3% and 98.8%, respectively. However, 19.7% of the NASDAQ population of firms represents the finance sector compared to 83.3% in the final sample. The concentration of firms in the finance sector in the final sample is caused by a combination of GAAP reporting and selection criteria for the VAIC model. The VAIC methodology uses total employee compensation for computing several IC measures of organization performance. Many firms opt to prepare their financial statements without separately presenting total employee compensation. While this complies with GAAP, those firms that do not disclose total employee compensation lack the data necessary to satisfy the VAIC model. The concentration of firms in the finance sector, however, occurred because these firms tend to present total employee compensation in their GAAP financial statements.

Table 3. *Revenue Demographics of Sample Firms*

		Revenue ($ Millions)				
Sector	*N**	Mean	Median	Minimum	Maximum	Range
Consumer Services	30	650.6	325.6	31.9	1,877.9	1,846.0
Energy	5	10.6	8.0	5.9	16.9	11.0
Finance	380	1,053.1	94.8	13.9	75,497.6	75,483.7
Health Care	10	6,530.4	6,049.7	296.0	13,626.2	13,330.2
Miscellaneous	5	372.3	363.8	229.2	491.8	262.5
Technology	5	807.8	825.6	676.9	983.1	306.3
Transportation	15	4,252.6	1,882.5	580.0	12,752.1	12,172.1
Total	450	1,232.7	110.8	5.9	75,497.6	75,491.7

Note: *Of the 90 firms representing the sample, each has five years of data. *N* represents the cumulative number of firm years of data by sector.

The sample of NASDAQ firms also reflects businesses of diverse sizes. Table 3 provides annual revenue demographics for the sample by market sector. Although the finance sector is the third largest based on average revenue (μ=$1,053,058), it has the largest number of sample firms. Table 4 provides further details on the industries that make up the finance sector.

Tables 2 through 4 describe the nature, size, and frequency of sample firms. This information provides an overview of the characteristics of the firms in the sample. The characteristics of the related sample data for CEO pay and the five IC variables based on the VAIC model are presented in Table 5.

Table 4. *Revenue Demographics of Sample Firms in the Finance Sector*

		Revenue ($ Millions)				
Finance Sector	*N*	Mean	Median	Minimum	Maximum	Range
Banks	20	37.8	30.6	21.2	59.1	37.9
Finance: Consumer Services	10	343.5	257.7	159.6	735.1	575.6
Invest. Banks/Brokers/Service	20	15,568.2	3,158.5	900.8	75,497.6	74,596.8
Investment Managers	10	1,739.7	1,007.4	487.0	4,441.2	3,954.2
Major Banks	255	211.8	85.9	13.9	1,185.8	1,171.8
Property-Casualty Insurers	5	185.3	136.1	101.7	416.6	314.9
Savings Institutions	55	214.6	71.1	14.3	1,355.3	1,341.0
Specialty Insurers	5	94.9	90.7	71.3	126.3	54.9
Total	380	1,053.1	94.8	13.9	75,497.6	75,483.7

Table 5. *Sample Data Characteristics for CEO Pay and Organization Performance*

	CEO_Pay ($000)	HCE	SCE	ICE	CEE	VAIC
N	450	450	450	450	450	450
Mean	1,928.1	3.80	0.56	4.36	3.48	7.84
Median	853.9	2.04	0.51	2.55	0.36	3.04
Minimum	57.0	1.02	0.02	1.04	0.06	1.12
Maximum	26,441.4	26.03	0.96	26.99	194.98	197.50
Range	26,384.4	25.01	0.94	25.95	194.92	196.38

Note: The information in this table was generated from SPSS and the final sample of NASDAQ listed firms.

The CEO pay data in Table 5 shows the wide range of remuneration among the sample firms. The five IC variables are numerical measures of how sample firms use human capital (HCE), develop structures for capturing and sharing knowledge (SCE), and deploy physical and financial capital (CEE) to add value. ICE or intellectual capital efficiency is a combined measure of HCE and SCE. The VAIC combines ICE and CEE as a single overall measure of IC. Each of these IC measures can be used to assess performance over a firm's history, against other firms, and between industries. Thus, when the VAIC figures are tracked and compared they provide measures of IC performance at the subcomponent and organization levels.

Descriptive Statistics

The descriptive statistics for CEO pay and IC are presented in Table 6. These statistics extend the frequency parameters to describe the sample's measures of central tendency, variability, and distribution of data. Measures of central tendency consist of the mean, median, and mode. Measures of variability and dispersion of the sample data include the standard deviation, variance, range, minimum, maximum, skew, kurtosis, and quartiles. Together with histograms of the sample data in Appendix B, the descriptive statistics summarize the properties of the sample.

A visual review of the histograms shows a concentration of data points for most of the variables. The data for most of the variables are clustered on the left side of the distribution with long-tails extending to the right. These patterns in the histograms are consistent with the skewness and kurtosis scores in the descriptive statistics. With the exception of SCE, the distributions have high positive scores for both statistics. These scores and histograms describe positive concentrations on the left side of the distribution that are very pointy with heavy-tails. The more skewness and kurtosis scores vary from zero, the greater potential for normalcy issues. Normalcy is addressed further under the discussion of inferential statistics.

Table 6. *Descriptive Statistics for CEO Pay and Organization Performance*

Statistics		CEO_Pay ($000)	HCE	SCE	ICE	CEE	VAIC
N	Valid	450	450	450	450	450	450
	Missing	0	0	0	0	0	0
Mean		1,928.1	3.80	0.56	4.36	3.48	7.84
Std. Error of Mean		138.6	0.19	0.01	0.20	0.91	0.93
Median		853.9	2.04	0.51	2.55	0.36	3.04
Mode		281.0	1.02[a]	.02[a]	1.04[a]	.06[a]	1.12[a]
Std. Deviation		2,939.8	4.05	0.22	4.22	19.31	19.71
Variance		8,642,282.9	16.37	0.05	17.80	372.90	388.58
Skewness		4.258	2.76	0.14	2.63	7.21	6.65
Std. Error of		.115	0.12	0.12	0.12	0.12	0.12
Kurtosis		23.572	8.98	-0.74	8.12	54.30	48.13
Std. Error of		.230	0.23	0.23	0.23	0.23	0.23
Range		26,384.4	25.01	0.94	25.95	194.92	196.38
Minimum		57.0	1.02	0.02	1.04	0.06	1.12
Maximum		26,441.4	26.03	0.96	26.99	194.98	197.50
Percentiles	25	521.2	1.71	0.41	2.12	0.25	2.49
	50	853.9	2.04	0.51	2.55	0.36	3.04
	75	1,995.4	3.55	0.72	4.26	1.18	5.57

Note: a. Multiple modes exist. The smallest value is shown.

Inferential Statistics

A number of tests were run on the dataset to assess the distribution of the sample data for inferential analysis. These include statistics on normally distributed data, homogeneity of variance, independence of errors, linearity and multicollinearity.

Normalcy

Normalcy was assessed through the Kolmogorov-Smirnov test (K-S), Shaprio-Wilk test, and P-P plots. The results of the K-S and Shaprio-Wilk tests presented in Table 7 confirm the visual inspection of the histograms in Appendix B and the P-P plots in Appendix C. All test statistics were interpreted in conjunction with graphs to confirm the non-normal distributions for all variables. The K-S and Shapiro-Wilk tests, for instance, have significant statistics ($p < .001$) for all variables indicating the distributions deviate from a normal distribution.

Table 7. *Tests of Normalcy*

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Variable	Statistic	*df*	Sig.	Statistic	*df*	Sig.
CEO_Pay	.266	450	.000	.542	450	.000
HCE	.287	450	.000	.626	450	.000
SCE	.094	450	.000	.962	450	.000
ICE	.272	450	.000	.657	450	.000
CEE	.493	450	.000	.147	450	.000
VAIC	.368	450	.000	.268	450	.000

Note: a = Lilliefors Significance Correction.

Homogeneity of Variance

The homogeneity of variance assumes data points are approximately equal at different points on the predictor variable (Field, 2009). This assumption was tested using the Breusch-Pagan (BPT) and Koenker (KT) tests of heteroscedasticity. The BPT score was 3.957 with a significance level of .5556. The KT score was 3.398 with a significance level of .6389. The lack of significant results for these tests indicates the sample data satisfies this assumption for regression by exhibiting homogeneity of variances.

Independence of Errors

The independence of errors was tested using the Durbin-Watson test. The Durbin-Watson test in Table 8 was computed as part of an initial multiple linear regression on the sample data for all variables. With CEO pay as the dependent variable, this forced entry regression excluded two independent variables from the model and produced a Durbin-Watson score of .711.The values for the Durbin-Watson range from 0 to 4. According to

Fields (2009), scores less than 1 or greater than 3 indicate a lack of independent errors. The score of .711 suggests autocorrelation exists in the variables retained for this initial regression model.

Table 8. *Independence of Errors*

			Adjusted	Std. Error	Change Statistics					
		R	*R*	of the	*R* Square	*F*			Sig. *F*	Durbin-
Model	*R*	Square	Square	Estimate	Change	Change	*df* 1	*df* 2	Change	Watson
1	.099[a]	.010	.003	2935.087	.010	1.479	3	446	.220	.711

Note: This table is a model summary based on CEO_Pay as the dependent variable. a. Predictors: (Constant), VAIC, SCE, HCE.

Linearity and Multicollinearity

Linearity assumes the relationship between the mean values of CEO pay and each increment of the independent predictor variables represents a straight line. A related concept is multicollinearity which exists when there is a strong correlation between two or more predictors in the regression model (Field 2009). Multicollinearity threatens linearity and regression by preventing the unique identification of important predictors. Tests of linearity and multicollinearity were performed using Pearson Correlations displayed in Table 9. Generally, correlations of .80 or above can indicate multicollinearity (Field, 2009). As indicated by the bolded correlations in Table 9, four of the five predictor variables have one or more strong correlations that suggest multicollinearity and threaten the assumption of linearity. These concerns were addressed through additional tests of collinearity.

The concerns noted in the Pearson Correlation led to further examination of the sample dataset. This included collinearity diagnostics such as the variance inflation factor

(VIF) and Eigenvalue statistics. Both statistics were derived from an initial multiple linear regression using all variables from the sample dataset and forced entry. This regression retained three of five predictor variables in computing VIF statistics shown in Table 10.

Table 9. *Test of Linearity and Multicollinearity*

Variable / Statistic		CEO_Pay	HCE	SCE	ICE	CEE	VAIC
CEO_Pay	Pearson Correlation	1	.015	-.017	.013	.087	.088
	Sig. (2-tailed)		.751	.725	.775	.066	.063
	N	450	450	450	450	450	450
HCE	Pearson Correlation	.015	1	.771**	**.999****	-.014	.201**
	Sig. (2-tailed)	.751		.000	0.000	.775	.000
	N	450	450	450	450	450	450
SCE	Pearson Correlation	-.017	.771**	1	.792**	-.001	.168**
	Sig. (2-tailed)	.725	.000		.000	.980	.000
	N	450	450	450	450	450	450
ICE	Pearson Correlation	.013	**.999****	.792**	1	-.013	.201**
	Sig. (2-tailed)	.775	0.000	.000		.783	.000
	N	450	450	450	450	450	450
CEE	Pearson Correlation	.087	-.014	-.001	-.013	1	**.977****
	Sig. (2-tailed)	.066	.775	.980	.783		.000
	N	450	450	450	450	450	450
VAIC™	Pearson Correlation	.088	.201**	.168**	.201**	**.977****	1
	Sig. (2-tailed)	.063	.000	.000	.000	.000	
	N	450	450	450	450	450	450

Note: **Correlation is significant at the 0.01 level (2-tailed).

Because all of the VIF statistics are less than 10 for each variable, collinearity does not appear to be a concern for these specific variables. This result is reinforced by tolerances in Table 10 that are substantially higher than 0.1 for each variable retained in the regression model. At the same time, the average of all three variables provides a contrasting result. The average is 2.002 and suggests the potential for bias in the regression model from multicollinearity when it exceeds 1.

Table 10. *Variance Inflation Factor Statistics*

Model / Variable[a]		Collinearity Statistics Tolerance	VIF
1	HCE	.400	2.497
	SCE	.405	2.467
	VAIC	.959	1.042

Note: a. Dependent Variable: CEO_Pay.

The Eigenvalues presented in Table 11 were based on the same multiple linear regression used to compute the VIF statistics. The variance proportions from Eigenvalues have been used in this study to highlight collinearity issues. Predictor variables with large proportions across variables can indicate collinearity issues. For example, the last line of Table 11 shows large proportions spanning several variables. This indicates multicollinearity exists between HCE and SCE.

Table 11. *Eigenvalue Statistics*

				Variance Proportions			
Model[a]		Eigenvalue	Condition Index	(Constant)	HCE	SCE	VAIC
1	1	2.882	1.000	.01	.02	.01	.03
	2	.763	1.944	.01	.01	.00	.96
	3	.321	2.996	.12	.41	.00	.01
	4	.035	9.135	.87	.57	.99	.00

Note: a. Dependent Variable: CEO_Pay.

The tests of linearity and multicollinearity began with concerns identified by Pearson Correlations. An expanded analysis using VIF and Eigenvalues provided mixed results. The VIF statistics showed no collinearity issues while the Eigenvalue statistics found multicollinearity for HCE and SCE. In checking the assumptions of linearity and multicollinearity, the bulk of these tests suggest the assumptions are not satisfied.

The tests of linearity and multicollinearity, like those for normalcy, homogeneity and independence of errors show the sample dataset fails to fully satisfy the assumptions for inferential statistics and regression. To resolve these issues, the sample dataset was transformed.

Transformations

Transformation is an arithmetic process for converting data into another unit of measure without changing the relationship between variables. The change in unit of measure does, however, correct for outliers, unequal variances, and distributional issues in the data. The transformation technique selected for each variable was based on the nature of the issues observed in previous tests, histograms, and P-P plots. Histograms and P-P plots of the untransformed sample dataset are contained in Appendices B and C, respectively. Table 12 summarizes the transformation techniques applied to each variable.

Table 12. *Transformations*

Variable Name(s)		Transformation	
Untransformed	Transformed	Technique	To Resolve
CEO_Pay	CEO_Pay_Log10	Log10	Positive skew, high positive kurtosis.
CEE	CEE_Pwr	Power	Positive skew, high positive kurtosis.
ICE	ICE_Cub	Cubic	Positive skew, positive kurtosis.
SCE	SCE_Cub	Cubic	Positive skew, negative kurtosis.
HCE	HCE_Cub	Cubic	Positive skew, positive kurtosis.
VAIC	VAIC_Inv	Inverse	Positive skew, high positive kurtosis.

Descriptive Statistics After Transformations

When examining differences between variables, the same transformation must be performed on all variables for consistent units of measure (Fields, 2009). Because this study examines variable relationships rather than the differences between them, transformation techniques can be tailored to each variable to address data issues without compromising statistical analysis. The purpose of this section is to repeat the descriptive and inferential statistics using the transformed data to satisfy the assumptions for regression.

Table 13. *Descriptive Statistics After Transformations*

Description / Statistic[a]		CEO_Pay _Log10	HCE _Cub	SCE _Cub	ICE _Cub	CEE _Pwr	VAIC _Inv
N	Valid	450	450	450	450	450	450
	Missing	0	0	0	0	0	0
Mean		3.0280	3.0280	3.0280	3.0280	1.0173	.7559
Median		2.9314	3.0184	3.0214	3.0208	1.0093	.7273
Mode		2.45	2.91[a]	2.94[a]	2.92[a]	1.00[a]	.63[a]
Std. Deviation		.44131	.04884	.06056	.05024	.02327	.07130
Variance		.195	.002	.004	.003	.001	.005
Skewness		.527	3.729	.404	3.235	5.016	1.135
Std. Error of		.115	.115	.115	.115	.115	.115
Kurtosis		.069	31.456	-.412	25.889	28.085	.544
Std. Error of Kurtosis		.230	.230	.230	.230	.230	.230
Range		2.67	.62	.34	.61	.17	.35
Minimum		1.76	2.91	2.94	2.92	1.00	.63
Maximum		4.42	3.53	3.28	3.52	1.17	.98
Percentiles	25	2.7170	3.0034	2.9735	3.0019	1.0069	.7061
	50	2.9314	3.0184	3.0214	3.0208	1.0093	.7273
	75	3.3000	3.0509	3.0747	3.0521	1.0240	.7911

Note: a. Multiple modes exist. The smallest value is shown.

As presented in Table 13, transformation improved the descriptive statistics for most variables. In particular, CEO_Pay_ Log10, SCE_Cub, ICE_Cub, and the VAIC_Inv have substantially reduced skewness and kurtosis.

Normalcy

The K-S and Shapiro-Wilk tests for normalcy on the transformed data displayed in Table 14 are, however, identical to those for the untransformed data. That is, all variables have significant results ($p < .05$) indicating the distributions deviate from a normal distribution. Although data transformation has resolved several problematic issues, it retains the relationships between variables. Therefore, the lack of change(s) in the K-S and Shapiro-Wilk tests is not unexpected.

Table 14. *Test of Normalcy After Transformations*

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
Variable	Statistic	*df*	Sig.	Statistic	*df*	Sig.
CEO_Pay_Log10	.092	450	.000	.974	450	.000
HCE_Cub	.119	450	.000	.755	450	.000
SCE_Cub	.079	450	.000	.944	450	.000
ICE_Cub	.090	450	.000	.796	450	.000
CEE_Pwr	.254	450	.000	.452	450	.000
VAIC_Inv	.199	450	.000	.869	450	.000

Note: a = Lilliefors Significance Correction.

Homogeneity of Variance After Transformations

The homogeneity of variance was tested by repeating the Breusch-Pagan (BPT) and Koenker (KT) tests of heteroscedasticity on the transformed data. The BPT statistic was 7.656 with a significance level of .1762. The KT score was 6.574 with a significance level of .2543. The lack of significant results for these tests indicates the sample data after transformation exhibits homogeneity of variances.

Independence of Errors After Transformations

The Durbin-Watson test on the transformed data was computed in SPSS using an initial multiple linear regression for all variables (Table 15). With CEO pay as the dependent variable (CEO_Pay_Log10), this forced entry regression included all independent variables in the model and produced a Durbin-Watson score of 1.816. This score falls close to 2.0 and indicates the transformed data exhibits independence of errors.

Table 15. *Independence of Errors After Transformations*

					Change Statistics					
Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	*R* Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	Durbin-Watson
1	.272[a]	.074	.063	.42708	.074	7.082	5	444	.000	1.816

Note: This table is a model summary based on CEO_Pay_Log10 as the dependent variable. a = Predictors: (Constant), SCE_Cub, HCE_Cub, ICE_Cub, CEE_Pwr, VAIC_Inv.

Linearity and Multicollinearity After Transformations

For linearity and multicollinearity, a Pearson Correlation analysis was repeated using the transformed data. This analysis indicates that only the relationship between HCE_Cub and ICE_Cub is problematic. These variables were strongly correlated, $r(448) = .995$, $p < .001$, and are bolded in Table 16. With the exception of these relationships, the Pearson Correlations (Table 16) on the transformed data support the assumption of linearity and suggest no material threats of multicollinearity.

Tests of collinearity were also repeated on the transformed data using VIF and Eigenvalue statistics. Both statistics were derived from the initial multiple linear regression using the transformed dataset and forced entry. This regression model retained all five predictor variables in computing both statistics.

Table 16. *Test of Linearity and Multicollinearity After Transformations*

Variable / Statistic		CEO_Pay _Log10	HCE _Cub	SCE _Cub	ICE _Cub	CEE _Pwr	VAIC _Inv
CEO_Pay _Log10	Pearson Correlation	1	.111*	.137**	.114*	.238**	.198**
	Sig. (2-tailed)		.019	.004	.016	.000	.000
	N	450	450	450	450	450	450
CEE _Pwr	Pearson Correlation	.238**	.119*	.185**	.099*	1	.676**
	Sig. (2-tailed)	.000	.012	.000	.035		.000
	N	450	450	450	450	450	450
VAIC _Inv	Pearson Correlation	.198**	.405**	.413**	.403**	.676**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	450	450	450	450	450	450
ICE _Cub	Pearson Correlation	.114*	**.995****	.392**	1	.099*	.403**
	Sig. (2-tailed)	.016	0.000	.000		.035	.000
	N	450	450	450	450	450	450
SCE _Cub	Pearson Correlation	.137**	.383**	1	.392**	.185**	.413**
	Sig. (2-tailed)	.004	.000		.000	.000	.000
	N	450	450	450	450	450	450
HCE _Cub	Pearson Correlation	.111*	1	.383**	**.995****	.119*	.405**
	Sig. (2-tailed)	.019		.000	0.000	.012	.000
	N	450	450	450	450	450	450

Note: *Correlation is significant at the 0.05 level (2-tailed). **Correlation is significant at the 0.01 level (2-tailed).

The VIF statistics in Table 17 indicate collinearity issues are present. The HCE_Cub and ICE_Cub variables have scores in excess of 10 and tolerances below 0.1. An average of VIF scores with and without the HCE_Cub and ICE_Cub variables produces scores exceeding 1. These results suggest the potential for bias in the regression model due to multicollinearity among the variables. A separate collinearity test using Eigenvalues in Table 18 supports the results of the VIF statistics.

Table 17. *Variance Inflation Factor Statistics After Transformations*

Model / Variable[a]		Collinearity Statistics Tolerance	VIF
1	HCE_Cub	.009	107.717
	SCE_Cub	.760	1.316
	ICE_Cub	.009	109.490
	CEE_Pwr	.478	2.091
	VAIC_Inv	.393	2.544

Note: a. Dependent Variable: CEO_Pay_Log10.

Table 18. *Eigenvalue Statistics After Transformations*

				Variance Proportions					
Model[a]		Eigenvalue	Condition Index	(Constant)	HC _Cub	SCE _Cub	ICE _Cub	CEE _Pwr	VAIC _Inv
1	1	5.993	1.000	.00	.00	.00	.00	.00	.00
	2	.006	30.588	.00	.00	.00	.00	.00	.44
	3	.000	118.899	.01	.00	.03	.00	.39	.05
	4	.000	149.034	.00	.00	.82	.00	.01	.00
	5	.000	286.946	.99	.00	.14	.00	.54	.49
	6	.000	2205.335	.00	1.00	.01	1.00	.06	.02

Note: a. Dependent Variable: CEO_Pay_Log10.

The tests of linearity and multicollinearity, like those for homogeneity and independence of errors, used the transformed data and showed substantial improvement. Yet, the curvilinear nature of many of the variables caused the tests of normalcy on the untransformed and transformed data to produce significant results. Overall, a check of the assumptions for regression identified multicollinearity between at least two variables—ICE_Cub and HCE_Cub—and aspects of curvilinear relationships across all variables.

Regression Modeling

The multiple linear regression (MLR) models in this study used transformed data. The decision to use the transformed data for modeling was based on the improved statistics previously reported. The model development followed a two-stage approach to identify the strongest model for addressing the research questions and hypotheses. The first stage involved a MLR model using all of the predictors except ICE_Cub and HCE_Cub. These predictors were excluded prior to developing the initial model due to the multicollinearity previously noted. The second stage extended the model development to exclude outliers based on Mahalanobis distances. The following discussion reports the results for each MLR model and a cross-validation analysis of the final model.

Multiple Regression Modeling

The results of the first MLR model are presented in Table 19. They show this model is significant, $F(3, 446) = 10.50$, $p < .01$, $R^2 = .07$. The overall fit of the model to the data based on an analysis of variance (ANOVA) is also significant ($p < .01$). Of the predictors, only CEE_Pwr ($\beta = .21$, $t(446) = 3.31$, $p < .01$) is significant. Finally, the Durbin-Watson of 1.82 is close to 2 indicating independence of errors.

Table 19. *MLR One Model Summary*

Model[b]	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	Change Statistics: *R* Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	Durbin-Watson
1	.257[a]	.066	.060	.42793	.066	10.499	3	446	.000	1.828

Note: a. Predictors: (Constant), VAIC_Inv, SCE_Cub, CEE_Pwr. b. Dependent Variable: CEO_Pay_Log10.

The coefficients for the first model in Table 20 show the predictors SCE_Cub and VAIC_Inv are not significant and have confidence intervals that cross zero. When confidence intervals cross zero, it means some predictors have data with a negative relationship to the outcome variable while others have a positive relationship. Thus, predictor variables with confidence intervals crossing zero weaken the MLR model and should be removed.

Table 20. *MLR One Coefficients*

	Unstandardized Coefficients		Standardized Coefficients			Confidence Interval for B		Collinearity Statistics	
Model[a]	B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1 (Constant)	-3.060	1.550		-1.974	.049	-6.107	-.014		
SCE_Cub	.657	.370	.090	1.775	.077	-.070	1.384	.813	1.230
CEE_Pwr	3.934	1.189	.207	3.308	.001	1.597	6.271	.533	1.877
VAIC™_Inv	.130	.419	.021	.311	.756	-.693	.953	.457	2.186

Note: a. Dependent Variable: CEO_Pay_Log10.

A revised MLR model was developed excluding SCE_Cub and VAIC_Inv as presented in Table 21. The results of the revised model are significant, $F(3, 446) = 26.97$, $p < .01$, $R^2 = .06$; although excluding SCE_Cub and VAIC_Inv caused R and R^2 to drop slightly from the first model. The overall fit of the revised model based on an analysis of variance (ANOVA) is still significant ($p < .001$). With CEE_Pwr as the only significant predictor ($\beta = .24$, $t(446) = 5.19$, $p < .01$), the Durbin-Watson statistic for this model is relatively unchanged.

Table 21. *MLR One Revised Model Summary*

					Change Statistics					
Model[b]	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate	*R* Square Change	*F* Change	*df*1	*df*2	Sig. *F* Change	Durbin-Watson
1	.238[a]	.057	.055	.42907	.057	26.974	1	448	.000	1.852

Note: a. Predictors: (Constant), CEE_Pwr. b. Dependent Variable: CEO_Pay_Log10.

The coefficients in Table 22 for the revised model show a tighter confidence interval for CEE_Pwr, 95% CI [2.809, 6.230]. Although the collinearity statistics deteriorated slightly for the revised model, the tests of collinearity indicate it is not an issue. Lastly, removing variables adversely impacted the significance for CEO_Pay_Log10 causing it to rise from .05 (p = .05) in the first model (MLR One) to .08 (p = .08) in the revised model (MLR One Revised).

Table 22. *MLR One Revised Coefficients*

Model[a]	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	*t*	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1 (Constant)	-1.570	.886		-1.773	.077	-3.310	.170		
CEE_Pwr	4.520	.870	.238	5.194	.000	2.809	6.230	1.000	1.000

Note: a. Dependent Variable: CEO_Pay_Log10.

The change in significance for CEO_Pay_Log10 led to further examination of the data for undue influences. Box plots were run for CEO_Pay_Log10 and CEE_Pwr to identify outliers. A visual inspection of the plots showed a number of outliers for both variables. In addition, a quantitative analysis of outliers was performed using Mahalanobis distances. Ten cases representing 2.2% of the total observations were identified as outliers based on a chi-square score greater than 15.09 (x^2 = 15.09). The 15.09 cutoff was determined using chi-square distribution tables with 5 degrees of freedom (*df*) at a significance of .01 (p < .01). After these cases were removed from the transformed dataset, another MLR model was developed. The results of this model have been labeled as MLR Two and are presented in Table 23.

Table 23. *MLR Two Model Summary*

				Std. Error of the	Change Statistics					
Model[b]	*R*	*R* Square	Adjusted *R* Square	Estimate	*R* Square Change	*F* Change	*df* 1	*df* 2	Sig. *F* Change	Durbin-Watson
1	.218[a]	.048	.045	.42926	.048	21.869	1	438	.000	1.911

Note: a. Predictors: (Constant), CEE_Pwr b. Dependent Variable: CEO_Pay_Log10.

After excluding outliers, the results of the second model are significant, $F(1, 439) = 21.87$, $p < .01$, $R^2 = .05$. The overall fit of the model to the data from an analysis of variance (ANOVA) also proved to be significant ($p < .001$). As the sole predictor in this model, CEE_Pwr was found to be significant ($\beta = .22$, $t(439) = 4.68$, $p < .01$). Finally, the Durbin-Watson score of 1.91 is now closer to 2 than previous models indicating improved independence of errors.

Table 24. *MLR Two Coefficients*

		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
Model[a,b]		B	Std. Error	Beta	*t*	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-7.288	2.204		-3.307	.001	-11.619	-2.957		
	CEE_Pw	10.162	2.173	.218	4.676	.000	5.891	14.432	1.000	1.000

Note: a. Dependent Variable: CEO_Pay_Log10. b. Statistics exclude ten cases identified as outliers.

Table 24 for the second model (MLR Two) shows the confidence interval for CEE_Pwr increased from the previous model while the collinearity statistics are still satisfactory. The beta ($\beta = .22$) for the second model (MLR Two) dropped slightly from previous models; however, the statistics reported for this model show that it is the strongest developed so far. As the strongest and final MLR model (FM), it was tested for cross-validation.

Cross-Validation Tests

Cross-validation was performed on the final MLR model to assess its predictive performance and fit to the data. The cross-validation began with partitioning the transformed dataset without outliers into two subsets referred to as the *estimation fold* (EF) and the *holdover fold* (HF). Each fold was determined using the SPSS random case selection feature and approximated 50% of the transformed dataset after excluding outliers. The final MLR model was applied to the partitioned data from both folds and the results were compared with those from the full dataset. The results in Table 25 show the final MLR model statistics from the full dataset fall in between those of the estimation and holdover folds. In addition, the cross-validation results are significant ($p < .01$) with Durbin-Watson statistics supporting independence of errors.

As presented in Table 26, the coefficients for the final MLR model (FM) also fall in between those of the estimation fold (EF) and the holdover fold (HF). The predictors for all models are significant ($p < .01$). The constant is significant for the EF and FM models ($p < .01$) while the constant for the HF model ($p = .055$) is non-significant.

The model fit based on ANOVA is significant ($p < .001$) for all three models as displayed in Table 27. Overall, the cross-validation tests produced results that differ slightly from those of the final MLR model. Although differences are to be expected, the results of the cross-validation folds show the final MLR model produces results that fall

Table 25. *Cross-Validation Comparison of Model Summaries*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df 1	df 2	Sig. F Change	Durbin-Watson
EF	.240[a]	.057	.053	.44393	.057	13.469	1	221	.000	1.698
FM	.218[a]	.048	.045	.42926	.048	21.869	1	438	.000	1.911
HF	.191[a]	.037	.032	.41549	.037	8.149	1	215	.005	2.030

Note: a. Predictors: (Constant), CEE_Pwr. b. Dependent Variable: CEO_Pay_Log10. EF = Model results from the estimation data fold. FM = Final MLR model. HF = Model results from the holdover data fold.

Table 26. *Cross-Validation Comparison of Coefficients*

Model		Unstd. Coefficients B	Std. Error	Std. Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	Upper Bound	Collinearity Statistics Tolerance	VIF
EF	(Constant)	-8.060	3.020		-2.669	.008	-14.011	-2.110		
	CEE_Pwr	10.928	2.978	.240	3.670	.000	5.060	16.796	1.000	1.000
FM	(Constant)	-7.288	2.204		-3.307	.001	-11.619	-2.957		
	CEE_Pw	10.162	2.173	.218	4.676	.000	5.891	14.432	1.000	1.000
HF	(Constant)	-6.268	3.251		-1.928	.055	-12.676	.141		
	CEE_Pwr	9.152	3.206	.191	2.855	.005	2.833	15.471	1.000	1.000

Note: a. Dependent Variable: CEO_Pay_Log10.

Table 27. *Cross-Validation ANOVA Comparison*

Model		Sum of Squares	df	Mean Square	F	Sig.
EF	Regression	2.654	1	2.654	13.469	.000[b]
	Residual	43.553	221	.197		
	Total	46.207	222			
FM	Regression	4.030	1	4.030	21.869	.000[b]
	Residual	80.707	438	.184		
	Total	84.736	439			
HF	Regression	1.407	1	1.407	8.149	.005[b]
	Residual	37.116	215	.173		
	Total	38.523	216			

Note: a. Dependent Variable: CEO_Pay_Log10. b. Predictors: (Constant), CEE_Pwr.

within a limited range. Thus, the final MLR model appears to produce reliable results for assessing the research questions and hypotheses testing.

Research Questions and Hypotheses Testing

This research examines the relationship between CEO compensation and organization performance. Intellectual capital (IC) and its subcomponents are based on the VAIC model as a proxy for organizational performance. The top-level research question and subquestions focused on how much of the variance in CEO pay could be explained by IC and its subcomponents. The remainder of this section reports the results for each of the research questions and the related hypotheses in this study.

The top-level research question (RQ 1.0) and related null hypothesis ($H_0 1.0$) asked how much of the variance in CEO compensation can be significantly explained by IC and its subcomponents. The subcomponents are HCE, SCE, ICE, and CEE. When they are combined, according to Pulic's (1998) approach, they provide an aggregate measure of IC referred to as the VAIC.

The results of the final MLR model applied to the transformed variables after excluding outliers produced an R^2 of .048 or 4.8% of the variance in CEO compensation. This result was significant ($p < .001$) and the goodness-of-fit for the model was also significant ($p < .001$) based on ANOVA. In considering the proportion of variance in CEO compensation (CEO_Pay_Log10) explained by IC and its subcomponents, only CEE_Pwr was retained in the final MLR model as a significant predictor ($p < .001$). While these overall findings are small, they are significant and provide the basis for rejecting the null hypothesis ($H_0 1.0$) related to this research question. For the top-level research question and related null hypothesis ($H_0$1.0), the results were obtained by working through the subquestions and associated null hypotheses in developing the final MLR model.

The subquestions and related null hypotheses in this study assess how much variance in CEO compensation can be significantly explained by each one of the five predictor variables. The first subquestion (SQ 1.1) and related null hypothesis ($H_0$1.1) asked how much of the variance in CEO compensation can be significantly explained by its relationship to intellectual capital (IC)? IC in this study was operationalized as the VAIC. This variable (VAIC_Inv) was dropped from the final MLR model because it added little to the model's predictability (β = .021), lacked significance (p = .756), and exhibited potential bias with a confidence interval that crossed zero, 95% CI [-.693, .953]. By dropping this variable in the MLR modeling process, the results of this study were unable to answer this subquestion. The lack of significant findings for the VAIC variable also provides for acceptance of the related null hypothesis ($H_0$1.1).

The second subquestion (SQ 1.2) asked how much of the variance in CEO compensation can be significantly explained by its relationship to the human capital efficiency (HCE) component of IC? This component of IC (HCE_Cub) was removed from the final MLR model due to collinearity with ICE (ICE_Cub) as evidenced by Pearson Correlations (Table 16, r = .995) and a high VIF score (VIF = 107.717). By dropping this variable in the MLR modeling process, the results of this study were unable to address this subquestion. The exclusion of the HCE variable precludes any significance and the related null hypothesis ($H_0$1.2) is accepted.

The third subquestion (SQ 1.3) asked how much of the variance in CEO compensation can be significantly explained by its relationship to the structural capital efficiency (SCE) component of IC? This variable (SCE _Cub) was dropped from the final MLR model because of a small contribution (β = .090), a lack of significance (p = .077), and potential bias exhibited by a confidence interval that crossed zero, 95% CI [-.070, 1.384]. By dropping this variable in the MLR modeling process, the results of this study were unable to answer this subquestion. The lack of significant findings for the SCE variable also means the related null hypothesis ($H_0$1.3) is accepted.

The forth subquestion (SQ 1.4) asked how much of the variance in CEO compensation can be significantly explained by its relationship to the intellectual capital efficiency (ICE) component of IC? This component of IC (ICE_Cub) was removed from the final MLR model due to multicollinearity with HCE (HCE_Cub) noted in the Pearson Correlations (Table 16, r = .995) and a high VIF score (VIF = 109.490). Thus, the final MLR model and its results cannot address this subquestion. The exclusion of the ICE variable precludes any significance and the related null hypothesis ($H_0$1.4) is accepted.

The last subquestion (SQ 1.5) asked how much of the variance in CEO compensation can be significantly explained by its relationship to the physical and financial capital employed efficiency (CEE) component of IC? As noted in the previous discussion of the top-level research question, the CEE (CEE_Pwr) component of IC was retained in the final MLR model and explained 4.8% (R^2 = .048) of the variance in CEO compensation (CEO_Pay_Log10). These results were significant (p < .001) for both this predictor as part of the model and the model fit based on ANOVA. The significant findings for the CEE variable also allows for the rejection of the related null hypothesis ($H_0$1.5).

The top-level research question, subquestions, and related hypotheses provided a thorough examination of the relationship between CEO compensation, IC and its subcomponents. The findings associated with these research questions and hypotheses identified CEE as a subcomponent of IC that explains 4.8% (R^2 = .048) of the variance in CEO compensation.

In examining the relationship of the five variables in this study to CEO compensation, only CEE was found to have a statistically significant relationship (p < .001). Thus, the overall null hypothesis is rejected for CEE as a subcomponent of IC. The results for the remaining four predictors—VAIC, HCE, SCE, and ICE—failed to reject their null hypotheses. The results for all research questions and related null hypotheses are presented in Table 28.

This study examined five predictors for statistically significant relationship(s) to CEO compensation. Of these predictors, only CEE was found to have a statistically significant relationship with CEO compensation. Thus, the null hypotheses for IC ($H_0$1.0) and CEE as a subcomponent of IC ($H_0$1.5) were rejected. The null hypotheses for the remaining four predictors were accepted (i.e., VAIC, ICE, HCE, and SCE).

Table 28. *Results for Research Questions and Hypotheses*

Research Question	Null Hypotheses	Finding(s)
RQ 1.0. How much of the variance in CEO compensation can be explained by IC and its subcomponents?	$H_0 1.0$. There is no statistically significant relationship between CEO compensation, IC, and its subcomponents.	Rejected
SQ 1.1. How much of the variance in CEO compensation can be explained by its relationship to intellectual capital (IC)?	$H_0 1.1$. There is no statistically significant relationship between CEO compensation and IC.	Accepted
SQ 1.3. How much of the variance in CEO compensation can be explained by its relationship to the structural capital (SCE) component of IC?	$H_0 1.2$. There is no statistically significant relationship between CEO compensation and HCE.	Accepted
SQ 1.3. How much of the variance in CEO compensation can be explained by its relationship to the structural capital (SCE) component of IC?	$H_0 1.3$. There is no statistically significant relationship between CEO compensation and SCE.	Accepted
SQ 1.4. How much of the variance in CEO compensation can be explained by its relationship to the intellectual capital efficiency (ICE) component of IC?	$H_0 1.4$. There is no statistically significant relationship between CEO compensation and ICE.	Accepted
SQ 1.5. How much of the variance in CEO compensation can be explained by its relationship to the physical and financial capital employed efficiency (CEE) component of IC?	$H_0 1.5$. There is no statistically significant relationship between CEO compensation and CEE.	Rejected

Note: The research questions represent a top-level question (RQ), subquestions (SQ), and related hypotheses.

Summary

This chapter reported the sample characteristics and a variety of statistical analysis centered on this study's research questions and hypotheses. The sample characteristics describe 450 observations covering a five-year period for 90 firms randomly selected from the NASDAQ constituent list as of December 31, 2014. To satisfy the selection criteria for the VAIC model, the bulk of the sample firms were from the finance sector. The sample characteristics were extended to descriptive and inferential statistical analysis. This also provided the basis for checking the sample dataset against the assumptions for regression. Several concerns were noted in meeting the assumptions and, as a result, data transformations were performed. The transformation process substantially satisfied the assumptions leading to the development of a series of MLR models. The final MLR model was cross-validated using a random selection of cases before assessing the study's research questions and hypotheses.

The research questions in this study provided a framework for examining how much of the variance CEO compensation can be explained by IC and its subcomponents. Overall, CEE was found to be the only statistically significant predictor for explaining 4.8% of the variance in CEO compensation. In turn, the top-level null hypothesis ($H_0$1.1) and the null hypothesis for CEE ($H_0$1.5) were rejected due to significant findings. The null hypotheses for all other predictors were accepted. Further analysis and interpretation of the results reported in this chapter are presented in Chapter 5.

CHAPTER 5. DISCUSSION, IMPLICATIONS, RECOMMENDATIONS

This research investigated the relationship between CEO compensation and IC as a proxy for organizational performance. Given the rapid rise in CEO pay and the increasing importance of IC for competitive advantage, this study adopted the VAIC model to operationalize IC. The VAIC model consists of an aggregate measure for IC and several subcomponents. The use of the VAIC model in this study to investigate the growth in CEO compensation fills a gap in the literature and provides a new direction for examining CEO pay and organization performance.

The purpose of this study was to identify how much of the variance in CEO compensation can be significantly explained by IC and it subcomponents. To investigate this relationship, 450 observations of financial data for the VAIC model and CEO compensation were collected between 2009 and 2014 for a random sample of 90 NASDAQ listed firms. CEO compensation was lagged by one year against the VAIC and its subcomponents for MLR analysis. In the reminder of this chapter, the results are summarized before discussing their implications, limitations, recommendations, and the conclusions to be drawn from them.

Summary of Results

The growth in CEO compensation has contributed to continuing interests in its relationship to organization performance. The literature on CEO pay and organization performance (CEO pay-performance) spans theories on agency, executive compensation, firm performance, and measurement of organizational performance. A common thread throughout this literature is the assumption based on agency theory that organization performance has a significant influence on CEO pay.

The objective of this study was to examine the CEO pay-performance relationship using the VAIC model. The bulk of previous research examined this relationship based on firm size, stock market valuations, and a variety of accounting metrics with mixed results. By focusing on IC as a measure organization performance, this study takes a new direction in examining the factors that influence CEO compensation.

This quantitative non-experimental study analyzed the CEO pay-performance relationship using MLR modeling. A series of models were developed to identify the proportion of variance in CEO compensation that could be explained by the VAIC and its subcomponents. The final MLR model was cross-validated and the results showed CEE significantly ($p < .001$) accounted for 4.8% ($R^2 = .048$) of the variance in CEO compensation. The four remaining predictors—VAIC, ICE, HCE, and SCE—were dropped from the MLR model. These predictor variables were dropped due a lack of significance, multicollinearity, and other reasons addressed in the discussion of results.

Discussion of the Results

As CEO pay continues its unprecedented rise, a large portion of the literature claims CEO pay is decoupled from organization performance. In fact, with the exception of the relationship between CEO pay and firm size, research to date has yet to agree on the factors driving the growth in CEO compensation. To understand this trend, this study examined the relationship between CEO compensation and IC based on the VAIC model as a proxy for organization performance. Fulfilling this objective led to several research questions and related hypotheses focused on how much of the variance in CEO pay could be significantly explained by IC and its subcomponents.

Research Questions and Hypotheses

The top-level research question (RQ 1.0) and related null hypothesis ($H_0$1.0) asked how much of the variance in CEO compensation can be significantly explained by IC and its subcomponents. The subcomponents are HCE, SCE, ICE, and CEE. When these variables are combined according to Pulic's (1998) approach, they provide an aggregate measure of IC referred to as the VAIC. The results of the final MLR model applied to the transformed variables after excluding outliers produced an R^2 of .048 or 4.8% of the variance in CEO compensation. This result was significant ($p < .001$) and the goodness-of-fit for the model was also significant ($p < .001$) based on ANOVA. In considering the proportion of variance in CEO compensation (CEO_Pay_Log10) explained by IC and its subcomponents, only CEE (CEE_Pwr) was retained in the final MLR model as a significant predictor ($p < .001$).

The retention of a single, significant variable was unexpected according to the literature on IC and the RBV of the firm. IC has emerged as a central component of business strategy and talent management. In Pulic's (1998) methodology, these aspects are emphasized by the subcomponents HCE, SCE, ICE, and the VAIC. These components provide information on which elements are contributing to IC. In addition to providing an organization level measure of IC, the VAIC also reflects how subcomponents interact to build IC. All of the excluded variables are intangibles that, directly or indirectly, create value added from human capital. CEE, in contrast, is based on the firm's value added from physical and financial capital. Thus, the rejection of the top-level null hypothesis ($H_0$1.0) and a finding that CEE is the only significant variable in explaining the variance in CEO compensation appears unusual on the surface.

Typically, value added is created when subcomponents of IC such as human capital (HCE) interact with CEE. This can occur, for example, when human ingenuity or innovation is married with manufacturing equipment to minimize scrap or increase output. However, the overall results in this study found that only the firm's CEE significantly explains the variance in CEO compensation. Although the proportion of variance accounted for is small (R^2 = .048), this outcome is consistent with the literature linking CEO pay and firm size. The literature on CEO pay and firms size has used several measures of firm size. These have included the firm's market value, revenues, and assets to name a few. Because CEE is derived from similar financial measures, the findings in this study are consistent with existing research in this area. Thus, these findings are aligned with the research on CEO pay and firm size.

The exclusion of all primary IC variables from the MLR model was another unexpected result. The statistical analysis in this study excluded the primary IC variables (HCE, SCE, ICE and VAIC) from the MLR model. The exclusion of these IC variables suggests the investment in talented employees, systems to capture and cultivate knowledge, and their interaction to create value has no bearing on CEO compensation. This may be partially due to redundant relationships or multicollinearity among these variables. IC is a multifaceted construct and each of its subcomponents is intertwined. Therefore, some degree of multicollinearity among the VAIC and its subcomponents should be expected. While multicollinearity may be one factor in excluding these variables, their entire exclusion has practical and theoretical implications.

Under agency theory, the board of directors is responsible for monitoring CEO performance and rewarding them as agent-managers. The exclusion of HCE, SCE, ICE, and the VAIC from this study's results contradicts agency theory and the theory of the RBV of the firm. As representatives of shareholder-principals, these results indicate corporate boards are not considering these organizational performance measures in monitoring and rewarding CEOs. In addition, the RBV of the firm emphasizes a bundle of intangible resources such as those in the VAIC for value creation and competitive advantage. The exclusion of HCE, SCE, ICE, and the VAIC in this study is evidence that boards are not considering IC resources in assessing CEO compensation. Together, these practical and theoretical implications contribute to the growing body of research showing CEO compensation is decoupled from organization performance.

The top-level research question and related null hypothesis take a macro perspective in discussing the results in this study. A more detailed analysis is reserved for the subquestions and related hypotheses. Each of the five subquestions and related null hypotheses assessed how much variance in CEO compensation can be significantly explained by each one of the predictors (i.e., HCE, SCE, ICE, CEE, and the VAIC). In addressing each subquestion and null hypothesis, the following discussion draws from existing research and theory to interpret the results.

The first subquestion (SQ 1.1) and related null hypothesis ($H_0$1.1) asked how much of the variance in CEO compensation can be explained by its relationship to intellectual capital (IC)? IC in this study was operationalized as the VAIC. This variable (VAIC_Inv) was dropped from the final MLR model because it added little to the model's predictive capacity (β = .021), it lacked significance (p = .756), and exhibited potential bias from a confidence interval that crossed zero, 95% CI [-.693, .953]. By dropping this variable in the MLR modeling process, the results of this study were unable to answer this subquestion (SQ 1.1) and the related null hypothesis ($H_0$1.1) was accepted. This result, however, runs counter to what was expected. This result is particularly unusual given the large number of firms from the finance sector in this study.

With no tangible products to manufacture and sell, the finance sector is heavily dependent on talented employees and information technology. Both are essential for producing the intangible products and services characterized by firms in this market sector. In addition, the VAIC model has been used extensively to study IC in the finance sector for national and global competitiveness (e.g., see Cabrita & Bontis, 2008;

Janošević, Dženopoljac, & Bontis, 2013; Kamath, 2007; Mavridis, 2004; Mavridis & Kyrmizoglou, 2005; Puntillo, 2009; Sledzik, 2013). Given these factors, the VAIC was expected to make a significant contribution to the MLR model and account for a large proportion of the variance in CEO pay. The lack of a significant relationship aligns the results for the VAIC with those of traditional accounting measures of firm performance. That is, both the VAIC and many accounting measures of organizational performance have failed to find a consistent relationship with CEO pay. These results provide further evidence that CEO pay has become decoupled from organization performance.

The second subquestion (SQ 1.2) and related null hypothesis ($H_0$1.2) asked how much of the variance in CEO compensation can be significantly explained by its relationship to the human capital efficiency (HCE) component of IC? This component of IC (HCE_Cub) was removed from the final MLR model due to multicollinearity with ICE (ICE_Cub) as evidenced by Pearson Correlations (Table 16, r = .995) and a high VIF score (VIF = 107.717). By dropping this variable in the MLR modeling process, the results of this study were unable to address this subquestion (SQ 1.2) and the related null hypothesis ($H_0$1.2) was accepted. Furthermore, the lack of a significant relationship between the firm's human capital (HCE) and CEO pay raises concerns about resource utilization and executive compensation practices.

As an agent-manager and the primary decision-maker in the organization, the CEO is responsible for deploying resources to create value. According to Fama and Jensen's (1983) view of agency theory, CEO remuneration and firm performance are linked through a four-stage hierarchy of internal decision controls. These controls support the effective use of firm resources and organization performance that should drive CEO pay. In the absence of a relationship between CEO pay and HCE, it suggests the possibility that other factors unrelated to HCE are behind these findings. For instance, these findings may be indirect evidence that excessive CEO compensation is caused by corporate boards overriding these essential internal controls.

The third subquestion (SQ 1.3) and related null hypothesis ($H_0$1.3) asked how much of the variance in CEO compensation can be significantly explained by its relationship to the structural capital efficiency (SCE) component of IC? This variable (SCE _Cub) was dropped from the final MLR model because of a small contribution (β = .090), a lack of significance (p = .077), and potential bias exhibited by a confidence interval that crossed zero, 95% CI [-.070, 1.384]. By dropping this variable in the MLR modeling process, the results of this study were unable to answer this subquestion (SQ 1.3) and the related null hypothesis ($H_0$1.3) was accepted. These results also suggest CEOs may be reluctant to invest in structural capital.

Agency theory assumes CEOs are risk-adverse agents (Jensen & Meckling, 1976). Research has noted that CEOs can be induced to take risks such as investing in structural capital; however, this relationship is convex. A convex curve that rises and then flattens before tailing off indicates incentive compensation encourages risk-taking up to a point. The point in the curve where it flattens shows where incentives lose their effectiveness as CEOs begin to protect their compensation and personal wealth. This risk-adverse behavior, for instance, can occur with long-term investments where the benefits arise subsequent to the CEO’s tenure. In many respects, the development of systems to capture, cultivate, and harvest IC are a long-term investments. The investment in structural capital, unlike investments in physical capital, has been historically difficult to track and justify. Although SCE is designed to address these issues and support investment in structural capital, the risk-averse behavior of CEOs may explain its lack of a meaningful contribution to the MLR model and lack of significant results in this study.

The forth subquestion (SQ 1.4) and related null hypothesis ($H_0$1.4) asked how much of the variance in CEO compensation can be significantly explained by its relationship to the intellectual capital efficiency (ICE) component of IC? This component of IC (ICE_Cub) was removed from the final MLR model due to multicollinearity with HCE (HCE_Cub) noted in the Pearson Correlations (Table 16, r = .995) and a high VIF score (VIF = 109.490). Thus, the final MLR model and its results cannot address this subquestion (SQ 1.4) and the related null hypothesis ($H_0$1.4) was accepted. ICE is designed to highlight the interaction between HCE and SCE. With both of these variables previously excluded, these results were expected.

The last subquestion (SQ 1.5) and related null hypothesis ($H_0$1.5) asked how much of the variance in CEO compensation can be significantly explained by its relationship to the physical and financial capital employed efficiency (CEE) component of IC? As noted in the previous discussion of the top-level research question, the CEE (CEE_Pwr) component of IC was retained in the final MLR model and explained 4.8% (R^2 = .048) of the variance in CEO compensation (CEO_Pay_Log10). These results were significant (p < .001) for both this predictor as part of the model and the model fit based on ANOVA. Thus, the findings for CEE support previous research linking CEO pay and firm size.

CEE is derived from the firm's physical and financial capital. Assets are one measure of firm size that previous research has linked to CEO pay. The significant relationship between CEO pay and CEE found in this study, affirms this subquestion and previous research. These results, however, are much weaker compared to those found in prior research on CEO pay and firm size. Furthermore, of the five variables in this study examined individually and in aggregate for statistically significant relationships to CEO compensation, only CEE was found to have a statistically significant relationship ($p < .001$). Thus, the null hypothesis ($H_0 1.5$) is rejected for CEE as a component of IC. The null hypotheses ($H_0 1.1$ to $H_0 1.4$) for the remaining four predictors were accepted (i.e., VAIC, HCE, SCE, and ICE).

Addressing the research questions and hypotheses in this study involved a multilevel examination of the relationship of IC and CEO compensation. This was achieved using the VAIC model because it produces a high-level, aggregate measure of IC from lower-level subcomponents. This combination can help to identify IC resource bundles that drive value creation and the CEO pay-performance relationship. The concept of resource bundles from the VAIC model and the RBV of the firm contributed to the expectation that two or more predictors of IC would be linked to CEO pay. The finding that a single subcomponent of IC is significant led to the rejection of both the top-level null hypothesis ($H_0 1.0$) and the related null hypothesis ($H_0 1.5$) for CEE. These results contradict the study's expectations and the concept of resource bundling under the RBV of the firm. Thus, the null hypothesis for CEE as a single variable is rejected and the null hypotheses are accepted for the other four variables.

Implications

This study filled a gap in the literature by examining the influence of IC on CEO compensation. The use of IC as a proxy for organization performance is unique to this study. This approach hoped to shift the debate on CEO pay by utilizing organization performance measures that are relevant to today's knowledge economy. The results of the study, however, failed to confirm these expectations. The implications of these results, therefore, did not shift the CEO pay-performance debate but rather added to it.

Aside from general criticisms over the growth in CEO pay, the implications of the results of this study can be contrasted with two primary positions in the literature. The first is literature linking CEO pay and firm size. The second is research focused on the link between CEO pay and organization performance.

The research on CEO compensation has largely confirmed the relationship between CEO pay and firm size. Firm size has been defined in a number of ways; however, most often it is either revenue or assets. The implications from this study and its findings support the existing research on CEO pay and firm size. This support is reflected in the exclusion of all intangible sources of IC and the singular finding that CEE is statistically significant. While CEE represents value added from the firm's physical and financial capital, its lack of interdependence with intangibles sources of IC indirectly validates previous research on firm size as a primary influence on CEO pay.

CEO pay and organization performance studies have produced mixed results. Without consistent findings demonstrating a link to organization performance, this research has surmised that CEO pay is decoupled from performance. This aspect of the CEO pay debate has been amplified, in large part, because of the rapid rise in CEO pay relative to organization performance. The implications of the results of this study confirm the decoupling noted in previous CEO pay-performance research.

Although CEE was found to be statistically significant, it accounts for only 4.8% of the variance in CEO pay. This small amount of variance accounted for by this study's results and the exclusion of all intangible sources of IC variables suggests CEO pay is not materially influenced by these organization performance measures. Therefore, with the exception of CEE, the lack of a relationship between organization performance and CEO pay in this study provides further evidence of decoupling.

This multilevel examination of the relationship between CEO pay and IC in this study has implications for several areas of research. For instance, these implications are consistent with those in the research on CEO pay and firm size as well as literature on the decoupling of CEO pay and performance. Together, these implications contradict practical and theoretical foundations of corporate governance derived from agency theory. Strong independent governance calls for monitoring of CEO-agents and aligning their compensation with firm performance. The implications from this study, however, show no material indications that IC as a measure of organization performance is present in board governance or CEO compensation decisions.

Limitations

This study is subject to several assumptions and limitations about the VAIC model, secondary data, and the nature of CEO compensation practices. The VAIC model is an alternative method for assessing organization performance in an economy where firm resources are largely intangible. This study assumes the VAIC model is a relevant measure of organization performance for assessing CEO compensation. Satisfying the selection criteria for the VAIC model limits this study to firms that present financial statements with total employee compensation and have no operating losses or deficit in equity. Another inherent limitation is the assumption that intangible resources are essential for organization performance and can be captured by the VAIC model. Furthermore, this study is limited by its focus on IC and its subcomponents to the exclusion of other influences on CEO compensation.

The data collected and used in the VAIC model was obtained from publicly available SEC filings for a random selection of for-profit, NASDAQ firms. This secondary financial data is self-reported to the SEC after being audited by independent Certified Public Accountants. The focus on for-profit, publicly-traded firms in this study limits the transferability of findings beyond this population. The use of secondary financial data in this study is a further limitation due its dependence on the quality, consistency, completeness, and integrity of company reports filed with the SEC. Thus, this study assumes the financial reports and CEO compensation data included in this study do not contain material inaccuracies.

CEO compensation is established through a voluntary, mutual negotiation with the board of directors and their compensation committee. The nature of this process is multidimensional, confidential, and inherently complex. As a result, this study is limited by the fact that CEO compensation practices and the data for setting CEO compensation is not fully available, unobservable, or both. Plus, CEO compensation often consists of tangible and intangible benefits such as perquisites, status, power, prestige, and more. This study is limited by having restricted its scope to total CEO compensation and total employee compensation as presented in the firm's SEC filings. This study is further limited by its use of total CEO compensation rather than the variety of individual components of an executive compensation package (e.g., stock options, equity, retirement pay, performance bonuses, etc.).

This study is limited by its lag of CEO compensation by one year in examining organization performance. That is, current CEO compensation is established based on previous organization performance requiring a lag for anticipated results (Milidonis & Stathopoulos, 2014; Pepper & Gore, 2012). Therefore, this study is limited by its assumption that a one-year lag between the firm's performance and CEO compensation is sufficient for examining the relationship between IC and CEO pay.

The assumptions and limitations found in this study's design, selection criteria for data collection, and dependence on secondary data limit the generalizability of this research. In addition, the findings it this study may be limited to the specific time frame examined in this research as CEO compensation practices evolve in the future. Thus, the limitations of this study can be a source of recommendations for future research.

Recommendations

The SEC continues to expand CEO remuneration disclosure as required by the Dodd-Frank Act. As additional data becomes available in the future, it will provide new opportunities to investigate the factors underlying CEO compensation. This will present new research opportunities that may tip the scales in the CEO pay-performance debate or resolve decoupling. Thus, future research into CEO compensation and organization performance is likely to increase given the opportunities that lie ahead. Among these opportunities are two recommendations for future research.

First, the data in this study suffered from multicollinearity. Considering the strategic importance placed on IC in the knowledge economy, further research is recommended into IC and its subcomponents to understand the cause(s) of this multicollinearity. This is essential for understanding how intangible resources interact to create value and contribute to CEO compensation. Secondly, the results in this study accounted for only a small portion of the variance in CEO compensation. This may be due to *institutional isomorphism* (DiMaggio & Powell, 1983) from the use of compensation consultants in setting CEO pay or practices unique to specific industries. If so, CEO compensation within each industry may have its own data structure. To assess this potential, it is recommended that future research focus on CEO pay data by industry and general linear modeling (GLM). GLM is a regression method geared toward analyzing data that contains an inherent structure. Therefore, it is recommended that the current study be repeated in the future using GLM and specific industry data to investigate the CEO pay-performance relationship.

Although the debate over CEO pay is far from over, new research possibilities will arise as the SEC expands executive compensation disclosures. These recommendations can be combined with the new data from expanded disclosures to overcome many of the limitations noted in this study for a deeper, more robust investigation of the relationship between CEO pay and organizational performance.

Conclusions

The rapid rise in CEO compensation is contemporaneous with the prominence placed on IC in today's knowledge economy. It reflects the shift from an industrial society focused on the manufacture of physical goods, capital equipment, and financial capital to a knowledge-based economy that stresses IC. This context gave rise to six research questions and related null hypotheses to examine the relationship between CEO compensation and organization performance based on the VAIC model. The VAIC is an organizational measure of IC derived from several subcomponents.

The relationship between CEO pay and variables from the VAIC model were examined through MLR modeling. A random sample of 90 NASDAQ firms produced 450 observations of CEO pay and organization performance for MLR modeling. After data transformations to resolve issues with the assumptions for regression, a series of MLR models were developed. The final MLR model was cross-validated and CEE (R^2 = .048) was the only IC variable found to be a statistically significant predictor of CEO compensation. Thus, the top-level null hypothesis and the null hypothesis for CEE were rejected. The null hypotheses for the remaining IC variables (i.e., HCE, SCE, ICE, and the VAIC) were accepted. Because CEE is tied to the valued added from the firm's physical and financial capital, it provides support for previous research linking CEO pay and firm size. Aside from the small amount of the variance in CEO pay accounted for by the final MLR model in this study, the lack of findings for any of the primary intangibles making up IC such as HCE, SCE, ICE, and the VAIC was unexpected.

The lack of findings linking any of the primary sources of IC and CEO pay substantiates a decoupling between CEO pay and organization performance. The results of this study, despite their limitations, filled a gap in the literature and led to recommendations for capitalizing on new research opportunities in the CEO pay-performance debate.

REFERENCES

ASU (2013). Accounting Standards Update (ASU). 2013-12, Definition of a public business entity. Retrieved from http://www.fasb.org

Agarwal, N. (1981). Determinants of executive compensation. *Industrial Relations, 20*(1), 36-46. doi:10.1111/j.1468-232X.1981.tb00180.x

Amihud, Y., & Lev, B. (1981). Risk reduction as a managerial motive for conglomerate mergers. *The Bell Journal of Economics 12*(2), 605-617. doi:10.2307/3003575

Armstrong, C. S., Jagolinzer, A. D., & Larcker, D. F. (2010). Chief executive officer equity incentives and accounting irregularities. *Journal of Accounting Research, 48*(2), 225-271. doi:10.1111/j.1475-679X.2009.00361.x

Armstrong, C. S., & Vashishtha, R. (2012). Executive stock options, differential risk-taking incentives, and firm value. *Journal of Financial Economics, 104*(1), 70-88. doi:10.1016/j.jfineco.2011.11.005

Astami, E. W., & Tower, G. (2006). Accounting-policy choice and firm characteristics in the Asia Pacific region: An international empirical test of costly contracting theory. *The International Journal of Accounting, 41*(1), 1-21. doi:10.1016/j.intacc.2005.12.004

Attaway, M. C. (2000). A study of the relationship between company performance and CEO compensation. *American Business Review, 18*(1), 77-85. Retrieved from https://business.illinois.edu/profile/journals-ambure

Baker, R. J. (2008). *Mind over matter: Why intellectual capital Is the chief source of wealth.* Hoboken, NJ: Wiley.

Banker, R. D., Darrough, M. N., Rong, H., & Plehn-Dujowich, J. M. (2013). The relation between CEO compensation and past performance. *Accounting Review, 88*(1), 1-30. doi:10.2308/accr-50274

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*(1), 99-120. doi:10.1177/014920639101700108

Bebchuk, L. A., & Fried, J. M. (2004). *Pay without performance - The unfilled promise of executive compensation*. Cambridge, MA: Harvard University Press.

Bebchuk, L. A., & Fried, J. M. (2005). Pay without performance: Overview of the issues. *Journal of Applied Corporate Finance, 17*(4), 8-23. doi:10.1111/j.1745-6622.2005.00056.x

Bebchuk, L. A., & Grinstein, Y. (2005). The growth of executive pay. *Oxford Review of Economic Policy, 21*(2), 283-303. doi:10.1093/oxrep/gri017

Becker, G. S. (1962). Investments in human capital: A theoretical analysis. *Journal of Political Economy, 70*(5), 9-44. doi:10.1086/258724

Belmont Report (1979). *The Belmont Report: Ethical principles and guidelines for the protection of human subjects of research*. Retrieved from http://www.hhs.gov/ohrp/humansubjects/guidance/belmont.html

Berle, A. A., & Means, G. C. (1932). *The modern corporation and private property*. New York, NY: Macmillan.

Berrone, P., & Gomez-Mejia, L. R. (2009). Environmental performance and executive compensation: An integrated agency-institutional perspective. *Academy of Management Journal, 52*(1), 103-126. doi:10.5465/AMJ.2009.36461950

Bertrand, M., & Mullainathan, S. (2000). Agents with and without principals. *American Economic Review 90*(2), 203–208. doi:10.1257/aer.90.2.203

Bhatia, K. (2010). *Compensation management*. Mumbai, India: Himalaya Publishing House.

Bliss, R. T., & Rosen, R. J. (2001). CEO compensation and bank mergers. *Journal of Financial Economics, 61*(1), 107-138. doi:10.1016/S0304-405X(01)00057-5

Bloom, M., & Milkovich, G. T. (1998). Relationships among risk, incentive pay, and organizational performance. *Academy of Management Journal, 41*(3), 283-297. doi:10.2307/256908

Bontis, N. (1996). There's a price on your head: Managing intellectual capital strategically. *Business Quarterly, 60*(4), 40. Retrieved from http://www.business.mcmaster.ca/mktg/nbontis/bq.htm

Boone, A. L., Field, L. C., Karpoff, J. M., & Raheja, C. G. (2007). The determinants of corporate board size and composition: An empirical analysis. *Journal of Financial Economics, 85*(1), 66-101. doi:10.1016/j.jfineco.2006.05.004

Bornemann, M. (1999). Potential of value systems according to the VAIC™ method. *International Journal of Technology Management, 18*(5-8), 463-475. doi:10.1504/IJTM.1999.002781

Brooking, A. (1996). *Intellectual capital*. London; England: International Thomson Business Press.

Cabrita, M.R. & Bontis, N. (2008). Intellectual capital and business performance in the Portuguese banking industry. *International Journal of Technology Management 43*(1-3): 212–237. doi:10.1504/IJTM.2008.019416

Cadman, B., Carter, M. E., Hillegeist, S. (2010). The incentives of compensation consultants and CEO pay. *Journal of Accounting and Economics, 49*(3), 263-280. doi:10.1016/j.jacceco.2009.03.002

Cennamo, C. (2008). Shareholders' value maximization and stakeholders' interest: Is CEO long-term compensation the answer? In L. R. Gomez-Mejia & S. Werner, (Eds.). *Global compensation: Foundations and perspectives* (pp. 100-112). London; England: Routledge.

Challenger & Gray, Inc. (2014). *2014 Year-end CEO report* (Press Release). Retrieved from http://www.challengergray.com

Chan, H. K. (2009). Impact of intellectual capital on organisational performance: An empirical study of companies in the Hang Seng Index (Part 1). *The Learning Organization, 16*(1), 4-21. doi:10.1108/09696470910927641

Chen, M., Cheng, S. & Yuchang, H. (2005). An empirical investigation of the relationship between Intellectual capital and firms' market value and financial performance. *Journal of Intellectual Capital, 6*(2), 159-176. doi:10.1108/14691930510592771

Chng, D., Rodgers, M. S., Shih, E., & Song, X. (2012). When does incentive compensation motivate managerial behaviors? An experimental investigation of the fit between incentive compensation, executive core self-evaluation, and firm performance. *Strategic Management Journal, 33*(12), 1343-1362. doi:10.1002/smj.1981

Chu, S. K. W., Chan, K. H., & Wu, W. W. Y. (2011). Charting intellectual capital performance of the gateway to China. *Journal of Intellectual Capital, 12*(2), 249-276. doi:10.1108/14691931111123412

Chu, S. K. W., Chan, K. H., Yu, K. Y., Ng, H. T., & Wong, W. K. (2011). An empirical study of the impact of intellectual capital on business performance. *Journal of Information & Knowledge Management, 10*(01), 11-21. doi:10.1142/S0219649211002791

Coase, R. H. (1937). The nature of the firm. *Economica, 4*(16), 386-405. doi:10.1017/CBO9780511817410.009

Combs, J. G., & Skill, M. S. (2003). Managerialist and human capital explanations for key executive pay premiums: A contingency perspective. *Academy of Management Journal, 46*(1), 63-73. doi:10.2307/30040676

Conyon, M. J., Peck, S. I., & Sadler, G. V. (2009). Compensation consultants and executive pay: Evidence from the United States and the United Kingdom. *The Academy of Management Perspectives, 23*(1), 43-55. doi:10.5465/AMP.2009.37008002

Cooper, D.R., & Schindler, P.S. (2011). *Business research methods* (11th ed.). Homewood, IL: McGraw Hill/Irwin.

Creswell, J. W. (2009). *Research design: Qualitative, quantitative, and mixed methods approaches.* Thousand Oaks, CA: Sage.

Cronqvist, H., Heyman, F., Nilsson, M., Svaleryd, H., & Vlachos, J. (2009). Do entrenched managers pay their workers more? *Journal of Finance, 64*(1), 309-339. doi:10.1111/j.1540-6261.2008.01435.x

Crotty, M. (1998). *The foundations of social research: Meaning and perspective in the research process*. London; England: Sage.

Datta, S., Iskandar-Datta, M., & Raman, K. (2004). In defense of incentive compensation: Its effect on corporate acquisition policy. *Journal of Applied Corporate Finance, 16*(4), 82-88. doi:10.1111/j.1745-6622.2004.tb00675.x

DeYoung, R., Peng, E. Y., & Yan, M. (2013). Executive compensation and business policy choices at U.S. commercial banks. *Journal of Financial & Quantitative Analysis, 48*(1), 165-196. doi:10.1017/S0022109012000646

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American Sociological Review, 48*(2), 147-160. doi:10.2307/2095101

Drucker, P. F. (1993). The rise of the knowledge society. *Wilson Quarterly, 17*(2), 52-70. Retrieved from http://wilsonquarterly.com

Drucker, P. F. (2001). Will the corporation survive? *The Economist, 360*(8239), 16. Retrieved from http://www.economist.com

Dyl, E. A. (1989). Agency, corporate control and accounting methods--the LIFO-FIFO choice. *Managerial & Decision Economics, 10*(2), 141-145. doi:10.1002/mde.4090100209

Edvinsson, L., & Malone, M. S. (1997). *Intellectual capital: The proven way to establish your company's real value by finding its hidden brainpower.* London; England: Piatkus.

Edvinsson, L., & Sullivan, P. (1996). Developing a model for managing intellectual capital. *European Management Journal, 14*(4), 356-364. doi:10.1016/0263-2373(96)00022-9

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review, 14*(1), 57-74. doi:10.5465/AMR.1989.4279003

Executive Compensation, 17 C.F.R., Subpart 229, § 229.402 (2000).

Fama, E. F. (1980). Agency problems and the theory of the firm. *Journal of Political Economy, 88*(2), 288-307. doi:10.1086/260866

Fama, E. F., & Jensen, M. C. (1983). Separation of ownership and control. *Journal of Law and Economics, 26*(2), 301-325. doi:10.1086/467037

Fathi, S., Farahmand, S., & Khorasani, M. (2013). Impact of intellectual capital on financial performance. *International Journal of Academic Research in Economics and Management Sciences, 2*(1), 6-17. Retrieved from http://www.hrmars.com

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G* Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149-1160. doi:10.3758/BRM.41.4.1149

Field, L. C., & Karpoff, J. M. (2002). Takeover defenses of IPO firms. *The Journal of Finance, 57*(5), 1857-1889. doi:10.1111/0022-1082.00482

Field, A. (2009). *Discovering statistics using SPSS*. Thousand Oaks, CA: Sage.

Firer, S., & Stainbank, L. (2003). Testing the relationship between intellectual capital and a company's performance: Evidence from South Africa. *Meditari Accountancy Research, 11*(1), 25-44. doi:10.1108/10222529200300003

Firer, S., & Williams, S. M. (2003). Intellectual capital and traditional measures of corporate performance. *Journal of Intellectual Capital, 4*(3), 348-360. doi:10.1108/14691930310487806

Forst, A., Park, M. S., & Wier, B. (2013). Insider entrenchment and CEO compensation: Evidence from initial public offering firms. *Journal of Management Accounting Research, 26*(1), 101-120. doi:10.2308/jmar-50622

Frydman, C., & Saks, R. E. (2010). Executive compensation: A new view from a long-term perspective, 1936–2005. *Review of Financial Studies, 23*(5), 2099-2138. doi:10.1093/rfs/hhp120

Gates, S., & Langevin, P. (2010). Human capital measures, strategy, and performance: HR managers' perceptions. *Accounting, Auditing & Accountability Journal, 23*(1), 111-132. doi:10.1108/09513571011010628

Gerdes, J. (2003). EDGAR-Analyzer: Automating the analysis of corporate data contained in the SEC's EDGAR database. *Decision Support Systems, 35*(1), 7-29. doi:10.1016/S0167-9236(02)00096-9

Gomez-Mejia, L., Berrone, P., & Franco-Santos, M. (2010). *Compensation and organizational performance: Theory, research and practice.* Armonk, NY: M. E. Sharpe.

Gomez-Mejia, L. R., Tosi, H., & Hinkin, T. (1987). Managerial control, performance, and executive compensation. *Academy of Management Journal, 30*(1), 51-70. doi:10.2307/255895

Gormley, T. A., Matsa, D. A., & Milbourn, T. (2013). CEO compensation and corporate risk: Evidence from a natural experiment. *Journal of Accounting and Economics, 56*(2), 79-101. doi:10.1016/j.jacceco.2013.08.001

Grabke-Rundell, A., & Gomez-Mejia, L. R. (2002). Power as a determinant of executive compensation. *Human Resource Management Review, 12*(1), 3-23. doi:10.1016/S1053-4822(01)00038-9

Grinstein, Y., & Hribar, P. (2004). CEO compensation and incentives: Evidence from M&A bonuses. *Journal of Financial Economics, 73*(1), 119-143. doi:10.1016/j.jfineco.2003.06.002

Guest, P. M. (2009). The impact of mergers and acquisitions on executive pay in the United Kingdom. *Economica, 76*(301), 149-175. doi:10.1111/j.1468-0335.2007.00674.x

Hambrick, D. C., Werder, A. V., & Zajac, E. J. (2008). New directions in corporate governance research. *Organization Science,19*(3), 381-385. doi:10.1287/orsc.1080.0361

Harrison, J. S., & Wicks, A. C. (2012). Stakeholder theory, value, and firm performance. *Business Ethics Quarterly, 23*(1), 97-124. doi:10.5840/beq20132314

Healy, P. M. (1985). The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics, 7*(1), 85-107. doi:10.1016/0165-4101(85)90029-1

Herd, T. J., & McManus, R. (2012). Who says M&A doesn't create value? *Outlook: The journal of high-performance business (Accenture, Issue No. 1)*. Retrieved from http://www.accenture.com

Hermalin, B. E., & Weisbach, M. S. (2012). Information Disclosure and Corporate Governance. *Journal of Finance, 67*(1), 195-234. doi:10.1111/j.1540-6261.2011.01710.x

Hirschey, M., & Pappas, J. L. (1981). Regulatory and life cycle influences on managerial incentives. *Southern Economic Journal, 48*(2), 327-334. doi:10.2307/1057933

Holton, III and Burnett (2005). The basics of quantitative research. In R. A. Swanson & E. F. Holton III, (Eds.), *Research in organizations: Foundations and methods of inquiry* (pp. 29-44). San Francisco, CA: Berrett-Koehler.

Jackson, S. B. (2008). The Effect of firms' depreciation method choice on managers' capital investment decisions. *Accounting Review, 83*(2), 351-376. doi:10.2308/accr.2008.83.2.351

James, P. C. (2014). A review of the current literature on executive compensation: New insights and understandings. *International Journal of Finance and Banking, 1*(1), 44-54. doi:10.18533/jefs.v2i02.134

Janošević, S., Dženopoljac, V., & Bontis, N. (2013). Intellectual capital and financial performance in Serbia. *Knowledge and Process Management, 20*(1), 1-11. doi:10.1002/kpm.1404

Javornik, S., Tekavcic, M., & Marc, M. (2012). The efficiency of intellectual capital investments as a potential leading indicator. *International Business & Economics Research Journal (IBER), 11*(5), 535-558. Retrieved from http://www.cluteinstitute.com

Jensen, M. C. (1986). Agency cost of free cash flow, corporate finance, and takeovers. *American Economic Review,76*(2), 323-329. Retrieved from https://www.jstor.org

Jensen, M. C. (2002). Value maximization, stakeholder theory, and the corporate objective function. *Business Ethics Quarterly*, *12*(2), 235-256. doi:10.2307/3857812

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305-360. doi:10.1016/0304-405X(76)90026-X

Jensen, M., & Murphy K. (1990). Performance pay and top-management incentives. *Journal of Political Economy*, *98*(2): 225-264. doi:10.1086/261677

Johl, S. K., Bruce, A., & Binks, M. (2013). Remuneration structure and corporate entrepreneurship: A UK study. *International Journal of Business and Management, 8*(7), 116-126. doi:10.5539/ijbm.v8n7p116

Kamath, B. G. (2007). The intellectual capital performance of the Indian banking sector. *Journal of Intellectual Capital, 8*(1), 96-123. doi:10.1108/14691930710715088

Kamath, B. G. (2008). Intellectual capital and corporate performance in Indian pharmaceutical industry. *Journal of Intellectual Capital*, *9*(4), 684-704. doi:10.1108/14691930810913221

Kaplan, R.S. and Norton, D.P. (1992). The balanced scorecard - measures that drives performance. *Harvard Business Review, 70*(1), 71-79. Retrieved from https://hbr.org

Kaplan, R. S., & Norton, D. P. (1996). Using the balanced scorecard as a strategic management system. *Harvard Business Review*, *74*(1), 75-85. Retrieved from https://hbr.org

Kim, J. W., Kogut, B., & Yang, J. (2015). Executive compensation, fat cats, and best athletes. *American Sociological Review, 80*(2), 299-328. doi:10.1177/0003122415572463

Kong, E. (2008). The development of strategic management in the nonprofit context: Intellectual capital in social service non-profit organizations. *International Journal of Management Reviews 10*(3), 281–299. doi:10.1111/j.1468-2370.2007.00224.x

Kong, E., & Thomson, S. B. (2009). An intellectual capital perspective of human resource strategies and practices. *Knowledge Management Research & Practice, 7*(4), 356-364. doi:10.1057/kmrp.2009.27

Kujansivu, P. & Lönnqvist, A. (2007). How do investments in intellectual capital create profits? *International Journal of Learning and Intellectual Capital, 4*(3), 256–275. doi:10.1504/IJLIC.2007.015610

Laing, G., Dunn, J. & Hughes-Lucas, S. (2010). Applying the VAIC™ model to Australian hotels. *Journal of Intellectual Capital, 11*(3), 269-183. doi:10.1108/14691931011064545

Lambert, R. A., Larcker, D. F., & Verrecchia, R. E. (1991). Portfolio considerations in valuing executive compensation. *Journal of Accounting Research, 29*(1), 129-149. Retrieved from http://www.jstor.org

Lambert, R. A., Larcker, D. F. and Weigelt, K. (1991). How sensitive is CEO compensation to organizational size? *Strategic Management Journal, 12*, 395-402. doi:10.1002/smj.4250120506

Larcker, D. F., Richardson, S. A., & Tuna, I. (2007). Corporate governance, accounting outcomes, and organizational performance. *The Accounting Review, 82*(4), 963-1008. doi:10.2308/accr.2007.82.4.963

Larraza−Kintana, M., Wiseman, R. M., Gomez−Mejia, L. R., & Welbourne, T. M. (2007). Disentangling compensation and employment risks using the behavioral agency model. *Strategic Management Journal, 28*(10), 1001-1019. doi:10.1002/smj.624

Lerro, A., & Schiuma, G. (2013). Intellectual capital assessment practices: Overview and managerial implications. *Journal of Intellectual Capital, 14*(3), 352-359. doi:10.1108/JIC-03-2013-0041

Lewellen, W. G. (1969). Management and ownership in the large firm. *Journal of Finance, 24*(2), 299-322. doi:10.2307/2325296

Lewellen, W. G., & Huntsman, B. (1970). Managerial pay and corporate performance. *American Economic Review, 60*(4), 710-720. Retrieved from https://www.jstor.org

Li, H., Jahera, J. S., Jr., & Yost, K. (2013). Corporate risk and corporate governance: Another view. *Managerial Finance, 39*(3), 204-227. doi:10.1108/03074351311302773

Machlup, F. (1962). *The production and distribution of knowledge in the United States (Vol. 278).* Princeton, NJ: Princeton University Press.

Madura, J., Martin, A. and Jessell, K. (1996). Determinants of CEO compensation in small publicly-traded businesses. *American Business Review, 14*(1), 80-8. Retrieved from https://business.illinois.edu/profile/journals-ambure

Makki, M. & Lodhi, S. (2008). Impact of intellectual capital efficiency on profitability (a case study of LSE25 companies). *Lahore Journal of Economics*, *13*(2), 81-98. Retrieved from http://www.lahoreschoolofeconomics.edu.pk/EconomicsJournal

Makki, M., Suleman, A. & Rohra, C. (2009). Impact of intellectual capital on shareholders earning. *Australian Journal of Basic and Applied Sciences, 3*(4), 3386-3399. Retrieved from http://www.ajbasweb.com

Marr, B., Gray, D., & Neely, A. (2003). Why do firms measure their intellectual capital? *Journal of Intellectual Capital, 4*(4), 441-464. doi:10.1108/14691930310504509

Marr, B., Schiuma, G., & Neely, A. (2004). Intellectual capital-defining key performance indicators for organizational knowledge assets. *Business Process Management Journal, 10*(5), 551-569. doi:10.1108/14637150410559225

Masson, R. T. (1971). Executive motivations, earnings, and consequent equity performance. *Journal of Political Economy, 79*(6), 1278-1292. doi:10.1086/259835

Mavridis, D. G. (2003). Are Greek listed firms knowledge workers: An empirical investigation. *In Proceedings of the 1st Conference for Quantitative Methods, Athens*, (26-28). Retrieved from https://www.researchgate.net

Mavridis, D. G. (2004). The intellectual capital performance of the Japanese banking sector. *Journal of Intellectual Capital, 5*(1), 92-115. doi:10.1108/14691930410512941

Mavridis, D. G., & Kyrmizoglou, P. (2005). Intellectual capital performance drivers in the Greek banking sector. *Management Research News, 28*(5), 43-62. doi:10.1108/01409170510629032

McGuire, J. W., Chiu, J. Y., & Elbing, A. O. (1962). Executive incomes, sales and profits. *American Economic Review, 52*(4), 753-761. Retrieved from https://www.jstor.org

Mehralian, G. H., Rasekh, H. R., Akhavan, P., & Farzandi, G. H. (2012). An assessment of structural (organizational) capital indicators in knowledge intensive industries: Evidence from pharmaceutical industry. *Journal of Basic and Applied Scientific Research, 2*(8), 8240-8248. Retrieved from http://ssrn.com

Mention, A. L., (2012). Intellectual capital, innovation and performance: A systematic review of the literature. *Business and Economic Research, 2*(1), 1-37. doi:10.5296/ber.v2i1.1937

Milidonis, A., & Stathopoulos, K. (2014). Managerial incentives, risk aversion, and debt. *Journal of Financial & Quantitative Analysis 49*(2), 453-481. doi:10.1017/S0022109014000301

Mishel, L., & Sabadish, N. (2013). *CEO Pay in 2012 was extraordinarily high relative to typical workers and other high earners.* Economic Policy Institute (Issue Brief No. 367). Retrieved from http://www.epi.org

Morck, R., Shleifer, A., & Vishny, R. (1990). Do managerial objectives drive bad acquisitions? *Journal of Finance 45*, 31-48. doi:10.1111/j.1540-6261.1990.tb05079.x

Murphy, K. J. (1986). Incentives, learning, and compensation: A theoretical and empirical investigation of managerial labor contracts. *RAND Journal of Economics, 17*(1), 59-76. doi:10.2307/2555628

Murphy, K. J. (1999). Executive compensation. In O. Ashenfelter and D. Card (Eds.), *Handbook of labor economics, Vol. 3* (pp. 2485-2563). New York, NY: Elsevier Science, North-Holland.

Murphy, K. J., & Sandino, T. (2010). Executive pay and “independent” compensation consultants. *Journal of Accounting and Economics*, *49*(3), 247-262. doi:10.1016/j.jacceco.2009.12.001

Nazari, J. & Herremans, I. (2007). Extended VAIC™ model: Measuring intellectual capital components. *Journal of Intellectual Capital, 8*(4), 595-609. doi:10.1108/14691930710830774

Nourayi, M. M., & Daroca, F. P. (2008). CEO compensation, firm performance and operational characteristics. *Managerial Finance, 34*(8), 562-584. doi:10.1108/03074350810874082

Nulla, Y. M. (2012a). The CEO compensation system of New York Stock Exchange (NYSE) technology companies: An empirical study between CEO compensation, firm size, firm performance, and CEO power. *International Journal of Scientific and Engineering Research, 3*(8), 57-68. doi:10.2139/ssrn.2284295

Nulla, Y. M. (2012b). The accounting relationship between CEO cash compensation and firm size in TSX/S&P companies. *International Journal of Scientific and Engineering Research, 3*(7), 345-350. doi:10.2139/ssrn.2284290

Nulla, Y. M. (2012c). The study of CEO compensation system in American health companies: An analysis between CEO compensation, firm size, accounting firm performance, and corporate governance. *International Journal of Scientific and Engineering Research, 3*(8), 894-904. doi:10.2139/ssrn.2284297

Nyberg, A. J., Fulmer, I. S., Gerhart, B., & Carpenter, M. A. (2010). Agency theory revisited: CEO return and shareholder interest alignment. *Academy of Management Journal, 53*(5), 1029-1049. doi:10.5465/AMJ.2010.54533188

Ocean Tomo (2011). *Intangible asset market value*. Retrieved from www.oceantomo.com

OECD (1996). Organization for economic co-operation and development. *The knowledge-based economy*. Paris. Retrieved from http://www.oecd.org

O'Kelley, C. (2012). Coase, Knight, and the nexus-of-contracts theory of the firm: A reflection on reification, reality, and the corporation as entrepreneur surrogate. *Seattle University Law Review, 35*(4), 1247-1269. Retrieved from http://ssrn.com

Olsen, K. J., Dworkis, K. K., & Young, S. M. (2014). CEO narcissism and accounting: A picture of profits. *Journal of Management Accounting Research, 26*(2), 243-267. doi:10.2308/jmar-50638

Ordóñez de Pablos, P. (2002). Evidence of intellectual capital measurement from Asia, Europe, and the Middle East. *Journal of Intellectual Capital, 3*(3), 287-302. doi:10.1108/14691930210435624

O'Reilly III, C. A., Main, B. G., & Crystal, G. S. (1988). CEO compensation as tournament and social comparison: A tale of two theories. *Administrative Science Quarterly, 33*(2), 257-274. Retrieved from http://asq.sagepub.com

Ozkan, N. (2011). CEO compensation and firm performance: An empirical investigation of UK panel data. *European Financial Management, 17*(2), 260-285. doi:10.1111/j.1468-036X.2009.00511.x

Parmar, B. L., Freeman, R. E., Harrison, J. S., Wicks, A. C., Purnell, L., & de Colle, S. (2010). Stakeholder theory: The state of the art. *Academy of Management Annals, 4*(1), 403-445. doi:10.1080/19416520.2010.495581

Patton, A. (1961). *Men, money, and motivation: Executive compensation as an instrument of leadership*. New York, NY: McGraw-Hill.

Pagnattaro, M. A., & Greene, S. (2011). "Say on Pay": The Movement to Reform Executive Compensation in the United States and European Union. *Northwestern Journal of International Law & Business, 31*(3), 593-635. Retrieved from http://scholarlycommons.law.northwestern.edu/njilb

Penrose, E., & Pitelis, C. (2009). *Oxford historical monographs: Theory of the growth of the firm* (4th ed.). Oxford, England: Oxford University Press.

Pepper, S. (2006). *Senior executive reward: Key models and practices*. Burlington, VT: Gower Publishing Company.

Pepper, A. & Gore, J. (2012). Behavioral agency theory: New foundations for theorizing about executive compensation. *Journal of Management, 41*(4), 1045-1068. doi:10.1177/0149206312461054

Pepper, A., Gore, J., & Crossman, A. (2013). Are long-term incentive plans an effective and efficient way of motivating senior executives? *Human Resource Management Journal, 23*(1), 36-51. doi:10.1111/j.1748-8583.2011.00188.x

Pulić, A. (1998). *Measuring the performance of intellectual potential in knowledge economy.* Paper presented at the 2nd McMaster World Congress on measuring and managing intellectual capital by the Austrian team for intellectual potential. Retrieved from http://xa.yimg.com/kq/groups/21741988/1414311172/name/pulic+1998.pdf.

Pulić, A. (2000). VAIC™–an accounting tool for IC management. *International Journal of Technology Management, 20*(5-8), 702-714. doi:10.1504/IJTM.2000.002891

Pulić, A. (2004). Intellectual capital--does it create or destroy value? *Measuring Business Excellence, 8*(1), 62-68. doi:10.1108/13683040410524757

Pulić, A., & Kolakovic, M. (2003). Value creation efficiency in the new economy. *Global Business and Economics Review, 5*(1), 111-128. doi:10.1504/GBER.2003.006201

Puntillo, P. (2009). Intellectual Capital and business performance. Evidence from Italian banking industry. *Electronic Journal of Corporate Finance, 4*(2), 97-115. Retrieved from http://cfjournal.hse.ru

Quinnell, K. (2015, May 15). Executive PayWatch 2015: CEO pay continues to skyrocket. *AFL-CIO Now*. Retrieved from http://www.aflcio.org

Rhee, E. Y., & Fiss, P. C. (2014). Framing controversial actions: Regulatory focus, source credibility, and stock market reaction to poison pill adoption. *Academy of Management Journal, 57*(6), 1734-1758. doi:10.5465/amj.2012.0686

Riahi-Belkaoui, A. (2003). Intellectual capital and firm performance of US multinational firms. *Journal of Intellectual Capital, 4*(2), 215-226. doi:10.1108/14691930310472839

Roberts, D. R. (1956). A general theory of executive compensation based on statistically tested propositions. *Quarterly Journal of Economics, 70* (2), 270-294. doi:10.2307/1884268

Roberts, D. R. (1959). *Executive compensation*. Glencoe, IL: Free Press.

Robinson, J. R., Xue, Y, & Yu, Y (2011) Determinants of disclosure noncompliance and the effect of the SEC review: Evidence from the 2006 mandated compensation disclosure regulations. *The Accounting Review*, *86*(4), 1415-1444. doi:10.2308/accr-10033

Roos, G., & Roos, J. (1997). Measuring your company's intellectual performance. *Long Range Planning, 30*(3), 413-426. doi:10.1016/S0024-6301(97)90260-0

Roos, J., Roos, G., Dragonetti, N., & Edvinnson, L. (1997). *Intellectual capital: Navigating in the new business landscape.* New York, NY: New York University Press.

Rosen, R. (2004). Betcha can't acquire just one: Merger programs and compensation. *Federal Reserve Bank of Chicago* (Working Paper No. 2004–22). doi:10.2139/ssrn.621222

Ross, S. A. (1973). The economic theory of agency: The principal's problem. *The American Economic Review, 63*(2), 134-139. Retrieved from https://www.jstor.org

Ross, S. A. (2004). Compensation, incentives, and the duality of risk aversion and riskiness. *The Journal of Finance, 59*(1), 207-225. doi:10.1111/j.1540-6261.2004.00631.x

Rossi, F., & Celenza, D. (2014, April). *Value added intellectual coefficient (VAIC™) and financial performance: Empirical evidence from the Italian manufacturing sector*. Paper presented at the European conference on intellectual capital, Trnava, Slovak Republic (pp, 168-178). doi:10.1111/j.1540-6261.2004.00631.x

Schultz, T. W. (1961). Investment in human capital. *American Economic Review, 51*(1), 1-17. https://www.jstor.org/journal/amereconrevi

SEC (2013). U. S. Securities and Exchange Commission (2013, September). *Pay ratio disclosure* (Proposed Rule Release Nos. 33-9452; 34-70443). Washington, DC. Retrieved from https://www.sec.gov

SEC (2015). U. S. Securities and Exchange Commission (2015, May). *Pay versus performance* (Proposed Rule Release No. 34-74835). Washington, DC. Retrieved from https://www.sec.gov

Sepe, S. M. (2011). Making sense of executive compensation. *Delaware Journal of Corporate Law, 36*(1), 189-235. Retrieved from http://www.djcl.org

Serfling, M. A. (2014). CEO age and the riskiness of corporate policies. *Journal of Corporate Finance, 25*, 251-273. doi:10.1016/j.jcorpfin.2013.12.013

Shalev, R., Zhang, I. X., & Zhang, Y. (2013). CEO compensation and fair value accounting: Evidence from purchase price allocation. *Journal of Accounting Research, 51*(4), 819-854. doi:10.1111/1475-679X.12015

Shiu, H. J. (2006). The application of the value added intellectual coefficient to measure corporate performance: Evidence from technological firms. *International Journal of Management, 23*(2), 356-365. Retrieved from http://www.journals.elsevier.com

Shorter, G. (2013). The “Pay ratio provision” in the Dodd-Frank Act: Legislation to repeal it in the 113th Congress. *Congressional Research Service*. Retrieved from http://www.fas.org

Sigler, K. J. (2011). CEO compensation and company performance. *Business and Economic Journal, BEJ-31*, 1-8. Retrieved from http://astonjournals.com

Sitar, A., & Vasic, V. (2004). Measuring intellectual capital: Lessons learned from a practical implementation. *Innovation Center of Gorenje Group, University of Ljubljana, Eslovenia*. Retrieved from http://www.fm.upr.si/zalozba/ISBN/961-6486-71-3/337-351.pdf

Sledzik, K. (2013). The intellectual capital performance of polish banks: An application of VAIC™ model. *E-Finanse, 9*(2), 92-100. Retrieved from http://www.e-finanse.com

Ståhle, P., Ståhle, S., & Aho, S. (2011). VAIC™: A critical analysis. *Journal of Intellectual Capital, 12*(4), 531-551. doi:10.1108/14691931111181715

Stewart, T. (1997). *Intellectual capital: The new wealth of organizations*. New York, NY: Currency/Doubleday.

Sveiby, K. E. (1997). *The new organizational wealth: Managing & measuring knowledge-based assets.* San Francisco, CA: Berrett-Koehler Publishers.

Sveiby, K.E. (2010). *Methods for measuring intangible assets*. Retrieved from www.sveiby.com

Tan, H., Plowman, D. & Hancock, P (2007). Intellectual capital and financial returns of companies. *Journal of Intellectual Capital, 8*(1), 76-95. doi:10.1108/14691930710715079

Taticchi, P., Tonelli, F., & Cagnazzo, L. (2010). Performance measurement and management: A literature review and a research agenda. *Measuring Business Excellence, 14*(1), 4-18. doi:10.1108/13683041011027418

Tosi, H. L., & Gomez-Mejia, L. R. (1989). The decoupling of CEO pay and performance: An agency theory perspective. *Administrative Science Quarterly, 34*(2), 169-189. doi:10.2307/2989894

Tosi, H. L., Werner, S., Katz, J. P., & Gomez-Mejia, L. R. (2000). How much does performance matter? A meta-analysis of CEO pay studies. *Journal of Management, 26*(2), 301-339. doi:10.1177/014920630002600207

Valančienė, L., & Gimžauskienė, E. (2008). Dimensions of open systems in performance measurement: Theoretical aspect. *Economics & Management, 13,* 79-87. Retrieved from https://www.researchgate.net

Vishnu, S. & Gupta, V. K. (2014). Intellectual capital and performance of pharmaceutical firms in India. *Journal of Intellectual Capital, 15*(1), 83 - 99. doi:10.1108/JIC-04-2013-0049

Vogt, W. P. (2007). *Quantitative research methods for professionals*. New York, NY: Pearson Education.

Wang, H. C., Venezia, C. C., & Lou, Y. I. (2013). Determinants of chief executive officer compensation. *The International Journal of Business and Finance Research, 7,* 29–42. Retrieved from http://www.theibfr.com

Weygandt, J. J., & Warfield, T. D. (2011). *Intermediate accounting (Vol. 1)*. Hoboken, NJ: Wiley.

Williams, S. M. (2001). Is intellectual capital performance and disclosure practices related? *Journal of Intellectual Capital, 2*(3), 192-203. doi:10.1108/14691930110399932

Zéghal, D., & Maaloul, A. (2010). Analyzing value added as an indicator of intellectual capital and its consequences on company performance. *Journal of Intellectual Capital, 11*(1), 39-60. doi:10.1108/14691931011013325

Zuriekat, M., Salameh, R., & Alrawashdeh, S. (2011). Participation in performance measurement systems and level of satisfaction. *International Journal of Business and Social Science, 2*(8), 159-169. Retrieved from http://www.ijbssnet.com

APPENDIX A. SAMPLE AND VARIABLES

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
DJCO	1	2009	1,934.6	1.8	0.4	2.3	0.6	2.8
DJCO	1	2010	1,740.8	1.8	0.4	2.3	0.5	2.7
DJCO	1	2011	1,586.8	1.9	0.5	2.4	0.4	2.8
DJCO	1	2012	1,033.3	1.6	0.4	2.0	0.3	2.3
DJCO	1	2013	650.0	1.4	0.3	1.6	0.2	1.9
BWLD	1	2009	1,970.0	1.5	0.3	1.8	1.1	2.9
BWLD	1	2010	2,115.1	1.6	0.4	1.9	1.1	3.0
BWLD	1	2011	3,922.0	1.6	0.4	1.9	1.1	3.0
BWLD	1	2012	3,783.4	1.5	0.3	1.9	1.1	3.0
BWLD	1	2013	4,012.2	1.5	0.3	1.9	1.2	3.0
CAKE	1	2009	3,699.0	2.2	0.5	2.8	2.3	5.0
CAKE	1	2010	4,135.6	2.4	0.6	3.0	2.2	5.3
CAKE	1	2011	5,386.7	2.3	0.6	2.9	2.4	5.3
CAKE	1	2012	5,368.1	2.4	0.6	2.9	2.4	5.3
CAKE	1	2013	5,394.3	2.3	0.6	2.9	2.5	5.4
RICK	1	2009	724.8	7.0	0.9	7.8	1.4	9.2
RICK	1	2010	653.7	6.0	0.8	6.8	1.4	8.2

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
RICK	1	2011	778.9	6.4	0.8	7.3	1.5	8.8
RICK	1	2012	1,113.7	5.9	0.8	6.8	1.4	8.2
RICK	1	2013	1,015.9	5.5	0.8	6.3	1.5	7.8
TXRH	1	2009	689.8	2.9	0.7	3.6	1.9	5.5
TXRH	1	2010	614.8	3.1	0.7	3.8	1.8	5.7
TXRH	1	2011	4,332.4	2.9	0.7	3.6	1.9	5.5
TXRH	1	2012	1,169.1	2.9	0.7	3.5	2.0	5.5
TXRH	1	2013	1,086.1	2.9	0.6	3.5	2.0	5.5
CPHC	1	2009	268.1	1.1	0.1	1.3	0.7	2.0
CPHC	1	2010	231.5	1.0	-	1.1	0.7	1.8
CPHC	1	2011	298.2	1.2	0.1	1.3	0.7	2.1
CPHC	1	2012	256.7	1.2	0.2	1.4	0.9	2.2
CPHC	1	2013	330.1	1.2	0.2	1.3	0.8	2.2
PFIE	2	2009	231.0	6.7	0.9	7.5	2.1	9.7
PFIE	2	2010	258.8	7.4	0.9	8.2	1.8	10.0
PFIE	2	2011	381.7	9.2	0.9	10.1	1.6	11.7
PFIE	2	2012	377.6	8.5	0.9	9.4	1.7	11.1
PFIE	2	2013	332.2	5.8	0.8	6.7	1.5	8.2
ESSA	3	2009	417.8	1.7	0.4	2.1	0.1	2.3
ESSA	3	2010	435.6	1.5	0.3	1.8	0.1	2.0
ESSA	3	2011	601.8	1.5	0.3	1.9	0.1	2.0

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
ESSA	3	2012	612.6	1.1	0.1	1.1	0.1	1.2
ESSA	3	2013	939.0	1.7	0.4	2.1	0.2	2.3
GCBC	3	2009	287.3	2.0	0.5	2.5	0.3	2.9
GCBC	3	2010	346.7	2.2	0.5	2.7	0.3	3.1
GCBC	3	2011	520.6	2.1	0.5	2.6	0.4	3.0
GCBC	3	2012	494.4	2.1	0.5	2.6	0.3	3.0
GCBC	3	2013	536.0	2.1	0.5	2.7	0.3	3.0
HBCP	3	2009	422.8	1.7	0.4	2.1	0.1	2.3
HBCP	3	2010	434.9	1.6	0.4	1.9	0.2	2.1
HBCP	3	2011	429.9	1.5	0.3	1.8	0.2	2.0
HBCP	3	2012	440.3	1.8	0.4	2.2	0.2	2.5
HBCP	3	2013	476.1	1.6	0.4	2.0	0.2	2.2
PEOP	3	2009	490.0	8.9	0.9	9.8	1.2	11.0
PEOP	3	2010	561.9	16.4	0.9	17.3	1.1	18.4
PEOP	3	2011	1,995.4	15.5	0.9	16.5	1.1	17.6
PEOP	3	2012	1,012.2	13.0	0.9	13.9	1.1	15.1
PEOP	3	2013	534.9	12.3	0.9	13.2	1.1	14.4
PRAA	3	2009	2,508.5	4.9	0.8	5.7	1.6	7.3
PRAA	3	2010	3,010.1	6.0	0.8	6.9	1.5	8.4
PRAA	3	2011	3,535.0	6.6	0.8	7.5	1.5	9.0
PRAA	3	2012	3,950.0	6.5	0.8	7.4	1.6	8.9

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
PRAA	3	2013	4,596.1	7.1	0.9	7.9	1.6	9.5
SNFCA	3	2009	520.9	3.5	0.7	4.2	1.6	5.8
SNFCA	3	2010	523.5	3.3	0.7	4.0	1.5	5.5
SNFCA	3	2011	619.7	3.8	0.7	4.5	1.5	6.0
SNFCA	3	2012	588.1	3.9	0.7	4.7	1.7	6.4
SNFCA	3	2013	490.7	3.4	0.7	4.1	1.6	5.7
CME	3	2009	3,889.5	5.5	0.8	6.3	99.1	105.4
CME	3	2010	3,199.2	5.3	0.8	6.1	113.9	119.9
CME	3	2011	3,254.3	5.3	0.8	6.2	117.9	124.0
CME	3	2012	4,149.4	4.7	0.8	5.5	108.6	114.1
CME	3	2013	5,368.6	4.3	0.8	5.1	106.6	111.7
INTL	3	2009	973.8	1.3	0.3	1.6	0.2	1.8
INTL	3	2010	1,506.2	1.2	0.2	1.3	0.5	1.9
INTL	3	2011	3,907.7	1.4	0.3	1.6	0.8	2.4
INTL	3	2012	909.3	1.2	0.1	1.3	0.7	2.0
INTL	3	2013	1,157.6	1.1	0.1	1.3	0.7	2.0
NDAQ	3	2009	5,813.6	14.3	0.9	15.3	1.2	16.4
NDAQ	3	2010	7,567.8	14.0	0.9	14.9	1.2	16.2
NDAQ	3	2011	8,911.3	13.4	0.9	14.3	1.2	15.5
NDAQ	3	2012	13,840.0	13.9	0.9	14.8	1.2	16.1

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
NDAQ	3	2013	12,083.9	7.9	0.9	8.7	1.4	10.2
SEIC	3	2009	1,349.7	6.3	0.8	7.2	1.7	8.8
SEIC	3	2010	1,264.2	6.5	0.8	7.3	1.6	9.0
SEIC	3	2011	1,455.9	5.9	0.8	6.7	1.6	8.3
SEIC	3	2012	1,689.5	5.3	0.8	6.1	1.7	7.8
SEIC	3	2013	1,763.6	5.6	0.8	6.4	1.7	8.2
ACAS	3	2009	8,655.2	1.7	0.4	2.1	0.1	2.2
ACAS	3	2010	13,146.3	2.6	0.6	3.2	0.1	3.3
ACAS	3	2011	10,214.0	3.2	0.7	3.9	0.1	3.9
ACAS	3	2012	9,537.7	3.6	0.7	4.4	0.1	4.4
ACAS	3	2013	16,902.8	2.5	0.6	3.1	0.1	3.2
CG	3	2009	3,683.0	5.1	0.8	5.9	2.5	8.4
CG	3	2010	3,827.0	9.6	0.9	10.5	1.9	12.4
CG	3	2011	281.0	22.8	1.0	23.8	1.2	25.0
CG	3	2012	281.0	12.6	0.9	13.5	1.3	14.8
CG	3	2013	282.0	6.3	0.8	7.2	1.4	8.6
ACNB	3	2009	453.1	1.6	0.4	2.0	0.3	2.3
ACNB	3	2010	501.8	1.7	0.4	2.2	0.3	2.5
ACNB	3	2011	841.5	1.8	0.4	2.2	0.3	2.5
ACNB	3	2012	529.3	1.7	0.4	2.1	0.3	2.4

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
ACNB	3	2013	654.0	1.7	0.4	2.2	0.3	2.5
AROW	3	2009	184.1	2.3	0.6	2.8	0.4	3.3
AROW	3	2010	244.9	2.3	0.6	2.8	0.4	3.3
AROW	3	2011	345.8	2.3	0.6	2.8	0.4	3.2
AROW	3	2012	426.5	2.3	0.6	2.8	0.4	3.3
AROW	3	2013	557.0	2.3	0.6	2.8	0.4	3.2
AUBN	3	2009	57.0	1.4	0.3	1.6	0.2	1.8
AUBN	3	2010	91.7	1.9	0.5	2.4	0.3	2.6
AUBN	3	2011	132.3	1.8	0.4	2.2	0.2	2.4
AUBN	3	2012	142.8	2.0	0.5	2.5	0.3	2.8
AUBN	3	2013	141.1	2.2	0.5	2.7	0.3	3.0
BANF	3	2009	435.7	1.7	0.4	2.1	0.3	2.5
BANF	3	2010	459.1	1.9	0.5	2.4	0.3	2.7
BANF	3	2011	478.4	1.9	0.5	2.3	0.4	2.7
BANF	3	2012	498.3	1.9	0.5	2.4	0.4	2.7
BANF	3	2013	486.9	1.9	0.5	2.4	0.3	2.7
BBNK	3	2009	619.8	1.1	0.1	1.2	0.2	1.4
BBNK	3	2010	1,065.4	1.3	0.2	1.5	0.2	1.7
BBNK	3	2011	2,375.9	1.6	0.4	2.0	0.3	2.3
BBNK	3	2012	1,170.9	1.8	0.4	2.3	0.4	2.6

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
BBNK	3	2013	1,519.8	1.8	0.4	2.2	0.4	2.6
BDGE	3	2009	720.3	2.0	0.5	2.5	0.5	3.0
BDGE	3	2010	805.0	1.9	0.5	2.4	0.5	2.9
BDGE	3	2011	732.8	1.9	0.5	2.4	0.3	2.7
BDGE	3	2012	868.8	2.0	0.5	2.5	0.3	2.8
BDGE	3	2013	1,180.6	2.0	0.5	2.5	0.3	2.8
BKSC	3	2009	159.8	1.7	0.4	2.1	0.3	2.3
BKSC	3	2010	175.0	2.0	0.5	2.5	0.3	2.9
BKSC	3	2011	204.4	2.0	0.5	2.5	0.3	2.8
BKSC	3	2012	208.0	2.1	0.5	2.6	0.3	2.9
BKSC	3	2013	228.7	2.2	0.5	2.7	0.3	3.0
BSRR	3	2009	790.7	8.8	0.9	9.6	1.2	10.9
BSRR	3	2010	935.3	9.1	0.9	10.0	1.2	11.2
BSRR	3	2011	845.6	9.7	0.9	10.6	1.2	11.8
BSRR	3	2012	945.5	9.9	0.9	10.8	1.2	12.0
BSRR	3	2013	919.5	10.1	0.9	11.0	1.2	12.3
BYLK	3	2009	302.0	1.4	0.3	1.7	0.3	2.0
BYLK	3	2010	554.7	1.1	0.1	1.2	0.2	1.4
BYLK	3	2011	630.9	1.4	0.3	1.7	0.3	2.0
BYLK	3	2012	651.1	1.6	0.4	2.0	0.3	2.3

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
BYLK	3	2013	589.1	1.8	0.4	2.2	0.3	2.5
CBSH	3	2009	2,812.9	1.8	0.5	2.3	0.3	2.6
CBSH	3	2010	3,919.4	2.1	0.5	2.6	0.4	2.9
CBSH	3	2011	4,169.5	2.2	0.6	2.8	0.4	3.1
CBSH	3	2012	3,469.0	2.2	0.6	2.8	0.4	3.1
CBSH	3	2013	3,751.5	2.2	0.5	2.7	0.4	3.1
CCNE	3	2009	545.6	3.2	0.7	3.9	0.7	4.5
CCNE	3	2010	688.6	3.2	0.7	3.8	0.5	4.3
CCNE	3	2011	725.0	3.0	0.7	3.7	0.4	4.1
CCNE	3	2012	854.0	3.0	0.7	3.7	0.4	4.1
CCNE	3	2013	875.9	3.1	0.7	3.8	0.4	4.2
CFNB	3	2009	189.9	2.3	0.6	2.8	0.1	3.0
CFNB	3	2010	189.0	3.0	0.7	3.6	0.1	3.7
CFNB	3	2011	189.4	2.7	0.6	3.3	0.1	3.4
CFNB	3	2012	187.1	2.5	0.6	3.1	0.1	3.2
CFNB	3	2013	187.3	2.3	0.6	2.9	0.1	3.0
CHMG	3	2009	647.2	1.5	0.3	1.8	0.3	2.2
CHMG	3	2010	715.5	1.9	0.5	2.4	0.4	2.8
CHMG	3	2011	889.0	1.8	0.5	2.3	0.3	2.6
CHMG	3	2012	871.0	1.8	0.4	2.2	0.3	2.6

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
CHMG	3	2013	1,045.2	1.6	0.4	2.0	0.3	2.3
CTBI	3	2009	655.3	1.9	0.5	2.4	0.3	2.7
CTBI	3	2010	604.4	2.1	0.5	2.6	0.3	2.9
CTBI	3	2011	972.3	2.2	0.6	2.8	0.3	3.1
CTBI	3	2012	802.9	2.3	0.6	2.9	0.3	3.2
CTBI	3	2013	1,037.9	2.3	0.6	2.9	0.3	3.2
CVCY	3	2009	524.0	1.2	0.2	1.4	0.2	1.6
CVCY	3	2010	549.8	1.3	0.2	1.5	0.2	1.7
CVCY	3	2011	810.0	1.6	0.4	2.0	0.2	2.2
CVCY	3	2012	619.1	1.7	0.4	2.0	0.2	2.3
CVCY	3	2013	704.6	1.6	0.4	2.0	0.2	2.2
DNBF	3	2009	496.0	1.6	0.4	1.9	0.3	2.2
DNBF	3	2010	688.7	2.0	0.5	2.5	0.4	2.9
DNBF	3	2011	684.5	2.1	0.5	2.6	0.4	2.9
DNBF	3	2012	658.1	2.0	0.5	2.5	0.3	2.9
DNBF	3	2013	712.5	1.8	0.4	2.2	0.3	2.5
EMCF	3	2009	276.3	1.4	0.3	1.7	0.2	1.9
EMCF	3	2010	313.7	1.7	0.4	2.1	0.3	2.4
EMCF	3	2011	354.5	1.8	0.4	2.2	0.3	2.5
EMCF	3	2012	427.3	1.7	0.4	2.2	0.2	2.4

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
EMCF	3	2013	468.6	1.7	0.4	2.1	0.3	2.4
EWBC	3	2009	5,065.6	3.3	0.7	4.0	0.1	4.2
EWBC	3	2010	10,660.2	2.8	0.6	3.5	0.2	3.7
EWBC	3	2011	8,222.8	3.8	0.7	4.6	0.3	4.8
EWBC	3	2012	5,711.3	4.0	0.7	4.7	0.3	5.0
EWBC	3	2013	5,860.0	4.0	0.7	4.7	0.3	5.0
FBMS	3	2009	221.8	6.6	0.8	7.4	1.3	8.7
FBMS	3	2010	277.8	8.1	0.9	8.9	1.2	10.2
FBMS	3	2011	331.2	7.7	0.9	8.6	1.2	9.8
FBMS	3	2012	417.7	7.1	0.9	7.9	1.3	9.2
FBMS	3	2013	471.1	7.3	0.9	8.1	1.3	9.4
FBSS	3	2009	393.6	1.5	0.4	1.9	0.4	2.3
FBSS	3	2010	637.5	1.6	0.4	1.9	0.4	2.3
FBSS	3	2011	521.8	1.6	0.4	2.0	0.4	2.4
FBSS	3	2012	499.3	1.4	0.3	1.7	0.3	1.9
FBSS	3	2013	619.0	1.7	0.4	2.1	0.3	2.5
FFIC	3	2009	1,606.2	2.5	0.6	3.1	0.2	3.3
FFIC	3	2010	1,676.0	2.7	0.6	3.3	0.2	3.5
FFIC	3	2011	1,650.5	2.6	0.6	3.2	0.2	3.5
FFIC	3	2012	1,894.2	2.4	0.6	3.0	0.2	3.2

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
FFIC	3	2013	2,306.7	2.4	0.6	3.0	0.2	3.3
FMER	3	2009	5,510.3	1.7	0.4	2.1	0.3	2.4
FMER	3	2010	6,363.7	1.8	0.5	2.3	0.3	2.6
FMER	3	2011	7,401.4	1.9	0.5	2.3	0.3	2.6
FMER	3	2012	16,411.2	1.9	0.5	2.4	0.3	2.7
FMER	3	2013	4,917.6	1.9	0.5	2.3	0.2	2.6
FNLC	3	2009	524.8	2.7	0.6	3.4	0.2	3.6
FNLC	3	2010	601.4	2.5	0.6	3.1	0.2	3.3
FNLC	3	2011	791.5	2.4	0.6	3.0	0.2	3.2
FNLC	3	2012	853.9	2.4	0.6	2.9	0.2	3.1
FNLC	3	2013	1,206.1	2.3	0.6	2.8	0.2	3.0
GABC	3	2009	772.1	1.9	0.5	2.4	0.4	2.8
GABC	3	2010	813.9	2.0	0.5	2.5	0.4	2.9
GABC	3	2011	835.5	2.2	0.5	2.7	0.4	3.1
GABC	3	2012	824.6	2.4	0.6	2.9	0.4	3.3
GABC	3	2013	874.0	2.3	0.6	2.9	0.4	3.2
GBCI	3	2009	370.1	1.6	0.4	1.9	0.2	2.1
GBCI	3	2010	360.8	1.7	0.4	2.1	0.2	2.3
GBCI	3	2011	669.9	1.4	0.3	1.6	0.1	1.7
GBCI	3	2012	1,036.7	2.1	0.5	2.6	0.2	2.9

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
GBCI	3	2013	1,289.4	2.3	0.6	2.9	0.2	3.1
GSBC	3	2009	521.5	3.5	0.7	4.2	0.5	4.7
GSBC	3	2010	686.4	1.9	0.5	2.4	0.3	2.7
GSBC	3	2011	935.5	2.0	0.5	2.5	0.3	2.8
GSBC	3	2012	677.6	2.4	0.6	3.0	0.3	3.3
GSBC	3	2013	1,111.5	2.1	0.5	2.6	0.3	2.9
HBHC	3	2009	1,466.3	1.9	0.5	2.4	0.3	2.7
HBHC	3	2010	2,449.2	1.5	0.3	1.9	0.3	2.1
HBHC	3	2011	1,768.3	1.4	0.3	1.7	0.2	1.9
HBHC	3	2012	3,094.3	1.6	0.4	2.0	0.2	2.3
HBHC	3	2013	2,258.4	1.7	0.4	2.1	0.2	2.4
HBNC	3	2009	503.2	1.7	0.4	2.1	0.3	2.4
HBNC	3	2010	527.3	1.7	0.4	2.1	0.3	2.5
HBNC	3	2011	709.3	1.9	0.5	2.3	0.3	2.7
HBNC	3	2012	629.1	2.1	0.5	2.6	0.4	3.0
HBNC	3	2013	832.0	2.0	0.5	2.5	0.4	2.8
IBOC	3	2009	1,233.5	3.0	0.7	3.6	0.3	3.9
IBOC	3	2010	1,241.6	2.9	0.6	3.5	0.2	3.8
IBOC	3	2011	1,306.9	2.8	0.6	3.4	0.2	3.7
IBOC	3	2012	1,526.7	2.6	0.6	3.2	0.2	3.4

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
IBOC	3	2013	1,883.1	2.7	0.6	3.4	0.2	3.6
INDB	3	2009	1,814.5	1.5	0.3	1.9	0.3	2.1
INDB	3	2010	2,049.6	1.8	0.4	2.3	0.3	2.6
INDB	3	2011	2,008.7	1.9	0.5	2.4	0.3	2.7
INDB	3	2012	1,694.3	1.8	0.4	2.2	0.3	2.5
INDB	3	2013	2,768.7	1.8	0.5	2.3	0.3	2.6
LCNB	3	2009	570.9	2.1	0.5	2.6	0.3	2.9
LCNB	3	2010	655.3	2.1	0.5	2.7	0.3	3.0
LCNB	3	2011	553.1	1.9	0.5	2.4	0.3	2.7
LCNB	3	2012	406.3	2.1	0.5	2.6	0.3	2.9
LCNB	3	2013	790.4	2.0	0.5	2.5	0.2	2.7
MBCN	3	2009	356.2	1.4	0.3	1.7	0.2	1.9
MBCN	3	2010	357.9	1.5	0.3	1.8	0.3	2.1
MBCN	3	2011	378.1	1.8	0.4	2.2	0.3	2.5
MBCN	3	2012	397.6	2.2	0.6	2.8	0.3	3.1
MBCN	3	2013	400.7	2.3	0.6	2.8	0.3	3.1
MNRK	3	2009	419.1	1.6	0.4	1.9	0.4	2.3
MNRK	3	2010	515.8	1.6	0.4	2.0	0.4	2.4
MNRK	3	2011	709.5	1.5	0.4	1.9	0.5	2.4
MNRK	3	2012	682.2	1.8	0.4	2.2	0.6	2.8

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
MNRK	3	2013	710.8	1.6	0.4	2.0	0.6	2.6
MOFG	3	2009	436.3	1.3	0.2	1.5	0.2	1.7
MOFG	3	2010	547.5	1.7	0.4	2.1	0.2	2.4
MOFG	3	2011	585.6	1.9	0.5	2.3	0.3	2.6
MOFG	3	2012	569.4	1.8	0.4	2.2	0.3	2.5
MOFG	3	2013	646.3	2.1	0.5	2.7	0.3	2.9
NBTB	3	2009	2,990.7	1.9	0.5	2.4	0.3	2.7
NBTB	3	2010	4,509.4	1.9	0.5	2.4	0.3	2.7
NBTB	3	2011	3,519.9	1.9	0.5	2.3	0.3	2.7
NBTB	3	2012	1,837.1	1.8	0.4	2.2	0.3	2.6
NBTB	3	2013	4,601.7	1.9	0.5	2.3	0.3	2.6
NKSH	3	2009	1,111.5	2.7	0.6	3.3	0.2	3.5
NKSH	3	2010	1,592.6	2.9	0.7	3.5	0.2	3.8
NKSH	3	2011	1,371.9	3.1	0.7	3.8	0.2	4.0
NKSH	3	2012	1,144.4	3.0	0.7	3.6	0.2	3.9
NKSH	3	2013	1,427.3	3.0	0.7	3.7	0.2	3.9
NWBI	3	2009	920.1	1.5	0.4	1.9	0.1	2.0
NWBI	3	2010	2,064.5	1.9	0.5	2.4	0.1	2.6
NWBI	3	2011	1,469.1	2.0	0.5	2.5	0.2	2.6
NWBI	3	2012	905.2	1.9	0.5	2.4	0.2	2.6

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
NWBI	3	2013	1,684.9	1.9	0.5	2.4	0.2	2.6
NWFL	3	2009	309.8	2.5	0.6	3.0	0.3	3.3
NWFL	3	2010	329.1	2.6	0.6	3.2	0.3	3.5
NWFL	3	2011	356.4	2.3	0.6	2.9	0.2	3.1
NWFL	3	2012	363.7	2.4	0.6	3.0	0.2	3.3
NWFL	3	2013	427.6	2.4	0.6	3.0	0.2	3.2
OLBK	3	2009	463.4	1.8	0.4	2.2	0.2	2.4
OLBK	3	2010	606.2	1.5	0.4	1.9	0.2	2.1
OLBK	3	2011	693.9	1.8	0.5	2.3	0.3	2.5
OLBK	3	2012	1,025.7	2.0	0.5	2.5	0.3	2.8
OLBK	3	2013	1,091.6	1.8	0.4	2.2	0.2	2.5
OZRK	3	2009	2,196.5	2.9	0.7	3.5	0.3	3.9
OZRK	3	2010	2,639.2	3.4	0.7	4.1	0.4	4.5
OZRK	3	2011	3,483.4	3.8	0.7	4.5	0.5	5.0
OZRK	3	2012	4,311.1	3.0	0.7	3.7	0.3	4.0
OZRK	3	2013	5,091.8	3.1	0.7	3.8	0.3	4.1
PPBI	3	2009	645.1	10.2	0.9	11.1	1.1	12.2
PPBI	3	2010	716.5	1.9	0.5	2.3	0.2	2.5
PPBI	3	2011	1,041.2	2.4	0.6	3.0	0.4	3.3
PPBI	3	2012	1,056.4	2.7	0.6	3.3	0.3	3.6

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
PPBI	3	2013	1,428.8	1.7	0.4	2.1	0.2	2.4
RBCAA	3	2009	471.4	8.6	0.9	9.5	1.4	10.8
RBCAA	3	2010	517.7	9.7	0.9	10.6	1.4	12.0
RBCAA	3	2011	560.9	10.9	0.9	11.8	1.5	13.3
RBCAA	3	2012	404.4	13.0	0.9	13.9	1.5	15.4
RBCAA	3	2013	457.7	11.2	0.9	12.1	1.2	13.3
RNST	3	2009	913.7	8.9	0.9	9.8	1.2	11.0
RNST	3	2010	1,015.6	9.8	0.9	10.7	1.2	12.0
RNST	3	2011	1,524.2	9.0	0.9	9.8	1.2	11.1
RNST	3	2012	1,995.4	7.6	0.9	8.5	1.2	9.7
RNST	3	2013	2,402.0	8.3	0.9	9.1	1.2	10.4
SBBX	3	2009	501.3	6.1	0.8	7.0	1.3	8.3
SBBX	3	2010	553.7	6.2	0.8	7.0	1.3	8.3
SBBX	3	2011	553.5	6.1	0.8	6.9	1.3	8.3
SBBX	3	2012	644.5	5.6	0.8	6.4	1.2	7.7
SBBX	3	2013	651.3	6.2	0.8	7.1	1.2	8.3
SFST	3	2009	673.6	9.0	0.9	9.8	1.2	11.0
SFST	3	2010	531.4	8.4	0.9	9.3	1.2	10.5
SFST	3	2011	721.8	8.4	0.9	9.3	1.2	10.5
SFST	3	2012	996.0	8.0	0.9	8.9	1.3	10.2

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
SFST	3	2013	670.0	7.0	0.9	7.9	1.3	9.2
SRCE	3	2009	1,871.6	1.8	0.4	2.2	0.2	2.4
SRCE	3	2010	1,976.4	2.1	0.5	2.7	0.3	3.0
SRCE	3	2011	1,542.6	2.2	0.6	2.8	0.3	3.1
SRCE	3	2012	1,652.6	2.2	0.5	2.7	0.3	3.0
SRCE	3	2013	1,847.3	2.3	0.6	2.8	0.3	3.1
SSB	3	2009	1,798.5	8.6	0.9	9.5	1.2	10.7
SSB	3	2010	1,186.0	7.9	0.9	8.8	1.5	10.2
SSB	3	2011	1,415.7	7.2	0.9	8.0	1.3	9.3
SSB	3	2012	2,401.7	8.4	0.9	9.3	1.3	10.5
SSB	3	2013	2,642.3	9.8	0.9	10.7	1.2	11.9
STBA	3	2009	809.4	12.6	0.9	13.5	1.1	14.6
STBA	3	2010	1,085.6	14.2	0.9	15.1	1.2	16.3
STBA	3	2011	1,187.1	11.9	0.9	12.9	1.2	14.1
STBA	3	2012	630.6	11.1	0.9	12.0	1.2	13.2
STBA	3	2013	1,682.8	11.5	0.9	12.5	1.2	13.7
STBZ	3	2009	615.0	26.0	1.0	27.0	1.1	28.1
STBZ	3	2010	784.5	11.2	0.9	12.1	1.3	13.5
STBZ	3	2011	661.8	10.3	0.9	11.2	1.3	12.5
STBZ	3	2012	843.6	9.6	0.9	10.5	1.2	11.7

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
STBZ	3	2013	831.0	8.4	0.9	9.3	1.2	10.5
SUSQ	3	2009	1,479.8	1.1	0.1	1.2	106.3	107.5
SUSQ	3	2010	1,672.3	1.3	0.2	1.5	121.2	122.6
SUSQ	3	2011	4,529.5	1.3	0.2	1.5	123.5	125.0
SUSQ	3	2012	3,399.6	1.9	0.5	2.4	182.9	185.3
SUSQ	3	2013	3,987.5	2.0	0.5	2.5	195.0	197.5
THFF	3	2009	1,421.8	1.8	0.4	2.3	0.3	2.5
THFF	3	2010	1,960.7	2.0	0.5	2.5	0.3	2.8
THFF	3	2011	2,159.7	2.2	0.6	2.8	0.3	3.1
THFF	3	2012	1,443.5	1.9	0.5	2.4	0.3	2.7
THFF	3	2013	2,657.4	1.9	0.5	2.4	0.3	2.7
ESGR	3	2009	4,782.7	4.0	0.8	4.8	0.3	5.0
ESGR	3	2010	5,104.1	4.4	0.8	5.2	0.3	5.5
ESGR	3	2011	5,033.6	3.6	0.7	4.3	0.2	4.5
ESGR	3	2012	5,759.5	3.4	0.7	4.1	0.2	4.3
ESGR	3	2013	12,662.2	3.1	0.7	3.8	0.2	4.0
ANCX	3	2009	521.3	1.6	0.4	1.9	0.7	2.6
ANCX	3	2010	687.2	1.6	0.4	1.9	0.5	2.4
ANCX	3	2011	763.0	1.7	0.4	2.1	0.5	2.7
ANCX	3	2012	825.5	1.9	0.5	2.4	0.7	3.1

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
ANCX	3	2013	802.7	1.8	0.5	2.3	0.5	2.8
BOFI	3	2009	1,129.4	3.2	0.7	3.9	0.2	4.1
BOFI	3	2010	3,188.2	5.9	0.8	6.7	0.3	7.1
BOFI	3	2011	1,372.9	3.4	0.7	4.1	0.3	4.4
BOFI	3	2012	2,367.8	3.5	0.7	4.2	0.3	4.6
BOFI	3	2013	4,897.8	3.4	0.7	4.1	0.4	4.5
CASH	3	2009	702.3	1.0	-	1.1	0.7	1.8
CASH	3	2010	677.1	1.7	0.4	2.1	0.8	2.9
CASH	3	2011	1,077.1	1.4	0.3	1.7	0.5	2.2
CASH	3	2012	1,192.9	2.0	0.5	2.5	0.4	2.9
CASH	3	2013	1,819.1	1.6	0.4	2.0	0.4	2.4
CHEV	3	2009	305.8	1.4	0.3	1.7	0.1	1.8
CHEV	3	2010	320.5	1.7	0.4	2.2	0.1	2.3
CHEV	3	2011	370.4	1.8	0.4	2.3	0.2	2.4
CHEV	3	2012	372.5	1.8	0.5	2.3	0.1	2.4
CHEV	3	2013	440.1	1.4	0.3	1.7	0.1	1.8
CVLY	3	2009	508.1	1.4	0.3	1.6	0.2	1.9
CVLY	3	2010	478.4	1.7	0.4	2.1	0.3	2.3
CVLY	3	2011	614.5	1.7	0.4	2.1	0.3	2.4
CVLY	3	2012	607.2	1.9	0.5	2.4	0.3	2.7

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
CVLY	3	2013	706.2	2.0	0.5	2.4	0.3	2.7
DCOM	3	2009	2,711.5	2.3	0.6	2.9	0.3	3.2
DCOM	3	2010	3,147.0	3.1	0.7	3.7	0.3	4.1
DCOM	3	2011	2,860.5	3.2	0.7	3.9	0.3	4.3
DCOM	3	2012	2,161.8	2.9	0.7	3.5	0.3	3.8
DCOM	3	2013	3,724.3	3.0	0.7	3.6	0.3	3.9
FSFG	3	2009	711.7	1.0	-	1.0	0.1	1.1
FSFG	3	2010	283.6	1.5	0.3	1.9	0.2	2.1
FSFG	3	2011	318.6	1.8	0.4	2.2	0.2	2.4
FSFG	3	2012	357.8	1.7	0.4	2.2	0.2	2.4
FSFG	3	2013	367.9	1.7	0.4	2.2	0.2	2.4
IROQ	3	2009	426.4	1.8	0.4	2.2	0.3	2.5
IROQ	3	2010	459.4	1.8	0.4	2.2	0.3	2.5
IROQ	3	2011	487.6	1.7	0.4	2.1	0.3	2.4
IROQ	3	2012	492.4	1.3	0.2	1.6	0.1	1.7
IROQ	3	2013	819.5	1.8	0.4	2.2	0.2	2.4
PBCT	3	2009	485.1	16.1	0.9	17.0	1.1	18.1
PBCT	3	2010	506.4	15.1	0.9	16.1	1.1	17.2
PBCT	3	2011	474.2	13.9	0.9	14.9	1.1	16.0
PBCT	3	2012	352.0	14.0	0.9	14.9	1.2	16.1

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
PBCT	3	2013	354.4	12.6	0.9	13.5	1.2	14.7
SIFI	3	2009	601.0	6.1	0.8	6.9	1.2	8.1
SIFI	3	2010	821.3	6.6	0.8	7.5	1.3	8.8
SIFI	3	2011	987.4	9.5	0.9	10.4	1.2	11.5
SIFI	3	2012	639.9	9.1	0.9	10.0	1.2	11.2
SIFI	3	2013	647.3	9.6	0.9	10.5	1.1	11.6
TFSL	3	2009	3,244.8	23.9	1.0	24.8	1.1	25.9
TFSL	3	2010	1,882.4	22.3	1.0	23.3	1.1	24.4
TFSL	3	2011	3,440.8	24.8	1.0	25.7	1.1	26.8
TFSL	3	2012	4,977.4	24.0	1.0	25.0	1.1	26.0
TFSL	3	2013	4,425.3	23.8	1.0	24.8	1.1	25.9
ITIC	3	2009	419.1	1.4	0.3	1.6	0.3	1.9
ITIC	3	2010	431.0	1.5	0.3	1.9	0.3	2.1
ITIC	3	2011	592.7	1.5	0.3	1.9	0.3	2.2
ITIC	3	2012	858.5	1.8	0.4	2.2	0.3	2.5
ITIC	3	2013	681.6	1.9	0.5	2.3	0.4	2.7
CYHHZ	4	2009	20,960.6	1.2	0.2	1.3	2.8	4.1
CYHHZ	4	2010	21,584.5	1.2	0.2	1.3	2.7	4.0
CYHHZ	4	2011	17,261.2	1.2	0.2	1.3	2.7	4.0
CYHHZ	4	2012	8,835.7	1.2	0.2	1.3	2.5	3.9

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
CYHHZ	4	2013	26,441.4	1.2	0.1	1.3	2.3	3.6
AFAM	4	2009	1,234.5	1.5	0.4	1.9	0.8	2.7
AFAM	4	2010	1,065.7	1.6	0.4	1.9	0.8	2.8
AFAM	4	2011	1,272.7	1.4	0.3	1.6	0.6	2.3
AFAM	4	2012	1,532.6	1.3	0.2	1.6	0.6	2.2
AFAM	4	2013	2,415.7	1.2	0.1	1.3	0.6	1.9
HMSY	5	2009	1,489.5	1.8	0.5	2.3	0.6	2.9
HMSY	5	2010	3,765.6	1.8	0.4	2.2	0.6	2.8
HMSY	5	2011	1,860.0	1.8	0.4	2.3	0.6	2.9
HMSY	5	2012	2,535.2	1.7	0.4	2.1	0.6	2.7
HMSY	5	2013	3,278.4	1.5	0.3	1.9	0.6	2.4
PLUS	6	2009	1,425.9	1.5	0.3	1.8	0.7	2.5
PLUS	6	2010	1,352.0	1.4	0.3	1.7	0.6	2.3
PLUS	6	2011	1,500.1	1.6	0.4	2.0	0.6	2.6
PLUS	6	2012	1,547.1	1.5	0.3	1.8	0.7	2.5
PLUS	6	2013	1,767.5	1.6	0.4	2.0	0.8	2.8
ATSG	7	2009	1,696.8	1.3	0.3	1.6	2.1	3.7
ATSG	7	2010	2,125.0	1.9	0.5	2.3	1.1	3.4
ATSG	7	2011	1,658.9	1.7	0.4	2.1	1.2	3.3
ATSG	7	2012	867.4	1.7	0.4	2.1	1.0	3.1

Ticker	Sect.	Yr.	DV CEO Pay	IVs				
				HCE	SCE	ICE	CEE	VAIC
ATSG	7	2013	2,772.9	1.4	0.3	1.7	0.7	2.4
CHRW	7	2009	4,458.4	2.0	0.5	2.5	1.1	3.7
CHRW	7	2010	3,966.1	2.0	0.5	2.5	1.1	3.6
CHRW	7	2011	5,021.3	2.0	0.5	2.6	1.1	3.7
CHRW	7	2012	4,909.9	2.3	0.6	2.9	1.2	4.0
CHRW	7	2013	5,029.5	1.9	0.5	2.4	1.7	4.0
ODFL	7	2009	1,957.1	1.2	0.2	1.4	1.5	2.9
ODFL	7	2010	2,963.9	1.3	0.2	1.5	1.5	3.0
ODFL	7	2011	3,688.8	1.3	0.2	1.6	1.5	3.0
ODFL	7	2012	4,301.5	1.4	0.3	1.6	1.4	3.0
ODFL	7	2013	5,417.6	1.4	0.3	1.7	1.3	3.0

Note. Sect. (Sector Legend): 1 – Consumer Services, 2 – Energy, 3 – Finance, 4 – Health Care, 5 – Miscellaneous, 6 – Technology, 7 – Transportation. DV = Dependent Variable. IV = Independent Variables.

APPENDIX B. HISTOGRAMS OF STUDY VARIABLES

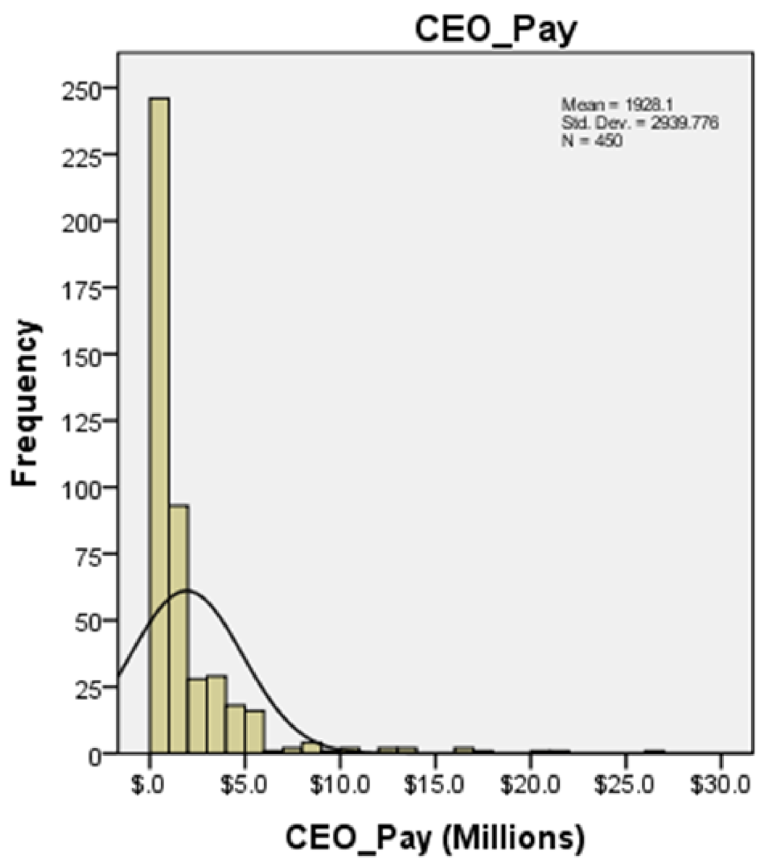

Figure B1. Histogram of Variable CEO_Pay

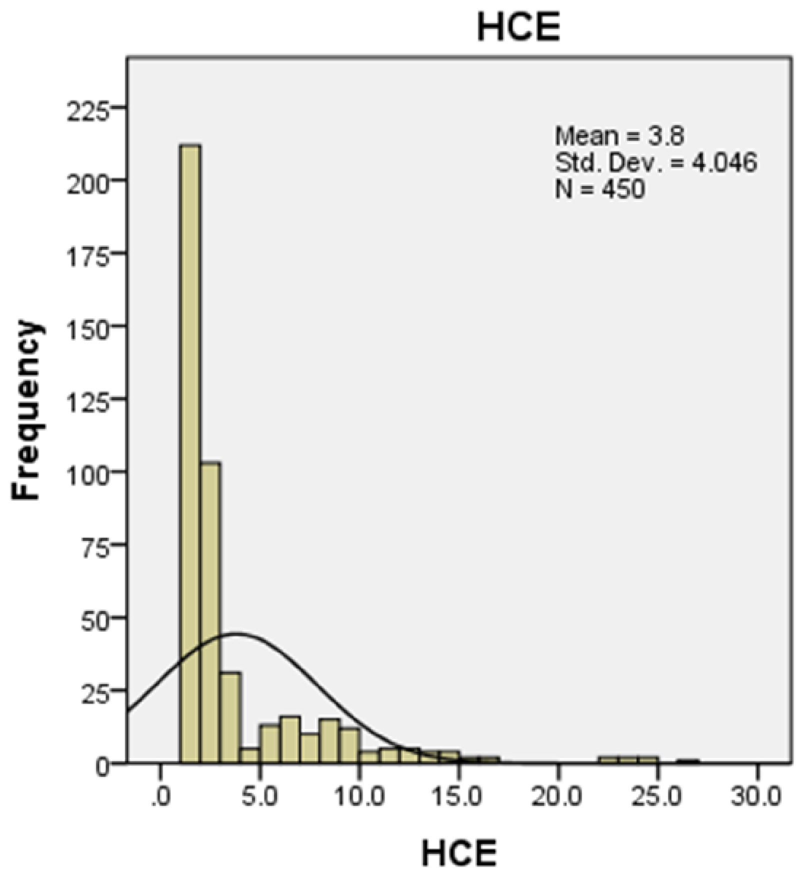

Figure B2. Histogram of Variable HCE

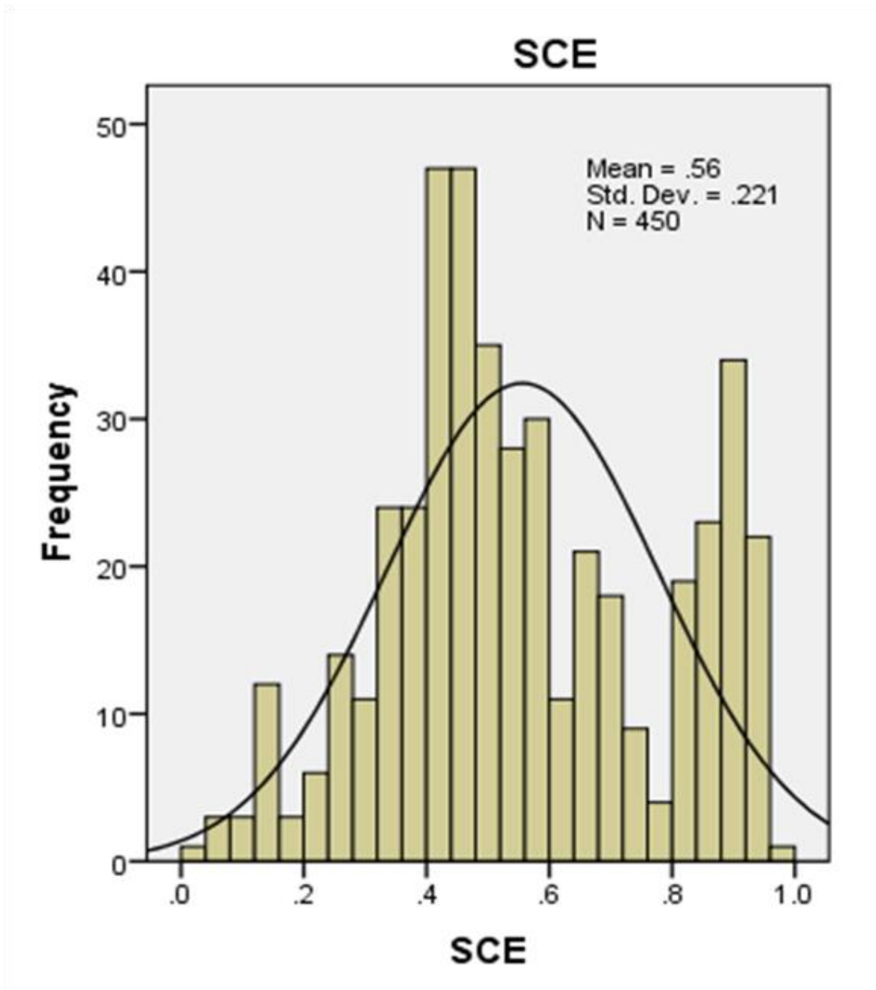

Figure B3. Histogram of Variable SCE

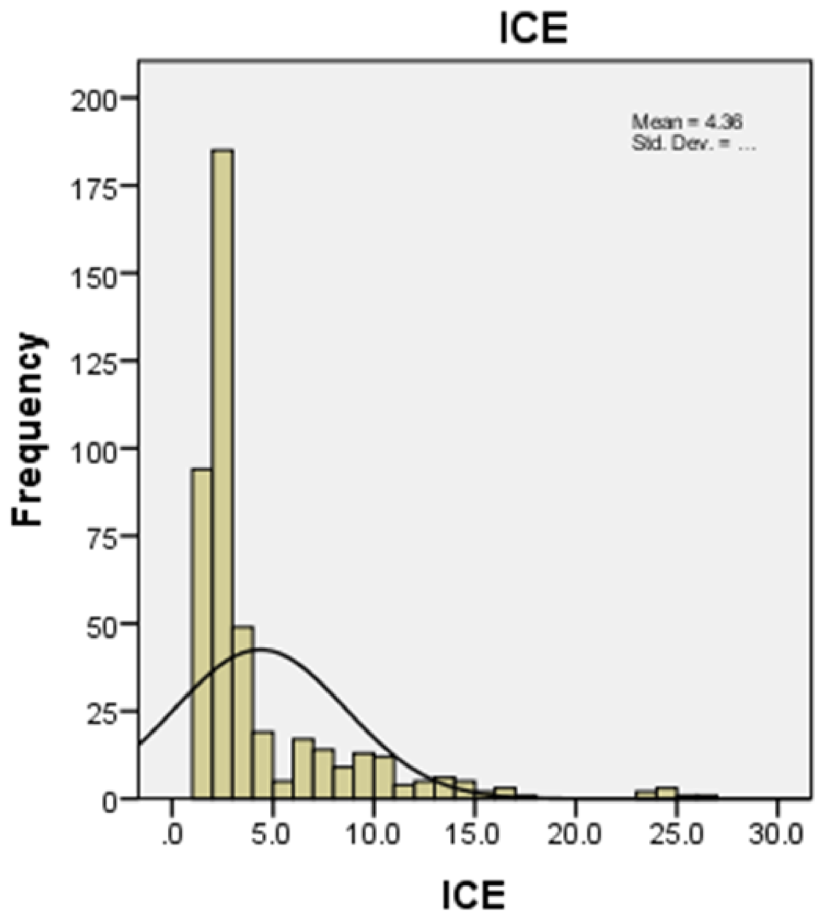

Figure B4. Histogram of Variable ICE

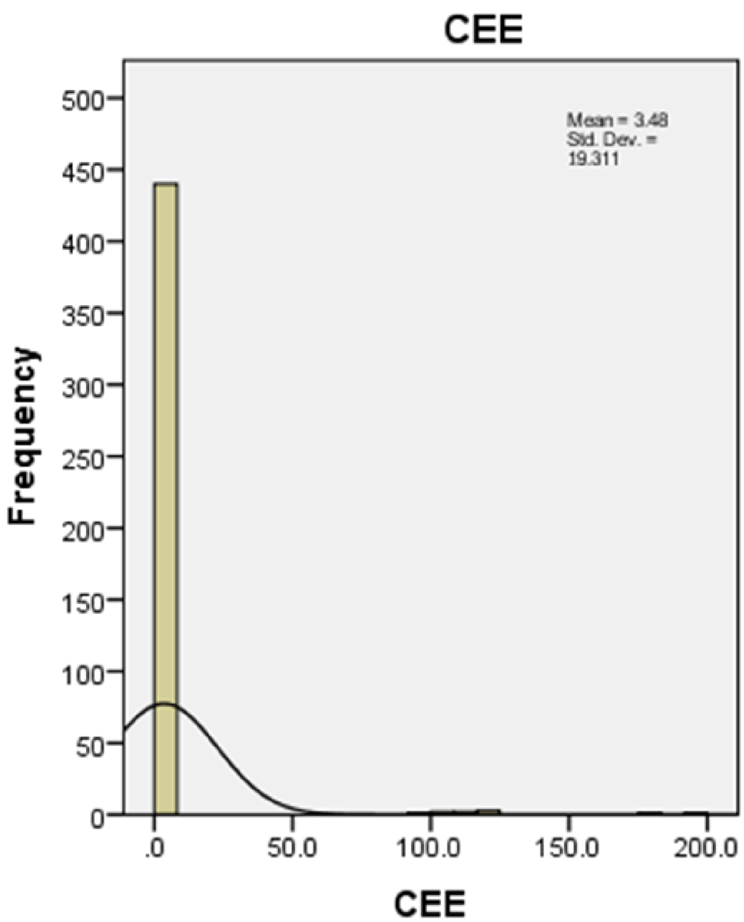

Figure B5. Histogram of Variable CEE

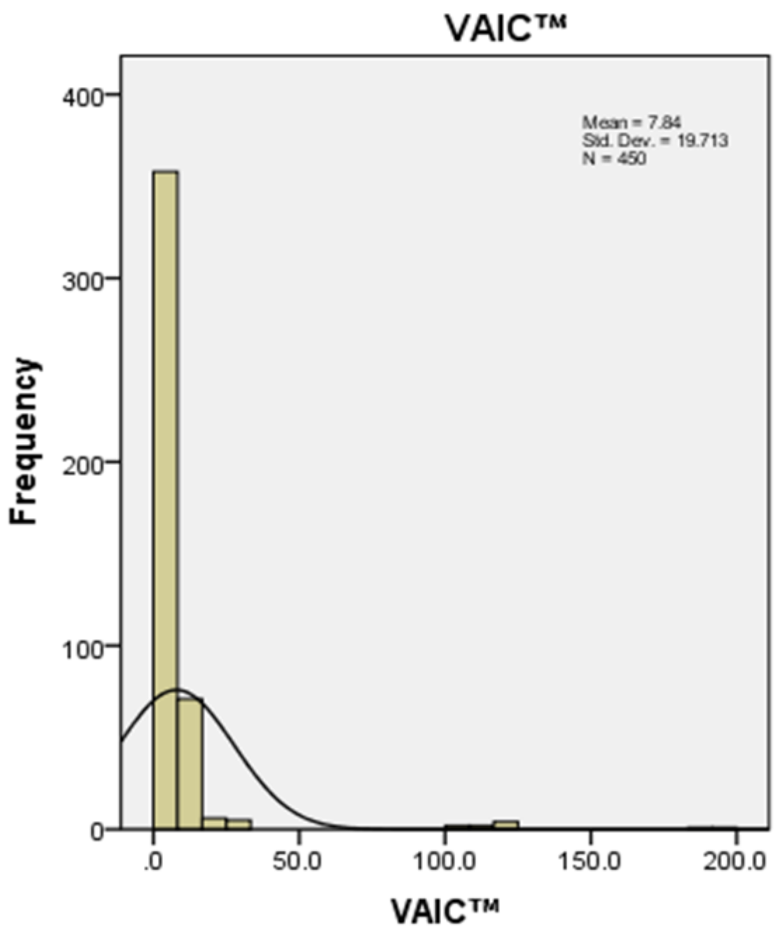

Figure B6. Histogram of Variable VAIC

APPENDIX C. P-P PLOTS OF STUDY VARIABLES

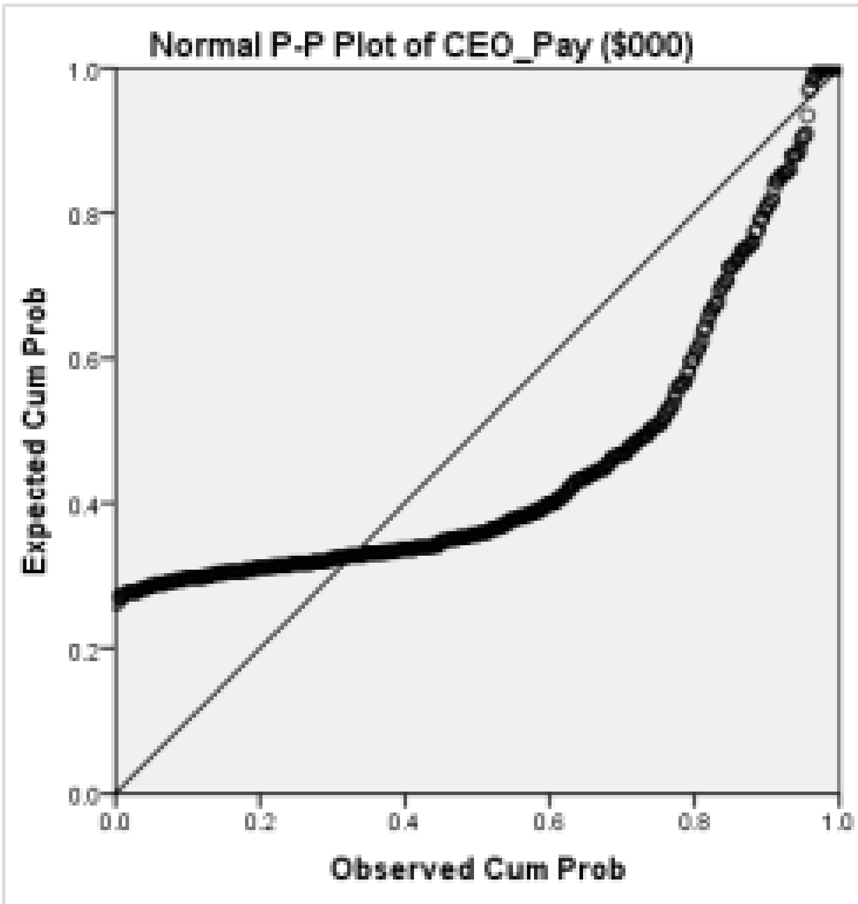

Figure C1. P-P Plot of Variable CEO_Pay

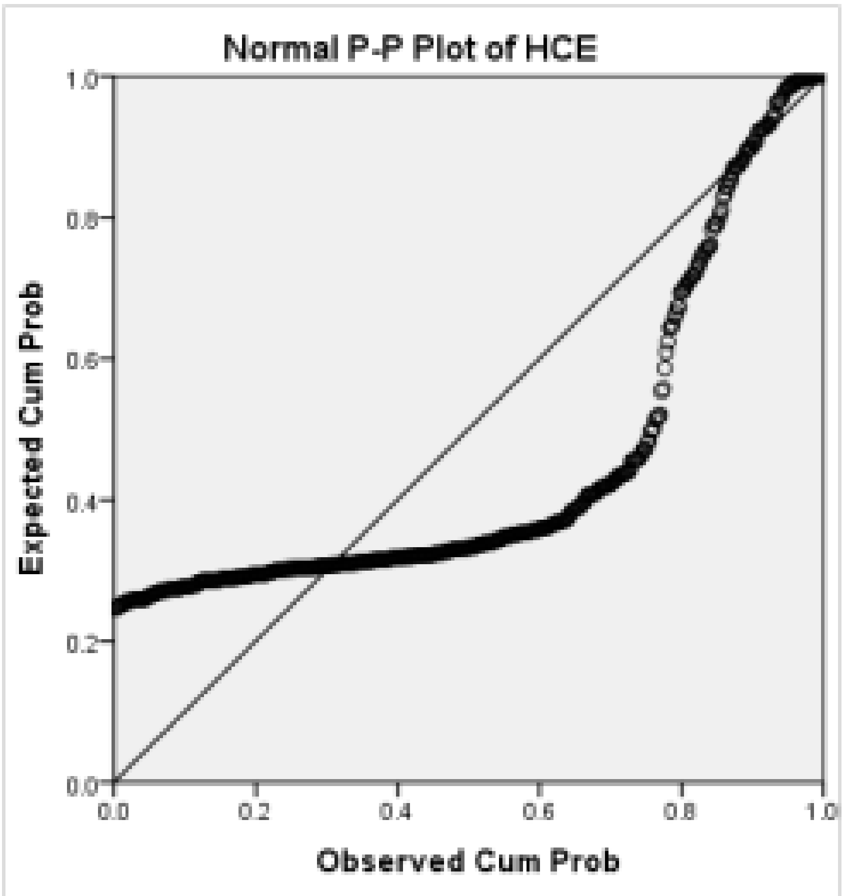

Figure C2. P-P Plot of Variable HCE

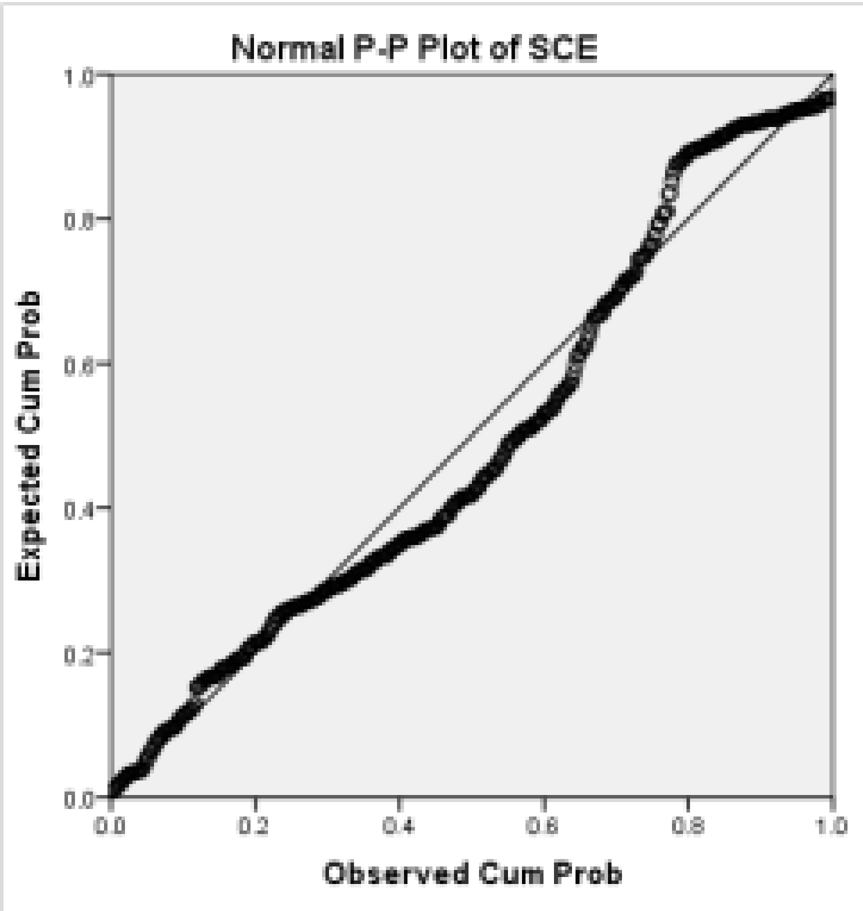

Figure C3. P-P Plot of Variable SCE

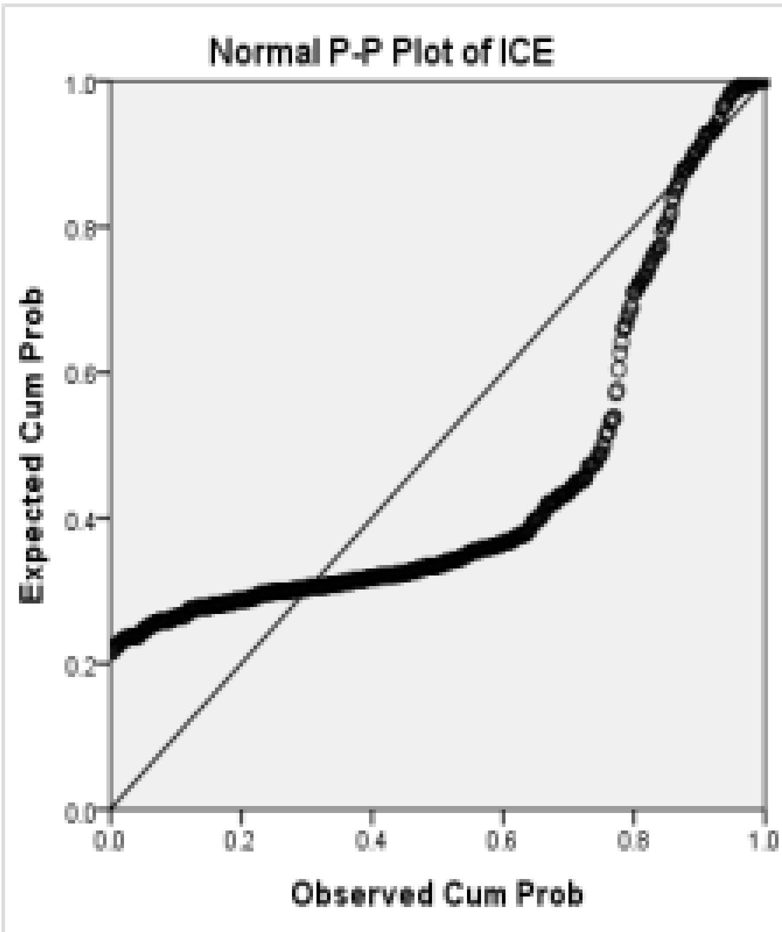

Figure C4. P-P Plot of Variable ICE

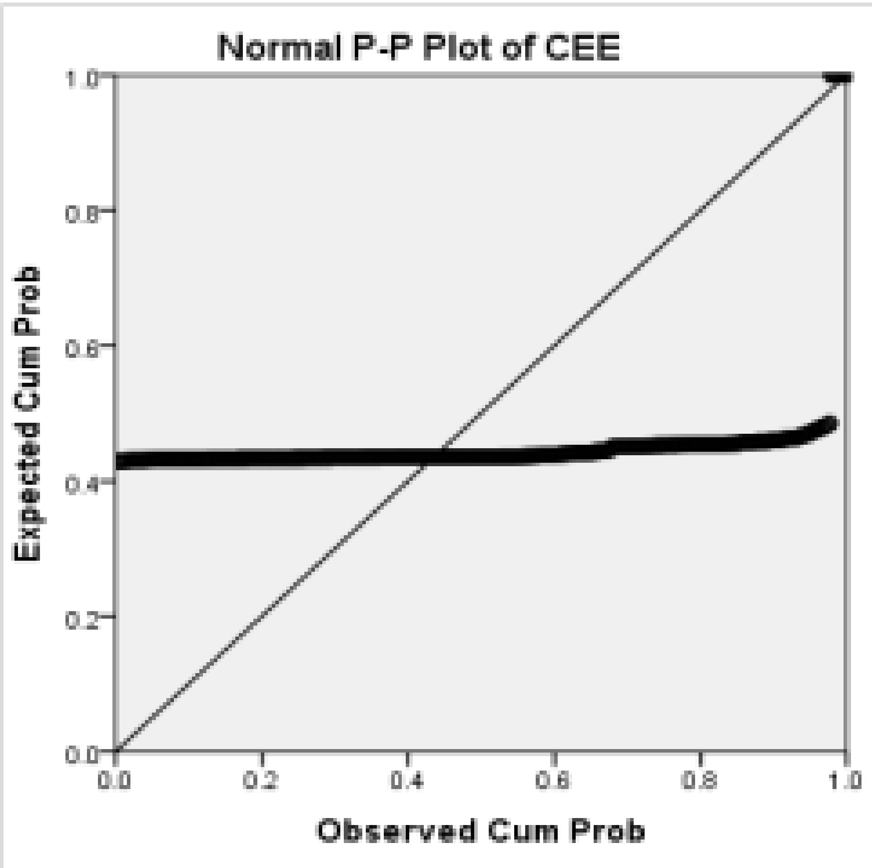

Figure C5. P-P Plot of Variable CEE

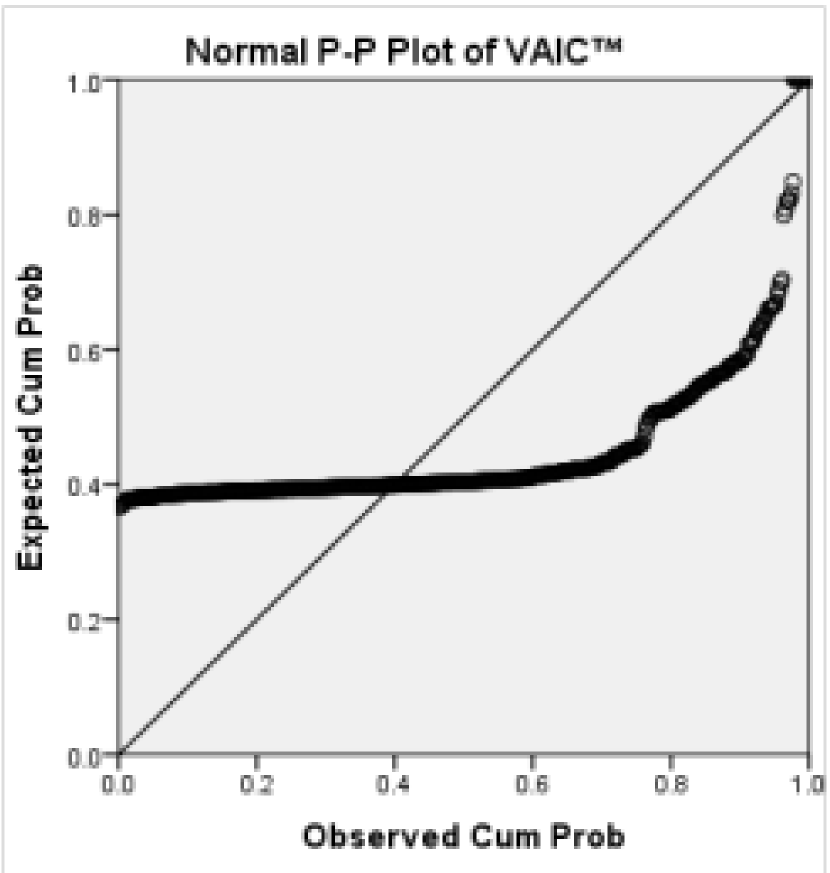

Figure C6. P-P Plot of Variable VAIC